Environmental Impact Analysis Process

DEPARTMENT OF THE INTERIOR

D R A F T

ENVIRONMENTAL STATEMENT

PROPOSED PUBLIC LAND WITHDRAWAL

NELLIS AIR FORCE BOMBING RANGE

NYE, CLARK, AND LINCOLN COUNTIES, NEVADA

PREPARED BY

BUREAU OF LAND MANAGEMENT

DEPARTMENT OF THE INTERIOR

AND

DEPARTMENT OF THE AIR FORCE

Air Force
Environmental Planning Division
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16 JUL 93

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DEPARTMENT OF THE INTERIOR

DRAFT
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State Director, Nevada State Office

Department of the Interior
Disclaimer

The environmental statement on the withdrawal of public land for use by the Department of the Air Force, has been cooperatively prepared by the Department of the Air Force, the Fish and Wildlife Service, and the Bureau of Land Management. Chapter X, as well as data and information relating to Air Force mission objectives and continued need for the facility, are included to meet DOD and DOE requirements. The Bureau of Land Management, and the Fish and Wildlife Service, of the Department of the Interior take no position in regard to this material.

SUMMARY

Draft (X) Final ( ) Environmental Statement
Department of the Interior, Bureau of Land Management

1. TYPE OF ACTION: Administrative ( ) Legislative (X)

2. BRIEF DESCRIPTION OF ACTION: The United States Air Force has applied for renewal of the 2,945,726 acre Nellis Air Force Range withdrawal, in Nevada, for a period of 15 years with an option to renew for an additional 10 years. Nellis AFR consists of two units - the North Range (1,959,158 acres) and the South Range (986,568 acres). The South Range includes 826,000 acres of the Desert National Wildlife Range, managed by U.S. Fish and Wildlife Service. Associated with the proposed withdrawal, the Air Force plans to increase the electronic warfare threat capability in order to meet the training requirements. Fifty-three additional electronic warfare sites would be added on the North Range.

   A maintenance personnel complex would be built to provide for equipment repair, housing and administration requirements. About 315 miles of existing roads on both ranges would be repaired to provide access to the existing targets and approximately 60 miles of new roads would be built to the proposed electronic warfare sites. If the withdrawal is granted, the Air Force would continue memorandums of understanding (MOU) with the Department of Interior (DOI) and other Federal/State agencies for the natural resources. Future utilization of the Range by the Department of Energy (DOE), specifically Pahute Mesa, Tonopah Test Range (TTR), and possibly Timber Mountain, must be authorized either by a withdrawal as specified in Section 204 of the Federal Land Policy Management Act of 1976 (Public Law 94-579) or MOU's.

3. SUMMARY OF ENVIRONMENTAL IMPACTS: Major impacts of the proposed action include:

   Continued restrictions on public use and access to about 2,120,000 acres of public lands and 826,000 acres of wildlife refuge. Among the probable uses foregone are recreation, livestock grazing, mineral exploration and development and wildlife management on the public lands; and recreation uses of the refuge lands.

   Low overflights and sonic booms detract from wilderness experience of a limited number of visitors at DNWR and create an annoyance to residents in the area.

   Past activities have resulted in surface disturbance on over 12,000 acres; an additional 7,600 acres will be disturbed by construction and operational activities. This will include soil disturbance or loss, vegetation removal and wildlife habitat loss.

Local, limited levels of fugitive dust and gaseous emissions will occur throughout the range. These will be temporary, in the areas of operations and construction. There will be continued release of radioactive gases and limited resuspension of radioactive contaminated particulates.

Range activities will use 31,000 gallons of water daily. Underground nuclear testing may result in contamination of groundwater systems in Pahute Mesa area.

Military and DOE nuclear test activities may result in more extensive contamination of the range.

An additional 550 military personnel and their dependents will be added to the area.

Destruction of 7,600 acres of habitat will result in some wildlife losses. Also, the effects of disturbance by low flying aircraft, sonic booms and electromagnetic radiation on wildlife are unknown.

4. ALTERNATIVES CONSIDERED:

a. No Action: This alternative would require relocating the air-to-air, air-to-ground and DOE operations to other locations. The operational cost to the Air Force would be about $390,000 per year for temporary duty assignments for the aircrews to train on other Ranges, $19.1 million per year for additional fuel requirements, and between one to two million dollars to relocate the target facilities and equipment. In addition, this alternative would not permit the return of the lands to public use due to existing contamination and difficulties with rehabilitation.

Fugitive dust and aircraft emissions would be reduced in the area. The potential impacts to the soil, watershed, vegetation, animals and wildlife habitat, and cultural resources would be avoided. If the Air Force also lost the overlying air space, then air-to-air activity would not be conducted, thus noise and sonic boom impacts over the DNWR would be eliminated. Socio-economic impacts would include population decreases of 217 at Beatty, 280 at Tonopah, and 3920 at Las Vegas. Loss of income and expenditures would be about $43.2 million collectively to Beatty, Tonopah and Las Vegas. Unemployment would increase by 112, 80, and 1,184 at Beatty, Tonopah, and Las Vegas, respectively.

b. Establish a New Range in Another Area: This alternative would require the Air Force to find land space comparable in size to the Nellis AF Range. The area would need to have a comparable number of visual flight rule days, be free of commercial traffic routes, and unpopulated. If the new area is not within commuting distance for the aircraft, or close to a military installation capable of handling the air traffic, then a new base would have to be built.

The environmental impact on the Nellis AF Range would be as described in the no action alternative, except noise and sonic boom impacts over the South Range and Desert National Wildlife Range would also be removed. Impacts of closing Nellis AFB would be a direct loss of 24,855 military and civilian personnel and their dependents. The direct and indirect population decrease would reduce Clark County's population by 13 percent. A dollar flow of 48.5 million would be lost to the Las Vegas economy per year.

'Reduction in Size" and "Joint Use," two other possible alternatives, were examined but determined to be not viable. A reduced withdrawal would not serve the mission needs of the Air Force. Joint use is not viewed as an alternative but any such proposals will be carefully considered by the Air Force and accommodated to the extent compatible with their mission.

5. COMMENTS HAVE BEEN REQUESTED FROM THE FOLLOWING:

a. Federal:

Department of the Interior

- Fish and Wildlife Service
- Geological Survey
- Bureau of Mines
- National Park Service
- Bureau of Reclamation
- Heritage Conservation and Recreation Service
- Bureau of Indian Affairs

Department of Agriculture

- Forest Service
- Soil Conservation Service

Department of Housing and Urban Development

Environmental Protection Agency

Department of Transportation

- Federal Aviation Administration

Department of Health, Education, and Welfare

Department of Energy

Advisory Council on Historic Preservation

b. State of Nevada:
   Clearinghouse
   Bureau of Mines
   Historic Preservation Office
   Fish and Game

c. Counties:
   Clark
   Nye
   Lincoln

d. Municipal:
   City of Las Vegas
   City of North Las Vegas
   Town of Tonopah
   Town of Beatty

e. Private and Public Interest Groups - See Chapter IX for the complete list

DATE DRAFT STATEMENT MADE AVAILABLE TO EPA AND THE PUBLIC:

27 JUL 1979

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CHAPTER I

DESCRIPTION OF THE PROPOSED ACTION CONTINUED WITHDRAWAL OF THE NELLIS AIR FORCE RANGE

PROPOSED ACTION

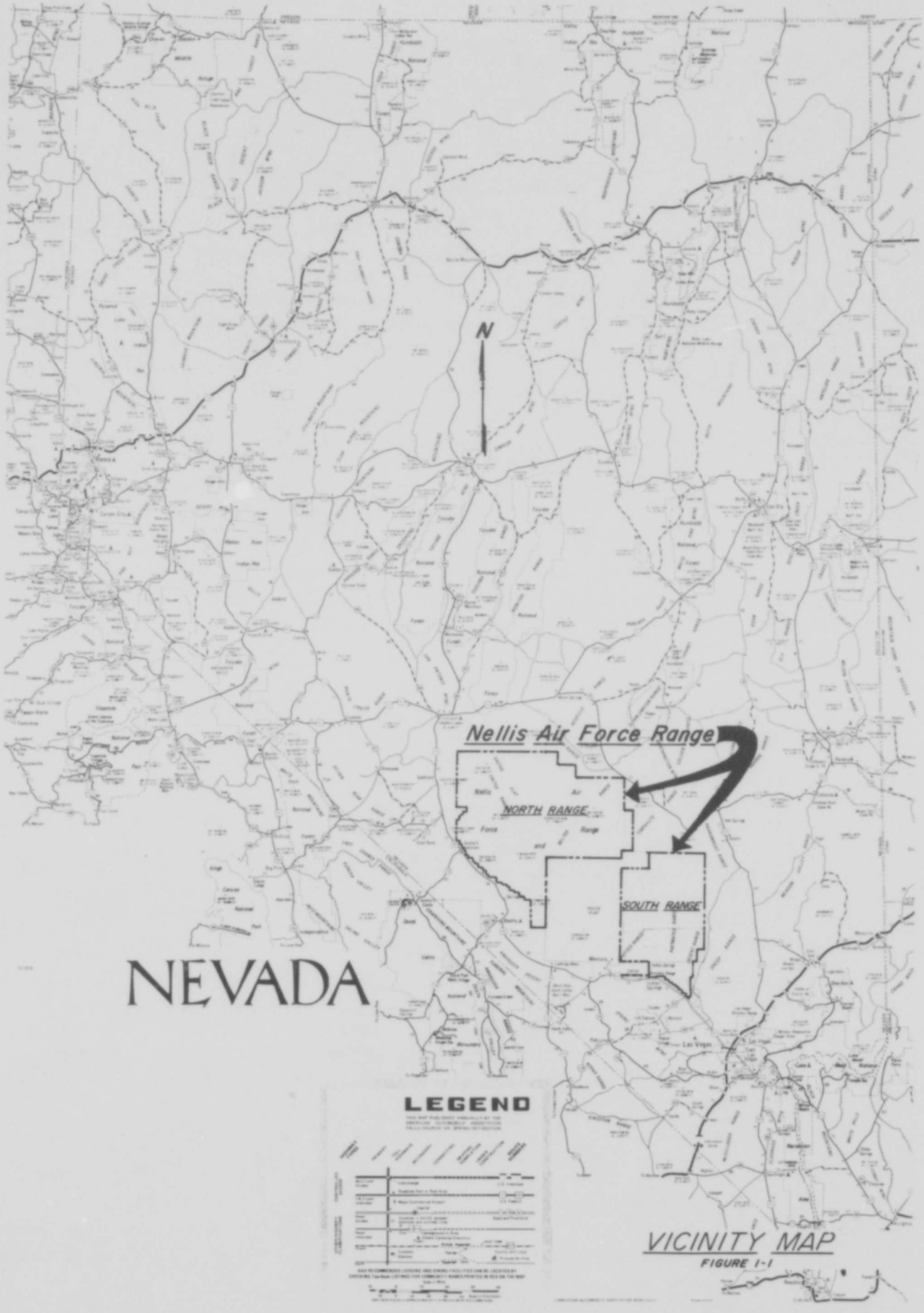
The United States Air Force proposes to withdraw 2,945,726 acres, more or less, of public land in the State of Nevada from settlement, sale, location, or entry under the public land laws of the United States, including the mining and mineral leasing laws and disposal of materials under the Act of July 31, 1947 (30 USC 6701, et. Seq.) for continued use as the Nellis Air Force Range. This withdrawal is proposed pursuant to the Act of 1958, Public Law 85-337, known as The Engle Act and Public Law 94-579, The Federal Land Policy and Management Act of 1976 (FLPMA).

Appendix A provides the legal description of the land proposed for withdrawal. Included in the proposal are some minor adjustments to the presently established boundaries around the southern extension of the DNWR to facilitate Fish and Wildlife Service (FWS) management objectives for the DNWR. The boundary adjustments would reduce the current withdrawals under Executive Order (E.O.) 9019 and Public Law (P.L.) 87-310 by approximately 5,600 acres. The proposed renewal of withdrawal will be for a period of 15 years with an option to renew for ten additional years. The proposal does not include public land which has been withdrawn on Nellis AFB, Lake Mead Base, or the Nellis Air Force Gunnery Range, because these areas are not part of the Range.

The Nellis AF Range is geographically located northwest of Las Vegas, NV., in Clark, Lincoln, and Nye Counties. It is bordered by U.S. highways 95 on the south and west, 6 on the north side, 25, 91, and 93 on the east side. (See figure 1-1.)

The Nellis AF Range is the most sophisticated range in the Air Force inventory. Although some of the capability or training is duplicated at other Air Force ranges, these ranges do not have the land space that is required for changing training scenarios. Nellis AF Range has the land necessary to prevent stereotype training. The climate of southern Nevada is most condusive to year around range operations.

Purpose of the proposed withdrawal is to continue providing a suitable range complex to conduct training, testing, and weapons evaluation operations for the Air Force, Army, Marine Corps, National Guard, Navy, Reserve Forces, DOE, and other Federal agencies with defense related programs that require uninhabited land to prevent compromising safety and national security.



VICINITY MAP

FIGURE 1-1

HISTORY

President F.D. Roosevelt established the Desert Game Range in 1936 by Executive Order No. 7373 for the protection and preservation of the resident populations desert bighorn sheep. On October 29, 1940, President Roosevelt by E.O. 8578 established the Las Vegas Bombing and Gunnery Range (now called Nellis AF Range). Since this date, the range has been the subject of two additional E.O.'s, nine Public Land Orders, two Memorandums of Understanding (MOU's) and one Public Law. Withdrawn land of Indian Springs AAF dates back to November 12, 1942 when PLO-58 designated 25,294 acres of public land for military use. (Subsequently, more definitive surveys show the actual acreage to be 26,622. Only 1,974 acres of PLO-58 was designated as Indian Springs AAF land. The balance was included in the Nellis AF Range Complex.) Since that time three other PLOs were enacted to provide a total of 2,082 acres of public land for Indian Springs AAF.

Table 1-1 provides a brief chronological history of the various actions involving the real estate of the Nellis AF Range and Indian Springs AAF.

TABLE 1-1

NELLIS AIR FORCE RANGEwCOMPLEXw

TYPE OF DOCUMENT	DATE	ACTION	ACREAGE AS SHOWN ON DOCUMENT	ACREAGE COMPILED FROM LAND PLAT MAPS*
Executive Order 7373	May 20, 1936	Established DNWR	2,200,000.00	
Executive Order 8578	Oct 29, 1940	Reserved	3,560,000.00	3,560,000.00
Executive Order 9019	Jan 12, 1942	Deleted (E.O. 8578)	942,700.00	937,730.12
		Added	483,840.00	470,836.00
Executive Order 9086	Mar 4, 1942	Added	184,371.28	184,371.28
Public Land Order 58	Nov 12, 1942	Added	27,006.09	26,621.79
Public Land Order 89	Feb 10, 1943	Added	66.60	30.60
Public Land Order 168	Sep 17, 1943	Added	37.40	37.40
Public Land Order 712	Apr 16, 1951	Added	394,799.37	94,266.93
Public Land Order 762	Nov 9, 1951	Corrected Description Only (PLO-712)		
Public Land Order 805	Feb 12, 1952	Deleted for DOE (E.O. 8578)	435,000.00	415,418.44
Public Land Order 1382	Jan 16, 1957	Deleted (E.O. 8578)	155,645.00	155,645.00
		Deleted (E.O. 8578)	38,400.00	38 400.00
Public Land Order 1920	Jul 22, 1959	Delected (PLO-712)	5,120.00	4,749.00
Public Land Order 2568	Dec 19, 1961	Deleted for DOE (E.O. 8578)	318,000.00	318,000.00
Memorandum of understanding	Jan 20, 1961	Added	54,680.66	
Public Law 87-310	26, 1961	Added	81,480.00	81,480.00
Public Land Order 2613	Feb 16, 1962	Extended PLOs 8578, 9019, 9086, 58, 89, and 168	-	-
Public Land Order 4079	Aug 26, 1966***	Reserved	1,588,460.00	
Public Land Order 4986	Dec 24, 1970	Added	3,631.19	3,631.19
Public Land Order 5300	Nov 20, 1972	Added	40.00	40.00
Memorandum of Understanding	Mar 11, 1976	Deleted	54,680.00	-
Proposed Withdrawal Renewal	-	Delete (P.L. 87-310 and E.O. 9019)	-	-
		TOTAL**	2,940,406.60	2,945,725.57

*Acreages shown are as compiled from the latest master title plats or file in the Nevada State Office, Reno, NV.

**Total does not include E.O. 7373 or PLO 4079 which are related to NWR.

***Changed name of Desert Game Range to Desert National Wildlife Range and reduced the size to 1,500,000 acres.

From the initial date of the Nellis AF Range until 1959, co-use was granted to cattlemen and miners. Between 1959 and 1965, under the authority of the Air Force Real Estate Directive 592.2, dated September 21, 1954, a total of $708,000 was expended in the extenguishment of all grazing and mineral rights within the Range except for three patented mining claims that are still under lease [1].

In order to provide for the protection of bighorn sheep and wild horses, the Air Force, FWS, and BLM entered into MOUs on June 1951 and June 1962. Those MOUs have been updated and amended as necessary to assure proper management by the respective agencies. More detailed discussion on these MOUs will be provided in the Interrelationship section (p. 1-32) of this chapter.

Public Land Orders 805, 1382, and 2568 transferred portions of the Nellis AF Range to the Atomic Energy Commission (now DOE) for the development of the Nevada Test Site (NTS) located between the north and south portion of the Nellis AF Ranges. The Air Force through an MOU permitted 369,280 acres in November, 1956 to DOE for TTR utilization as a fully instrumented ballistic test range. This area is referred to as the Tonopah Test Range (TTR). This permit was renewed in April, 1969 for a period of ten years and was made subject to joint use of the land.

"A training camp was erected in 1942 at Indian Springs, Nevada, to facilitate air-to-air firing training for aircrews. Later in 1942, the camp was designated as Indian Springs Army Air Field. The airfield has been transferred to many different Air Force Commands, but has now been a part of the Tactical Air Command since April 1, 1961 and was redesignated as Indian Springs Auxiliary Air Field (AAF) on April 1, 1964 [7]." Indian Springs AAF provides support and maintenance for the Nellis AF Range and thus is considered part of the total range complex.

"In the past, the capability of the United States Air Force to accomplish its wartime mission has often been dependent on weapon systems that have never been tested and evaluated in an operational environment of the type expected when required to engage the enemy. Similarly, the aircrews that utilize these weapon systems have not, in many cases, received adequate training for their employment. This condition has historically cased a high loss rate of manpower and equipment during the early days of a war. A study made of World War II and the Korean War revealed that the first ten combat missions flown by our aircrews were the most hazardous. Results of this study were substantiated by our experiences in the Vietnam War" [1]. To alleviate this condition, a capability must be provided to operationally test and evaluate new weapon systems, and permit aircrew combat training, under conditions that simulate, as nearly as possible, an actual enemy scenario. This mission has been assigned to the Air Force's Tactical Fighter Weapons Center (TFWC) located at Nellis Air Force Base in Nevada. The TFWC is the command organization for Nellis AFB and functions directly under the Commander, Tactical Air Command. Subordinate units of the TFWC which are responsible for conducting the TFWC range operations are the 57th Tactical Training Wing (TTW), the 440th Tactical Fighter Training Group (TFTG), and the TFWC Range Group.

Range maintenance and support for the Department of Energy (DOE), formerly Energy Research and Development Administration (ERDA), is provided by Indian Springs Auxiliary Air Field (AAF). The 57th Combat Support Squadron (CSS) is the command of the 57th TTW at Nellis AFB.

In order to provide a superior defense in both conventional and nuclear capability, the Air Force, as the action agency for DOD is seeking continued use of these public lands for use as the Nellis AF Range.

PROCEDURES FOR WITHDRAWAL

Public Land Order 2613, dated February 16, 1962 extended PLOs 8578, 9019, 9086, 58, 89, and 168 for a 15 year period and thus expired on February 15, 1977. Withdrawal under P.L. 87-310 was also a 15 year withdrawal which expired on September 25, 1976. The remainder of the PLOs (712, 4968, and 5300) have no termination dates but are subject to review by the Bureau of Land Management within 15 years to determine if the Air Force still has a valid requirement for the land. Therefore, environmental documentation is being provided on the entire range complex for consideration under the Act of 1958 (PL 85-337), the Federal Land Policy and Management Ace (FLPMA) of 1976 (PL 94-579), and the National Environmental Policy Act of 1969 as ammended (PL 91-190). (See Appendix D).

ENGLE ACT CONSIDERATIONS

Passage of the Act of 1958 (PL 85-337) shifted the responsibility for defense-related withdrawals from the Executive Branch of Government back to Congress.

The Engle Act requires congressional legislation for withdrawals in excess of 5,000 acres. Withdrawals of less than 5,000 acres will continue to be made by the Executive Branch by enacting PLOs.

FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (FLPMA) CONSIDERATIONS

Passage of FLPMA provided procedures for withdrawal of public land by the Secretary of the Interior. The Act established new procedures for executing land withdrawals for public lands not under the DOD jurisdiction and established a segregative period of two years, allowing the Secretary of the Interior adequate time to evaluate and process the application for withdrawal. Since the lands proposed for withdrawal for the Nellis AF Range are under the administrative jurisdiction of BLM and FWS, FLPMA procedures are being followed to process the land withdrawal. The major legislative difference between application of the FLPMA and the Engle Act is that under FLPMA, Congress must act to disapprove the proposed withdrawal. In the absence of disapproval, the withdrawal takes effect. Under the Engle Act, Congress must approve the withdrawal giving use of the land to the DOD. Because the Department of Denfense is using BLM and FWS lands, both Acts must be considered by the Secretary of the Interior and Defense before submittal to Congress.

NATIONAL ENVIRONMENTAL POLICY ACT CONSIDERATIONS

The National Environmental Policy Act (NEPA) of 1969 (PL 91-190) insures that the environmental impacts of continued withdrawal of land for Nellis AF Range will be addressed. Additionally, NEPA requirements support FLPMA requirements in that Congress must be provided documentation of the environmental and economic impacts; a clear explanation of the proposed use of the land; evaluation of the natural resources; possible alternatives; and, consultation with other Federal and State and public interest groups agencies concerning the withdrawal.

As discussed previously, several Executive and Public Land Orders were granted to the Air Force in establishing the present range acreage. This current withdrawal action would consolidate the land under one withdrawal legislative action.

The Air Force will comply with all requirements contained in such legislation as Clean Air, Clean Water, Wilderness, Endangered Species, Historic Preservation Acts, etc.

EXISTING OPERATIONS AND SITE CONDITIONS

AIR FORCE UTILIZATION OF THE NELLIS AF RANGE

In order to assure proper training of aircrews and operational evaluation of weapons system capability, the TFWC has established an array of subranges with target complexes which encompass simple air-to-ground supervised (manned) ranges to the more complicated tactical air-to-ground and air-to-air ranges. Tables 1-2A and 1-2B list the subranges by South Range (DNWR, FWS) and North Range (BLM) respectively, their major use, types of target array, ordnance types authorized, total acreage, and amount of acreage disturbed from bombing and construction activities.

Figure 1-2 shows the subrange locations within the Range. Bombing circles, triangles, simulated runways, and airfields are constructed by blading with a bulldozer to scribe the target on the land. Convoys, industrial complexes, and aircraft targets are constructed with old vehicles, 55 gallon drums, and wood constructed aircraft, respectively. Occasionally, old aircraft are used when available through salvage supply channels. Intercontinental Ballistic Missiles (ICBM) targets are constructed by stacking 55 gallon drums and painting them silver to simulate an ICBM site. Anti-aircraft artillery (AA) and Surface to Air Missile (SAM) targets are simulated by using old armament vehicles equipped with gun barrels and wood constructed missiles, respectively.

Electronic warfare sites are mobile vans with antenna mounts. Electrical power for the units is provided by diesel generators. Electronic warfare equipment is utilized in subrange 76 at Tolicha Peak and on the Tonopah Test Range. This equipment provides an electronic environment for aircrews

that simulates an environment typical of that expected in a real enemy target area. The environment includes electronic emissions from simulated enemy surface-to-air missile, radar, anti-aircraft artillery radars, and early-warning and ground-based jamming-type radar units.

Like the enemy systems, the mobile electronic warfare simulators are periodically relocated to prepared sites on the Range in order to change scenarios and prevent sterotyped training.

The current and projected Nellis AF Range utilization, by aircraft sorties (one take-off and landing equals one sortie), are shown in Table 1-3. The 57 TTW at Nellis has an assortment of aircraft that are utilized to support various TFWC missions. They currently possess 104 aircraft composed of F-4s, F-5s, F-111s, A-10, A-15s and T-38s. "The 57th TTW flies an average of 15,000 sorties per year. About 30 percent of these utilize the Nellis AF Range, of which approximately 1,400 are flown in support of the Red Flag Exercise. An additional 5,700 transient aircraft (excluding Red Flag) pass through Nellis annually. Very few of the transient aircraft utilize the Nellis AF Range [1]." The 474th Tactical Fighter Wing (TFW) is a tenant organization at Nellis AFB and presently operate F-4 type aircraft.

TABLE 1-2A

SOUTH RANGE

SUB RANGE	MAJOR USE	FACILITIES	ORDNANCE	TOTAL ACREAGE	IMPACTED* ACREAGE
61	Tactical Firepower Demonstration Range	Assault type runway with parallel taxiways. Targets are built as required for particular demonstrations. Spectator area	Live ordnance	4,882	15
62	Unmanned Tactical Range	Bladed circle targets, simulated supply area, anti-aircraft artillery site, simulated missile site, vehicle convoy, SAM site, and ICBM site	Live ordnance allowed on specified targets	342,080	968
63	Instrumented Manned Range, used for testing and evaluating new weapons systems	Bladed circle, triangle, and rectangle targets range equipped with radar, cameras, and TV systems to score bomb and rocket deliveries	Live ordnance allowed on specified targets	87,458	69
64	Unmanned Tactical Range	Convoy, tanks, simulated artillery, simulated supply depot and railroad, special force camp, and an airfield with simulated aircraft	Live ordnance allowed	498,767	215

TABLE 1-2A (CONT'D)

SUB RANGE	MAJOR USE	FACILITIES	ORDNANCE	TOTAL ACREAGE	IMPACTED* ACREAGE
65	Instrumented Manned Range	Bladed bomb circles, strafe targets, skip bomb target, scorable tactical targets, and radar bombing target. Scoring systems include visual, acoustiscore, and theodolite	Inert ordnance	53,381	65
Air-to-Air	Aircraft gunnery firing at towed targets (darts)	Conducted above subranges 62 and 64	Live ordnance		
ACMI	Air-to-Air Combat Training	Conducted above subranges 62, 63, 64 and 65	None		
Roads		190 Miles			323
			TOTAL SOUTH RANGE ACREAGE	986,568	1,655

*DATA COMPILED FROM AERIAL PHOTOGRAPHS

TABLE 1-2B

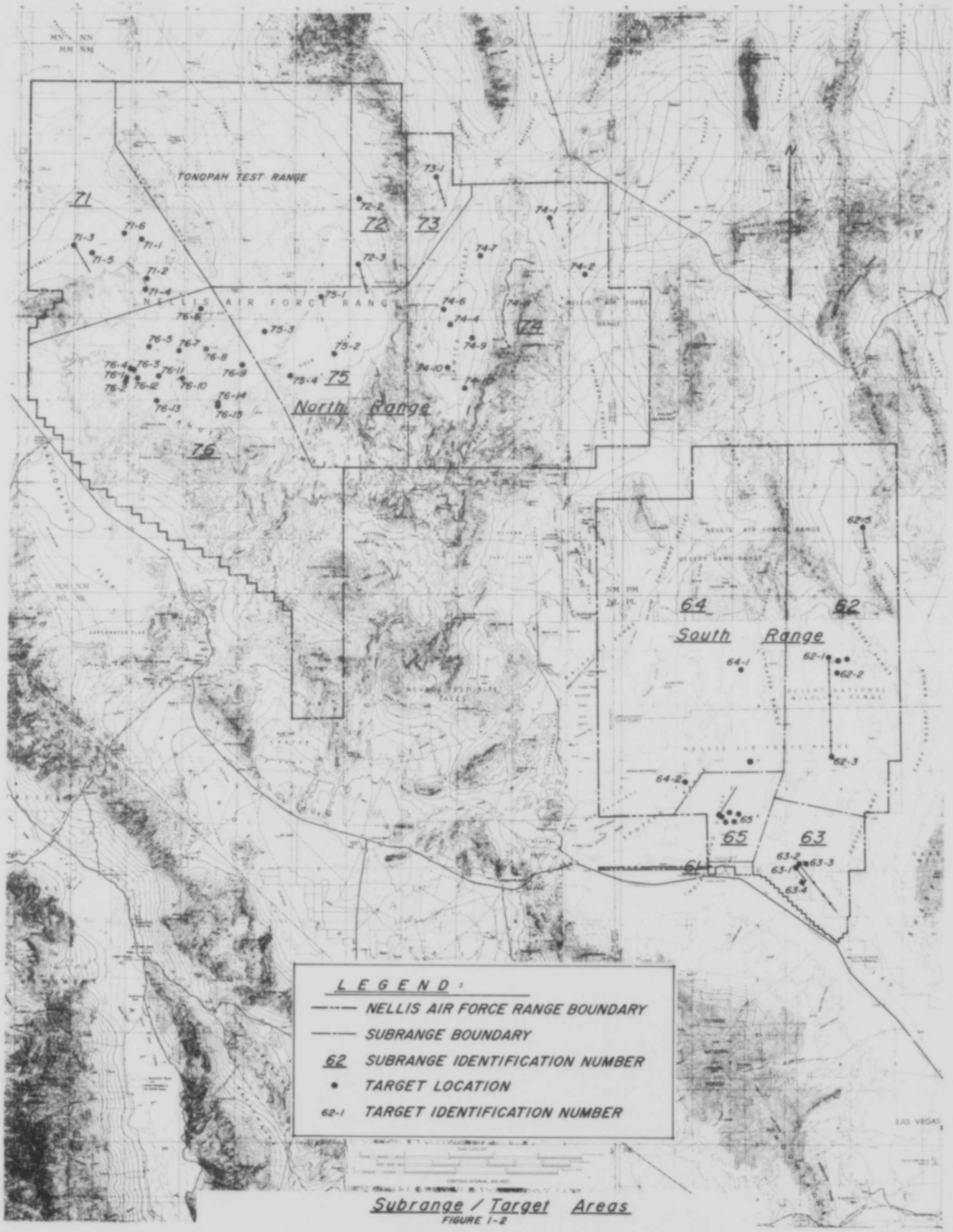
NORTH RANGE

SUB RANGE	MAJOR USE	FACILITIES	ORDNANCE	TOTAL ACREAGE	IMPACTED* ACREAGE
71	Radar Bombing	6 targets consisting of concentric circles and 2 targets of panel array	Inert ordnance except for flares, rockets and 20-30 MM ammunition	228,289	67
72	Radar Bombing	Simulated missile site and a concentric circle target including radar reflectors	Inert ordnance except for flares, rockets and 20-30 MM ammunition	92,540	251
73	Radar Bombing	Concentric circle target and three radar reflectors	Inert ordnance except for flares, rockets and 20-30 MM ammunition	49,772	76
74	Visual Bombing and Gunnery Practice	Concentric circle targets enclosed by triangles, vehicles, missile site and simulated radar antennas, convoy, airfield with aircraft, and simulated industrial complex	Inert ordnance except for flares, rockets and 20-30 MM ammunition Live ordnance used on simulated airfield	484,874	390
75	Visual Bombing and Gunnery Practice	Simulated airfield, missile sites and a convoy with simulated bridge	Live ordnance	209,582	2,054
76	Visual Bombing	Simulated industrial complex, marshaling yard and railroad depot, missile sites, convoys, airfields, forward edge of battle area (FEBA) including 180 vehicles, and electronic warefare equipment	Live ordnance	524,821	3,342

TABLE 1-2B (CONT'D)

SUB RANGE	MAJOR USE	FACILITIES	ORDNANCE	TOTAL ACREAGE	IMPACTED* ACREAGE
Air Intercept Missile Range	Missile Intercept Practice	Located above subranges 71 and 76	Inert ordnance except for flares, rockets and 20-30 MM ammunition		
Roads		727 Miles (excluding Tonopah Test Range)			1,234
Tonopah Test Range	(SEE TABLE 1-4)	(SEE TABLE 1-5)		369,280	1,164
Pahute MESA	Underground Nuclear Testing	-	-	(Acreage Figure included in Sub-Ranges 74, 75, and 76)	1,955
			TOTAL NORTH RANGE	1,959,158	10,533
			GRAND TOTAL	2,945,726	12,188

*DATA COMPILED FROM AERIAL PHOTOGRAPHS



Subrange / Target Areas

FIGURE 1-2

In order to fulfill the TFWC mission of aircrew training and equipment evaluations, many training exercises and test evaluations are conducted on various portions of the Range. The larger exercises and test evaluations such as Red Flag, Alpha Strike, and Air Combat Evaluation/Air Intercept Missile Evaluation (ACEVAL/AIMVAL), are summarized below for the reader's understanding of the range utilization and to establish the point of departure for future range development requirements.

Red Flag exercises are scenarios of real war conditions, in which aircraft are confronted with enemy electronic warfare radar, various types of missile and anti-aircraft artillery, and aggressor aircraft threats. To stage the offensive, various types of aircraft support the primary deployed units. A representative Red Flag mission is depicted in Figure 1-3.

The strike force (Blue Force) is assigned a specific target in the North Range. The force consisting of 12-16 aircraft configured with bombs to destroy the target, and 4-8 aircraft configured to protect the bombers from enemy aircraft, departs from Nellis. Shortly after departure, the force rendezvous with tanker aircraft to perform air refueling as would be required in a real war. After refueling, the force is joined by 4 to 8 Wild Weasel aircraft which have the mission of protecting the force from the enemy threat radar nets.

Once in the range area the strike force is vulnerable to attack by aggressor aircraft who attempt to disrupt or delay the strike force and prevent a successful attack on the target. The strike force must penetrate an enemy threat radar net equipped with an extensive array of SAM and AAA radars, which are positioned to protect target complex areas. Some support aircraft are configured with electronic warfare equipment used to assist the strike force penetration by countering the enemy radar threats both enroute and in the immediate target area.

The Army, Navy, Air National Guard, Air Force Reserve, Pacific Air Force, U.S. Air Forces in Europe, Strategic Air Command, Military Airlift Command and Air Defense Command also participate in Red Flag operations in order to evaluate their support functions as would be required in a real war. Integration of a total force strike also provides the forces a valid review of their equipment capability and helps develop design criteria for new equipment.

The Navy utilizes the Nellis AF Range through a program called Alpha Strike, which was established to provide combat training for naval tactical fighter units assigned to aircraft carriers. Each strike is a large-scale tactical strike operations consisting of 30-35 aircraft. Alpha Strikes are accomplished during those periods when fighter units are operating from nearby Naval Air Stations while their carriers are in port.

TABLE 1-3

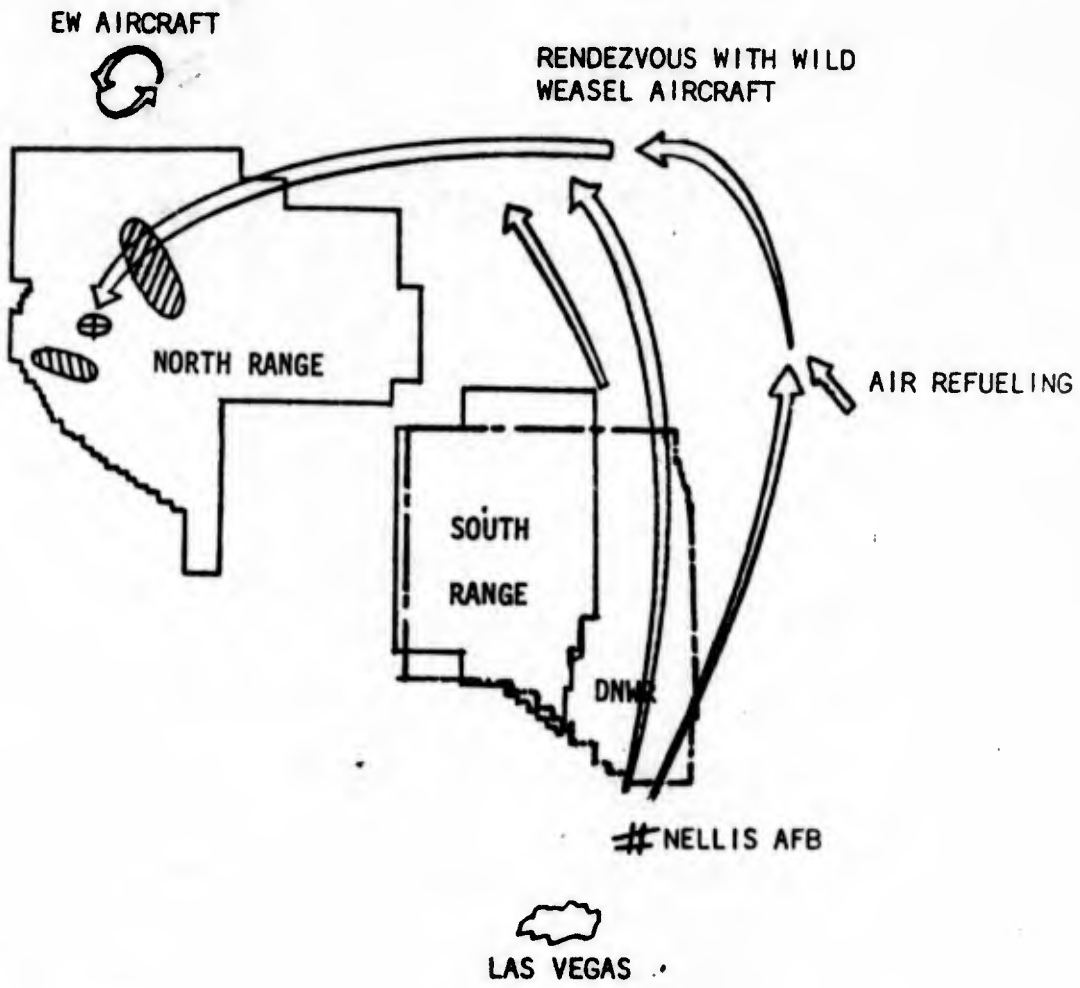
NELLIS AF RANGE UTILIZATION BY SORTIES

USER/OPERATION	1977	1978	1979
57 TTW (Nellis)	4,500	4,500	4,500
474 TFW (Nellis)	5,000	12,000	12,000
RED FLAG EXERCISE*	15,000	16,000	17,000
ALPHA STRIKE (Navy)	400	400	400
ACEVAL/AIMVAL	2,500		
OTHER	5,000	5,000	5,000
TOTAL	32,400	42,900	38,900

* The 57 TTW supports Red Flag with approximately 1,400 sorties annually. The sorties are included in the 57 TTW sortie rate figures.

A sortie consists of a take-off and landing.

There are an average of 260 operational days per year.



LEGEND:

- TARGET
- ENEMY RADAR
- ESTABLISHED AIRCRAFT FLIGHT PATH
- BOUNDARY DESERT NATIONAL WILDLIFE RANGE

A TYPICAL RED FLAG TRAINING EXERCISE

FIGURE 1-3

ACEVAL/AIMVAL was a two-part project conducted jointly by the Air Force and Navy to evaluate the aerial combat capabilities of the F-14 (Navy) and F-15 (Air Force) fighter aircraft against F-5 aggressor aircraft utilizing enemy tactics. This portion of the evaluation is ACEVAL. The AIMVAL portion was flown to obtain data that will be used to help select advanced air-to-air missiles for the two aircraft.

Numerous other DOD units utilize the range on a routine basis to obtain updated training for their aircrews and evaluation of their equipment effectiveness against the United States' most advance simulated enemy target complex.

Many different types of ordnance are dropped on the Nellis AF Range during air-to-ground bombing and gunnery practice missions. This ordnance can be put in two categories, live and inert. Live ordnance is filled with explosive material and is the same type ordnance that would be used in a combat. Inert ordnance is shaped like live ordnance and is filled with a non-explosive material, such as concrete, to give it the same weight and aerodynamic characteristics. However, it does contain an explosive spotting charge. Inert ordnance has the advantages of lower cost, less damage to target areas and reduced range cleanup problems for explosive ordance disposal personnel. Nearly all ordnance dropped on the Range is accomplished by aircraft operating from Nellis AFB and Navy aircraft during their Alpha Strikes. Approximately 3,000 tons of inert and 700 tons of live ordance are dropped on the range annually.

In early years of the Nellis AF Range, live ordance was expended against naturally occurring features throughout the area. As time progressed targets were constructed; however, once destroyed, new targets were built in other locations. Additionally, as aircraft enter the Range with live ordnance, the ordnance is armed from the cockpit. Occasionally, due to faulty trigger mechanisms, ordnance could be inadvertently dropped during the arming process.

Realizing the safety hazard involved during constructing or maintaining targets, the Air Force issued a directive in 1958 to remove debries from the target sites. In 1963 the directive was expanded and required total range clearance on an annual basis. The 1963 directive was revised in 1972 by Air Force Manual 50-46 (Training-Weapons Ranges) which required range ordnance clearance after each test or training period in the area of the target and a complete range surface clearance each five years. This change was necessary because too much aircrew training time was lost due to the range clearance program. Additionally, the size of the Nellis AF Range and limited number of ordnance personnel available for range clearance prevented full implementation of the 1963 directive. Nellis AF Range personnel initiated the 1972 requirements in early 1974 and are still in effect today. These procedures provide some degree of safety for range personnel; however, there is no guarantee that the Range is completely free of unexploded ordnance. Since 1958 range clearance activity has been only for ordnance on the surface. No subsurface clearance program has been conducted except in the immediate areas of presently used targets.

From 1958 until 1975, all ordnance collected on the Range was buried in pits on the Range (See figure 1-4 for burial site locations.) Since 1975, all ordnance of market value, is deactivated and sold. The remainder is buried on the Range.

INDIAN SPRINGS AAF OPERATIONS

Indian Springs AAF provides support for the Nellis AF Range through the 57th Combat Support Squadron, the host base unit. 'As an emergency airfield, Indian Springs AAF is used to recover aircraft with malfunctioning high explosive ordnance that cannot be released from the aircraft [7].' The Air Force Aerial Demonstration Squadron, based at Nellis AFB, uses airspace around Indian Springs to practice and perfect aerial maneuvers. The Airfield is approved for flight rule" (VFR) traffic and as such, is also used for practice approaches for aircrew training.

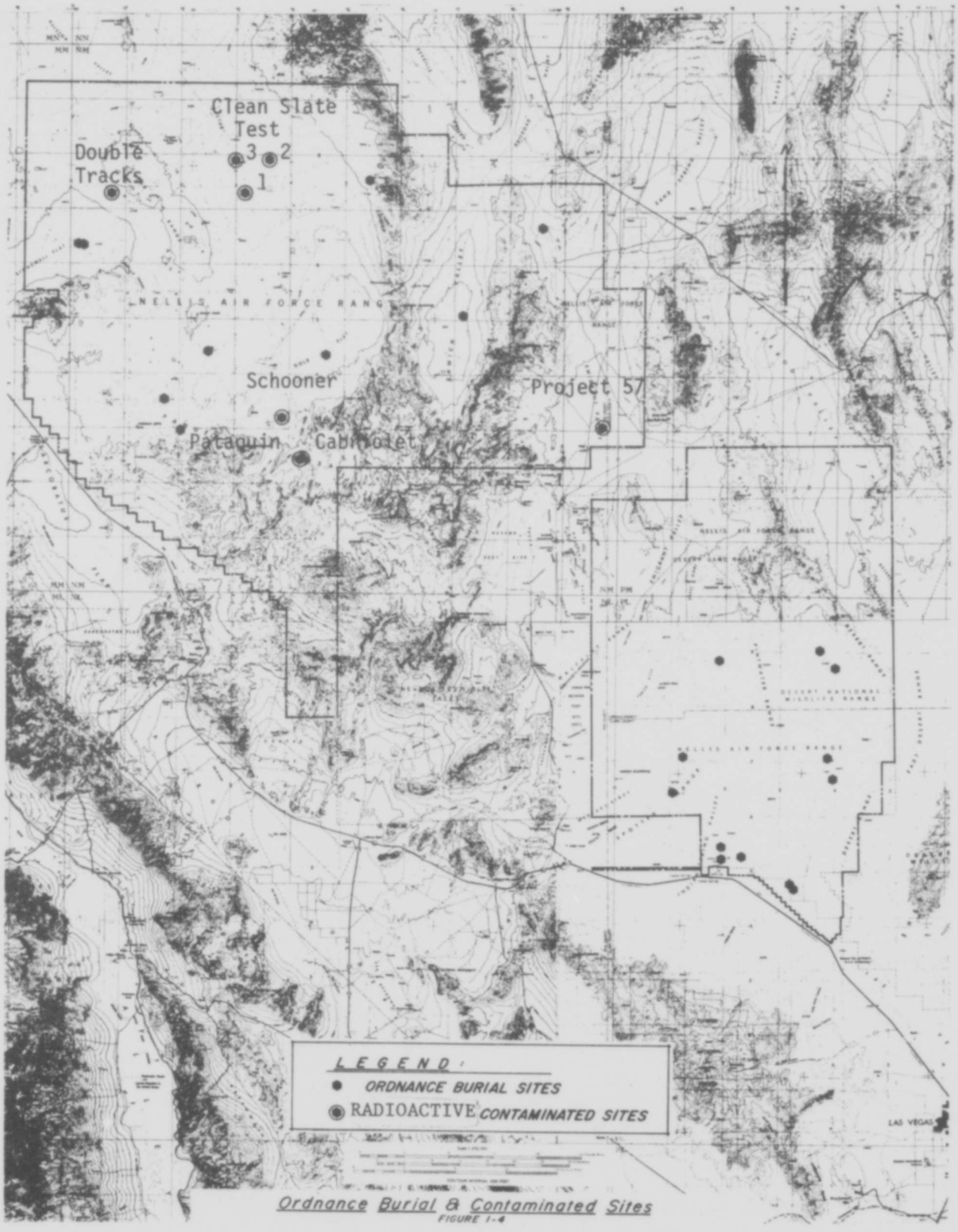
Indian Springs AAF also provides helicopter support to the DOE operators for the control towers and transmitter station and communications equipment repair for the subranges.

Indian Springs AAF is comprised of 2,317 acres, of which 235 acres are owned in fee and 2,082 acres have been withdrawn from the public lands. Within Indian Springs AAF there are four miles of paved roads, eight miles of gravel roads, 145,296 square feet of administrative and industrial space, seventy-nine family housing units, twenty-eight mobile home spaces, and permanent quarters for 90 single airmen and ancillary infrastructure facilities [7]."

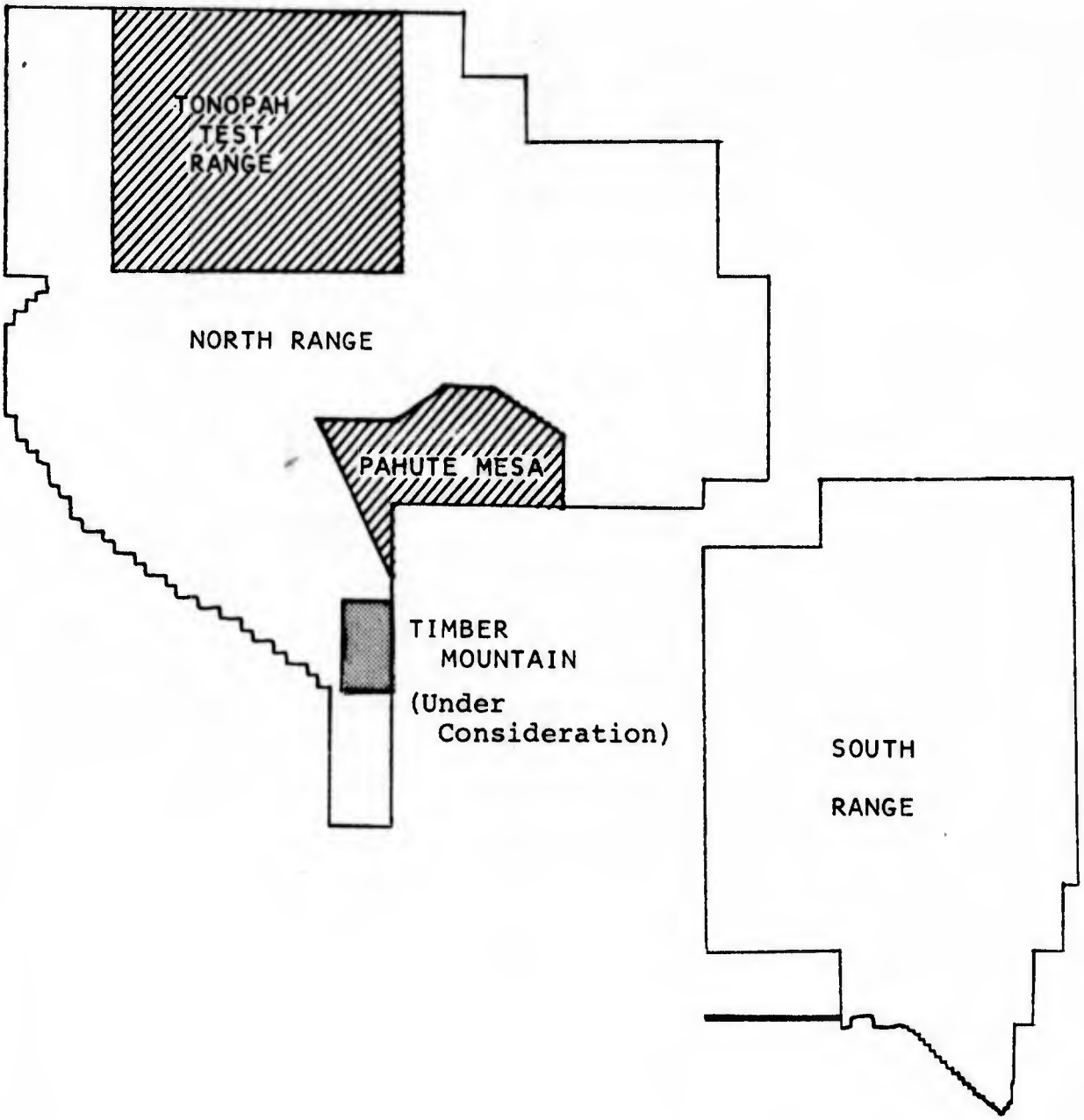
"There are three runways at Indian Springs AAF. The primary runway is 150 feet wide, 7,650 feet long and has a 75 foot shoulder on each side with 1,000 foot by 150 foot asphalt overruns. The two additional runways are, respectively, 6,650 and 6,500 feet long by 150 feet wide with 75 foot shoulders and 1,000 feet of compacted gravel overruns on each end. There are 114,444 square yards of aircraft parking apron and 112, 491 square yards of aircraft taxiways [7]."

OTHER FEDERAL OPERATIONS AND SITE CONDITIONS ON THE NELLIS AF RANGE

To provide for the nation's common defense and security, it is the policy of the United States to maintain a strong nuclear, as well as conventional, force to discourage attack by any potential aggressor. The DOE is responsible for conducting nuclear research and development work, and for producing nuclear weapons on the basis of requirements developed by the DOD. A principle point of field testing is the Nevada Test Site, located between the North and South portions of the Nellis AF Range. DOE operations are also conducted on public lands withdrawn by the Air Force; specifically, the Tonopah Test Range and Pahute Mesa. (See figure 1-5) Use of these areas is governed by MOUs.



Ordnance Burial & Contaminated Sites
FIGURE 1-4



DEPARTMENT OF ENERGY LAND USE AREAS
FIGURE 1-5

The TTR is operated for DOE by the Sandia Laboratories. 'Their principal reponsibility is research and development of nuclear ordnance; the arming, fusing, and firing systems used in nuclear bombs and warheads. In addition, Sandia designs bomb casings for the weapons which would be dropped from aircraft [9]." Table 1-4 lists Sandia's major test activities and provides a brief review of the frequency and type of operations conducted on the TTR. Table 1-5 gives the major use areas of the TTR and briefly enumerates the type of facilities and current damaged acreage. Figure 1-6 shows the geographical layout of the TTR. A point of special interest concerning existing site conditions and operations on the TTR centers around radioactive testing.

In 1963 a series of four safety tests, collectively called Roller Coaster, were conducted to study plutonium dispersal from explosion of plutonium bearing weapons. These tests (Double Tracks, Clean Slate 1, 2, and 3) were conducted on TTR. Another safety test (Project 57) was conducted in 1957 at the Southeast corner of the North Range. (See figure 1-4.)

The Double Tracks test utilized plutonium, whereas the latter three (Clean States) had depleted uranium substituted for part of the plutonium. Although no serious scattering resulted from these tests, some residual radioactive contamination remains in the area. The affected areas, totaling 193 acres for the Roller Coaster test and 130 acres for Project 57, have been fenced off at the 1000 ug/m radioactive contamination contour as a measure of safety. 'Evaluation conducted in 1970 showed it would be more environmentally sound to leave the areas undisturbed because the required denudation would be worse than the existing conditions (9)".

Individual experiments are carried on at the TTR involving such materials as beryllium and uranium. These are monitored to insure personnel safety and to meet the scientific purposes of each experiment. There is no single pattern for monitoring these various experiments; each monitoring scheme is tailored to its experiment. By way of example, the following discussion describes the monitoring program associated with the Nonviolent Explosive Destruct System (NEDS) experiments.

The NEDS experiments are part of a program to design, fabricate, and test a transportable container that will retain the shrapnel, radioactive and toxic debris, and gaseous products produced by the one-point initiation of the high explosives in a nuclear weapon. In the mock-ups used in the TTR development testing, fissile materials are not present, but there may be as much as 10 kilograms of depleted uranium or a kilogram of beryllium present. These may be dispersed downwind from such a test if the container fails.

The NEDS tests are normally conducted in the late morning hours, while the winds are moderate, in order to keep atmospheric potential gradients at a minimum. Two high-volume air samplers are deployed in the upwind and downwind camera bunkers about 75 feet away. Thirty-minute samples are taken prior to, during, and after each test. The filters are analyzed for gross alpha with portable instruments immediately after re-entering the area. The re-entry party, which delays five minutes after the test before re-entering, wears protective clothing and full face respirators until it is established that no appreciable contamination exists. In the event of possible beryllium contamination, a swipe analysis is made in the field; but in any case, the filters and swipe samples are removed to Sandia Laboratories for a more accurate alpha, beta-gamma, and beryllium level determinations.

TABLE 1-4

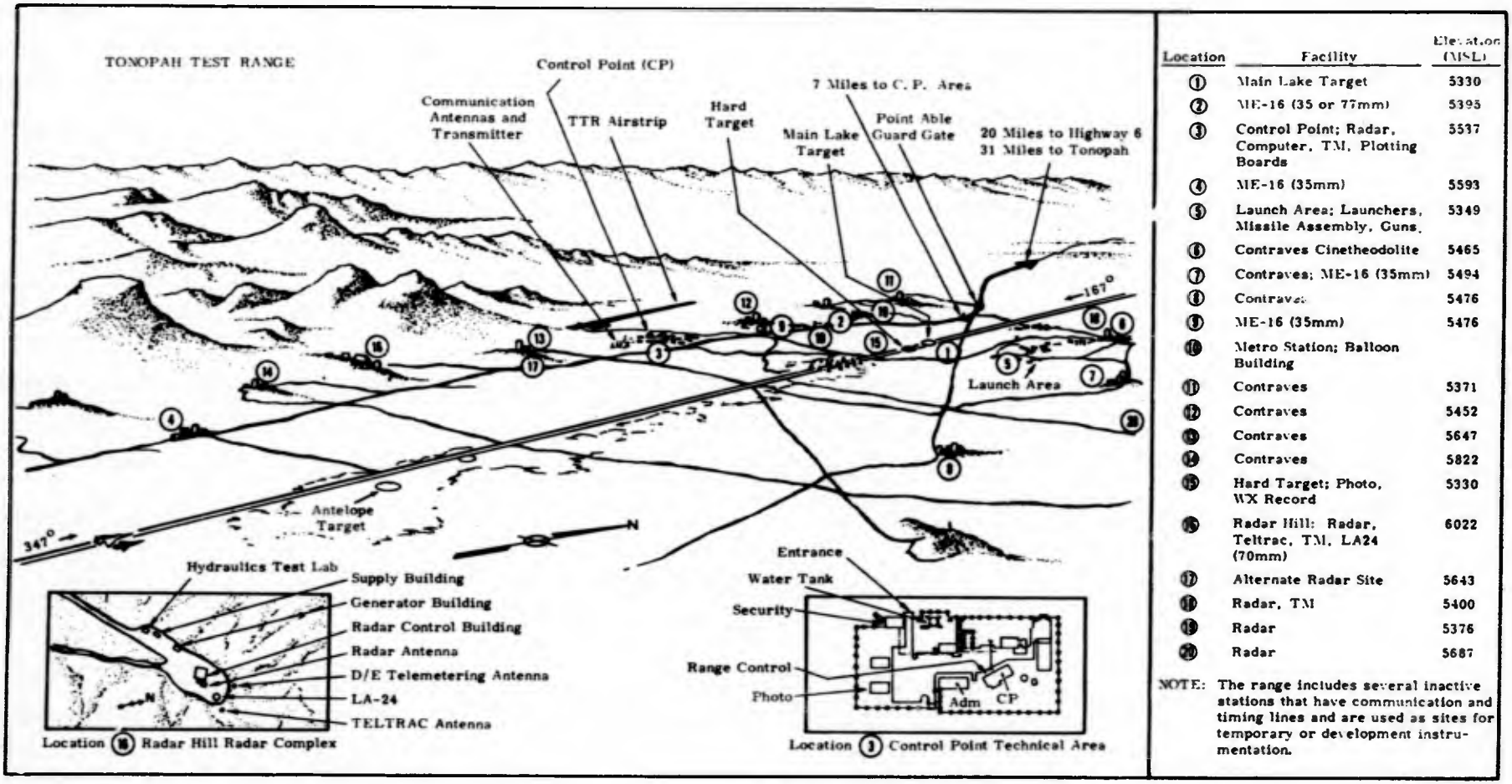
TONOPAH TEST RANGE ACTIVITIES

ACTIVITY	FUNCTION	REMARKS
Air Drops	Trajectory Study of Simulated Bombs and Weapons	Approximately 130 per year on designated targets. 30 to 35 drops are with bombs that contain high explosive or beryllium
Gun Firings	Firing of 155 MM and 8 inch projectiles	Approximately 150 firings per year. Firing is from area 9 with impact points 7,000 feet and 40,000 feet down wind. Many rounds have parachute recovery systems
Ground Launched Rockets	Antiaircraft rockets launched to study aeroballistics and material properties. Also study earth's magnetic field and high-altitude winds	Launch 8 rockets per year from area 9
Air-Launched Rockets	Launching of rockets from aircraft	Launch about 6 rockets a year at an altitude of 6,000 feet
Explosion Effects	Optimize design of shipping and storage containers for nuclear weapons	On-going program
Static Rocket Test	Assist the Navy in developing the trident submarine program	A static rocket motor test pad was constructed and is on stand-by for future Navy use
Earth Penetrator Test	Pioneering study of each surface to determine deceleration characteristic of high velocity penetrators	Approximately 10 test conducted per year for the Sandia Terradynamics program

TABLE 1-5

TONOPAH TEST RANGE FACILITIES

AREA	USE	FACILITIES/TEST	IMPACTED ACREAGE
Area 3	Control point	Has about 12 buildings which house administration, operational control, computer analysis and control, telemetry decoding and recoding, and maintenance support operations	58
Area 9	Rocket launch and gun firing	4 large buildings, 3 block houses, several explosive storage, 4 rocket launchers, 2 gun barrel mounts, 3 camera towers and telemetry antennas, and a 300 foot weather tower	45
Target Areas	Bomb drops	Hard target, soft target, main lake, rodden, mid, pedro, antelope, and rock target. Target complexes contain locations for telescopes, phototheodolites, radar, and telemetry	74
Radioactive test areas	Evaluations	Tests conducted include: Nonviolent explosive destrict system (NEDS); Clean slate 1, 2 & 3; and double track	193
Roads	-	381 miles of paved,wunimprovedwand dirt roads	647
Aircraft runways	-	1 paved runway; 6 unpaved (abandoned)	147
TOTAL ACREAGE OF THE RANGE: 369,280 acres		TOTAL	1,164



Location	Facility	Elevation (MSL)
①	Main Lake Target	5330
②	ME-16 (35 or 77mm)	5395
③	Control Point; Radar, Computer, TM, Plotting Boards	5537
④	ME-16 (35mm)	5593
⑤	Launch Area; Launchers, Missile Assembly, Guns,	5349
⑥	Contraves Cinetheodolite	5465
⑦	Contraves; ME-16 (35mm)	5494
⑧	Contraves	5476
⑨	ME-16 (35mm)	5476
⑩	Metro Station; Balloon Building	
⑪	Contraves	5371
⑫	Contraves	5452
⑬	Contraves	5647
⑭	Contraves	5822
⑮	Hard Target; Photo, WX Record	5330
⑯	Radar Hill: Radar, Teltrac, TM, LA24 (70mm)	6022
⑰	Alternate Radar Site	5643
⑱	Radar, TM	5400
⑲	Radar	5376
⑳	Radar	5687

NOTE: The range includes several inactive stations that have communication and timing lines and are used as sites for temporary or development instrumentation.

FIGURE 1-6 Plan View of the Tonopah Test Range

Source: Reference 4.

In addition to DOE using the TTR, in November, 1963 DOEwandwthewAir Force entered into an agreement for their use of the Pahute Mesa Area (See figure 1-5.) The area is approximately 167,960 acres and is used to conduct underground explosion testing. About 30 large large diameter, vertical drill holes have been constructed in the past (See figure 1-7.) DOE reserves the right to continue drilling operations for future test activity in the area. If the area is withdrawn, then DOE must obtain an MOU between the Air Force and BLM for any use of this land which is not identified in the legislation.

The emplacement holes vary in diameter from 30 to 96 inches and in depth from a few hundred to nearly 4,400 feet. Most of the holes were cased throughout their depth with heavy steel liners which permit the safe emplacement of the nuclear devices to be tested. After the cased holes are securely refilled to contain the effects of the explosion undergound, the devices are detonated and necessary test measurements obtained. Numerous smaller (9 to 15 inch.) diameter exploratory holes have been drilled to provide ancillary information on the geology, hydology and post-event conditions [3].

From 1965 through 1968, there were three cratering tests, Schooner, Cabiolet, and Palaquin (See figure 1-4) conducted in the Pahute Mesa area. Close-in areas around the test were completely denuded, or the vegetation smothered under the ejecta from the crater. Due to these three tests, a total of 2,496 acres of land have been contaminated with Cesium-137, Strontium-90 and other fission products along with some other unburned fission fuels. The areas have been posted and fenced at the 5 millirem/hour radiation contour to assure personnel safety. The areas are evaluated each year under DOEs radiation safety program.

Contruction of roads and support faclities to conduct the underground tests at Pahute Mesa has resulted in altering 530 acres of wildlife habitat through earth moving and resurfacing activities. The total impacted acreage on Pahute Mesa, excluding and radioactive contaminated areas, is approximately 1,955 acres. There have been other minor impacts to the landscape (survey traffic, instrumentation emplacements, and monitoring of off-road locations) which are of a less enduring character.

FUTURE DEVELOPMENTS AND OPERATIONS

Since the proposed withdrawal would be for a 15 year time period with a 10 year renewal option, it is not possible to describe all activities, tests, and programs in this document which will be conducted during the withdrawal period. As national defense requirements change, programs will have to be modified, deleted, and new ones developed. Some of the actions described below are at the concept stage of planning, and as such, the environmental consequence will require a more indepth analysis prior to initiating the action.

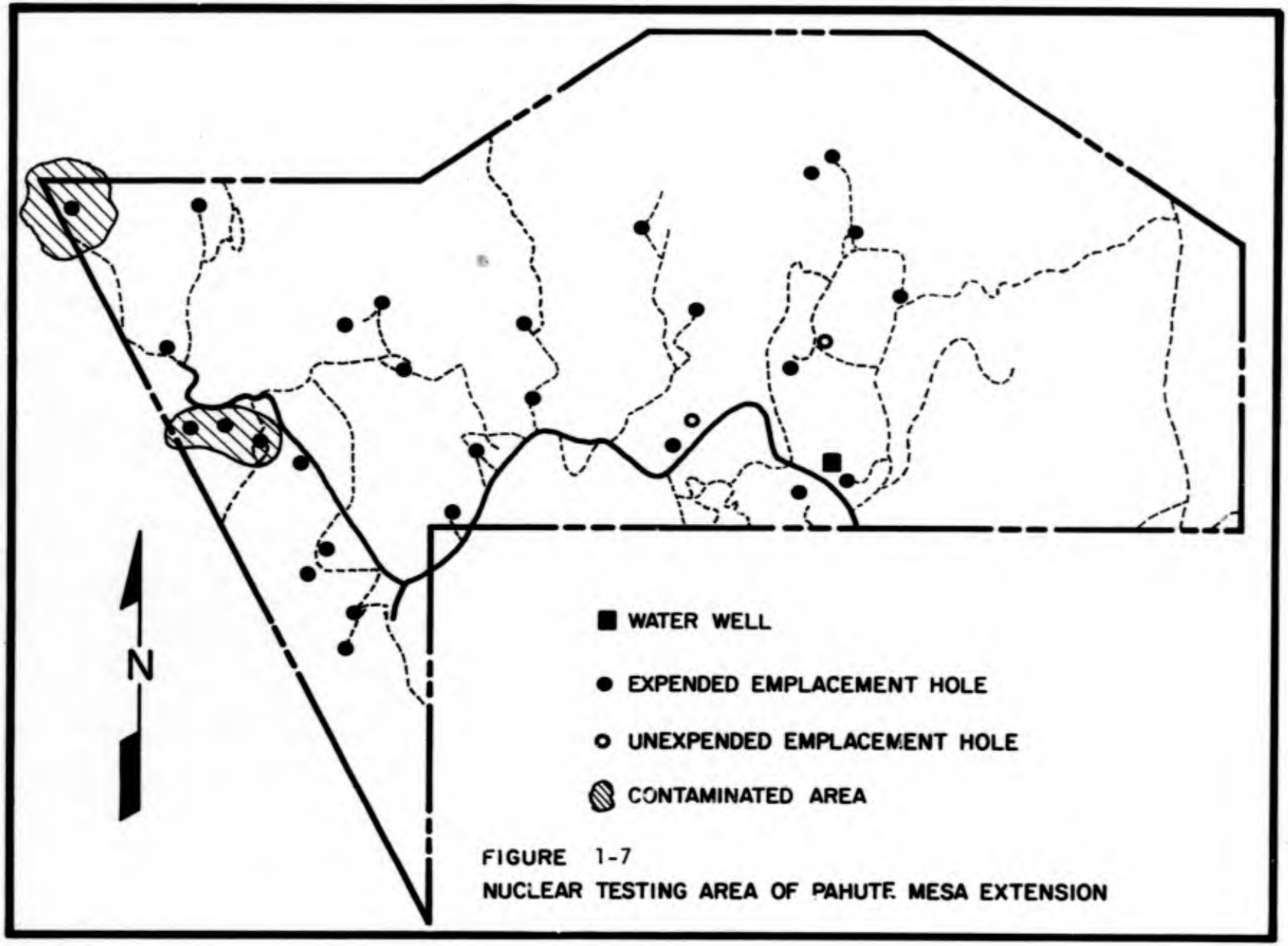


FIGURE 1-7
NUCLEAR TESTING AREA OF PAHUTE MESA EXTENSION

U.S. AIR FORCE

To assure a strong National defense, new weapon systems must be developed to counter any potential enemy threat. Successful deployment of the new systems mandates that they be operationally evaluated and aircrews trained in the type threat environment in which the systems will be utilized. To prevent sterotyped scenarios and to improve realism during training or exercise missions, realistic targets (fixed, movable, and mobile) will have to be developed.

Table 1-6 shows the future projects to be developed on Nellis AF Range.

The TFWC projects no change other than road improvements in the South Range target complexes. However, to support operational readiness training, they have identified the need to expand the electronic warfare (EW) threat capability on the North Range. Currently, there are 20 pieces of EW equipment located on the TTR and in subrange 76 at Tolicha Peak. By 1983, the TFWC projects adding 53 more systems to the North Range. Although no specific sites have been identified for this equipment, present planning indicates they will be located in subranges 71, 72, 73 and 75. Current targets on subranges 72 and 73 (see table 1-2) will be deleted and the new EW equipment installed. Each equipment site will require about 7,850 sq. ft. of land. Projecting this footage requirement for the 1983 forecast shows that approximately 10 acres of vegetation and habitat will be removed in the future.

Siting of the targets has not been accomplished; however, for purposes of environmental evaluation, it is assumed each site would require approximately one mile of new road. Considering a 14' wide road, and an impact zone of 30 feet for construction, the estimated acreage involved would be 190 acres, or 200 acres for the site and roads.

TABLE 1-6

FUTURE PROJECTS FOR THE NELLIS AF RANGE

PROJECT	LOCATION	SCOPE	ESTIMATED IMPACT ACREAGE
Electronic Warfare Sites	North Range	53 Sites	200
EW Maintenance Complex	North Range	34,350 Sq. Ft.	4
Electric Line	North Range	5 miles	60
Road Repairs	North & South Range	315 miles	585
Under Ground Nuclear Testing	Pahute Mesa	Continuing	150/shot
Terminal Nuclear Waste Disposal	Timber Mountain	Not Defined	100/Site

In order to maintain and operate the EW sites, the Air Force plans to construct support facilities near the TTR and in subrange 76 at Tolicha Peak. At the TTR site a 34,350 sq. ft. pre-engineered maintenance complex with space for operations and administration, maintenance of vehicles, electronic gear and generators will be constructed. Depending upon final site location, about five miles of aboveground electrical transmission line, a water well and storage tank with distribution lines would have to be installed. Sanitary waste from the facility would be treated before disposal into an evaporation pond.

It is projected about 800 personnel will be required to maintain and operate the EW sites; 630 for the TTR area and 170 for the Tolicha Peak operations . Currently there are 177 Air Force personnel operating the sites at TTR and 70 at Tolicha Peak. The TTR and Beatty personnel live at Tonopah and Beatty, respectively.

In consideration of the projected manning requirement, the TFWC is evaluating range operations to determine the feasibility of contracting the range operations versus continued use of military personnel. The latter alternative may have up to three options: (1) add the additional personnel into Tonopah and Beatty, (2) build a remote military base, and (3) build domitories on the range at TTR and Tolicha Peak. Although options (2) and (3) may be determined unfeasible, the latter does represent the worst-case adverse socio-economic condition and therefore will be used in this document to describe maximum impacts that would be experienced by continued range operations.

Approximately 315 miles of existing road will be upgraded throughout the North and South Range (See figure 1-8) to provide better access to target areas for maintenance and service operations. The roads have been constructed over the years with many different widths; this project will reduce the road widths to 14 feet. In an estimated 75% of the roads, the shoulders and drainage ditches will be within the existing established roadway. The remaining 25% will require widening from 4 to 8 feet in order to construct proper drainage to prevent erosion. The road repairs will require 268,380 cubic yards of base coarse material and 24,692 cubic yards of crushed gravel. It is estimated that 40% of the required base coarse material and all of the crushed gravel will have to be manufactured. Final site selections for these materials will not be made until proper environmental surveys are completed.

The TFWC projects an increase in aircraft sorties for 1978 and 1979 over the base year of 1977. (See Table 1-3) These increases are due to the 474th TFW conversion from F-111 to F-4 type aircraft, expanded crew training in Red Flag exercises, and the inception of Electronic Warfare/Close Air Support exercise program. The 474th TFW's conversion to F-4 aircraft requires more sortie training on the Nellis AF Range because the fuel for an F-4 is approximately half that of the F-111. While the F-111 aircraft could utilize other ranges in the western states, the F-4's fuel limitation will restrict range training primarily to the Nellis AF Range unless air refueling operations are performed.

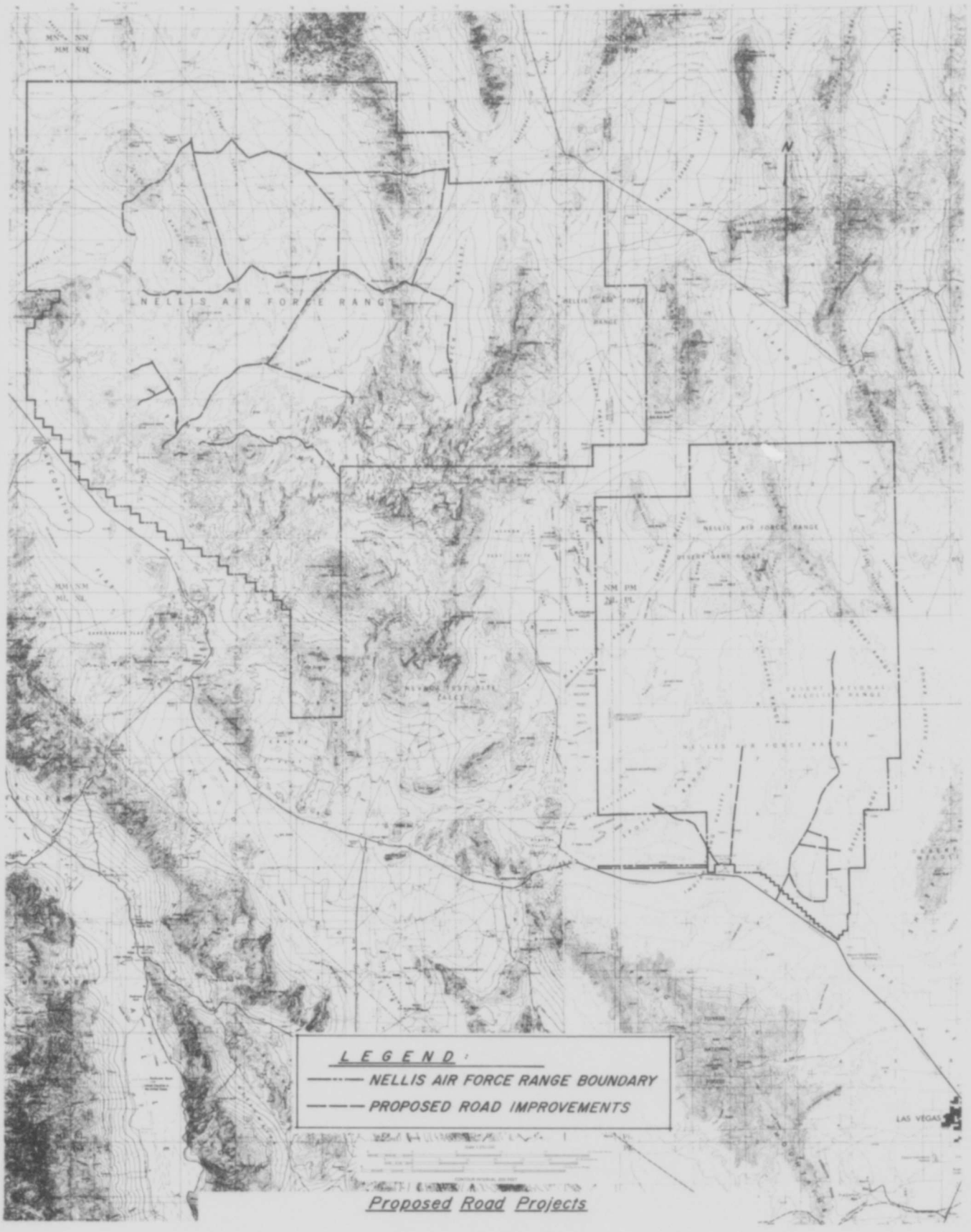

NELLIS AIR FORCE RANGE
N
LEGEND:
NELLIS AIR FORCE RANGE BOUNDARY
PROPOSED ROAD IMPROVEMENTS
LAS VEGAS
Proposed Road Projects

Figure 1-8

Current planning calls for an average of ten Red Flag exercises per year. As the new electronic warfare threat equipment is installed on the Range, it will expand the training capability and; thus, is reflected in the projections given in table 1-3. Another exercise planned for the first half of 1978, involves Electronic Warfare/Close Air Support (EW/CAS). This exercise will test the effectiveness of electronic warfare in close-air-support role (supporting ground troops in the area of the Forward Edge of the Battle). The test will require approximately 5,000 sorties, which will be flown in many different types of aircraft, primarily on the North Range.

DEPARTMENT OF ENERGY

There are no projected changes in the current operations of the TTR. They will continue to utilize the same facilities and currently impacted areas.

DOE operations at Pahute Mesa is expected to continue for 25 years, at about the same pace as in past years; about three to six shots per year. These shots will utilize, to the maximum extent possible, areas already impacted from previous tests.

The DOE is examining the geology of Timber Mountain (that portion on the Nellis AF Range) as well as other areas on the NTS, as a potential site for a pilot demonstration of a terminal waste disposal repository.

Recent projections of growth, in the use of commercial nuclear power reactors and recent Federal policy decisions concerning the commercial nuclear fuel reprocessing plant availability, indicate significant delays for the anticipated production of high-level radioactive waste.

As a result, priorities for managing radioactive waste have been reoriented to include retrievable storage as an adjunct to terminal disposal in geologic formations. However, terminal disposal is considered a vital program and needs to be developed by DOE. To this extent, DOE has already conducted aeromagnetic surveys on Timber Mountain to infer the magnitude of the granitic structure. DOE has also conducted exploratory drilling into the welded tuff structure of Yucca Mountain and conducted surface geophysical measurements on the part of Yucca Mountain which extends onto the Nellis AF Range. Black Mountain may also be considered in the future.

If the exploratory surveys show favorable conditions at Timber Mountain or Yucca Mountain and DOE decides to continue other investigations, rock properties and hydrologic phenomona will be studied at depths of several hundred feet beneath the surface from vertically drilled holes. Depending upon these studies, several mined test chambers within the formations could be constructed. Electrical and radioactive heat sources would be placed in the test chambers within drilled holes and the combined heat and radiation effects upon the media would be studied. If these experiments demonstrate that the structure is suitable, a pilot demonstration of a terminal waste disposal repository could be conducted.

Since such projects are at the concept state, DOE would have to prepare an environmental analysis to evaluate the environmental impacts anticipated, should they develop beyond the research and development stage.

INTERRELATIONSHIPS

FISH AND WILDLIFE SERVICE - DESERT NATIONAL WILDLIFE RANGE

The South Range coincides with the western half of the DNWR. (See figure 1-9.) The DNWR consists of approximately 1,588,000 acres and is managed by FWS. "The primary management objectives within the wildlife range are to preserve and protect natural environmental qualities vital to the perpetuation of optimum population of desert bighorn sheep and other native wildlife. Periodic resource inventories, applied management research, limited water development and maintenance, fire suppression, and routine patrol are necessary management activities [8]:. The FWS has proposed 1,332,900 acres of the DNWR be designated as a unit of the National Wilderness Preservation System. The Wilderness Act of 1964 directed the Secretary of Interior to review every recommendation as to the suitability of each such area for designation as a wilderness. Final decision on the wilderness proposal has been postponed until surveys for mineral resources as completed.

Before, during, and after World War II, there were numerous military withdrawals affecting the DNWR. PLO 2613, dated February 16, 1962, made all outstanding military withdrawals subject to the terms and conditions contained in MOU between the Secretaries of the Interior and Air Force. "The agreement specifies that only certain locations within the Range may be used for target sites. These locations total approximately 16 percent of the DNWR. The remaining portion of the South Range, coincident with the DNWR, is authorized for use as air space only.[8]"

Target facilities, in general, are restricted to lands below the 3,600 foot elevation contour line. Aircraft are restricted, when practical, to a minimum of 2,000 feet above ground level except when landing or taking-off at Indian Springs AAF and when using air-to-ground targets. Air-to-air gunnery operations were required to be conducted at an elevation of 10,000 feet above ground level.

The Air Force has agreed to furnish the Department of Interior (DOI), when available with aircraft and other equipment and operating personnel for the purposes of aerial patrol, search and rescue, maintenance of the Range, wildlife inventory, waterhole inspection, and other wildlife management practices on the Range.

BUREAU OF LAND MANAGEMENT WILD HORSE MANAGEMENT AREA

The Nevada Wild Horse Range is located in the north central portion of the Nellis AF Range. (See figure 1-9.) The Wild Horse Management Area is managed by the BLM and has been established for the protection of wild horses and burros.

An agreement between BLM and the Commanding Officer of Nellis AFB was signed in June 1962 to establish a Wild Horse Management Area. An additional agreement containing the same provisions, but modifying the location of the wild horse management area, was implemented in June 1965.

In 1971, P.L. 92-195 was passed to protect wild horses and burros. The Law requires observation of the principles of multiple use, sustained yield and environmental quality. It is also dedicated to protect them from unauthorized actions and to manage their habitat in a manner to achieve and maintain an ecological balance and a population of sound, healthy individuals. In 1974, a cooperative agreement was signed by the DOI, ERDA (now DOE), and the Air Force to establish responsibilities relative to managing the Wild Horse Management Area. The developed management plan requires: an annual inventory of the wild horses and burros in the area of joint concern; continuing review of the habits of the wild horses and burros in terms of grazing and water patterns, seasonal migration, and the availability of water and forage; and determination of the necessary projects, such as water, fencing, etc., to provide for the welfare of the animals.

Nellis AFBs' responsibilities in the 1974 agreement are to cooperate in the removal of privately owned horses and burros, assist in the annual review of the management program, and to report any known violations of the Act or regulation to the Las Vegas District Manager of BLM.

FIVE PARTY COOPERATIVE AGREEMENT

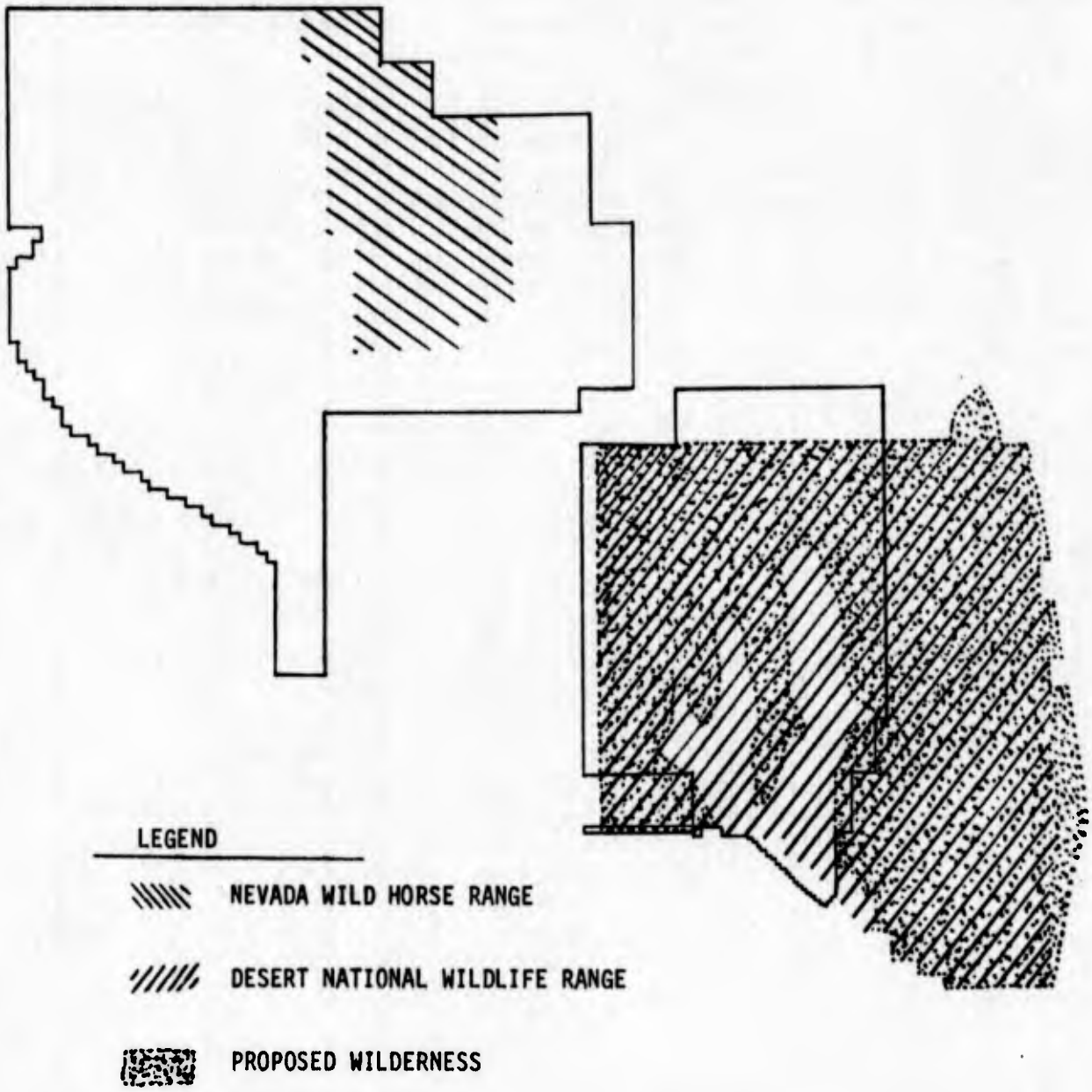
Under the purview of NEPA of 1969 (PL 91-190), Endangered Species Act of 1973 (PL 93-205), Wild Free-Roaming Horses and Burro Act of 1971 (PL 92-195), Taylor Grazing Act of 1934 as amended by PL 94-579, Public Land Administration Act of 1960 (PL 86-649), and under the principles of multiple use and sustained yield as defined in 86-517, a five party cooperative agreement was signed on January 27, 1977 by the Air Force, BLM, FWS, Nevada Department of Fish and Game, and ERDA (now DOE). The agreement was instituted for the purpose of protecting, developing and managing the natural resources, fish and wildlife, vegetation, watershed and wild horses and burros on the Nellis AF Range, NTS, and TTR.

The joint activities agree to:

- Cooperate in conducting resource inventories of the area and developing resource management plans for wild horses and burros, and fish and wildlife based on the inventory data.

- Meet jointly, at least annually, to discuss matters relating to the management plans.

- Allow hunting on the Range when game population and Air Force activities will allow. Hunting is in accordance with Federal and State game laws.



DEPARTMENT OF INTERIOR LAND MANAGEMENT AREAS

FIGURE 1-9

RELATIONSHIP OF THE ACTION TO LAND USE PLANS, POLICIES AND CONTROLS FOR THE AFFECTED AREA

The land comprising the Nellis AF Range is public land, the North Range is under BLM control and the South Range is under FWS jurisdiction. Various portions of the Range have been withdrawn from the public domain since the early 1940s; with the present acreage remaining fairly static since 1962. The withdrawal granted DOD use of the land for a bombing an gunnery range. BLM has not forecasted change of use for these lands, but FWS has proposed a major portion of DNWR as a wilderness area.

Additionally, land use plans, policies, and controls have been implemented through the various cooperative agreements that have been signed with the DOI, State agencies, DOE, and other concerned agencies. Continuation of the withdrawal would assure stability to the management programs covered in these agreements.

Recreational requirements for the state have been reviewed by the Nevada Department of Conservation and Natural Resources (NDCNR). None of the twenty-four sites identified for future development are on or adjacent to the Nellis AF Range; however, Nellis AFB aircraft may fly over some of the land while enroute to, or returning from, the north section of the Range.

With respect to potential noise disturbances, the character of Nellis AF Range activities over these recreation areas will be important to the planned future development of these areas. Consultation with state and local planners regarding the plans and policies for recreational developments will be essential to avoid incompatibilities between Nellis AF Range airspace uses and underlying recreational uses.

Based on population growths (see table 2-9), Clark County is growing faster than any of the other counties in which the Range is located. Clark County's growth is primarily from the Las Vegas area. Las Vegas is about 30 miles from the closest point of the Range. With this distance it is doubtful that urban growth would become a factor of concern in the continued use of the Nellis AF Range.

Three airports operate in close proximity to each other in the Las Vegas area; Nellis AFB, North Las Vegas Airport, and McCarran International. These airports form a triangle whose sides measure only 8, 8, and 10 nautical miles respectively. They cater to the military (Nellis), general aviation (North Las Vegas), and air carriers (McCarran). Their proximity to each other, the relationships of their runways, the diverse types of aircraft using them, and the volume of air traffic that each generates combine to produce a congested air traffic control environment. To cope with this issue letters of agreement between the contolling agencies at each installation establish compatible use zones and air traffic control procedures which enable safe and efficient air traffic flows.

CHAPTER II

DESCRIPTION OF THE ENVIRONMENT

This chapter discusses the existing environment of the Nellis AF Range. The resources are described at the level of detail commensurate with the anticipated impacts. The natural environment is subdivided into climate, air quality, geology, soils and watershed, vegetation, and animals. Similarly, the human environment is subdivided into cultural values, visual, land use and plans, and socio-economic factors.

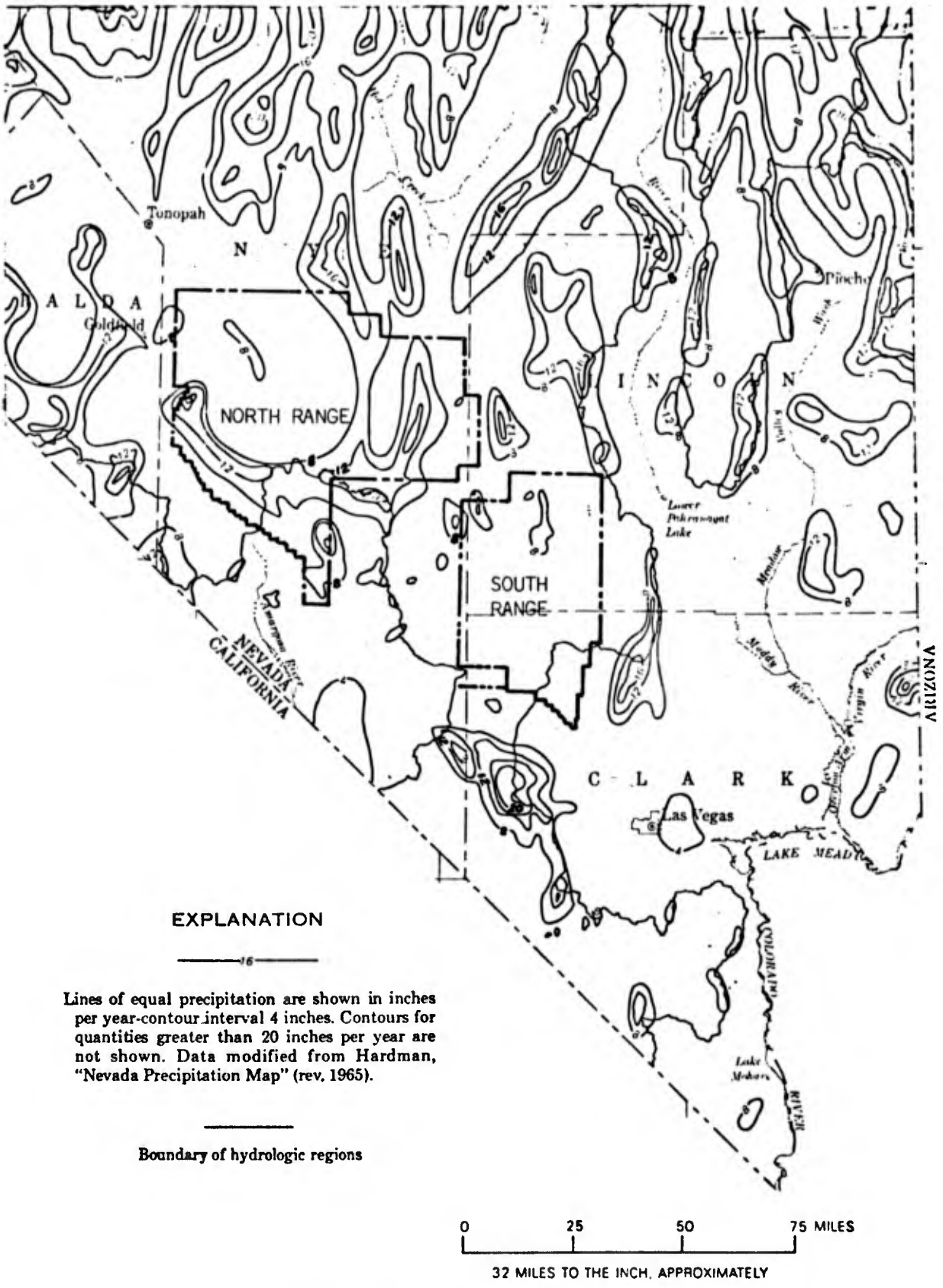
CLIMATE

The climate in the area of the Nellis AF Range is affected by two main sources of air movement. From fall through spring the area is influenced by Pacific air movements which come across the Sierra Nevada mountains. In summer to early fall winds from the Gulf of Mexico dominate the area.

Annual precipitation depends mainly on elevation and varies on the average from four inches on the desert floor to about 12 inches in the higher Mesa area. (See figure 2-1.) "The annual precipitation cycle displays a double maximum, with the primary in winter and secondary in the summer. Winter precipitation often falls as snow (at higher elevations), whereas summer rains are associated with thunderstorms which are intense enough at times to produce local flash flooding [3]."

The hottest months of the year are July and August with average monthly temperatures of about 76 Fahrenheit (F). Daily temperatures rise to the 90's and drop to the 50's at night. The average monthly winter temperature falls between 31F and 41F. The relative humidity averages 58 percent in the arly morning, dipping to an average daily low of 25 percent by late afternoon.

An assessment of the meterological potential for pollution can be made quantitatively using the results of Holzworth's studies [10]." However, because of the variable terrain over the ranges, significant deviations from average values can occur. Mixing heights average about 1,100 feet in the morning and 8,000 feet in the afternoon. Wind speeds range from 9 to 11 miles per hour in the morning to 11 to 13 miles per hour in the afternoon. With moderate to strong insolation throughout the year, stability ranges from slightly to moderately unstable from midmorning to late afternoon and becomes neutral in the early evening hours. Overall, dispersion characteristics are good to fair. During the period from October 1963 to April, 1970, the National Climatic Center issued pollution potential forecasts approximately 35 times over the area. The highest potential will exist in valleys; however, even here, wind direction must be considered in individual cases to arrive at qualitative figures. The highest potential exists during the winter months, December through February.



AVERAGE ANNUAL PRECIPITATION

FIGURE 2-1

AIR QUALITY

The Nellis AF Range is located within two Air Quality Control Regions (AQCR). The Clark-Mohave Interstate AQCR covers the southern half of the South Range, with the northern AQCR boundary coinciding with the county boundary common to Lincoln and Clark, and the western boundary common to the Nye and Clark county line. The remainder of the Nellis AF Range is located within the Nevada Intrastate AQCR (See figure 2-1 for county lines.)

There are no monitoring sites on or adjacent to the range to measure ambient air quality. However, in a general manner, the regional condition is portrayed in tables 2-1 and 2-2. Table 2-3 shows the respective Federal and Nevada State Air Quality standards which are applicable to the area. Table 2-1 shows the number of stations within each AQCR which exceeded the ambient air quality standards during 1974. It is evident that the Clark-Mohave AQCR has a particulate, carbon monoxide, and oxident problem; whereas, the Nevada Intrastate problem is with particulates and sulfur oxides. Review of the individual monitoring stations within each AQCR shows that the regional pollution burden comes primarily from the metropolitan areas. Data provided in table 2-2 shows monitoring sites in rural parts of Clark and Nye counties have a marginal particulate matter problem. Clark county did not exceed the 24-hour primary particulate standard; wheras, Nye County rural sites exceeded the 24-hour primary standard five times during 1974. Both counties appear to meet the annual particulate standard.

The Environmental Protection Agency (EPA) review of states attainment status of the National Ambient Air Quality Standards (published in the Federal Register, Vol. 43, No. 43, March 3, 1978) indicates the following air quality picture for the Nellis AF Range area: particulates and sulfur oxides are better than the National standards; and carbon monoxide, nitrogen oxides, and oxidants are better than the standards or cannot be classified.

The Las Vegas Metropolitan Area (in Clark-Mohave AQCR) has been designated as an Air Quality Maintenance Area (AQMA) for particulates, oxidants, and carbon monoxide. Nellis AFB is within the boundaries of the AQMA; however, the Nellis AF Range is well outside the delimited area.

The majority of military aircraft, using the Nellis AF Range, depart from and return to Nellis AFB. Although military aircraft are exempt from emission regulations promulgated under the purview of the Clean Air Act, those emissions emitted within the AQMA are of concern to the Air Force. A detailed review of aircraft emission around Nellis AFB is given in Chapter 3, p. 3-2 to facility defining secondary impacts from operations of the Nellis AF Range.

TABLE 2-1

NUMBER OF STATIONS AT WHICH NATIONAL AIR QUALITY STANDARDS WERE EXCEEDED - 1974

AQCR	PARTICULATES				SULFUR OXIDES			CARBON MONOXIDE		OXIDANTS	NITROGEN OXIDES
	ANNUAL		24-HOUR		ANNUAL	24-HOUR	3-HOUR	1-HR	8-HR	1-HR	ANNUAL
	Sec.	Pri.	Sec.	Pri.							
CLARK-MOHAVE											
Number of Valid Stations	10*	10*	24**	24**	2*	2**	2**	2**	2**	2**	0**
Number greater than standard	6	5	10	2	0	0	0	0	2	2	0
NEVADA INTRASTATE											
Number of Valid Stations	0	0	12	12	0	5	5	0	0	0	0
Number greater than standard	X	X	5	3	0	5	2	0	0	0	0

X - Stations with incomplete data to reflect annual status.
* - Number of stations reporting a full year of valid data.
** - Number of stations reporting at least 3 24-Hr. values or 400 hourly values.

SOURCE: Monitoring and Air Quality Trends Report, 1974, EPA-450/1-76-001, Feb. 1976.

TABLE 2-2

AMBIENT AIR QUALITY AT RURAL MONITORING STATIONS IN CLARK & NYE COUNTY - 1974

POLLUTANT	NO. OF DAILY VALUES EXCEEDING 24 HR. STND. PRI.	SEC.	HIGHEST 24 HR. VALUES 1ST	2ND	ANNUAL VALUE
PARTICULATES					
CLARK CO.	0	2	165	152	40
NYE CO.	5	15	377	278	55

DATA IS IN ug/m^3 (microgram per cubic meter)

These monitoring sites did not sample from sulfur oxides, carbon monoxide, oxidants, or nitrogen oxides.

SOURCE: Monitoring and Air Quality Trends Report, 1974, EPA-450/1-76-001, FEB. 1976

TABLE 2-3

AIR QUALITY STANDARDS

AIR POLLUTANT	FEDERAL STANDARDS AVERAGING TIME	PRIMARY STANDARDS	SECONDARY STANDARDS	NEVADA STATE STANDARDS AVERAGING TIME	LIMITS
Sulfur dioxide (SO 2)	AAM (a)	80 ug/m 3		AAM	60 ug/m 3
	24 h*	365 ug/m 3		24 h	260 ug/m 3
	3 h*		1300 ug/m 3	3 h	1300 ug/m 3
Particulate matter	AGM (b)	75 ug/m 3	60 ug/m 3	AGM	60 ug/m 3
	24 h*	260 ug/m 3	150 ug/m 3	24 h	150 ug/m 3
Nitrogen dixoide (NO 2)	AAM	100 ug/m 3	100 ug/m 3	AAM	100 ug/m 3
Ozone	1 h*	160 ug/m 3	160 ug/m 3	1 h	160 ug/m 3
Carbon Monoxide (CO)	8 h*	10 mg/m 3	10 mg/m 3	8 h	10 mg/m3
	1 h*	40 mg/m 3	40 mg/m 3	1 h	40 mg/m 3
Nonmethane Hydrocarbons	3 h* (6-9 AM)	160 ug/m 3	160 ug/m 3	3 h (6-9 AM)	160 ug/m 3

(a) Annual Arithmetic Mean

(b) Annual Geometric Mean

h Hour

ug Microgram

mg Milligram

*Not to exceed once/year

Maximum

TOPOGRAPHY AND GEOLOGIC SETTING

The topgraphic features of the Nellis AF Range are typical of the basin and range physiographic province, with long, north-trending ranges separated by wide valleys or topographic basins. The characteristic features are shown in figure 2-2. The primary mountain ranges are the Desert, Pintwater, and Spotted Ranges on the South Range of the Nellis AF Range Complex. The North Range contains the Belted, Kawich, and Cactus Ranges (See figure 1-4).

Elevations range from approximately 3,100 feet on the desert floor around Indian Springs up to about 8,500 feet at Wheelborrow Peak in the Belted Range. "The slope of the terrain generally is 10% or less on the desert floor, increasing to between 11 and 20% on the foothills, then to 21 to 45% in most mountain ranges. Slopes greater than 46% are characteristic of the highest mountains [4]." The mountainous and mesa areas contain many gullies which carry the infrequent rain water to the playas on the desert floor.

Most of Southern Nevada, including the area now used as the Nellis AF Range, was submerged under a shallow sea for long periods of geologic time. The present mountains on the range are made up of vast thicknesses of sediments deposited from surrounding areas that were above the water. The period of deposition was followed by constricting and folding that brought severe pressure on Nevada from California and Utah. "Basin and range high-angle normal faults ranging in age from Miocene to Holocene are present throughout most of the study area and bound mountains and ranges. North-trending normal faults are most common, but northwest trends are prevalent [15]." The present makeup of the mountain terrain is a result of the wearing down of the folds by wind and water erosion.

The entire Range complex is underlaid by a wide variety of rocks ranging in age from Precambrian to Quaternary times. Precambrian basement rocks are exposed in the North Range of the study area. Geneissic quartz monzonite and biotite schist crop out in the Trappman Hills area of Nye County, east of Mount Helen. Precambrian crystalline rocks occupy only a small part of the study area. These rocks consist primarily of quartzites, sandstones, shales, limestones, and dolomites and are exposed in the Stonewall Mountain, Cockeyed Ridge, and the Sheep Range.

"All seven periods of the Paleozoic era are represented in the study area by a thick sequence of marine sedimentary rocks. Longwell reports that the Paleozoic rocks exposed in the Range north of Las Vegas Valley in Clark County have a maximum thickness in excess of 26,000 feet. Tschanz reports that the Cambrian section of the Groom Range in western Lincoln County may well be the thickest Cambrian section in the Great Basin. Although the base of the section is not exposed, the measured portion exceeds 20,000 feet and the complete sequence may be several thousand feet thicker [15]."

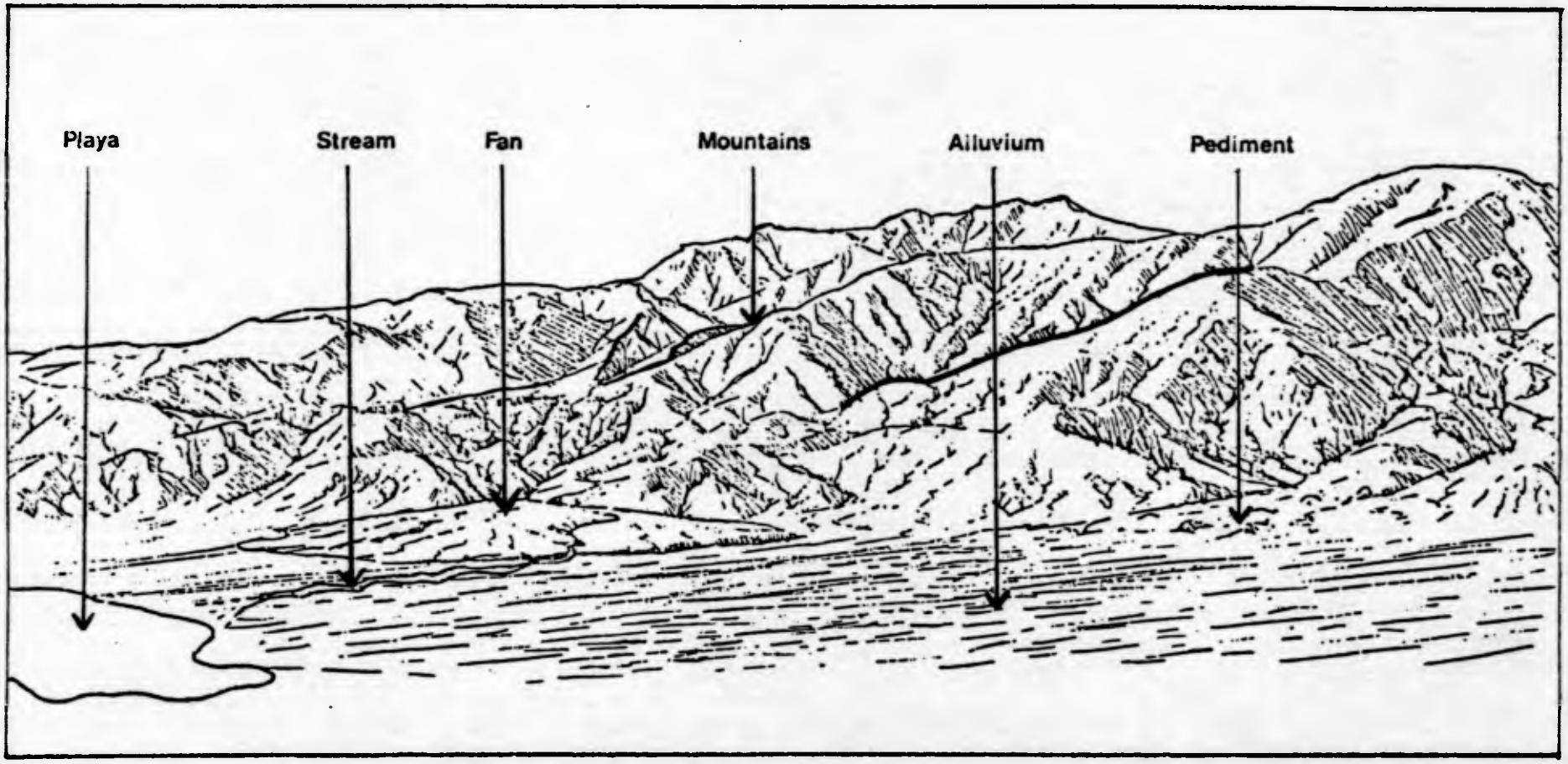


FIGURE 2-2 CHARACTERISTIC SURFICIAL FEATURES OF SOUTHERN NEVADA

Sedimentary Mesozoic rocks such as basal conglomerate, shale, fine-grained sandstone, limestone, dolomite, siltstones, and fineto-medium sized quartz grains weakly cemented by calcium carbonate and iron oxides are found in the study area.

Mesozoic igneous rocks occur as granitic intrusives and volcanic rocks. The volcanic rocks consist chiefly of lava flows, mud flows, breccias, and tuffs.

Cenozoic deposits may be categorized into three general types: (1) Tertiary sedimentary rocks: (2) Tertiary volcanics and incomposed of yellowish siltstone overlain by whitish limestone, gypsum, terrestrial conglomerate and interbedded sandstone and tuff are exposed in the study areas. Tertiary volcanic and associated tuffaceous clastics are in the aeas. The composition of the volcanics is predominantly rhyolitic or dacitic, but andestitic and basaltic rocks also occur. Tertiary intrusive rocks occur principally as small granite or diorite stocks and basaltic dikes, sills, and plugs. A significant portion of the study area is covered by thick deposits of alluvium and colluvium material. The alluvium varies in composition, texture, and other physical properties with the type of parent material, carbonate, compaction, and distance from source.

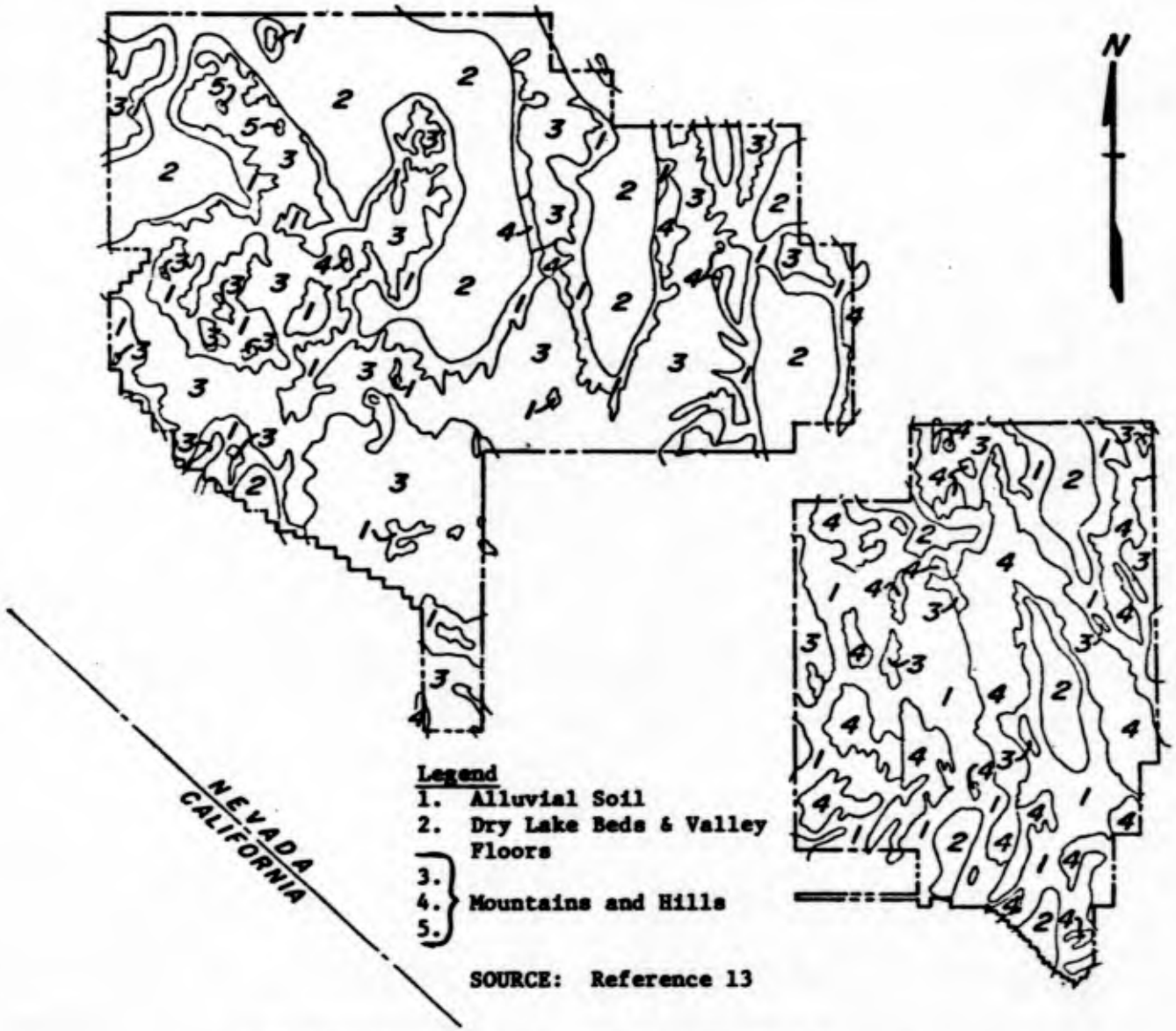
SOIL AND WATERSHED

The soil medium physically supports the existing vegetation is also the basic component of the watershed for the area. The soils are typical of arid regions and include materials for the alluvial immature consolidated upland classes. "Associations of Red Desert and alluvial are found in the lower elevations of the southern part of the state [12]."

The soil of the area can generally be classified into one of the five categories [13]. (See figure 2-3.)

Alluvial Soil Impediments: Shallow alluvial sediments usually iess than 1,000 feet to bedrock. Areas denoted by 1's on figure 2-3 represent this soil category. This area may include some quaternary basalt flows. The area is located between the deeper bottom land soils and the foothills. It consists of coalescing alluvial fans. Slope usually ranges from 4 to 15 percent including steeper interfluve sideslopes and areas joining foothills. The soils are usually shallow or moderately deep to hardpans. Texture in the root zone may range from coarse to fine. Gravel is usually present in quantity. Soil surface increases in stoniness upslope. In places, gravelly desert pavement occurs.

The soils of this area generally have many limitations for sanitation or community development facilities. They are generally unsuited for irrigated agriculture. They provide only a fair wildlife habitat.



GENERAL SOILS - GEOLOGY MAP

FIGURE 2-3

Dry Lake Beds and Valley Floors: Deep alluvial sediments are generally more than 1,000 feet thick, this includes dry lakes and some minor interbedded tuffs and gravel. Areas designated by 2's on figure 2-3 represent this soil category. This area is generally below 4,500 feet elevation.

The lowest position of this type of material within a basin is occupied by a generally barren and dry lake bed. The margins of the lake generally have dunes of either sand or clayey material. Moderate to strongly saline soils generally surround this area. Except for dune side slope, this area is relatively flat. Nearly level flood plains of varying width may enter the area. These usually have very deep, medium textured soils. Elsewhere, at its boundaries, slopes incease from four to eight percent; texture ranges from medium to moderately coarse; and, gravel content ranges from none to very gravelly conditions. This unit contains the deepest soils of the Range. In the peripheral area, the soils generally are moderately deep to duripan or gravel. The soils range up to five feet in depth at the lowest position.

The soils of this area are most subject to flooding, wind, and water erosion. Generally they have the fewest limitations for sanitation or development facilities. They provide the poorest wildlife habitat in the native state.

Mountains and Hills: This category is divided into three subgroups and are identified in figure 2-3 as types 3, 4, and 5 repectively.

Subgroup 1 (3 on figure 2-3) includes mountains and hills throughout the range but mostly in the northern and western parts. Although rock outcrops are common the general appearance is more rounded and less rugged than other mountains on the Range. This unit includes those areas dominated by woodland consisting mostly of Pinyon Pine and Juniper.

Soils of this area are generally moderately deep to hardpan or bedrock. Texture is usually moderately fine to moderately coarse and includes various amounts of gravel. The soils have a moderately low storage capacity for water. They are usually neutral or mildly alkaline in reaction. Clay of the shrinkswell type (caliche) must be taken into consideration for engineering purposes. The soils have an exceptionally high base exchange capacity which makes for fertile conditions. Slopes commonly range between fifteen and fifty percent.

Severe limitations for sanitation or development facilities are common to the areas. The soils generally provide fair to good wildlife habitat.

The mountains and hills of subgroup 2 (4 on figure 2-3) are generally steep and rugged. Limestone and dolomite are the principal rocks. Gypsum and quartzite are common in places. Woodland is the common vegetation consisting mostly of Pinyon Pine and Juniper with a few small patches of Bristlecone and Ponderosa Pine. This unit is most prevalent in the southeastern part of the Range.

Excepting colluvial mountain slopes, the soils are generally shallow to hardpan or bedrock. They are usually moderately alkaline and have low water holding capacity. Slopes commonly exceed thirty percent, and rock outcrops are common.

This area has severe limitation for sanitation or development facilities due mostly to slope, depth, and rockiness. The soils generally provide fair to good wildlife habitat.

Subgroup 3 (5 on figure 2-3) is of relatively minor significance on the Range, consisting of two relatively small mountains in the northwest part of the Range. Shrub or woodland vegetation types occur on the area but the density is less than that on the other mountain forming areas.

The soils are commonly coarse textured and moderately deep to bedrock. The soils are somewhat droughty resulting from low water holding capacity. They are neutral to mildly alkaline in reaction and are commonly nonsaline. They are generally not fertile. The soils generally provide poor to fair wildlife habitat.

Although the erosion potential of soils on the Nellis AF Range has not been determined, a qualitative evaluation can be made from the slope angle and soil types. Normally finer textured soils are more susceptible to water erosion. Sandy soils and granulated clays are most easily eroded by wind; however, considering the slope angles on the Nellis AF Range, these generalizations possibly do not hold true in all cases.

"In general, if the slope angle is greater than 10 percent, the soil its considered highly erodible; between 2 and 10 percent, it's moderately erodible; and, less than two percent slopes are considered slightly erodible [14]."

Considering the various slope angles of the land, the area ranges from moderate to highly erodible. Topographic features of the area demonstrate water erosion characteristics by the many gulleys and channels leading from the mountain ranges to the playas on the desert floor.

WATER RESOURCES

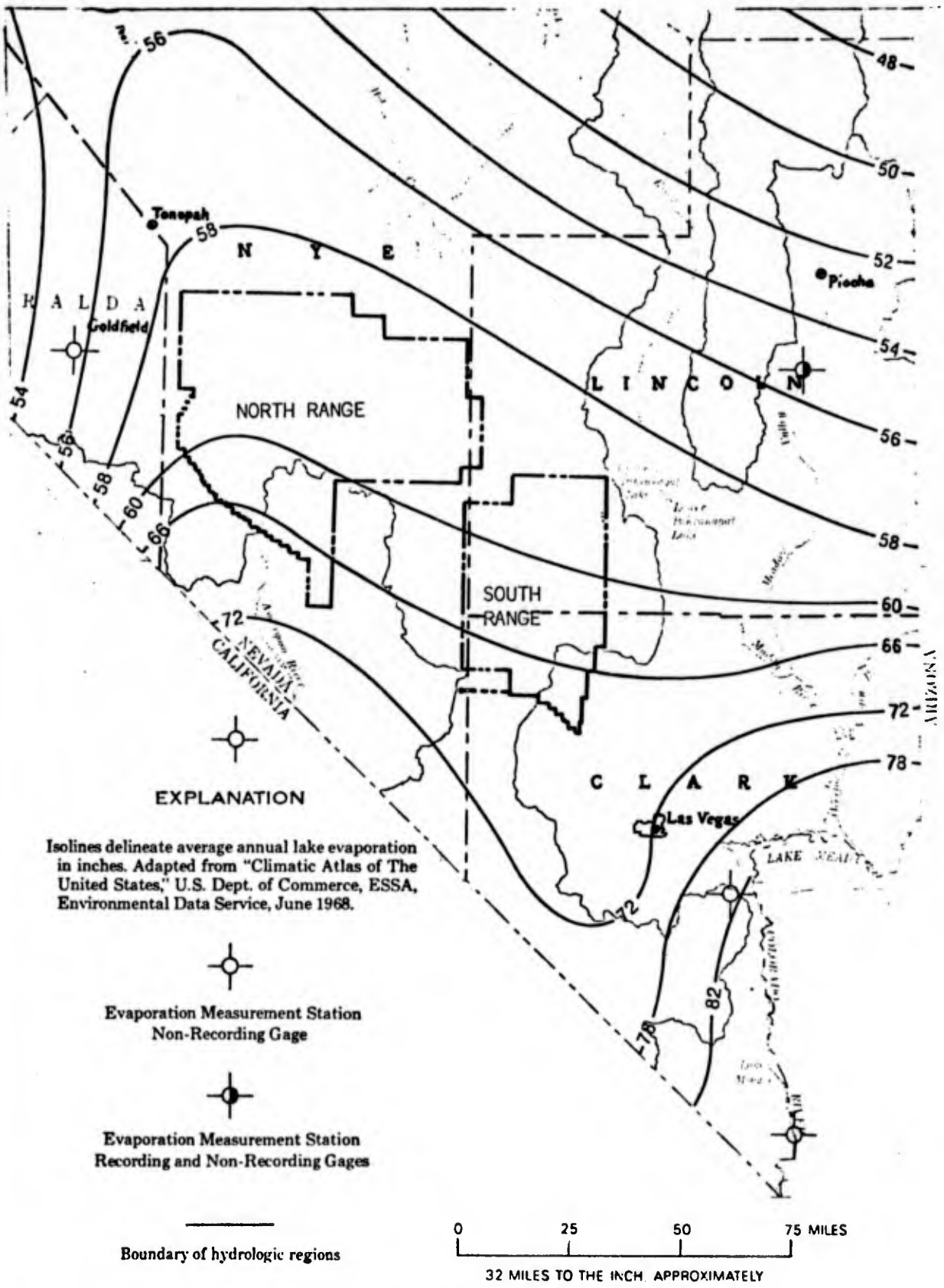
The precipitation pattern in Nevada is principally related to the topography. As shown in figure 2-1, stations at higher elevations generally receive more rainfall (including snow) than these at lower elevations. The greater precipitation in the mountainous area provides most of the recharge to the ground water system, while that which reaches the desert floor is mainly lost through evaporation. Figure 2-4 shows the annual evaporation rate from lakes in southern Nevada. The Nellis AF Range falls within the 58 to 72 inch annual evaporation rate. Run-off normally collects in many dry lake beds (playas) throughout the Range. Surface drainage from the South Range collects into the Three Finger Lake Valley and Indian Springs Valley playas. Similar playas in the Kawich, gold Flat, Cactus Flat, and Stonewall Flat collect and dissipate the runoff from the North Range. Fortymile Canyon, originating on Pahute Mesa, drains into the

There are various springs and natural, as well as man-made, water encatchments on the Range. Several have been developed by the BLM and FWS to provide water for wildlife.

While surface drainage patterns are quite evident on the Nellis AF Range, detailed subsurface drainage in many areas remains unknown. Figure 2-5 shows the estimated annual surface and groundwater flows between hydrologic areas around the Range. (This information has been extracted from the State of Nevada, Division of Water Resources Map prepared in 1971.

In the TTR, "The Cactus Flat ground-water system (See hydrographic boundaries 145, 146, and 148 on figure 2-5.) has been little studied and developed because of its isolation. It is probably part of the groundwater system discharging in Sarcabatus Flat northwest of Beatty along Highway 95, as are Stonewall Flat to the southwest of Cactus Flat and Lida Valley farther to the southwest. The number of wells available for study and the depth of the studies are not sufficient; however, to preclude entirely the possibility that Cactus Flat, like Gold Flat to its southeast, is part of the Pahute Mesa ground-water system in which case its ground water flows south to discharge eventually in the Amargosa Desert southeast of Beatty, Nevada [9]."

Groundwater drainage from the South Range and the southern portion of the North Range are a part of Ash Meadows and Pahute Mesa groundwater systems. The Pahute Mesa groundwater system, approximately 4,700 feet above mean sea level, in part moves southward beneath the Pahute Mesa, Fortymile Canyon, and Crater Flat toward the Amargosa Desert, and in part floors southwestward to Oasis Valley near Beatty. (See hydrographic boundaries 147, 157, 227 228, and 229 on figure 2-5.) Groundwater in Oasis Valley moves southward into the Amargosa Desert through gravel sands of the ancestral Amargosa River channel and probably, also through the underlying fractured rocks. The Ash Meadows Groundwater system (See hydrographic boundaries 158, 159, 160, 161, 168, 211, and 213 on figure 2-5.) generally moves downward through alluvium and volcanic rocks to the Paleozoic carbonate rocks, in which it then flows generally southwestward to discharge at the large springs in Ash Meadows.



AVERAGE ANNUAL EVAPORATION

FIGURE 2-4

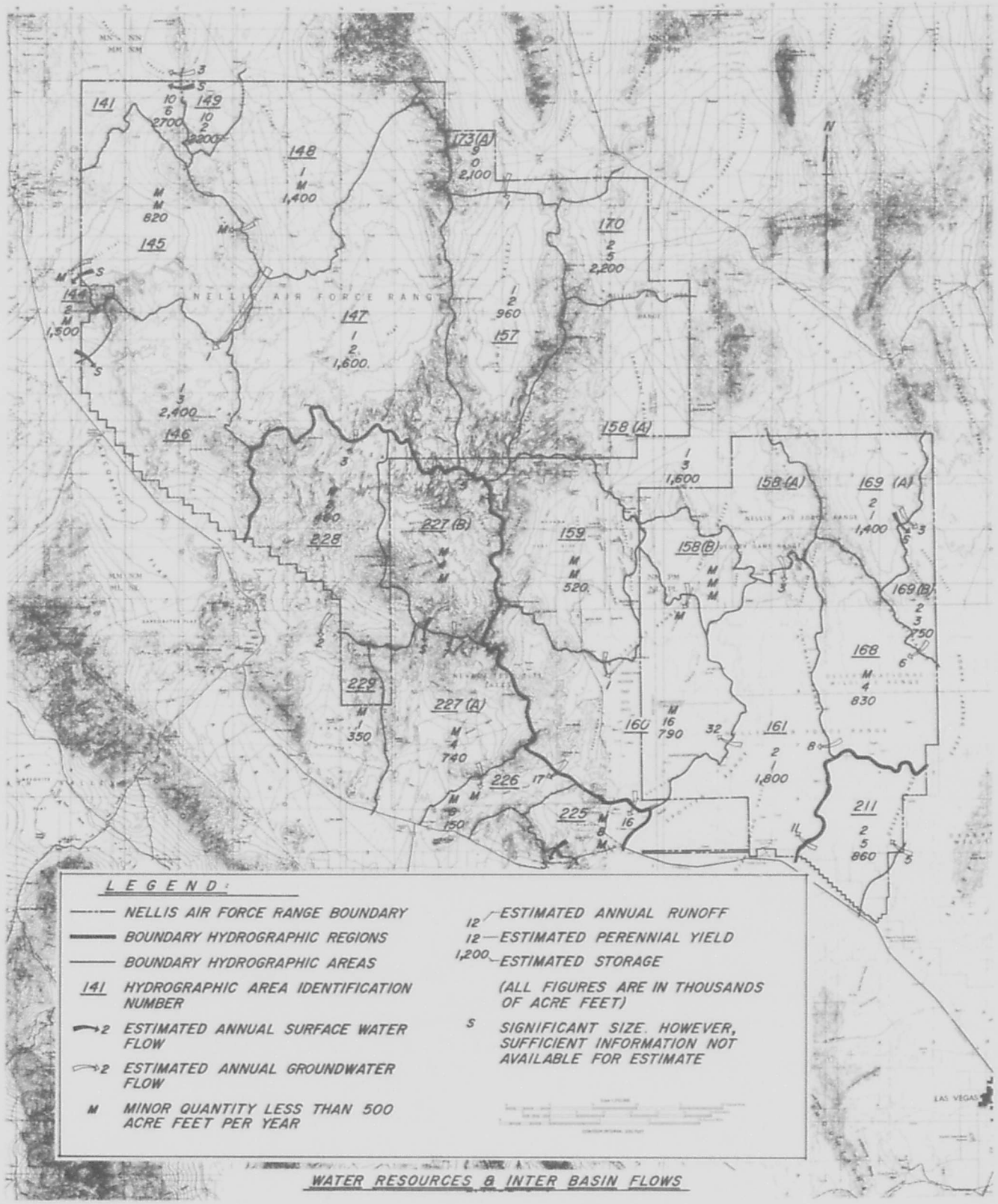

LEGEND:
NELLIS AIR FORCE RANGE BOUNDARY
BOUNDARY HYDROGRAPHIC REGIONS
BOUNDARY HYDROGRAPHIC AREAS
141 HYDROGRAPHIC AREA IDENTIFICATION NUMBER
2 ESTIMATED ANNUAL SURFACE WATER FLOW
2 ESTIMATED ANNUAL GROUNDWATER FLOW
M MINOR QUANTITY LESS THAN 500 ACRE FEET PER YEAR
12 / ESTIMATED ANNUAL RUNOFF
12 — ESTIMATED PERENNIAL YIELD
1,200 — ESTIMATED STORAGE
(ALL FIGURES ARE IN THOUSANDS OF ACRE FEET)
S SIGNIFICANT SIZE. HOWEVER, SUFFICIENT INFORMATION NOT AVAILABLE FOR ESTIMATE
WATER RESOURCES & INTER BASIN FLOWS
N
LAS VEGAS

Figure 2-5

Most of the annual discharge from the two groundwater systems, about 17,000 acre-feet from the Ash Meadows and 10,000 acre-feet from Pahute, Mesa, is transpired to plants or evaporated from soils and playas in the Amargosa Desert. The Amargosa Desert Water system is used to support agricultural operations in the area of the desert. Flow in the system occurs mainly through fractures in the massive carbonate and volcanic rocks. Groundwater velocity beneath the Pahute Mesa area has been estimated to be about 15 feet per year. These calculated estimates indicate that water from underground nuclear testing sites on Pahute Mesa could not leave government-controlled lands for more than 1,000 years (3).

"Many variables are involved in assessing ground water quality characteristics. For example, as ground water moves from areas of recharge to areas of discharge, the quality of the water may change in response to changing conditions in its environment. The dissolve solids content usually increases as water moves upward toward the surface (12)." These conditions could make ground water on the Nellis AF Range less desirable for agricultural use once it reached the hydrographic basin from which it would be pumped for irrigation of crop lands.

The quality of water available on the Nellis AF Range is generally good for domestic purposes. Table 2-4 shows typical monitoring data from wells at subrange 63 and Indian Springs AAF. Monitoring for radioactivity has been accomplished over several years by DOE. The potable water and supply wells show about 10 pCi/L of gross beta activity and 15 pCi/L of tritium. Other soluble decay products such as strontium-90 and Cesium-137 have not been detected. At this level of activity, one would not expect to exceed the EPA drinking water radioactivity standard for gross beta contamination.

VEGETATION

The predominant floral communities on the Nellis AF Range are shown in figure 2-6 and may be characterized into four groups:

- Southern Desert Scrub: These communities are found at the lower elevations, primarily below 4,000 feet, and are composed of Creosote Bush, Blackbush, Bursage, Boxthorn, Joshua Tree, Majave Yucca, Spanish Bayonet, Prickley Pear Cactus, Desert Needlegrass, and Big Galleta.

- Northern Desert Shrub: These communities are found at intermediate to high elevations throughout Nevada. In nearly each case a member of the genus Artemisia is dominate. The important plant species in this group include: Big Sagebrush, Rubber Rabbitbrush, Green Rabbitbursh, Bluebunch Wheatgrass, Squirrel Tail, and Nevada Bluegrass.

- Salt Desert Shrub: These plant communities are found primarily in valley bottoms and include White Sage, Shadscale, Four-winged Saltbrush, Bailey's Greasewood, Spiny Hopsage, Russian Thistle, Black Sagebrush, and Bud Sage.

TABLE 2-4

WATER QUALITY (mg/l)

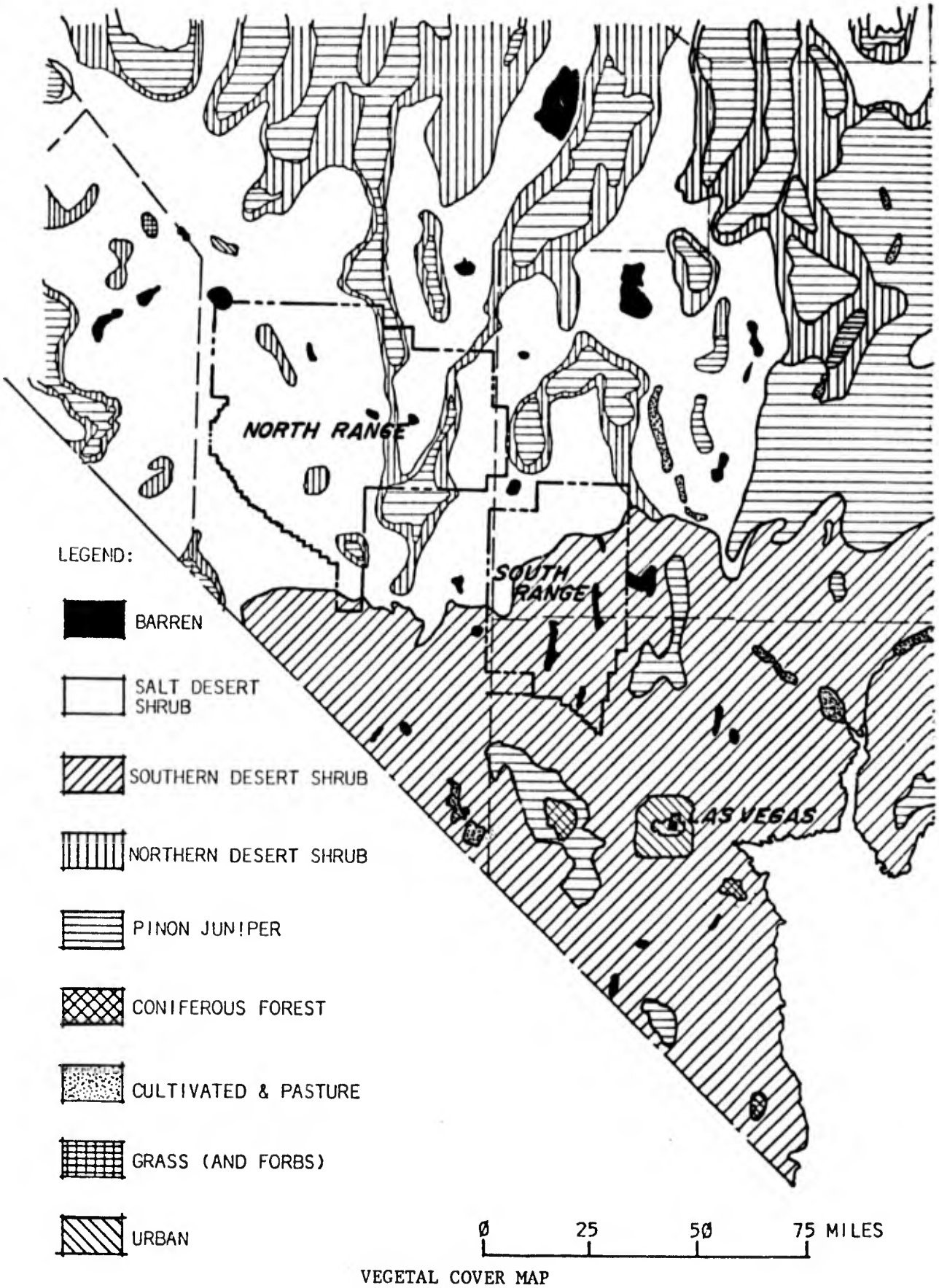
PARAMETER	SUBRANGE 63	INDIAN SPRINGS AAF
CALCIUM	32	47
MAGNESIUM	21	31
SODIUM	5.4	8.1
POTASSIUM	1.0	2.0
BICARBONATE	205	264
CARBONATE	ND*	ND*
SULFATE	9.3	46
CHLORIDE	9.7	12
FLUORIDE	0.1	0.1
NITRATES (as N)	0.3	0.8
SILICA	12	18
IRON	0.16	ND*
DISSOLVED SOLIDS	212	330
HARDNESS	170	250
ALKALINITY	168	217
PH	8.0	7.8

mg/l - Milligrams per liter

Analysis accomplished on 7 May 1976

*Non-Detectable

SOURCE: USAF Hq TAC/DEMU, Water Quality Report, 1976



VEGETAL COVER MAP
FIGURE 2-6

- Pinyon Juniper: This community is normally found above the northern desert shrub in a belt around many of the mountain ranges on the North and South portions of the Nellis AF Range. The two important plant species are Pinyon Pine and Utah Juniper.

Vegetation other than the plants belonging to the major communities also exists on the Nellis AF Range, but to a much lesser degree. For example, there is some mountain brush, forest, grasslands, and hydrophilous vegetation.

The desert riparian community occurs along washes throughout the cresoste bush community and the middle elevations of the black-brush community. The vegetation is similar to surrounding communities but denser and more luxuriant.

Table 2-5 lists the proposed endangered or threatened plants on and adjacent to the Nellis AF Range. These plants are among those listed by the FWS in, "Endangered and threatened Wildlife and Plants, Proposed Endangered Status for 1700 U.S. Vascular Plants," Federal Register, Part IV, 16 June 1976. There is no Nevada State list for endangered or threatened plant species.

Figure 2-7 shows the geographical location of the species. In the study area, as is common to the desert in general, vegetation productivity is highly variable from year to year. This variability, which depends on precipitation and a complex of other environmental factors, constitutes a major difficulty in assessing the status of specie populations. Rarity in any one particular year could not be considered evidence of a dwindling plant specie population. As cited in reference 11, Phacelia parishii was collected in a study conducted in 1941 and had not been observed since then until the Spring of 1976. 'There is, of course, no reason to believe that this species was absent for this entire period.[11]'

WILDLIFE

Table 2-6 lists the predominate species found on and adjacent to the Nellis AF Range. The species niche is described by the general flora communities. Comparison of table 2-6 with figure 2-6 will provide a general view of the species habitat. It must be remembered that the habitat for many species found on the Range is in localized zones of the various vegetative communities.

Coyotes, bobcats, foxes, badgers, and an occasional mountain lion are among the larger mammalian carnivores. Small mammals such as antelope ground squirrels, kangaroo rats, mice, cottontails, and jackrabbits are widely distributed but not abundant. Over 250 species of birds have been identified on the refuge, and of these, nearly 50 are permanent residents. Examples are Gambel's quail, roadrunner, pinyon

TABLE 2-5

PROPOSED ENDANGERED OR THREATENED FLORA

ON AND ADJACENT TO THE

NELLIS AF RANGE

	SPECIES	COMMON NAME	STATUS
1.	Arctomecon merriamii	Desert Poppy	E
2.	Astragalus beatleyae	Beatley's Milkvetch	E
3.	Astragalus nyensis	Nye Milkvetch	E
4.	Camissonia megalantha	Unnamed Evening-Primrose	E
5.	Frasera pahutensis	Pahute Green Gentian	E
6.	Galium hilendiae kingstonense	Kingston Bedstraw	E
7.	Lathyrus hitchcockianus	Mahave Sweet Pea	E
8.	Penstemon pahutensis	Pahute Beardtongue	E
9.	Phacelia beatleyae	Beatley's Five Leaf Clover	E
10.	Trifolium andersonii beatleyae	Beatley's Five Leaf Clover	E
11.	Asclepias eastwoodiana	Eastwood's Milkweed	E
12.	Agave utahensis v. eborispina	Utah Agave	T
13.	Arabis shockleyi	No Common Name	T
14.	Astragalus funereus	No Common Name	T
15.	Coryphantha vivipara v. rosea	No Common Name	T
16.	Eriogonum concinnum	No Common Name	T
17.	Gilia nyensis	No Common Name	T
18.	Gilia ripleyi	No Common Name	T

TABLE 2-5 (Cont'd)

	SPECIES	COMMON NAME	STATUS
20.	Hulsea vestita invoensis	No Common Name	T
21.	Linanthus arenicola	No Common Name	T
22.	Lupinus holmgrenanus	No Common Name	T
23.	Penstemon arenarius	No Common Name	T
24.	Penstemon pudicus	No Common Name	T
25.	Perityle megalocephala v. intricata	No Common Name	T
26.	Peteria thompsoniae v. nevadensis	No Common Name	T
27.	Phacelia mustelina	No Common Name	T
28.	Astragalus pseudiodanthus	Loco Weed	T
29.	Mirabilis pudica	Small Four O'Clock	T
30.	Astragalus musimonum	Loco Weed	T
31.	Erigeron ovinus	Daisy	T
32.	Erigeron uncialis v. conjugans	Daisy	T
33.	Lesquerella hitchcockii	Bladder Pod	T
34.	Lupinus montigenus	Lupine	T
35.	Machaeranthera grindeliodes v. depressa	Astor	T
36.	Penstemon thompsoniae jaegeri	No Common Name	T
37.	Townsendia jonesii v. tumulosa	No Common Name	T

E - Endangered T- Threatened

SOURCE: Endangered Plarts - Ref. 11; Threatened - BLM File Data.

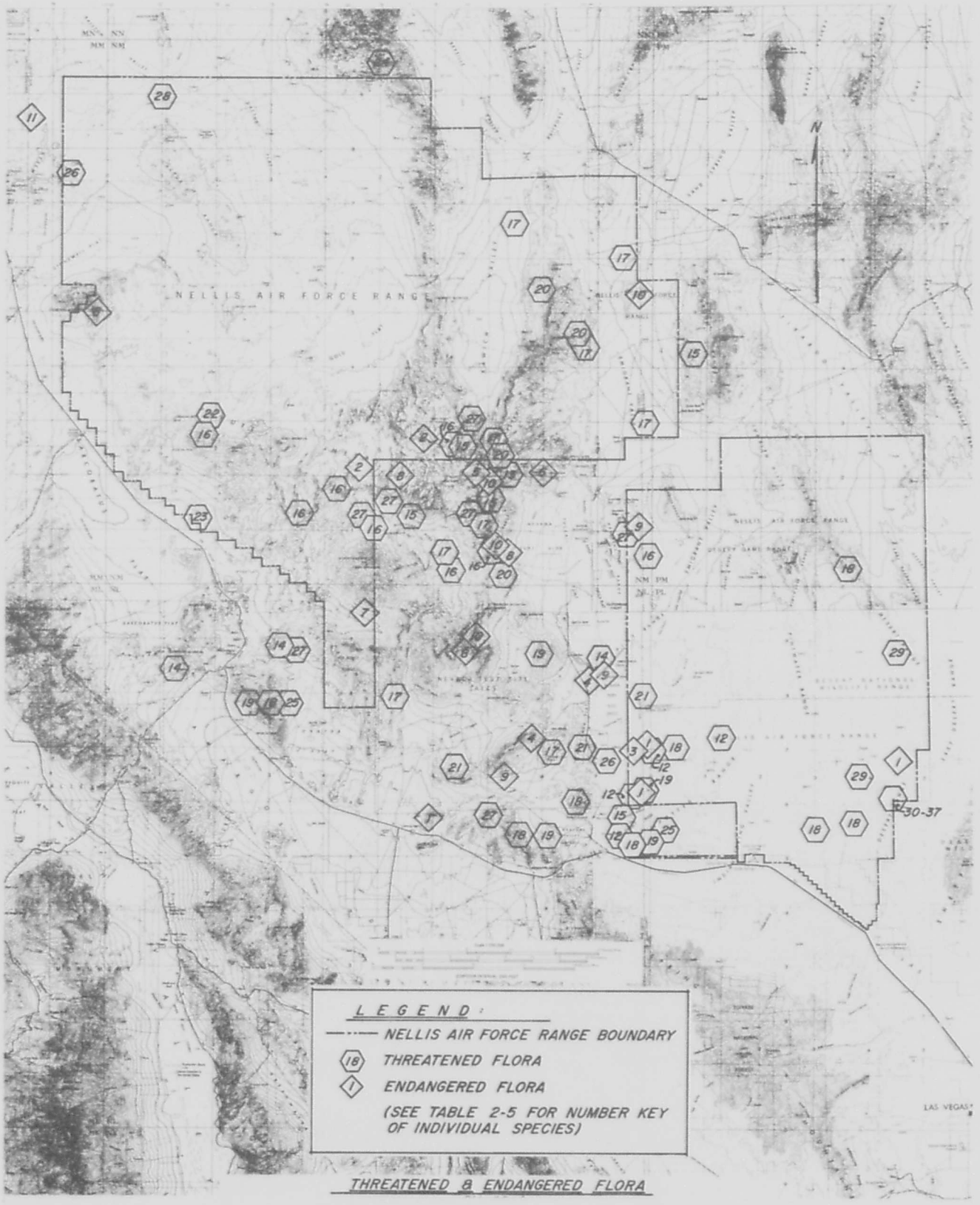

NELLIS AIR FORCE RANGE
N
LEGEND:
NELLIS AIR FORCE RANGE BOUNDARY
18 THREATENED FLORA
1 ENDANGERED FLORA
(SEE TABLE 2-5 FOR NUMBER KEY OF INDIVIDUAL SPECIES)
30-37
LAS VEGAS
THREATENED & ENDANGERED FLORA

Figure 2-7

jay, Clark's nutcracker, pine siskin, cactus wren, and burrowing and horned owls. A number of small water impoundments on the refuge attract, stop, and temporarily hold a variety of migrating waterfowl and wading birds, among them Canada geese, mallards, teal, redheads, gadwells, pintails, herons, egrets, and ibises. Several species of hawks are represented, with the Cooper's and sharp-shinned hawks being the most numerous in the timbered regions and the red-tailed hawk more common in the open country. Distribution of large animals and their range is approximately as shown on Figure 2-8. The Desert Bighorn Sheep habitat encompasses six mountains with the NWR. Within the proposed withdrawal area two mountain ranges, the Pintwaters and the Desert Ranges have year-round sheep use. The following population estimates were gathered during the 1978 fall helicopter survey. The Pintwaters have an estimated population of 205 animals and the Desert Range carries 126 animals. The Bighorn are nomadic in movement and migrate with the seasons; however, it is the need for water in this arid climate which restricts their movements during the summer months. Normally the Bighorns are found at the higher elevations but foraging for food carry them throughout the ranges.

No Federally listed endangered or threatened Wildlife species have been documented on the Nellis AF Range; however, the peregrine falcon and bald eagle may migrate through the Range. The desert tortoise, gila monster, and spotted bat are protected by the game laws of Nevada and could occur on the Range.

ANTIQUITIES

The natural and cultural development of southern Nevada can be traced through fossils found in the area, the remains of ancient cultures, and the more recent history of contemporary man.

PALEONTOLOGICAL RESOURCES

Paleontological records show the existence of animal and plant life in the area for nearly 600 million years. There are four general ages of sedimentary rocks in the area, representing the record from 600 million years ago to approximately the last one million years of geologic history.

Lower Paleozoic rocks (450-600 million years old) are well exposed in the Belted Range in the northern part of Nellis. A significant locality for fossils is in a canyon west of Belted Peak. Others have been found on the eastern part of the NTS. There also is an important occurrence of fossils in the hills northwest of Mercury.

Rocks classified as Middle Paleozonic (350-400 million years old) are not widely distributed in the area. Important areas are the south end of the NTS and the hills between there and U.S. Highway 95.

TABLE 2-6

WILDLIFE ON THE NELLIS AF RANGE

Vegetative Communities

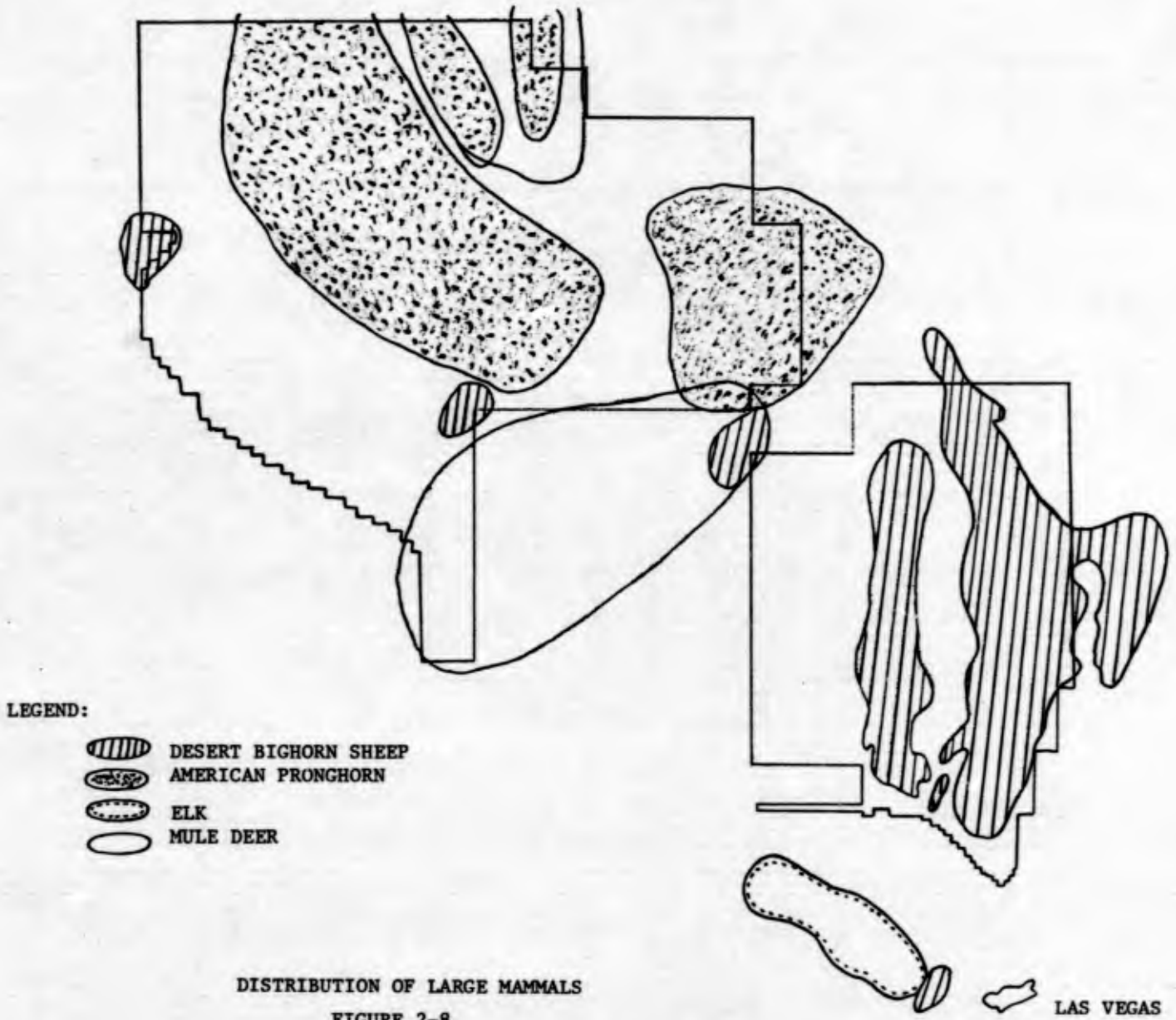
PREDOMINANT SPECIES	SALT DESERT SHRUB	SOUTHERN DESERT SHRUB	NORTHERN DESERT SHRUB	PINYON-JUNIPER	RIPARIAN
Reptiles					
Snakes					
Chionactis occipitalis (Western Shovel-nose Snake)		X	X		X
Masticophis flagellum piceus (Whipsnake-Red Racer)		X			X
Crotalus cerastes cerastes (Desert Sidewinder)		X			X
Lizards					
Callisaurus draconoides (Zebra-tailed Lizard)	X	X	X		X
Phrynosoma platyrhinos (Desert Horned Lizard)	X	X	X		X
Sceloporus occidentalis (Western fence lizard)	X	X		X	X
Uta stansburiana (Side-blotched Lizard)	X	X	X	X	X
Cnemidophorus tigris (Whip-tailed Lizard)	X	X		X	X
Turtle					
Gopherus agassizi (Desert Tortoise)		X			X

TABLE 2-6 (Con'd)

PREDOMINANT SPECIES	SALT DESERT SHRUB	SOUTHERN DESERT SHRUB	NORTHERN DESERT SHRUB	PINYON JUNIPER	RIPARIAN
Birds					
Lophortyx gambeli (Gambel's Quail)			X		
Alextoris graeca (Chukar)			X	X	X
Amphispiza nevadensis (Sage Sparrow)	X	X	X		X
Amphispiza bilineata (Black-Throated Sparrow)	X	X	X	X	X
Carpodacus mexicanus (House Finch)	X	X	X	X	X
Erimphila alpestris (Horned Lark)	X	X	X	X	X
Gymnorphinus cyanocephalus (Pinyon Jay)	X	X	X	X	X
Zenaidura macroura (Morning Dove)	X	X	X	X	X
Mammals					
Rodents					
Microdipodops megacephalus (Dark Kangaroo Mouse)	X	X	X	X	X
Microdipodops pallidus (Pale Kangaroo Mouse)	X	X	X	X	X

TABLE 2-6 (Cont'd)

	SALT DESERT SHRUB	SOUTHERN DESERT SHRUB	NORTHERN DESERT SHRUB	PINYON-JUNIPER	RIPARIAN
Thomomys bottae (Valley Pocket Gopher)	X	X	X	X	X
Microtus longicaudus lathus (Long-tailed Meadow Mouse)	X	X	X	X	X
Eutamias minimus (Least Chipmunk)		X		X	
Rabbits					
Lepus californicus (Jackrabbit)	X	X	X	X	X
Sylvilagus audubonii (Cottontail)				X	
Carnivors					
Canis latrans (Coyote)	X	X	X		X
Vulpes macrotis (Kit Fox)	X	X	X		X
Lynx rufus (Bobcat)	X	X	X	X	X
Large Mammals					
Odocoileus hemionus (Mule Deer)	X		X	X	X
Antilocarpa americana (American Pronghorn)	X		X	X	X
Ovis canadensis (Desert Bighorn Sheep)	X	X		X	X
Equus caballus (Horses)	X		X	X	X
Equus asinus (Burros)	X		X	X	X



DISTRIBUTION OF LARGE MAMMALS

FIGURE 2-8

Upper Paleozoic rocks (225-300 million years old) are common outcrops on the NTS. They comprise the bulk of the Elena Range.

There are several thousand feet of outcrops with sporadic occurrences of fossils. The Tippipah Formation is somewhat younger. These rocks occur in small outcrops in the hills on the southwest side of the Cactus Range on the Tonopah Test Range.

Pleistocene Beds, representing the last million years, outcrop along washes and alluvial fans. No fossil material is present in the sediments, although the older gravels and sands offer some possibilities, as they represent old terraces and stream channels where animals probably were common. Distribution within the area consists of a few square miles of alluvial fan exposures on the southwest side of the Cactus Range on the Tonopah Test Range.

CULTURAL RESOURCES

Existing cultural resource data on archaeological and historical properties is limited, and is primarily derived from a literature search compiled by the Archaeological Research Center, University of Nevada - Las Veges, the Museum of Natural History, for the Department of the Navy's Seafarer ELF Communications System Environmental Statement. (For further information, see reference 3). The literature search included only the Nellis Air Force North Range and NTS. At present, no data has been developed for the Nellis South Range.

Cultural sites located on the Nellis North Range consist of fourteen (14) aboriginal sites, six (6) historic sites, and four (4) sites which contain historical material in association with aboriginal sites.

Historic sites and materials are generally associated with late nineteenth and early twentieth century mining and ranching. These include historic mining townsites, homesites, mining sites, dugout structures, and historic scatters.

Aboriginal features include lithic scatters and concentrations, quarry workshops, caves and rockshelters, a campsite, burial site, pinyon nut roasting site, rock outline features, and pottery.

There have been previous impacts to the cultural resources on the North Range, primarily related to construction of roads and targets, the bombing and strafting of historic mining camps during the early years of range use, and the development of springs for livestock. There are no indications as to the exact time period when these sites were damaged; however, the Air Force is aware of the situation and is currently in the process of defining the scope of the problem to prevent additional impacts to these resources.

The Air Force is under contract with the University of Nevada at North and South Ranges. Along with an exhaustive literature search, field reconnaissance is being conducted for historical, archaeological, and significant vegetative resources. This effort will provide data on sensitive areas and the basis for future surveys when construction and/or operational activities are scheduled for a sensitive area.

Individual contracts are being utilized to provide cultural site clearance for the projects listed in this document as well as for those presently under construction. When a site survey indicates a sensitive area, the Air Force will move the project to an approved non-sensitive site. Commitment to this policy has been implemented by the TAC and all programming documents for construction activity on the Nellis AF Range are reviewed for compliance with this policy.

VISUAL RESOURCES

Public use of the visual resources on the Nellis AF Range is generally restricted to the portions of the range immediately adjacent to the highways (95 on the south and west 93, and 7 on the east and 25 on the northeast).

Public entry to the Nellis Range and the NTS is restricted.

Of the approximately 472 miles of perimeter on the Nellis Range, only about 75 miles of the perimeter are within the foreground-middle-ground zone (up to 3-5 miles), while the remainder of the perimeter of the Range is in the background zone (5-15 miles) or cannot be seen at all due to higher intermediate land masses. The foreground-middleground zones include the southwest portion of the North Range adjacent to Highway 95, northeast portion of the North Range near Highway 25, and the southern portion of the South Range adjacent to Highway 95.

Present target distribution in the North Range cannot be seen from either Highway 95 or 25 because of intervening higher terrain. (See figure 1-2). Past impacts to the landscape within the foreground-middle-ground zones on the North Range are those resulting from mining activity and roads.

The foreground-middleground zone on the southern portion of the South Range has been impacted in the vicinity of the targets in subranges 63 and 65 and in the area of the Indian Springs Air Field. (See figure 1-2). The present impacted areas in subranges 63 and 65 consist of surface disturbance and targets (See table 1-2A for a description of facilities) on the valley floor and playas and are not readily visible to the casual viewer passing by on Highway 95.

LAND USE

RECREATION

The specialized use of an area of interest as a Nellis Air Force Range, does not permit opportunities for public recreation at large. The entire Nellis AF Range is restricted from public use due to safety factors and national security. Limited access has been given to education groups for field trips and studies where participant safety is assured.

"In the three counties (Clark, Lincoln, and Nye) in which the Nellis AF Range is located, there are 12,661,466 acres of public recreation land. This acreage is composed of 12,566,809 acres of Federal, 93,576 acres of state, 25 acres of county, and 1,056 acres of local land [8]." Recreation facilities within 200 miles of the Range include Red Rock Canyon Recreation Area; the Toiyabe, Humboldt, and Inyo National Forests; Death Valley National Monument; Lake Mead National Recreational Area; Desert National and Pharanagat National Wildlife Ranges; and a host of states parks including Cathedral Gorge, Echo Canyon, Eagle Valley, Beaver Dam, Valley of Fire and Overton Wildlife Management Area.

The Desert National Wildlife Range's Corn Creek Field Station provides opportunities for sightseeing, animal photography, horse back riding, and nature trails. In concert with wilderness management, future activities will be directed towards public enjoyment of the more remote portions of the area. Annually the FWS (and the Nevada Fish and Game Department) holds two trophy ram/desert bighorn sheep hunts on DNWR. The second of these hunts is held within the proposed withdrawal area on the Pintwater and Desert Mountain Ranges. This requires a curtailment of Air Force activities during the hunt. The FWS and the Nevada Fish and Game Department consider these annual hunts to be a vital part of managing the State Bighorn Sheep populations and the most biologically sound system of harvest on any big game species in the world.

LIVESTOCK GRAZING

During 1956 the Air Force paid $708,000 to revoke grazing and mining rights on the Nellis AF Range. Management agreements between the Air Force, BLM, and FWS have been designed to protect wildlife, horses, and burros on the Range, recognizing that the sparse vegetation and animal competition coupled with the types of DOD operations are not compatible with domestic grazing. Grazing capacity in the range area is about 25 to 30 acres per animal unit per month.

On November 21 and 22, 1977, the Las Vegas District Office of BLM conducted an animal inventory on the North Range. The inventory showed 59 antelope, 4 burros, 825 cattle (trespass), 4 deer, and 1,378 horses. BLM reported to the Air Force that trespass domestic livestock were removed from the Range in 1978.

BLM has installed approximately 150 miles of fence along the northern border of the North Range to reduce the problem of trespass grazing. Competition among the large animals (mule deer, antelope, horses, and burros) which inhabit the range could present untenable management problems for protecting wildlife.

AGRICULTURE

There are no farming operations on the Nellis AF Range. Due to the soil structure and sparsity of rainfall, the Range possibly would not yield a very productive crop if it were open for agricultural unless some irrigation was done. Potential agricultural sites on the Range have been identified by BLM and are located at Cactus Flats, Kawich Valley, Emigrant Valley, and the lower lake of Three Finger Lake on the South Range (Range 63) [12].

Irrigation, in the area of the North Range, would require water to be pumped from the Ash Meadows and Pahute Mesa groundwater systems. These two systems discharge annually about 17,000 acre-feet and 10,000 acre-feet respectively. The discharge presently is transpired by plants or evaporated from soils and playas in the Amargosa Desert. Heavy pumping of the groundwater systems could alter the characteristics of the desert area.

MINERAL RESOURCES

A Stage One minerals inventory has been conducted by the U.S. Geological Survey and Bureau of Mines for the Nellis AF Range and immediate area [15]. The following summarizes this report.

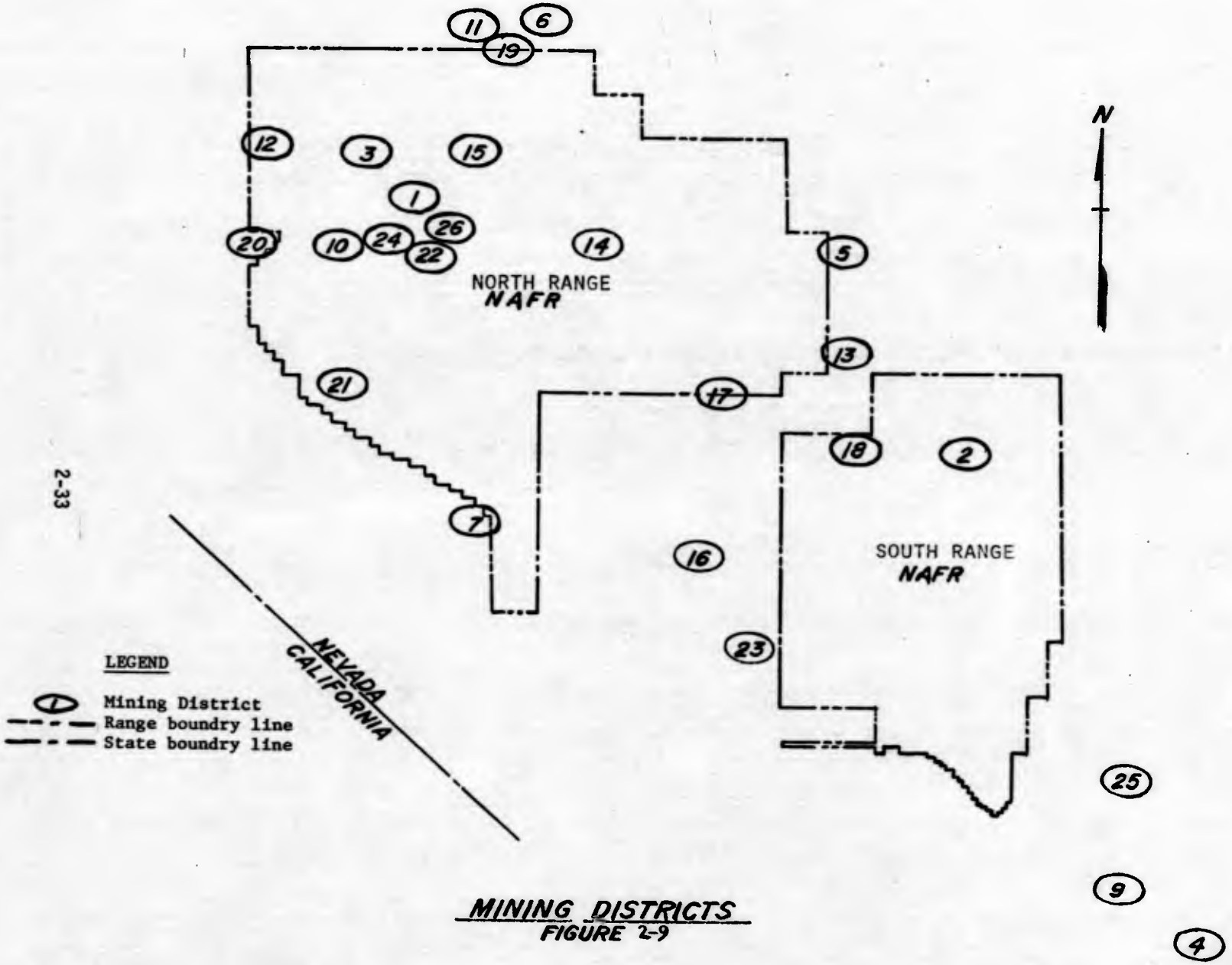
Mining activity in the study area, Nellis AF Range and adjacent lands, began in the mid-1860's; with most of the gold-silver deposits being located during the early 1900's. Although interest in the area's mineral deposits waned shortly after their discovery, activty at some sites continued sporadically through the 1920's and 30's. Total mineral production in the area is not known, but, over half the properties listed in table 2-7 are reported to have had some output. Figure 2-9 shows the geographical location of the mining districts in the study area.

TABLE 2-7

MINES ON AND ADJACENT TO NELLIS AF RANGE

MINING DISTRICT	COMMODITY	NO. OF MINES
1. Antelope Springs	Gold & Silver	3
2. Arrowhead	Copper, Lead, & Silver	1
3. Cactus Springs	Gold, Silver, Turquoise	3
4. Dike	Limestone & Lead	2
5. Dan Dale	Mercury, Lead, Silver, Copper, & Zinc	3
6. Eden	Silver, Gold	4
7. Fluorine	Fluorspar, Gold	2
8. Frenchman Mountain	Gypsum	7
9. Gass Peak	Zinc, Silver, Lead, Gold, Building Stone	3
10. Gold Crater	Lead, Gold, Silver	1
11. Golden Arrow	Silver, Gold	3
12. Goldfield	Gold	1
13. Groom	Lead, Zinc, Silver, Gold, Copper, Limestone	5
14. Kawich	Mercury, Gold, Manganese	6
15. Mellan Mountain	Gold	1
16. Mine Mountain	Lead, Mercury, Silver	1
17. Oak Springs	Tungsten, Gold, Silver Lead, Magnesite	9
18. Papoose	Silver, Gold, Lead	1
19. Silverbow	Silver, Gold	4
20. Stonewall	Silver	1
21. Tolicha	Gold, Silver	5
22. Trappmans	Gold, Silver	1
23. Wahmonie	Gold, Silver, Copper Travertine	4
24. Wellington	Gold, Silver, Copper	4
25. White Caps	Lead	1
26. Wilson	Silver, Gold	2

SOURCE: Reference 15.



MINING DISTRICTS
FIGURE 2-9

Little or no mineral exploration or related activity has occurred in the withdrawn area for nearly a half century because the Range has been withdrawn from operation of the mining laws. Nonetheless, geologic evidence and records of past mining activity support a premise that portions of the area could be a future source of selected mineral commodities to meet national requirements.

Mineral commodities found in the Nellis AF Range area are gold, silver, copper, lead, zinc, mercury, tungsten, turquoise, sand, gravel, and limestone. Gypsum and limestone are probably the most valuable commodities produced in the vicinity of, but not in, the Nellis AF Range. The average annual gypsum and limestone output for the early 1960's was estimated at 1,000,000 and 500,000 tons, respectively. Significant amounts of lead, silver, copper, and zinc have been recovered from the Groom mine about 3 miles east of the Range. (See Mining District No. 13 on figure 2-9).

Within the study area most of the metalliferous mineral deposits consist of gold-silver minerals, occurring as fissure fillings and replacements in shear zones. Some deposits also contain lead, zinc, and copper. Several occurrences of tungsten and molybdenite have been found in one district.

Areas having the highest geologic potential for mineral resources include the north end of the North Range, east of Goldfield, which may contain significant gold-silver deposits. The Oak Spring district (No. 17 on figure 2-9) at the north end of Yucca Flat has potential for new discoveries for tungsten-molybedenum and lead-silver deposits. Also, inasmuch as uranium mineral a few miles west of the Nellis AF Range and elsewhere in the Great Basin typically are found in Tertiary volcanic rocks and tuffaceous sedimentary rocks of silicic composition, particularly in the vicinity of volcanic centers, it appears that a fairly large area of ground having a potential for uranium resources could exist in the western part of the Range. Finally, some areas, mainly within mountain ranges, are covered by Tertiary volcanic rocks less than 1,000 feet thick, and areas, up to several miles wide, peripheral to the ranges are covered by alluvial material less than 1,000 feet thick. The bedrock beneath this relatively thin cover in places, as around the north end of Yucca Flat, may have a potential for mineral resources.

The USGS and BM recommend that an onsite mineral resource study of the Nellis Range should be conducted to determine areas having potential for mineral resources. Further geological, geochemical, and geophysical investigations would be required to confirm the significance of these potential resource areas.

WILDERNESS

On June 13, 1974, FWS proposed 1,332,900 acres of the DNWR be designated as a unit of the National Wilderness Preservation System. The Air Force ground-use areas, approximately 16% of the DNWR are not included in the wilderness proposal [8]: Air space utilization by the Air Force in Nellis Range activities includes all of the proposed Wilderness area. Figure 1-9 shows the boundaries of the Nellis AF Range, DNWR, and the proposed wilderness area.

The MOU between the Air Force and FWS restricts target facilities on the South Range to below 3,600 foot elevation contour line in the Indian Springs Valley and below the 4,000 foot contour line in the Three Lake Valley. Within the limits of practicability aircraft cannot operate below 2,000 feet above ground level except when using air-to-ground targets and the runways at Indian Springs AAF. Air-to-air training and gunnery operations over subrange 62 and 64 (figure 1-2) must be conducted above 10,000 feet.

Aircraft operations and training exercises are considerably different on the North Range than those conducted over the South Range. The North Range is a tactical range and in general requires the flexibility for aircraft to approach the targets from any direction. Ingress and egress routes to the subranges are established by the aircrews based on the scenario they intend to fly. Many scenarios require low approaches (100 feet above ground level) to the target. Additionally, the aircrew performs final ordnance arming when they enter the North Range boundary. Final arming must be conducted over restricted land since there is a possibility of inadvertent ordnance release during the arming cycle.

An evaluation of the North Range has been completed by BLM and indicates that the majority of the Range contains numerous hazards to human health and safety. Hazardous areas and conditions on the Nellis AF North Range include:

- eight areas of radioactive contamination.
- nine ordnance burial sites.
- the TTR (369,000 acres) and the Pahute Mesa area (172,000 acres) which are also intensively used by DOE.
- thirty-four extensive target arrays which are currently being intensively used,
- electronic warfare and monitoring equipment on the higher terrain,
- unexploded ordnance which has been dropped throughout the North Range over a period of about 40 years on established targets, targets of opportunity, land forms and other identifiable features. With the exception of established targets, the location and amount of unexploded ordnance is unknown.

- restricted airspace, with no ground access allowed without close supervision.

- numerous access roads which are currently used by the Air Force and DOE.

BLM has coordinated the North Range wilderness evaluation with representatives of the Sierra Club, Nevada Outdoor Recreation Association, and the University of Nevada, Reno, Recreation Department in March 1978 and subsequently with a representative of Friends of Nevada Wilderness. The only area identified by the representatives of the various groups was a part of the Kawich Range which extends into the North Range. (See figure 1-2, subranges 72 and 73). They felt this area should be inventoried as a potential area of critical environmental concern as defined in P.L. 94-579 (areas within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards). The Air Force and BLM conducted a reconnaissance of the questioned area and concluded the resources are protected under the Five Party Cooperative Agreement (see p. 1-33).

Considering the above aircraft operations, present land uses, and safety hazards of unexploded ordnance the North Range is not considered to meet the wilderness criteria as outlined in section 2(c) of the Wilderness Act of 1964.

LAND USE PLANS, CONTROLS AND CONSTRAINTS

Lands comprising the Nellis AF Range have been withdrawn by various PLOs, E.O., and one P.L. since 1940. The national policy for using the public land is well established - national defense. In order to assure proper utilization of these lands, MOUs have been instituted with various Federal and State agencies, stipulating various controls and constraints. Air Force operations on the Range are in strict agreement with the aforementioned controls and constraints and will remain so if the proposed renewal is approved.

Additional Nevada State legislation that concerns land use plans is given in table 2-8. Generally, these laws deal with solid waste disposal and control of fugitive dust.

Use of the Range by the Air Force and DOE has contaminated various areas with ordnance and radioactivity. Although there have been many programs instituted by the Air Force to remove unexploded ordnance, these programs have provided surface clearance only. Subsurface ordnance may be found in many locations throughout the Range since target complexes have been moved to new locations over the years. Additionally, prior to

TABLE 2-8

LAND-USE CONTROLS

CELDS Reference NO.*	TITLE OF NEVADA STATE LAW	APPLICABLE SECTION
1751	Solid Waste Land Disposal Site Locations	Sited to prevent water pollution, control measures to prevent Vector problems, must conform to land use plans, and site must be approved by state.
1744	General Rules for Solid Waste Disposal	Waste cannot be deposited within 4 feet of highest ground water table.
1753	Solid Waste Land Disposal Operations and Maintenance	Applicable operation and maintenance of land fills
1745	Disposal of Hazardous Waste	Cover waste with at least 4 feet of dirt. Oil, grease, and sludge cannot be buried unless approved by state.
1787	Underground Disposal of Radioactive or Toxic Waste	Permit required to discharge radioactive or toxic waste underground in liquid or explosive form.
1760	Permits for Air Contaminant Source	Permit required for any construction that disturbs topsoil of more than 20 acres.
1766	Fugitive Dust	Use of unpaved or untreated roads prohibited in areas designated by Director without some type of control. No topsoil or vegetative cover can be removed on 20 acres or more without permit.
1756	Permit for Activities Affecting Wildlife Habitat	Consent of Nevada Fish and Game required to remove vegetative cover on any watershed

* SOURCE: Computer-aided Environmental Legislative Data System, Civil Engineering Center, Tyndall AFB, FL., 32403.

developing targets, aircrews dropped live ordnance on natural features throughout the Range. Therefore, the Air Force considers the land not safe for public use in its present condition.

SOCIO-ECONOMIC CONDITIONS

The Bureau of Economic Analysis, U.S. Department of Commerce, divides the nation into numerous areas for statistical and projection purposes. Clark, Esmeralda, Lincoln, and Nye Counties are treated as an economic unit in Southern Nevada and will be used in this document as the region of influence.

POPULATION

Nevada's population growth in the 1960s averaged 5.53 percent annually (from 285,278 in 1960 to 488,738 in 1970). This annual rate of growth slowed to 4.28 percent between 1970 and 1975.

Clark County had 56 percent of the State population in 1975. Between 1960 and 1970 the population growth was at a 7.96 percent average annual rate but slowed to 4.32 percent between 1970 and 1975.

The regional population of the four counties in southern Nevada (Clark, Esmeralda, Lincoln, and Nye) represented 47 percent of the state total in 1960; however, that expanded to 58 percent between 1970 and 1975.

EMPLOYMENT

The dominant industry, in terms of total number employed in the region, is the resort, gambling, and tourist industry in Las Vegas. Next in importance are Federal Services in Nye and Clark Counties. Third in significant is manufacturing. Economic and employment benefits flow mainly to Clark County. Employment outside the basic sectors is primarily in retail, financial, construction, transportation, equipment, utilities, and government services (4).

Nellis AFB, including the Nellis AF Range, currently employs 8860 military and civilian personnel in Clark County and is the area's largest employer.

The establishment-based industrial employment in 1970 and 1974 for Clark, Esmeralda, Lincoln, and Nye Counties is provided in table 2-10 A, B, C, and D respectively.

TABLE 2-9

POPULATION FOR SELECTED COUNTIES AND STATE OF NEVADA
1960, 1970 and 1975

	1960	1970	1975
Clark County	127,016	273,288	337,597
Esmeralda County	619	629	862
Lincoln County	2,431	2,557	2,892
Nye County	4,374	5,599	6,400
4 County Total	134,440	282,073	347,751
Percent of State	47%	58%	58%
State of Nevada	285,278	488,738	602,793

SOURCE: Bureau of Business and Economic Research, University of Nevada - Reno, Revised March, 1977.

TABLE 2-10A

CLARK COUNTY ESTABLISHMENT BASED INDUSTRIAL EMPLOYMENT
1970, 1974

INDUSTRIAL SECTOR	EMPLOYMENT BY COUNTY 1970	1974	%Change
Mining	100	200	+100
Construction	7,400	9,000	+ 22
Manufacturing	4,300	5,100	+ 19
Public Utilities	7,300	8,700	+ 19
Trade	20,700	26,600	+ 29
Finance, Insurance & R.E.	4,200	5,700	+ 36
Services (1)	51,000	65,500	+ 30
Government	16,200	18,500	+ 15
Unemployment	6,800	11,900	+ 74

SOURCE: Manpower Data by Sector and County 1970 and 1974, Manpower Information and Research, Employment Security Department, Carson City, Nevada, 1970 and 1974.

(1) Includes agricultural services and Firms not elsewhere classified.

TABLE 10-2B

ESMERALDA COUNTY ESTABLISHMENT-BASED INDUSTRIAL EMPLOYMENT
1970, 1974

INDUSTRIAL SECTOR	EMPLOYMENT BY COUNTY 1970	1974	%Change
Mining	130	100	- 23
Construction	40	30	- 25
Manufacturing	0	0	-
Public Utilities	0	0	-
Trade	20	20	-
Finance, Insurance & R.E.	0	0	-
Services (1)	*	*	-
Government	70	70	-
Unemployment	10	20	+100

SOURCE: Manpower Data by Sector and County 1970 and 1974, Manpower Information and Research, Employment Security Department, Carson City, Nevada, 1970 and 1974.

(1) Includes agricultural services and firms not elsewhere classified.

* Less than ten.

TABLE 2-10C

LINCOLN COUNTY ESTABLISHMENT-BASED INDUSTRIAL EMPLOYMENT
1970, 1974

INDUSTRIAL SECTOR	EMPLOYMENT BY COUNTY 1970	1974	% Change
Mining	80	130	+ 63
Construction	*	30	
Manufacturing	*	20	
Public Utilities	80	90	+ 13
Trade	100	130	+ 30
Finance, Insurance & R.E.	*	10	
Services (1)	60	70	+ 67
Government	270	290	+ 7
Unemployment	110	100	- 9

SOURCE: Manpower Data by Sector and County 1970 and 1974, Manpower Information and Research, Employment Security Department, Carson City, Nevada, 1970 and 1974.

(1) Includes agricultural services and firms not elsewhere classified.

* Less than ten.

TABLE 2-10D

NYE COUNTY ESTABLISHMENT-BASED INDUSTRIAL EMPLOYMENT
1970, 1974

INDUSTRIAL SECTOR	EMPLOYMENT BY COUNTY 1970	1974	% Change
Mining	350	440	+ 26
Construction	100	110	+ 11
Manufacturing	10	20	+100
Public Utilities	70	110	+ 57
Trade	270	270	-
Finance, Insurance & R.E.	20	50	+150
Services (1)	5,090	3,510	- 31
Government	480	460	- 4
Unemployment	40	110	+175

SOURCE: Manpower Data by Sector and County 1970 and 1974, Manpower Information and Research, Employment Security Department, Carson City, Nevada, 1970 and 1974.

(1) Includes agricultural services and firms not elsewhere classified.

INCOME AND EXPENDITURES

The services sector is the largest single source of personal income in Clark and Nye counties ($679.4 and $57.7 million respectively in 1974 [2].) Government was the largest inductor of personal income in Esmeralda and Lincoln counties ($0.46 and $2.85 million, respectively in 1974) [2]. The region has seen a marked increase in personal income from $1.142 million in 1970 to $1,664 million in 1974. This is a 46 percent increase over the four year period and mainly comes from expansion in the Clark County service sector.

Per capita income from Clark, Esmeralda, Lincoln and Nye counties was $5,988, $3,574, $4,437, and $4,197 respectively in 1974 [2].

Personnel income (military and civilian) at Nellis AFB and the TFWC Range Group was $87.3 and $17.8 million, respectively, in fiscal year 1978. The operations and maintenance budgets for the Base and Range Group in fiscal year 1978 was $29.8 and $32.5 million, respectively. In general, the operations and maintenance budget includes funds for supplies, equipment, and services.

About 60 percent of the payroll is spent in the local economy. It is estimated that 2,400 Air Force families rent homes and an additional 2,500 Air Force families have purchased homes in Clark County.

Currently the personnel who operate the Range live at Tonopah and Beatty (both towns are in Nye County). At Tonopah, the Air Force is under contract for 101 bed spaces in two motels for a total cost of $490,476 per year. It is anticipated the Air Force personnel spend $212,200 per year in the local economy of Tonopah for food and recreation. Personnel living in Beatty spend about $184,000 per year for rental accommodations and about $114,900 per year for food and services.

GOVERNMENT FINANCE AND TAXATION

Assessed valuation for Clark County was $1,665,102,836 for fiscal year 1975-1976. Esmeralda, Lincoln, and Nye Counties had a combined assessed valuation of $86,199,987 for the 1975-1976 fiscal year.

By state authority the rate of taxation cannot exceed five percent of the assessed valuation; this includes local, county, regional, and state taxing bodies with the exception of special tax districts. Clark County had a combined unit rate of 3.58 percent while Esmeralda, Lincoln, and Nye Counties had 3.9, 3.5, and 3.4 percent, respectively.

Additional revenues should be generated in these four counties through the in-lieu tax. The in-lieu tax provides for the redistribution of Federal revenues to counties having Federal lands. These tax revenues go to county budgets, and should not appreciably affect the cities and towns.

HOUSING

Nellis AFB and the Range personnel predominately live in Clark and Nye Counties. In Nye County, the towns of Beatty and Tonopah are used by the Range personnel for lodging when working on the Range.

DOI [20] reported 120,966 occupied housing units in the Las Vegas area. Of these, 73,389 are single-family, 33,089 are apartments, and 15,040 are mobile homes. There is no indication of the vacancy rates; however, based on housing surveys conducted by Nellis AFB, housing is available but often expensive to purchase. Nellis AFB provides 2,446 dorm spaces and 1,260 family housing units. In Tonopah and Beatty there were 970 and 3,337 housing units (197 figures), respectively [18]. In 1970, Nye County had a housing shortage of 313 units; with the Beatty and Tonopah townships representing 16.1 and 46.3 percent of the available housing units, and 22.4 and 42.1 percent of the county population, respectively. (18)

It is estimated that 2,400 Air Force families rent homes and an additional 2,500 families have purchased homes in Clark County. All Air Force civilian personnel are restricted from military base housing; therefore, they either buy or rent housing accommodations in the Las Vegas - Henderson area.

Range personnel who reside in Beatty, based on 1970 housing statistics, utilize about 11 percent of the available units. Military personnel in Tonopah use Air Force contracted quarters, and, therefore, do not contribute to the area's housing problems.

In Tonopah there are 290 motels units of which the Air Force has contracted 101 for military personnel working in the TTR area of the North Range. It is reported through the Tonopah Convention Center that the yearly occupancy rate of the motels in Tonopah averages 90 percent. Based on an average room rate of about $20 per day, plus a 5 percent room tax, the industry grosses about $1,226,400 annually. The Air Force current contract for the two motels is $490,476. This gives a combined income for the industry of $1,716,876. The Air Force contract is exempt from the room tax.

HEALTH FACILITIES

Nye General Hospital (Tonopah), the only hospital in Nye County, provides acute and long-term care services. The service area is centered in Tonopah, Goldfield, Warm Springs, Silver Peak, Dyer, and Lida Junction. The residents of Beatty, Lathrop Wells, and Pahrump are considered to be in the Clark County Service area.

Two physicians live in Tonopah and one physician assistant serves Goldfield. One public health nurse serves Nye and Esmeralda Counties, while no school nurses are recorded for Nye. At the present time, a traveling dentist and a traveling optometrist each spend two days per month in Nye County.

SOCIAL ATTITUDES, EXPECTATIONS, AND LIFE STYLE

Resident leaders in the Las Vegas metropolitan area and in the smaller communities of the Moapa Valley, defined their communities as attractive places to live. Asked to state negative aspects, the metropolitan respondents mentioned such things as increasing air pollution and traffic congestion. The rural respondents were more concerned about a lack of local services, particularly hospital and medical care.

Rural and urban opinion leaders gave the most positive ratings to such factors as: a good place to raise a family; quality of local schools; recreational opportunities; and quality of the physical environment. While all areas have certain disadvantages that affect quality of life, the overwhelming feeling was that Clark County communities are good places to live.

The Las Vegas metropolitan area is a fairly normal residental community inhabited by persons with values and goals much like those of residents of similar cities in the county. A "value-profile" of the area [18] indicates that residents strongly value such things as quality educational opportunities for their children, family life, and personal honesty and trust. They tend to favor economic development and industrial growth and expansion for their communites. Personal status and environmental concerns receive less emphasis.

INFRASTRUCTURES

The Nellis AF Range is geographically located northwest of Las Vegas, NV., in Clark, Lincoln, and Nye Counties. It is bordered by U.S. highways 95 on the south and west, 6 on the north side, 25, 91, and 93 on the east side (See figure 1-1). Maintenance equipment and supplies are brought from Nellis AFB onto the Range via these highway systems. The Nellis AF Range has four primary access routes: (1) southern access through Indian Springs, (2) north-east access on Valley Road from State Highway 25, (3) from the west via a road at Goldfield, and (4) from the west via county road north of Springdale.

The regional transportation network has approximately 20 bridges and interchanges; about half of these are located on U.S. 95 between Las Vegas and Tonopah. Bridge capacities are rated at 20 tons gross vehicle weight [4]. The widths and carrying capacity of these structures are adequate to serve the Air Force transportation requirements.

Electric power for the area is supplied by the Nevada Power Company, Valley Electric Cooperative Association, Sierra Pacific Power Company, and Lincoln County Power District No. 1. The latter is planning to extend service to within ten miles of the Nellis AF Range [4]. There are four utility systems on the TTR and none on southwest border of the Nellis Range. Some public utilities are routed along the southwest border of the Nellis Range and provide ample service to Indian Springs AAF and the South Range area.

Currently solid waste is disposed at the landfill at Indian Spring AAF. The fill site is 150 acres with approximately 50 acres presently full. At the current rate of waste generation, 200 tons/yr, the projected life of the facility is approximately ten years. Indian Springs AAF is currently working with local officials to obtain approval to use the Indian Springs municipal landfill. However, if this approval is not obtained, they will have to prepare a detailed design and operating plan to meet the State and Environmental Protection Agency Guidelines for the Land Disposal of Solid Waste (40 CFR 241). Future development of the maintenance complex for electronic warfare equipment (projected for the North Range) might require a landfill and sanitary sewage treatment system. As these facilities are defined, engineering plans will be instituted to assure all applicable regulations are met.

HAZARDS AND SAFETY

The main hazards associated with the use of the Nellis AF Range are aircraft noise, sonic booms, range contamination from unexploded ordnance, radioactivity, seismicity, and potential range fires.

Supersonic activity is primarily associated with mock aircraft duels conducted in the Air Combat Maneuvering (ACM) area over the South Range. ACM missions are expected to generate some sonic boom overpressures up to 5 lb/ft^2 which may extend in width on the ground from 30 to 35 miles at bottom cutoff. Overpressure on the ground, at the cutoff point may be between 0.6 and 1.2 lb/ft^2 depending on source mach number and type of aircraft.

Existing operational restrictions and the MOU with FWS require that supersonic activity avoid populated or otherwise sensitive areas. During a mock-duel, the aircraft usually are supersonic for a short period of time. The area in which aircraft go supersonic is generally the center of the individual training areas; however, sonic booms may occur over the entire training area.

There is previous history of sonic booms occuring in the airspace over the Nellis AF Range. During 1977, the Air Force Sonic Boom Repository reported 4,969 booms occuring on the Nellis AF Range. The Air Force projects a modest increase in ACM missions; therefore, this increased activity with respect to potential impacts will be analyzed in this document.

The potential safety hazard from unexploded ordnance and radioactivity has been previously addressed in this chapter; however, the potential is far too great not be discussed here. From October 1976 to September 1977, 49,750 manhours were expended to surface clear 341,750 acres of range land. This is a tedious job and, although meant to be thorough, no guarantee can be given that additional ordnance is not present on the surface. It is not uncommon to find unexploded ordnance in areas that have been previously surveyed. No attempts have been made to remove subsurface ordnance except in those areas around the targets. Due to erosion forces some subsurface ordnance is uncovered

to be cleared and the topsoil land bladed. The environmental consequences would be too great to conduct this type program. Consequently, public access must be restricted.

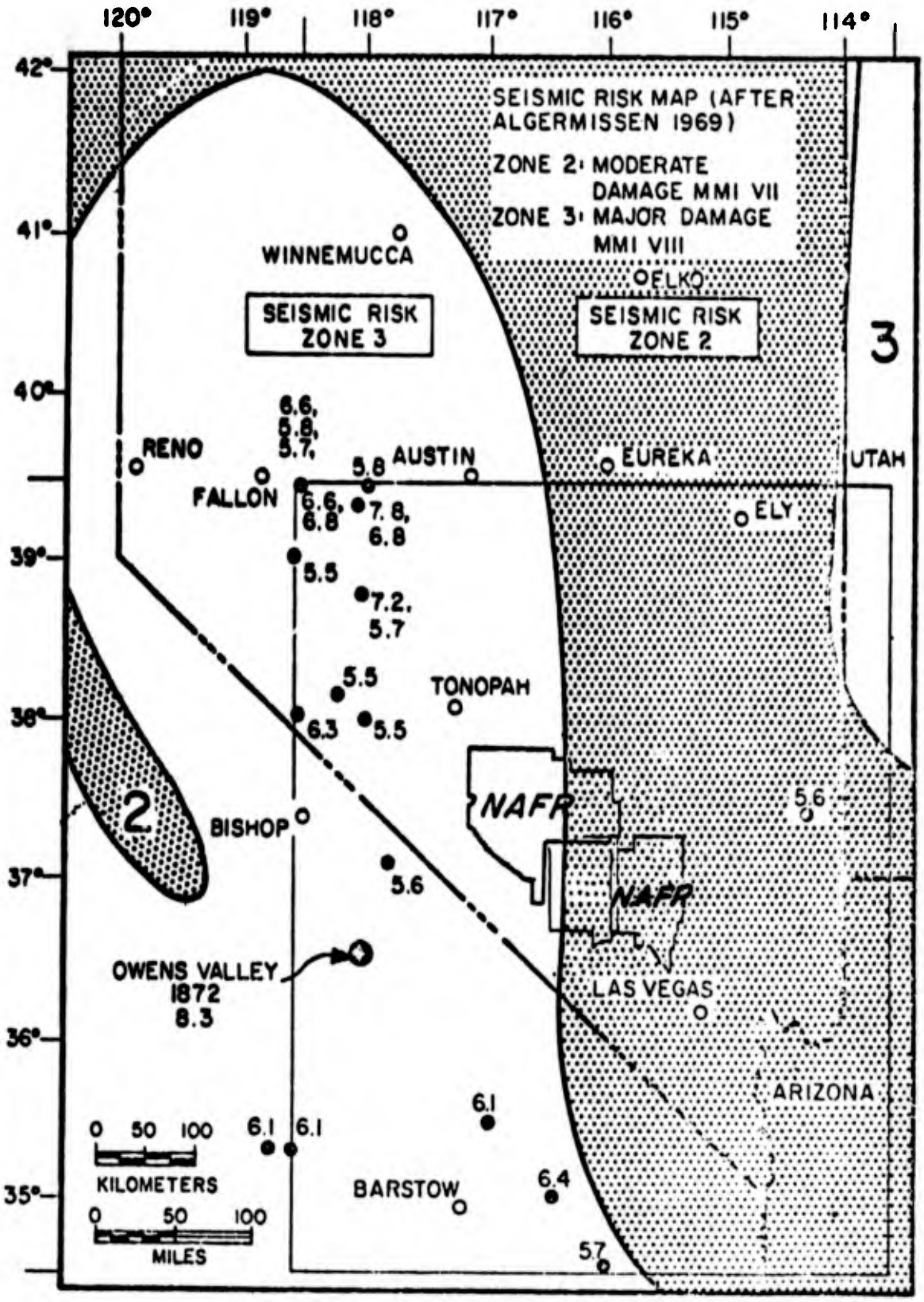
The southern Nevada region is generally characterized as an area of moderate seismic activity. (See figure 2-10.) There have been some 4,000 earthquakes recorded between 1900 and 1974 within an area of 95,000 square miles, centered about the NTS. The NTS is located between the North and South Ranges of the Nellis AF Range. Most of the earthquakes were small inconsequential events with only 21 having magnitudes of 5.5 or larger. From September 1961 to December 1973, there were 390 recorded seismic events located on the NTS. The vast majority of this activity was the result of nuclear tests and after-shocks related to those tests.

All underground nuclear explosions are followed by a sequence of small earthquakes which may persist from hours and days upward to several months. During the period prior to the cavity collapse, most of the seismicity correlates with the deterioration of the explosive cavity. After collapse occurs, the after-shock sequence for smaller-yield events usually ceases completely. For high-yield events, after-shocks will continue to occur in the media surrounding the shock point. In such cases, there is an apparent alignment of after-shock hypocenters with subsurface geologic structures. At one time, as many as 34 high-gain seismometers, located on and adjacent to Pahute Mesa, were utilized in the study of the seismicity preceding and following megaton explosions. These studies have shown that in an area having a radius of 8.7 miles from the point of ground zero and extending down to within three (3) miles of the surface, the distribution of after-shocks appears to be controlled by pre-existing geologic structures. The after-shock sequence generally decays to a background level within a period of several weeks.

"A comprehensive study completed in 1974 examined the regional seismicity and tectonics of the NTS from 1952 through 1973. The results of this study showed that the underground nuclear testing program did not produce any detectable influence on the natural pattern of earthquake activity except in the immediate area of the shots [3]."

Due to the dry arid climate, there is a potential for range fires. Many aircraft training operations utilize live ordnance; and, frequently, spotting flares are used to illuminate targets. In order to reduce the fire potential during abnormal vegetative growth years, target complexes where live ordnance or flares are used, the vegetative cover is cleared out to a 2,000 foot radius from the target. The Air Force has facilities and equipment which can augment that of BLM and FWS to provide fire protection.

As discussed in Chapter 1, page 1-21 and 1-25, the DOE has conducted a series of safety and cratering tests on the North Range. These tests have contaminated a total of 2,819 acres of land. Radioactive isotopes used in the safety tests were depleted uranium and plutonium. Cesium-137, strontium-90, and minute amounts of other fission products were produced in the cratering test.



F

SEISMIC ACTIVITY

FIGURE 2-10

The above ground areas, where safety experiments have been conducted, offer unique sites for studies of the behavior of plutonium in the natural desert environment. Recognizing this, DOE intentionally has preseved these sites. Studies have been conducted to determine the concentration of plutonium and other nuclides in the soil, biota, and resuspension in the air.

An intensive soil sampling program has been done in the safety shot areas. It is estimated there is a total of 113 curies (4 pounds) of plutonium in the top five centimeters of the 323 acres (fenced areas). Concentrations of radioactive isotopes, near ground zero, range from 120 microcuries/m (Clean Slate I) to about 2,800 micorcuries/m (Double Track) and progressively get smaller with increasing distance from ground zero.

Radionuclide levels in and on vegetation correlate relatively well with levels in the soil. The greatest amount of radionuclides measured for vegetation is contributed by radioactive dust on the plants rather than by radioisotopes taken up into the plants thorough the roots. "The discrimination ratio against plutonium being absorbed into the plants by way of root uptake, for instance, is of the order of 10^{-5} as compared to the amount in the soil [3]." Radioactive levels on various species of plant surfaces can varify by four orders of magnitude, depending mainly on the ability of external surfaces of the plants to retain particles. The inventory of plutonium for plants in the study areas, in comparison to the inventory for soils, is very small; for example, the inventory of plutonium for plants at the Project 57 site is only 0.000264 curies, compared with the soil inventory of 44 curies [3].

Radioactivity levels in vertebrates vary considerably with species, their habitats, and residence time on the area. In general however, the quantities of radionuclides on external surfaces (skin and hair) and in the gastrointestinal tracts correlate well with the contaminated environment in which the vertebrates reside. Radioactivity levels of plutonium on external surfaces an in the gastrointestinal tracts are at about the same level or one order of magnitude less than in the soil. Plutonium levels in tissues range from about three to five orders of magnitude less than the levels in soil. These low levels of plutonium in tissue are explicable because of the high discrimination against plutonium (and other transuranics of interest here) being absorbed from the lungs or gastrointestinal tract. Correlative experiments with transuranic elements at the DOE farm on the NTS, and results for beef herd grazing and wildlife also demonstrate high discrimination (10^{-4} to 10^{-5}) against transuranies.

Another area of study has been the transport of plutonium through entrainment or resuspension in the air. Resuspension measurements of radioactive materials in the air show that on the average extremely low quantities (on the order of a billionth) of the surface materials are being resuspended in air above the study sites. Possibly these levels are particularly low because the areas are vegetated and have stable soil surfaces, thus allowing little soil erosion by wind, even at high wind speeds. Concentrations of radioisotopes in air decrease by orders of magnitude within a few thousand feet, as the suspended particles settle

to the ground. Except within the immediate area of the test shots, the radioactive materials in the air are close to worldwide or background levels. 'Offsite measurements show no radioisotope concentrations which are statistically above those measured for many years. These observations appear to indicate that no detectable quantities of radioactive material are leaving the site via atmospheric resuspension [3].'

The potential spread of beryllium and depleted uranium from the Non-violent Explosive Destruct System (NEDS) test is another area of hazard and thus is described below.

In the NEDS test, quantities of beryllium of the order of 2.2 pounds and depleted uranium (where most of the U-235 isotop is removed) of the order of 22 pounds (0.003 curies) are used. The earliest tests were carried out unconfined, studing what forces containment casks would have to withstand. In these, the uranium was scattered in large pieces which could be recovered but most of the beryllium was dispersed as a particulate too small to recover. In present tests containment casks are used, but some fail. In these, about 80 percent of the uranium and 75 percent of the beryllium are in large enough pieces to recover.

Uranium is a naturally occurring element which in nature is composed of 99.3% U-238, 0.7% U-235, and 0.0006% U-234. Each of these alpha-emitting isotopes begin a series of decay products that end in a stable isotope of lead. Biological concentration of uranium along the food chains does not seem to occur [9]. The chief effects noted with animals and plants are attributed to the chemical toxicity of uranium rather than its radioactivity. The chemical toxicity of uranium in humans relates to effects on kidney functions. At lower levels these changes are reversible in that they disappear when exposure stops. In dispersal of large pieces, plant toxicity may occur at soil concentrations near 50 micrograms per gram of soil near the roots and acute toxicity may occur at levels ten times this value [9]. Since the large pieces are picked up, there should be minimal problems. That which is too small to recover has been evaluated by DOE [9] to be an insignificant problem in respect to its radiation or potential plant toxicity.

Beryllium is a nonradioactive element presenting two potential hazards to health. If inhaled over an extended time, beryllium may lessen the efficiency of an individual's lungs and in severe cases may be fatal. If beryllium enters a break in the skin, a slowly healing ulcer may form until the beryllium is surgically removed. Beryllium enters the body almost entirely by inhalation. The experimental evidence is that little beryllium is absorbed through the intestinal wall. "Animals fed the metal, or the metal oxide, at a level of 5% of their diet absorbed the beryllium so poorly that no effect on growth occurred over long periods of feeding [9]."

Soil samples collected after a total of 18 NEDS tests indicate that beryllium levels in the soil at the point of detonation and up to 100 feet down wind are less than the limit of detection, 5 mg/g soil (9).

After evaluation of present knowledge of potential hazards of plutonium and other radionuclear disseminated into the natural environment by DOE operations on the NTS and the Nellis AF Range, the degree of hazard appears to be extremely low. DOE has committed to continued surveillance of these areas to assure their established safety parameters provide maximum environmental protection.

CHAPTER III

ENVIRONMENTAL IMPACTS ON THE PROPOSED ACTION

Impacts described within this section are those which are likely to occur should the Air Force be granted continued withdrawal of the public lands for use as the Nellis AF Range.

Potential impacts are discussed and described in relation to the future plans of operation and developments for both the DOE and the Air Force.

CLIMATE

The climate of the study area would not be impacted by any of the future plans of operation and developments. The climate does, however, have an interrelationship to other potential impacts. Soil erosion, removal of vegetation, and subsequent revegetation on construction or target sites are controlled to some degree by climatic conditions.

AIR QUALITY

Pollutant contribution to local air quality would be generated in the form of fugitive dust (from construction activities and range maintenance) and particulate and gaseous emissions from aircraft operations. Also ordnance detonation will cause fugitive dust, particulate and gaseous emissions.

The quantity of dust generated from heavy construction operations are generally proportional to the area of land being worked, level of activity, type soil, and inversely proportional to the square of the moisture content. EPA [16] has adopted an emission factor of 1.2 tons per acre per month for fugitive dust generation from heavy construction activities. This factor is generally applicable to soils which have about 30 percent silt and a precipation-evaporation (PE) index of 50. Soils on the Range average less than 5 percent silt and have a PE index of about 13. Considering the range of these values, the 1.2 tons per month should be sufficiently descriptive to indicate the magnitude of dust generation from heavy construction activities described in this document. Since installation of an electrical line will not involve grading, ground excavation, or cut and fill operations, the fugitive dust generation will be assessed by using one-half of the heavy construction emission factor. Even at this rate, the value is considered to be high but is a compromise between values for vehicles and heavy construction.

Table 3-1 shows the projects which would generate fugitive dust during the construction phase. All projects, except the support facility, will be intermittent and somewhat restricted to the local area. Emissions for underground nuclear testing are not tabularized in table 3-1 since the majority of the projected 150 acres per test would be disturbed during formation of the subsidence crater and no emission rates are available for this type of operation. It is emphasized that not all tests form

subsidence craters. The underground nuclear waste burial projects indicated for the Timber and Yucca Mountain areas are in the concept stage. If DOE decides to proceed beyond the research and development stage, an environmental analysis would have to be prepared and would provide data on anticipated air quality impacts.

In addition to those sources listed in table 3-1, fugitive dust would continue to be generated by vehicular traffic on gravel roads and maintenance activities around target complexes. Once the road projects are completed, vehicle generated dust should be cut approximately in half due to the stabilizing effect on the oil/chip and gravel surface.

Since the projects and activities which generate fugitive dust would not be in one local area but would be spread out over the Range and may be constructed at different time periods, it is not anticipated there should be any significant impact to the local air quality. Dispersion analysis of fugitive dust from road construction indicates a downwind particulate concentration of 50 micrograms per cubic meter at one mile from the construction site. At two miles, the concentration would decrease to 14 micrograms per cubic meter. These concentrations would be experienced for about two-thirds of the day, the remaining third would be at normal background levels. Comparison of these figures with the daily standard for particulates (table 2-3) indicates the activity will not result in exceeding the particulate air quality standards for the area.

Military aircraft emissions would emit large quantities of pollutants into the atmosphere. Tabke 3-2 shows the projected annual aircraft emissions through 1979. Most of the Range training operations are conducted in the morning and up through mid-afternoon to take advantage of the more stable atmospheric conditions. Thermal rises are characteristic of the afternoon conditions and present problems in maintaining the aircraft on course during low level training; however, sorties are flown in the afternoon when the Range time schedule is booked for morning activities.

Since most sorties flown over the Nellis AF Range emanate from Nellis AFB secondary impacts to the Las Vegas Air Quality Maintenance area must be considered. Naugle [17] has dispersion modeled annual emissions from approximately 56,000 sorties (landings and take-offs) from Nellis AFB. Results of the Nellis AFB portion of this study are shown in table 3-3. Values shown represent aircraft emission contribution to existing ambient air quality at a distance of three miles from the centerline of the runway Comparison of the estimated annual concentrations, with the annual average of pollutants shown in table 2-3, show quality conditions. Although the accuracy of this particular modeling study was not validated by comparing model predictions with actual air quality measurements, experience with air quality models of this type have shown them to be accurate within a factor of two. Within this range of accuracy, the Nellis AFB modeling reliability substantiates the contention that military aircraft activity does not significantly impact local air quality in the Las Vegas Air Quality Maintenance area.

TABLE 3-1

PROJECT ASSESSMENT OF FUGITIVE DUST GENERATION

PROJECT	TOTAL ACRES	NO. OF MONTHS	ACRES/MO	EMISSION RATE	TONS-MO.
ROADS	585	40	14.6	1.2	17.6
EW TARGETS	200	5	2.0	1.2	2.4
SUPPORT COMPLEX	4	3	1.3	1.2	1.6
ELECTRIC LINE	60	2	30.0	0.6	18.0
UNDERGROUND NUCLEAR TESTING	150/Shot	-	-	-	-
NUCLEAR WASTE BURIAL	100/Site	-	-	-	-

TABLE 3-2

PROJECTED AIRCRAFT EMISSIONS (metric tons/year)

POLLUTANT	1977	1978	1979
PARTICULATES	202.7	268.0	243.4
CARBON MONOXIDE	682.6	902.4	819.8
HYDROCARBONS	151.2	199.9	181.6
NITROGEN OXIDES	1,701.8	2,249.8	2,043.9
SULFUR OXIDES	127.4	168.4	153.0

TABLE 3-3

DISPERSION ESTIMATE OF AIRCRAFT EMISSIONS AT NELLIS AFB

POLLUTANT	EMISSIONS (met. tons/yr)	CONTRIBUTION TO AMBIENT CONCENTRATIONS (Ug/m3)
PARTICULARES	35	0.3
CARBON MONOXIDE	1100	13.1
HYDROCARBONS	240	3.1
NITROGEN OXIDES	200	1.5
SULFUR OXIDES	23	0.1

In order to relate the potential impacts of aircraft emissions on the Nellis AF Range, a comparison of acres impacted on the Range to that impacted from the Nellis AFB modeling study, is provided. Review of aircraft operations given throughout Chapter 1 show the aircraft emissions would be spread over most of the 2,945,726 acres. The Nellis study involved about 39,000 acres. Additionally, approximately fifty percent of the aircraft emissions shown table 3-2 are emitted below 3,000 feet above ground level. Pollutants emitted above the mixing height exhibit very little to no impact on local ground level air quality. Holzworth [10] shows the annual average mixing height is about 1,100 feet in the morning and ranges up to about 8,000 feet in late afternoon. Consequently, less than fifty percent of the aircraft emissions are emitted below the mixing height.

Considering the area of impact, dispersion characteristics over the Range, and predicted amount of emissions below the mixing height, it is very unlikely that the aircraft emissions will cause local air quality standards to be exceeded.

DOE operations on the TTR and Pahute Mesa are not projected to increase in activity. Impacts associated with underground explosions and drop testing of ordnance would continue to cause fugitive dust to the same magnitude as present operations.

Radioactive noble gases are expected to be released to the atmosphere during drillback operations and from tunnel ventilations. Several hundred curies of radioactive noble gases (primarily xenon-133) have been released per year in the past. For example, in 1975 and 1976 this release was 22 and 91 curies, respectively [3]. The amounts released in the future will fluctuate depending upon the particular drilling and tunnel conditions.

"The measured concentrations of tritium and xenon-133 at offsite locations, when averaged over the year, have remained less than 0.01 percent of the concentration guides for a suitable sample of the population, as set forth in ERDAM 0524. The increased average concentrations of krypton-85 onsite have been discernible only by applying statistical techniques to the data. Atmospheric dilution of the krypton-85 reduced the concentrations to the point that they are not detectable offsite. It is unlikely that testing programs in the future will produce atmospheric concentrations of gaseous radionuclides greater than those observed to date [3]."

"Radioactivity attributable to the resuspension of dust particles in the air from contaminated areas onsite has never been detected in offsite samples and is not expected to be in the future [3]." More detailed analysis of radioactivity impacts from DOE operations are given in reference 3.

The overall impact on air quality for the Clark-Mohave Interstate and Nevada Intrastate Air Quality Control Regions is not considered to be significant.

TOPOGRAPHY AND GEOLOGICAL SETTING

Construction of the proposed facilities and continued operation of the Nellis AF Range would not impact the topography in a significant way. Some land features would be altered by constructing the EW sites and gravel pits which are required in the roads improvement project.

Ordnance dropped on the Range by the Air Force and DOE on the TTR and underground explosions on Pahute Mesa would continue to scar the surface. However, the magnitude (acres) of these scars would remain small in comparison to the total acreage of the Range and the presently altered areas. Currently 0.4% of the Range acreage has been distributed. The proposed action will increase this to about 0.6%.

Energy Research Development and Administration (now DOE) [3] has studied the seismicity pattern of Pahute Mesa in connection with high-yield tests. Ground motion from some explosions can be expected to cause displacement along preexisting faults near the explosion sites. 'Any displacement along preexisting faults is not expected to extend beyond the boundaries of the test areas and none will produce any significant environmental effect insofar as present or foreseeable use of the test site is concerned (3)."

SOILS AND WATERSHED

Disturbance of the soil profile by the construction activities and continued ordnance deliveries by both the Air Force and DOE would impact the soils of the Range. Activities which compact the soil will reduce infiltration rates and increase the potential for sheet and rill erosion. When organic matter is displaced the rain drop splash effect would occur with subsequent overland flow and erosion. In lower elevations, natural rehabilitation is slower than at higher elevations due to the dryer climate. Soil disturbance at low elevations would not entail as much vegetation disturbance per acre as would be in higher elevations; but, the disturbance would be just as permanent. Most of the soils in areas where construction would take place are easily eroded by wind and water. Water erosion is predominant at the higher elevations and wind is the stronger erosion force at lower elevations.

The proposed construction activities and underground nuclear testing would involve approximately 7,600 additional acres; however, 585 acres, shown in table 3-1, concern road repair throughout the North and South Range. About 25% of the mileage would require widening the road to a standard 14 foot width. Standardization of the road widths would import 134 presently undisturbed acres. This additional acreage is required to provide proper drainage to prevent increased erosion potential. The remaining road repair activities would be within the existing roadbed.

Construction of the EW sites and associated roads would require a total of 200 acres. Vegetation and some topsoil would be removed in order to construct a level concrete pad for the equipment. The EW Support Complex would require vegetation and topsoil removal from approximately four acres

pad. The water well, to be constructed for the support complex, would require some vegetation removal and alteration of the soil profile in the immediate area of construction. Soil disturbance is expected to come from compaction due to heavy equipment and spread of subsurface materials on the ground surface. The acreage involved has been integrated into the four acres for the support complex. About 60 acres of soil would be impacted from installing five miles of above ground electrical lines to provide power to the support facility.

Ordnance deliveries by the Air Force and DOE would continue cratering and mixing the soils in the immediate vicinity of the targets. Continued impact to the target areas is not expected to significantly change the presently altered conditions.

Underground testing on Pahute Mesa by DOE is anticipated to disturb 150 acres per test if subsidence craters are formed. Based on past experience, it can be expected that not all tests on Pahute Mesa will form subsidence craters; however, subsidence material would change the soil profile in the surface zero area. If DOE continues the current rate of testing, about 6,750 acres of soil would be disturbed at Pahute Mesa. These impacts are of more concern to vegetation and consequently will be discussed later. More detailed analysis of soil impacts is provided in reference 3.

Presently the impacted acreage on the range is 0.41% of the total acreage. The proposed activity will increase this to 0.67%. Appropriate engineering design practices will be applied on the construction projects to minimize the potential impact to the watershed. Thus the cumulative impacts to the soil and watershed resources of the Nellis AF Range are not considered to be significant.

WATER RESOURCES

The Air Force activities on the Nellis AF Range are not expected to have any significant impact to surface (springs) or subsurface waters.

In order to provide the water required for the support facility, a well would have to be installed. Capacity is expected to be approximately 31,000 gallons per day. Since the site selection for the support complex and well have not yet been identified, it is difficult to project which subhydrographic region would be used for the water supply. Figure 2-5 shows the estimated perennial yield and storage for each groundwater basin on the Range. Based on data provided here the Gold Flats and Sarcobatus Flats hydrographic region could supply the required amount of water with minimum impacts. If the well is placed in the Cactus Flats hydrographic basin, a more pronounced impact would occur due to the limited perennial yield.

Underground nuclear explosions on Pahute Mesa have the potential to contaminate the groundwater system. Infiltration of surface water caught where subsidence craters are formed will be somewhat greater than normal because of the increased permeability of the broken rock. However, infiltration through the cavity itself will be slowed because of the explosion compacted glazed envelope surrounding the cavity and the low permeability of the rock beneath the cavity. Additionally, the comtaminated water must

flow through tuffaceous rocks which have a relatively high ion-exchange for radionuclides. Any water reaching the water table may carry dilute concentrations of radionuclides.

The DOE groundwater monitoring program for sites on, and adjacent to, the NTS show the gross beta activity to be about 10 pCi/l and a small amount of tritium (average of 15pCi/l) but no soluble decay products such as strontium-90 or cesium-137. The soluble isotopes have either been absorbed by the high ion-exchange capacity of the zeolitized tuffs or have such a slow migration velocity that they have not reached the sampling points.

The DOE (3), evaluated the potential for tritium contamination of the Ash Meadows water system from operations in Yucca Flats. When comparing the aquifer discharge rate and the 300 years required for the water to flow from Yucca Flat to Ash Meadows, it was determined that at least 420 billion curies of tritium would have to injected in the aquifer under Yucca Flat in order to produce a concentration equal to the DOE standard of $1x10^4$ pCi/l. "This amount, of course, is many orders of magnitude above all of the tritium associated with nuclear testing at the NTS (3)."[4] If the same rationale is applied to the EPA tritium standard of $2x10^4$ pCi/l, it would take about 9 billion curies per year to equal the standard in the Ash Meadows water system. Again, this is many times greater than the tritium associated with nuclear testing. DOE (3) reports it would take at least 1000 years for water on Pahute Mesa to leave government controlled land. Thus, it can be seen that an even greater amount of tritium would have to be injected in the groundwater below Pahute Mesa before the EPA standard would be exceeded.

The concentrations of other isotopes having longer half-lives will not be reduced as rapidly by radioactive decay; but, they will be slowed by sorptive processes and are not anticipated to pose a future hazard. The ion-exchange capacity of the alluvium and tuffs appear to be the best defense against transport of very long-lived nuclides.

VEGETATION

Impacts associated with the proposed action include clearing of vegetation from the electronic warfare sites, maintenance complex construction area, and widening the roadways in various portions of the Range. Other construction activities which do not require actual blading of the soil surface would still result in some trampling and crushing of vegetation.

Table 3-1 shows the projected acreage for each construction project. The road repair project indicates 585 acres of virgin soils will be impacted. It is estimated that an 8 foot buffer zone on each side of the roads would receive some vegetation impact, that is, root damage, crushing or dust coated leaves (preventing respiration). It is estimated that the EW sites, support facility, and electric line will involve 200, 4, and 60 acres of vegetation impact, respectively, or a total of 849 acres of vegetation will be removed or altered due to Air Force construction.

The DOE operations on Pahute Mesa and Timber or Yucca Mountain (if DOE adopts the program) will disturb approximately 150 and 100 acres per site, respectively. Site preparation activity for future shots at Pahute

Mesa are scheduled to continue and may average three shots per year. At this rate, about 6,750 acres of soil, which support some vegetation, would be impacted. Impacts to vegetation would be root damage, crushing, dust coated leaves, and removal of plants during the construction and formation of the subsidence crater. There are no current projections on the number of underground burial sites DOE would require on Timber Mountain.

A set of shipping container explosion tests, conducted on the TTR, have scattered some beryllium and depleted uranium in the test Area. (Depleted uranium is uranium from which most of the U-235 isotope has been removed.) "The chief effects noted with animals and plants are attributed to the chemical toxicity of uranium rather than its radioactivity (9)." In dispersal of large pieces, plant toxicity may occur at soil concentrations near 50 parts per million near the roots and acute toxicity may occur at levels ten times this value. Beryllium is no paramount problem to plants unless present in high concentrations, which is not expected to occur at the TTR.

The explosion testing of shipping containers for radioactive waste material normally scatter large pieces of debris, consequently, "about 80 percent of the uranium and 75 percent of the beryllium are in large enough pieces to recover (9)." Soil samples collected after a total of 18 of the tests indicated that beryllium levels in the soil are less than the limit of detection of analytical analysis.

To assure protection and preservation of proposed endangered or threatened plant species, construction and operational activities would have to be conducted in areas free from those plants listed in table 2-5. Roads (11), in summary, has concluded that underground nuclear tests are not a hazard to the candidate endangered plant species except for Galium hilendiae var. kingstonense. This plant is not in the Pahute Mesa area and, consequently, should not be impacted by DOE operations conducted in that area (See figure 2-5).

It is anticipated that continuing activities on the Range during the proposed withdrawal will remove or alter approximately 7,600 acres of vegetation. This is a small percentange of the total Range acreage and thus is not considered to be a significant impact.

WILDLIFE

The primary impacts of the proposed Range renewal, and the asociated construction activities, to wildlife populations and habitats would be the removal of vegetation. The ground cover represents wildlife food, nesting or fawning sites, and protection from the climatic conditions on the desert.

Figure 2-6 shows that the vegetal cover on the north Range is predominantely salt desert shrub and that on the portion of the South Range, where the Air Force is allowed, ground activity is composed mainly of southern desert shrub. Table 2-6 shows the animal species which frequent these vegetal communities. Consequently, significant impact to these communities would impact the wildlife.

As described in the preceding vegetation section, a very small percentage of the habitat would be impacted due to proposed continued activities and construction projects. It is not expected that this loss of habitat will

be significant to the entire Range but could affect localized areas. There could be some individual animal losses due to population dynamics or their inability to adapt to the new location.

Since there would be increased aircraft activity and new electronic warfare sites, there would be an increased potential for electromagnetic radiation impacts.

USAF (1) provides a review of electromagnetic radiation by several authors. Although most authors were concerned with human exposures, some animal studies were reported. With respect to thermal effects, the blood stream is important in distributing and dissipating body heat. It can be expected that regions of the body with a poorly developed vascular system, such as the eye, would be especially sensitive to radiation. Exposure levels of the 100 mW/cm^2 for one hour to 2450 MHz radiation has been shown to cause thermal coagulation of lens protein and cataract formation in rabbits. Experiments at 50 mW/cm^2 for one hour to 2450 MHz repeated daily, apparently do not cause discernible eye damage.

There is no electromagnetic radiation standard for wildlife; however, the American Conference of Governmental Industrial Hygienist recommend occupational exposures be limited to 10 mW/cm^2 for periods of six minutes or more. This level of control should prevent elevation of the body temperature above one degree centigrade. The standard provides a safety factor of about 10 for both personnel and rabbits, and in general, may provide a degree of protection for other animals.

The Air Force has adopted the above standard and has determined the distance personnel must maintain from the main beam of the antennas in order to not exceed the $10mW/cm^2$ value. Review of the transmitters to be used show the safe-separation-distance to range from a few feet up to 407 feet.

Although the area around transmitters and antennas are posted at the $10mW/cm^2$ electronmagnetic radiation level to protect personnel, no fences are installed to exclude wildlife because the antennas are elevated above ground level and cannot be operated in a negative tilt direction. This prevents wildlife on the ground from being exposed to the main beam.

The potential impact to wildlife is small and would be limited to flying birds which may pass through the main beam within a safe separation distance. Due to the width of the electromagnetic radiation beam, birds would easily transit the area in a few seconds and should not be exposed for a time period sufficient to create a significant impact. Microwave radiation from these radars will be similar to existing military and civilian radar systems which have been operating continuously for many years without any noticable ecological damage.

Impacts to wildlife from future underground nuclear testing is considered by DOE (3) to be minor.

Impacts due to noise and sonic booms are discussed in the Hazards and Safety section of this chapter.

ANTIQUITIES

The cultural resources on the Nellis AF Range could be damaged by construction activities or ordnance drops. To assure the resources are protected the Air Force has adopted an affirmative action policy to survey the Range and locate the historical and archaeological sites. When the surveys are completed the data will be available for the Nevada State Historic Preservation Officer to review and determine if any sites meet the criteria for nomination to the National Register for Historic Places.

Sites which meet the criteria for inclusion in the National Register for Historic Places will be provided the required protection.

VISUAL IMPACTS

There should be no significant change to the current level of visual impacts since construction and operational activities will be in the background zone (5-15 miles from the borders of the Range).

LAND USE

RECREATION

Impacts to the recreationist, and recreation resources, vary in degree and intensity; and, the effects of certain impacts may differ between individuals or groups.

Recreation on the Nellis AF Range has been prohibited for many years due to national security and recreationist safety. Renewal of the withdrawal would continue to close the land to general recreational activities. The annual bighorn sheep hunt would be continued in conjunction with game management objectives of FWS and the State of Nevada.

Continued foreclosure of recreation resources on the Nellis AF Range affects 6 percent of the public lands in Nevada and is considered not to be a significant impact.

LIVESTOCK GRAZING

Livestock grazing rights were purchased by the Air Force in 1956. Since this time, trespass grazing of domestic cattle has occurred. In November, 1977 BLM inventoried the North Range and counted 825 domestic cattle; however, they were removed in 1978.

To assist in preventing trespass grazing, BLM has installed approximately 150 miles of fence along the northern border of the North Range. BLM and the Air Force consider this action is necessary to protect the wild horses, burros, mule deer, and antelope on the Range.

AGRICULTURE

Impact to potential agriculture land is considered to be minor. BLM (12) has identified Cactus Flats, Gold Flats, Kawich Valley, Emigrant Valley, and the lower lake of Three Finger Lake as having some agricultural potential. Although this potential exists, it is considered to be submarginal-to-marginal. Soil in the questioned area is fairly saline and water availability is low. Consequently, these areas are not listed by BLM as being valuable agriculture resource lands. More detailed analysis of these summarized conclusions is provided in reference 12. Additionally, the Soil Conservation Service (SCS) states they do not feel there are any prime or unique farmlands on the Range. As funds permit, they will make an official determination.

MINERAL RESOURCES

An extensive literature search and a review of core drilling data provided by the DOE has been conducted by BM and U.S. G.S. to evaluate the mineral potential on the Nellis AF Range.

Little or no mineral exploration, or related activity, as occurred in the withdrawn area for nearly a half century; however, Cornwall and Norerg (15) indicates geologic evidence and records of past mining activity support a premise that portions of the area could be a future source of selected mineral commodities to meet national requirements.

Cornwall and Norberg[15] suggests that mineral resources may be in the north end of the North Range, east of Goldfield around the Cactus and Kawich Ranges, and in the Oak Springs district (No. 17 on figure 2-9) at the north-east end of the NTS. Further geological, geochemical, and geophysical investigations would be required to more accurately delineate the nataure and extent of significant mineral resource occurrences.

The DOI and DOD are currently negotiating an interagency agreement on mineral survey requirements for military withdrawn lands. As soon as the survey policy is completed, the Nellis AF Range will be available for BLM to conduct more extensive investigations to document the mineral base on the Range. If these surveys show the Range contains a commodity vital to the national needs, the Range withdrawal may have to be modified and a mineral management plan developed between all interested parties.

WILDERNESS

As required by FLPMA of 1976, P.L 94-579, BLM is responsible for conducting Inventories/Evaluations on public lands under their jurisdictions to determine roadless areas and islands which may have wilderness characteristics and value. Conditions on the Nellis AF North Range are considered by BLM to pose a health and safety hazard. Evaluation of these conditions identified that criteria for roadless areas do not exist on the North Range. Therefore, the Range does not meet the minimum BLM requirements for a wilderness study area.

Although ground impact areas on the ranges are specifically outside of the areas of wildnerness consideration, the problem of aircraft overflight remains. Obviously, where low overflights occur, noise will have a detrimental effect on wilderness users and possible on wildlife as well. As a result, some users may suffer an adverse impact on their wilderness or experience.

LAND USE PLANS, CONTROLS, AND CONSTRAINTS

MOUs between the various use agencies provide necessary controls to guard against conflicts of land use. These agreements have generally been effective in the past; MOU's will be continued or renegotiated as necessary if the withdrawal is renewed.

Construction activities and future operations will be performed commensurate with all applicable laws concerning land use.

SOCIO-ECONOMIC CONDITIONS

POPULATION

It is anticipated that the Nellis AF Range personnel work force will increase about 550 persons by fiscal year 1983 once the EW sites and support facilities are completed. Personnel assigned to the Range will be on temporary duty status, living in transient quarters on the Range during the week and returning to the Nellis AFB/Las Vegas area for the weekends. Based on an average family size of 3.5, this would add 1,925 additional people to the expected population by 1980. Some induced population gains in the region of influence may result from implementation of the proposed action. The areas multiplier for indirect employment (21) indicates 330 new jobs would be created. Many of these jobs may be filled by unemployed people in the area; however, under a worst case condition, these jobs would attract people from outside the region of influence. In this case, another 1150 people (including the average family size of 3.5) would be added to the expected population.

It is anticipated the population increase would occur mainly in Clark County, in the Las Vegas - Henderson area (See table 3-4).

Currently, there are about 70 military personnel living in Beatty and 177 in Tonopah on a temporary duty status. Personnel in Beatty rent homes, trailers, and apartments for housing accommodations and thus are somewhat integrated into the town economy. It is doubtful that they provide the same economic stimulus as a full time resident since most of their shopping is done in the facilities at Nellis AFB. However, if they were completely dependent on the local resources, then the proposed action could reduce the town population by 217 people if they did not accept other local employment or join the unemployment ranks.

Personnel, living in Tonopah, live in motels contracted by the Air Force and thus, are considered a static type tourist in respect to the economic stimulus they provide to the community. Since the Tonopah Convention Center predicts the motel occupancy rate will not decline, if the Air Force moves onto the Range, it is concluded there would not be any decrease in employment and, thus, no decline in the population.

EMPLOYMENT

The proposed action would add about military personnel by 1983. Another 330 jobs would be created through indirect employment. It is anticipated these indirect jobs would be created in the Las Vegas area.

Since the military personnel living in Beatty would move onto the Range, into military furnished dormitories, employment would probably decrease. Under worst case conditions, it is anticipated 42 jobs would be lost in Beatty. No decrease is projected for Tonopah. These jobs would come from the trade and services sector. As can be seen in Table 3-10D, Nye County services sector of the industrial employment for 1970

TABLE 3-4

ESTIMATED POPULATION BY COUNTY PLUS
GROWTH FROM NELLIS AF RANGE PERSONNEL

COUNTY	ESTIMATED POPULATION (1)1980	ADDITIONAL (2)POPULATION	TOTAL
Clark	404,533	3075	407,608
Esmeralda	963	-	963
Lincoln	2,910	-	2,910
Nye	7,330	-	7,330
4 - County Total	415,736	3075	418,811

SOURCE: (1) Bureau of Business and Economic RFesearch, University of Nevada/Reno, Revised March 1977.

(2) Estimated by Nellis AFB.

1970 Census of Population Detailed Characteristics - nevada U.S.D.C., Bureau of the Census (Average Family Size 3.48).

to 1974 declined from 5,090 to 3,510. Additional declines in this area could have a significant impact on the county and even more specific in Beatty.

The overall impact on employment would be positive for the study area, with negative imapcts at Beatty. Relief is available to impacted communities. The President's Economic Adjustment Committee is charged with helping communities and individuals that may be affected by changes of Defense programs. Assistance is provided to help reduce dependence of Defense activities and to make necessary adjustments when program changes cause serious impacts.

Request for economic adjustment planning and project assistance may be addressed to: Chairman, Economic Adjustment Committee, Office of the Secretary of Defense, Attention: Director of Adjustment, Room 3E 772, Pentagon, Washington, D.C., 20301.

With the assistance available to Beatty, projects and programs can be developed prior to the decline in employment related directly or indirectly to the military activities and, thus, prevent a significant long term impact.

INCOME AND EXPENDITURES

It is anticipated that the proposed action will increase the area income by $6.9 million dollars. The operations and maintenance budget for Nellis AFB and the Range will probably remain close to the fiscal year 1978 figures, $29.8 and $32.5 million, respectively. Therefore, the proposed action would continue to provide some stimulus to the regional economy.

Income and expenditures at Tonopah would be reduced by $702,676 per year (however, this is anticipated to be off-set by increased accommodations for tourists), and $459,118 per year at Beatty.

On a regional basis, the proposed action has positive benefits; however, in Beatty, minor impacts may be experienced. Again, relief is available through the Economic Adjustment Committee with DOD. Therefore, there should not be significant impacts to the community.

GOVERNMENT FINANCE AND TAXATION

No significant changes are anticipated in the finance and taxation programs in the affected area.

HOUSING

DOI reported the median growth population for Las Vegas in 1985 and 2000 to be 520,000 and 750,000, respectively. It is anticipated that about 118,500 family units will have to be constructed to support his projected population growth in the year 2000. [20]

About 880 units will be required in the Las Vegas area to house the military personnel and indirect civilian population growth as a result of this action. Housing surveys conducted by Nellis AFB show housing is adequate in the area to support the action; however, it is often expensive for the lower grade airmen.

In 1970 Nye County had a deficit of 313 housing units (18). If this condition existed today, removal of military personnel from Beatty would free some of the housing assets and make them available for other residents in the community.

If the Air Force did not elect to construct dormitories on the Range, the additional 550 personnel would creater a significant impact on the local housing market in Beatty and would tie-up most of the motel units in Tonopah. Comparing the current cost to support 247 military personnel in the Beatty - Tonopah area to the projected 1983 manning of about 800, the Air Force will save a considerable sum by providing the dormitories. Based on current dollars and cost of support, the Air Force would spend about $3.2 million per year during and after 1983. The two dormitories are projected to cost $15.7 million. Although the cost to maintain and operate the dormitories has not been projected, it is considered to be small in respect to the current cost flowing into Beatty and Tonopah. It is possible the facilities will pay for themselves in 6 to 8 years. The ultimate savings to the tax payers by building the dorms is considered to be cost effective.

Within the scope of this analysis, it is not possible to determine how many of the local residents of Beatty would move into the 45 + vacated units; however, in 1970 about 19 percent of the housing lacked some type of plumbing facility. If the cost to rent these facilities were reduced to within the economic means of the potential renter, it is possible only a few of the trailers would remain vacant.

HEALTH FACILITIES

Emergency first-aid services would be provided in each of the dormitories (at TTR and Tolicha Peak). For more extensive care patients would be moved to Nye General Hospital in Tonopah until they were capable of being transferred back to Nellis AFB. Depending upon the severity of the condition, the patient may be air-lifted directly to the hospital at Nellis AFB. These arrangements have been coordinated with the administration of Nye General and no significant problems are anticipated.

SOCIAL ATTITUDES, EXPECTATIONS, AND LIFE STYLE

Continued withdrawal of the Nellis AF Range is not expected to materially change the attitudes and expectations of the general populace in the study area. There will continue to be small groups and individuals that want access to the Range land for various reasons. The Air Force will, as in the past, continue to evaluate each request in respect to participant's safety and national security.

Economic stability is provided by the various governmental agencies which are located within the study area. The overall Air Force contribution to this stability is considered to be substantial by many civic leaders. As long as this condition exists, it is felt the general attitude will be favorable to continued withdrawal.

INFRASTRUCTURES

The Federal highway systems are more than adequate to meet the Range transportation requirements. Future use of the road network should not significantly change from the current use rate; therefore, impacts should be minimum.

Electrical requirement for the electronic warfare support facility is expected to be approximately 312,000 KWH per year. Power to the facility will come from the Sierra Pacific Power Company. Required service is within approximately five miles of the proposed facility site; consequently, depending on where the facility will be located, additional electrical lines will have to be installed. Impacts of the line installation have been innumerated in previous sections.

Coordination with Sierra Pacific indicates the additional demand of the support facility is not great and should not be a significant impact.

Solid waste from the support complex is anticipated to be 25 tons per year. The haul distance down to Indian Springs will probably be economically unfeasible. Therefore, a solid waste landfill would have to be installed. Design and operation of the landfill to the Guidelines for Land Disposal of Solid Waste (40 CFR 241) and state requirements should minimize the environmental impacts.

HAZARDS AND SAFETY

Supersonic activity is primarily associated with the Nellis air traffic control assigned airspace areas. Supersonic aircraft operations over the Nellis AF Range are expected to continue with a slight expansion. Air Combat Maneuvering (ACM) missions are expected to generate some sonic boom overpressures up to 5 lb/ft^2 which may extend in width on the ground to 30 to 35 miles at the boom cut-off point. Overpressures on the ground at the cut-off point may be between 0.6 and 1.2 lb/ft^2 depending on tne

type aircraft and speed. Previous experience has shown the majority of sonic booms, associated with ACM activity, produce a boom area of about one square mile.

Increased utilization of the ACM airspace, for ACM exercises, increases the incidence of sonic booms in that region; however, the land area impacted is on the South Range and Desert National Wildlife Range. Much of this area is restricted from public use; thus, human exposure would be primarily limited to Air Force and FWS personnel assigned for range management. Outdoor recreationists adjacent to the range could be startled by the sonic booms; however, it is difficult to assess how quickly their reaction would turn from passing interest to irritation upon continued exposure.

Physiological and behavioral responses of humans have been extensively studied. Direct physiological effects have been reported at 95 lb/ft ; however, booms in the range of 20 to 144 lb/ft have been experienced without injury. Effects such as temporary hearing loss may occur in this range. Levels of overpressure in this range would only be generated for aircraft in low level supersonic flight. Flights of this nature are restricted over the Desert National Wildlife Range.

Wildlife exposure to sonic booms on the Range is a subject that has been evaluated by many authors; but, the studies are mainly centered on captive rather than inhabitat evaluations. Generally, the most delicate and sensitive behavior of animals is that associated with reproduction. Unfortunately, neither the impact on reproductive behavior modification nor observed animal responses to previous sonic booms in this region have been satisfactorily related to the likelihood of successful reproduction. For wild animals, only descriptive accounts of individuals in the breeding population have been offered.

The limited data available does not show that the behavior of big game animals has been altered by sonic booms or simulated sonic booms in any appreciable way; although they may show momentary concern.[22]

"Desert Bighorn Sheep have been observed to offer no reaction to single sonic booms. Multiple sonic booms repeated several times a day with increasing frequency might possibly cause mule deer to become edgy and move around more; but, such activities may or may not influence or change breeding behavior activities [1]."

USAF also discusses aircraft noise impacts to wildlife and cites many references that have evaluated animal responses to noise stimulus in various frequency ranges. It was condluded that the data on animal responses to noise are insufficient to enable accurate deductions of potential impacts arising from range operations. There is particular uncertainty regarding the effects that might arise from long-term protracted exposure. [1]

There has been a history of sonic boom exposure to the animal population in the range area. If response mechanisms facilitate accommodations to noise, as has been briefly alluded to in the various references cited in, then it is possible that adaptation and accommodation has to some extent tempered the impacts of noise. [1]

Little in the way of adverse impacts from sonic booms and general aircraft noise have been noted on the Range. FWS records show the bighorn sheep population on the Range has not changed much since 1947, averaging about 1500 sheep on DNWR with a density ranging from 1.3 to 3.7 sheep per square mile. If the most sensitive index of impact is reproduction, then it can be concluded that continued Air Force activity would have little impact on the bighorn sheep.

The potential safety hazard from unexploded ordance precludes public access on the Range. The impacts to recreationists and others who want access to the Range have been present for many years. Withdrawal renewal would continue to restrict access to the Range. No attempt to remove subsurface ordance, except in the area of existing targets, is anticipated. The environmental consequences of trying to ordance-free the entire Range is considered to far outweight that of restricting access.

Impact of future underground nuclear explosions on Pahute Mesa has the potential to create ground motion and structural response. The likelihood of triggering an earthquake is very remote; but, damage to structures is of concern to DOE. An underground nuclear detonation will invariably produce some detectable level of ground motion. After many years (since 1963) of monitoring and analyzing ground motion data, from a large number of underground nuclear explosions, empirical equations have been developed which define the important characteristics of the ground motion and the dynamic response of structures to that motion. The resulting equations are used to predict, with reasonable accuracy, the expected ground motion from planned underground nuclear tests and the effects that motion will have upon structures. The predictions are stated in terms of the peak amplitudes of acceleration, velocity, and displacement, which quantitatively describe the relative signal strength at the ground stations of interest.

Many tests conducted as part of the underground nuclear test program are by nature experimental so that the energy yield is not precisely known beforehand. However, a maximum credible yield can be calculated, based upon the best performance, which can reasonably be expected from the device components. Predictions of ground motion effects from any nuclear explosion will be made on the basis of this maximum credible yield. This introduces an element of conservatism into the predictions.

The successful application of the prediction techniques utilized over the years and the broad data base upon which these prediction techniques were developed give rise to a high degree of confidence that future underground nuclear testing, in the range of yields discussed in [3] will not produce ground motion significantly different from past experience. In addition, it is not expected that the response of structures to that motion will cause structural damage to existing buildings offsite. Some uncertainty relates to the future high-rise buildings projected for Las Vegas. New and innovative design concepts and building materials are being utilized in an effort to maintain an acceptable cost level for new buildings. There is no evidence of damage to offsite mines that could be attributed to ground motion produced by underground nuclear explosions. All mines within 30 miles of the test site are periodically examined and photographically documented by experienced mining engineers. At the levels of motion expected from future test activities, damage to offsite mines is not expected to occur.

Range fires caused by live ordance have the potential of destroying some vegetation, especially during the infrequent years when there is an abnormally large vegetation cover. This occurs during years of high fall precipitation, with pregermination of ephemeral species, followed by adequate spring moisture to cause a heavy growth. In view of the fact that some of the 20 MM ordance are tracers, there is a possible fire hazard. However, air-to-air and air-to-ground gunnery activity is carefully controlled; and, there are no known instances where Air Force activities have cause a fire on the Range. No increase in this type of ordance expenditure is planned.

CHAPTER IV

MITIGATING MEASURES

Continued withdrawal of the Nellis AF Range, coupled with the anticipated construction and increased utilization, would precipitate some environmental impacts that can be mitigated. Not all impacts will be completely mitigated; however, the following committed measures should minimize the adverse condition.

AIR FORCE COMMITTED MEASURES

The road improvement projects will include an oil/chip and gravel surface. This will reduce fugitive dust emissions from vehicular traffic on these roads by about 50 percent. Indiscriminate driving across the open desert floor will continue to be prohibited. Construction activities will utilize (where possible) appropriate engineering practices to limit generation of fugitive dust.

The Air Force has committed to an aircraft engine emission reduction program, "... if engineering and cost studies indicate feasibility and environmental impact studies indicate that such modification/retrofit is warranted [2]." "For engines in substantial production after 1 January 1979, carbon monoxide and hydrocarbon levels are to be below levels which result in an idle combustion efficiency of 99 percent for engines with an idle pressure-ratio above 3:1, and a combustion efficiency of 98 percent for engines with an idle pressure-ratio below or equal to 3:1 [2]."

"For engines in substantial production after 1 January 1981, carbon monoxide and hydrocarbon levels are to be below levels which result in an idle combustion efficiency of 99.5 percent for engines with an idle pressure-ratio above 3:1, and a combustion efficiency of 99 percent for engines with an idle pressure-ratio below or equal to 3:1 [2]."

"For engines in substantial production after 1 January 1979, nitrogen oxide levels are to be less than 75 percent of the present or uncontrolled levels, and after 1 January 1981, nitrogen oxide levels are to be less than 50 percent of the present or uncontrolled level ... [19]." "For engines in substantial production after 1 January 1979, emission levels of smoke are to be below the invisibility threshold ... [2]."

In addition to the above, the Air Force is currently replacing older aircraft with the more modern F-15, F-16, and A-10's. The newer aircraft are quieter and, except for nitrogen oxides, emit fewer pollutants than the F-4, F-100, and F-104 aircraft. These two commitments will result in less air pollution and noise impact on the environment.

The Air Force is committed to a cultural resource survey of the Nellis AF Range. This survey will identify the cultural resources and will provide a sensitivity map from which future survey requirements may be based. Until this survey is completed, identifying sensitive areas where new construction or land disturbing activities would be conducted, the Air Force will have a cultural resource survey made to identify the presence and significance of any cultural resources. Where possible, the activities will be relocated to avoid damage to the cultural resources. If the activities cannot be relocated, appropriate consultation and mitigating measures will be accomplished in accordance with E.O. 11593.

Sites will also be surveyed for the presence of threatened or endangered flora and fauna prior to activities that may affect these or their habitat. If the survey reveals the presence of threatened or endangered species of flora, fauna, or habitat that may be affected by the Air Force activity, Section 7 coordination as required by the Endangered Species Act will be initiated with the U.S. FWS.

Future projects and operations on the Range will be reviewed in respect to past and current use plans for the area. Where scenarios will allow, existing use areas will be utilized to minimize the amount of acreage that is impacted by Air Force operations. Siting of facilities and operations on the Range will be accomplished in the most environmentally sound manner. Engineering considerations for roads and facilities must include protection of the topography from erosion forces. Drainage ditches and storm culverts must be designed on the ten-year flood criteria, one hour average rainfall.

The Air Force commits to continuing relations developed through the MOUs with the various agencies responsible for activities and range management. These MOUs provide the using agencies an opportunity to share in management programs to protect the environment of the Range. Upon determination that the Nellis Air Force Base Range is to be relinquished by the Air Force, decontamination will be in accordance with the requirements of Air Force Manual 50-46.

All appropriate regulations concerning land use will be adhered to by the Air Force. Permits will be obtained for activities requiring construction or operating permits.

DEPARTMENT OF ENERGY

DOE will continue to use seismic instruments to document ground and building motion response to verify that actual motions are within the range or predicted response. Most of the documentation will be concentrated in Las Vegas. Although for high-yield test, recordings may be taken at other locations within and adjacent to the state.

Mines within 30 miles of the test site will continue to be examined and photographically documented as appropriate for specific tests.

DOE will continue to study groundwater movement in the area and evaluate waterborne radionuclide concentrations.

Underground nuclear testing in the Pahute Mesa area will use exsiting facilities of previous tests to the maximum extent possible, thus limiting acreage impact.

When possible, DOE will avoid all areas where threatened or endangered species and cultural sites have been identified. If an area cannot be avoided, coordination will be initiated as required by law.

DEPARTMENT OF DEFENSE COMMITTED MEASURES

Where community officials feel a potential community impact is possible, as a result of a change in a Defense program, a request for assistance can be made to the President's Economic Adjustment Committee. Through this committee, assistance is provided to help reduce dependency on Defense activities and to make necessary adjustments when program changes cause serious impacts.

Request for economic adjustment planning and project assistance may be addressed to: Chairman, Economic Adjustment Committee
Office of the Secretary of Defense
Attention: Director of Adjustment
Room 3E 772, Pentagon
Washington, D.C. 20301

CHAPTER V

ADVERSE IMPACTS THAT CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

INTRODUCTION

The following is a summary of the adverse impacts that will remain if the proposal is implemented and the effective mitigating measures discussed in Chapter IV are applied. The relative values and significance placed upon these impacts, and the degree of what is affected, is discussed.

AIR QUALITY

Dust production (fugitive dust), particulate, and gaseous emissions due to exploding ordanance and aircraft emissions would be sources of potential adverse impact to air quality. Construction-caused dust generation would be localized and shortterm; however, of more concern is the fugitive dust caused by wind and vehicular traffic after construction is completed. The road repair project would provide a significant reduction in fugitive dust over current conditions. Sound construction engineering practices, will be utilized during construction to limit dust generation.

Considering the aircraft modernization program and pollutant emission reduction goals identified in Chapter IV, there will still be emission of pollutants to the atmosphere. The cumulative impact of these sources on air quality should not be significant.

There will be continued releases of radioactive noble gases and limited resuspension of radioactive contaminated dust to the atmosphere.

TOPOGRAPHY

The desert terrain in the immediate area of new construction projects and underground nuclear testing would be altered. The magnitude (acres) of this impact would be small in comparison to the total acreage of the Range.

SOILS AND WATERSHED

Approximately 7,600 acres of soil would be impacted over and above the current conditions. These impacts would include both surface and subsurface soil disturbance.

The unavoidable impacts can be categorized as follows: Sheet and rill erosion will result from any soil disturbance due to soil compaction, which will reduce infiltration rates. When organic matter is displaced,

the rain drop splash effect would occur with subsequent overland flow and erosion. Soil profiles which have developed congruently with natural vegetation would be interrupted for several decades. Disturbed soils will be subject to increased wind ersion due to the vegetation being removed.

Cummulatively, 19,788 acres (0.67 percent) of topography, soils, and watershed would be impacted by the proposed withdrawal. Of this total 12,188 acres (0.41 percent) have been impacted by existing conditions and facilities. New construction and operational requirements would impact an additional 7,600 acres (0.26 percent).

WATER RESOURCES

There would be minimum impact from the Air Force activities to the water resources on the Range. Surface drainage patterns will be considered in the design and construction activities for the various projects.

Approximately 31,000 gallons of water per day would be required to support the maintenance complex on the North Range.

Underground nuclear explosions conducted by DOE on Pahute Mesa, have the potential to cause local contamination of the groundwater systems. Future tests should not materially differ from past tests in respect to the types of radionuclides. Dispersion, dilution, natural decay, and soil ion exchange are natural mechanisms which reduce radionuclide concentrations. Studies conducted by DOE have shown underground nuclear testing has negligible impact on the availability of water from the regional ground water systems or its potability and safety at points of use both on and off the Nellis AF Range and NTS.

VEGETATION

Unavoidable disturbance to vegetation would occur as a result of the proposed action being implemented. The areas most affected will be those in the salt desert shrub type, as this environment is least receptive to natural revegetation or re-seeding. Regrowth in these areas can take several decades, and in some circumstances where regrowth does occur, salt desert is usually replaced by invader weed species. Some impact will be experienced in the northern desert shrub and pinyon-juniper communities on Pahute Mesa.

When comparing the acreage of vegetation which would be impacted to the total acreage of the Range and more importantly, to the acreage of the respective vegetative community, the impact is not considered significant.

DOE has shown that vegetation exposed beryllium and uranium is not significant because the plant uptake of these contaminants is considerably below the toxic level. (9)

Mitigating measures committed to by the Air Force and DOE would provide protection to proposed endangered and threatened plant species on the Nellis AF Range.

ANIMALS

There will be approximately 7,600 additional acres of vegetative habitat impacted if the proposal is implemented. Animals which frequent these vegetative communities would be forced to seek habitat in another location on the Range. If the habitat is at carrying capacity many of the dispersing animals will be lost due to the population dynamics or their inability to find or adapt to a new location.

Impact to animals from electromagnetic radiation, generated from the electronic warfare equipment, is considered to be insignificant due to the probability of very low exposure time within the main beam at hazardous distances.

CULTURAL VALUES

If the mitigating measures as outlined in Chapter IV are followed, limited adverse impact on identified sources is expected. Depending on the specific location of construction activities, there may be some adverse impacts to sources which have not been previously located by cultural reconnaissance.

VISUAL

Minor impacts would occur to the visual resources on the Range. Construction activities would be located at sites which will be shielded from general public view. The ordnance hazard/safety zones are such that target complexes are well inside the range boundary and are difficult to observe.

LAND USE

RECREATION

Due to public safety and national security, recreation is restricted on the Nellis AF Range. If the land was not used as a bombing range, the remoteness which could be provided would be of high value to the wilderness seeking recreationist. For the general public the recreational advantages of the Range is not significant when compared to the assets provided in the region.

AGRICULTURE

BLM indicates the lands of the Nellis AF Range as submarginal to marginal for its agricultural potential. This loss, although relatively small, is an unmitigated impact. The soil profile, lack of ample rainfall, and cost of irrigation are factors which would present problems if the land were used for farming.

MINERAL RESOURCES

There may be some potential for mining several minerals on the Nellis AF Range. As the national mineral resources reserves are depleted, areas with nominal potential will become more important. Continued withdrawal of the Nellis AF Range precludes mining activity but does not prevent more intensive mineral surveys. If studies determine the withdrawn land contains minerals of vital importance to the economic stability of the Nation, the withdrawal may have to be modified.

WILDERNESS

Low levels flights over the proposed wilderness area, produce noise levels of a magnitude which reduce the wilderness experience of the users.

SOCIO-ECONOMIC CONDITIONS

The proposed action would add 550 more military personnel in the area. Associated with that increase would be a total area population increase of 3075. At Beatty, under a worst case type evaluation, the population could decrease by 217, approximately 42 jobs could be lost, direct expenditures would decrease by $459,118, and 45 home units could become vacant.

HAZARDS AND SAFETY

The increase of sonic booms is an impact that cannot be mitigated if the Air Force conducts the type training required to maintain combat readiness. Although overpressures on the ground at the boom cut-off-point are significantly below reported levels for direct physiological effects, studies on human and animal response to the anticipated overpressure levels are inconclusive.

The safety health hazard of unexploded ordnance radioactivity cannot be mitigated within sound environmental means. To assure complete ordnance removal, the subsurface would need to be evaluated to a depth of several feet. This would probably require denuding vegetation and altering some topographic features.

Underground nuclear explosions conducted on Pahute Mesa would continue to produce ground motion. However, DOE has committed to an extensive on-going research and evaluation program to forecast potential impacts. DOE will continue to monitor facilities (with seismic instrumentation) to verify actual motions are within the range which was predicted.

The potential for a range fire cannot be completely mitigated. Target construction and range management requirements incorporate techniques to reduce the potential for a range fire.

CHAPTER VI

RELATIONISHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

This chapter discusses the productivity of the environment which would be affected by construction and operational activities of the Air Force and DOE on the Nellis.

In this context "Short-term" refers to the life of the proposed withdrawal, 15 years plus 10 years optional. For the "long-term' aspect of maintenance and enhancement of the environment, the imprint of the Air Force's activity will be noticeable for many years, possibly hundreds of years, after operational activity is terminated on the Range.

Some of the short-term effects that could result from implementation of the proposal include fugitive dust generation and increased air pollution emissions from the operational and support activities of the Air Force and DOE. The short-term effects would be a minor impact to the local air quality and, thus, are not considered to be a significant impact.

Noise and sonic booms created by aircraft activity could be primarily a short-term effect; however, due to unknown physiological responses from repeated exposure, there may be some potential for long-term effects in the various animal species on the Range.

Long-term effects which would be noticeable for many years after operational activities ceased on the Range include minor topographic changes, soil loss and disruption through erosion and operational and/or construction activities. There would be a direct impact to 7,600 additional acres of vegetation with some adverse impact to wildlife due to the loss of habitat. Construction scars would be noticeable for many years.

Depending on the specific location of future construction activities, there could be long-term effects to historical and archaeological material which has not been previously located by cultural reconnaissance.

Radioactive contaminated sites, unexploded ordnance, and ordnance burial sites represent long-term effects which must be considered in future land use planning decisions. These factors also contribute to a degradation of the potential recreational resource if the land were not used as a bombing and gunnery range.

In summary, the baseline site condition has been established for many years. The proposed action would impose approximately 7,600 additional acres to vegetation and soil impacts. Currently 0.41 percent of the total Range acreage has been impacted by construction and operational activity. The proposed action to continue using the Range would increase this value to 0.67 percent.

CHAPTER VII

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The land involved in this proposed action has been committed to use as a bombing and gunnery range since the early 1940s. Inherent with this commitment, operations have been conducted which make most of the land a safety hazard and thus requires restricting general public use.

Unexploded ordnance may be found in any area of the Range and there are locations where radioactive contamination could present a health and safety hazard. Although these conditions exist, certain non-military activities are compatible and thus do not cause a total irreversible and irretrievable commitment of the land resources.

Thus, in respect to general public use, the land is committed but not to the point that other restricted type operations can be conducted.

Proposed construction and operational activities would impact approximately 7,600 additional acres of vegetation, soil, and gravel loss. Table 3-1 shows the amount of fugitive dust that would be generated during construction activities. In addition to this, soil loss would also come from wind and water erosion. These construction and, in some respect, operational activities will change the ecological interrelationships by altering the habitats through soil and vegetation disturbances. These localized impacts on ecological interrelationships may alter the character of the entire ecosystem, and will last as long as the effects of soil and vegetation disturbances persist. Topographic features which would be altered by construction and underground nuclear testing would be an irreversible commitment.

Construction materials, nuclear source materials, fuel, and manpower efforts would be irretrievably committed. Water requirements for the construction and operation of the Range would be irretrievably committed.

Any undiscovered archaeological sites accidentally disrupted during construction may be irreversibly damaged and could lose much or all of their archaeological and historical value.

CHAPTER VIII

ALTERNATIVES TO THE PROPOSED ACTION

NO ACTION

Under no action alternative, the Air Force would not seek renewal of the Nellis AF Range withdrawal. This action would precipitate operation impacts on the Nellis AFB mission as well as the mission of other units which depend on the Range for their training activity.

Mission Impacts:

Provided the airspace above the Range remains a restrictive or designated special use airspace, all Range activitiy except certain air training would be terminated.

Air-to-air training which required use of live ordnance would be terminated. Therefore, the Air Force would have to relocate all air-to-ground operations and support requirements to another base which has the required range facilities or utilize other Ranges. The latter option would require the aircrews fly to another Range to obtain their training. The aircrews would have to either use intransit air refueling or temporary duty assignment to the base operating the Range. Based on the 1978 Range utilization figures provided in table 1-3, about 85 percent of the sorties would have to be flown on other ranges.

Ranges in the area which could provide the type of training conducted at the Nellis AF Range include but are not limited to the Hill-Wendover-Dugway Range Complex (west of Salt Lake City, Utah), China Lake (southwest of Nellis AFB and located in California), Fallon (east of Reno, Nevada), and Luke AF Range (southwest of Phoenix, Arizona). The Cuddeback Range, operated by George AFB in California, is not considered capable of supporting the Nellis AFB mission since the Range is only a two by six (2x6) mile area and currently is under use restrictions due to its small size.

Of the Ranges listed above, the current utilization of any one is too small to accept all air-to-ground activity conducted at the Nellis AF Range. It may be possible to split the activity between the ranges; 25 percent to China Lake and Fallon, 45 percent to Hill-Wendover-Dugway, and 30 percent to the Luke AF Range. Use of the Luke AF Range would require the aircrews to utilize temporary tour of duty assignments at Luke AFB in order to obtain their range training.

The no action alternative would also impact DOE operations at the TTR and on Pahute Mesa. DOE would be forced to either seek a withdrawal of these two areas or move the operations to another location.

Environmental Impacts:

The environmental impacts associated with this alternative (no action), assuming DOE operations at TTR and Pahute Mesa would move to a new location, are discussed below.

It is projected that about 700 personnel assigned to Nellis AFB (including the people managing the Nellis AF Range) would no longer be needed at Nellis AFB and consequently would be relocated to other military installations. The operational cost associated with splitting the Nellis AF Range activity between other Ranges is anticipated to be $390,000 per year for temporary duty assignments $19.1 million per year for additional fuel requirements, and between one to two million dollars to relocate the target facilities and equipment.

Air pollution emission from ground vehicles, construction, and underground nuclear testing on the Range would be eliminated. Aircraft emissions, and their impact on the Las Vegas Air Quality Maintenance Area, would be reduced if aircrews are assigned to air ranges elsewhere. Since aircraft emissions are emitted at some altitude, in most cases above the atmospheric mixing layer, the resultant decrease would not be expected to significiantly improve regional ambient air quality levels.

The projected increase of about 0.26 percent impact to soils and vegetation from construction and operational activity would not occur. The 0.41 percent of the Range acreage which has been impacted from previous use would be allowed to return to natural conditions after the targets, unexploded ordnance, and equipment were removed from the Range. A Range clearance survey would have to be conducted to remove unexploded ordnance from the surface. Unexploded subsurface ordnance and the radioactive contaminated sites would remain on the land since the impacts associated with removing all hazards would be environmentally unacceptable and also cost prohibitive. It is possible that because of the unexploded ordnance and radio-active contaminated sites, the land could not be returned to the public for unrestricted use.

Potential impacts to wildlife from loss of vegetation would be eliminated allowing the area to revert back to natural conditions with greatly reduced noise would be a positive benefit to the area. If air-to-air training were still conducted over the South Range the proposed wilderness area (on the Range and the Desert National Wildlife Range) would continue to have about the same level of noise impact as previously documented in this statement.

The impact of the no action alternative on the FWS and BLM management programs would be mostly positive with some negative impact. The management programs are designed to enhance and protect the wildlife and their habitat. Additional protection is provided by the military by restricting public access to the range but also restricts FWS management opportunities. If the withdrawal is terminated, it is possible bighorn sheep and other wildlife could be impacted by poachers.

If the withdrawal were not renewed, BLM and FWS would have unrestricted access to their management areas and would increase tneir management activities. Coordination with both BLM and FWS indicate their current

programs are adequate on those lands not withdrawn by the Air Force; however, from a long range standpoint, future legislation may require expanding the programs.

The potential impact to water would remain as documented herein, except the limited amount for the support facilities would not be required. Underground nuclear testing has deposited radioactive material both above and below the water table. The half-life of the isotopes run into several hundred years; therefore, the potential for impact will remain for an indefinite period of time. Current studies indicate radioactive contamination of the ground water is well within acceptable levels and poses no threat to public water supplies. However, DOE will continue their survey efforts to assure public protection.

If the withdrawal were not continued, the cultural values of the Range may not be evaluated for several years. Although the potential threat of inadvertent damage exists from the continued use, conducting the surveys (along with legal requirements to protect significant sites) would help develop a better understanding of the history of the area, and assure the protection of these resources.

The no action alternative would, to some degree, free the land for commercial mining if mineral surveys confirmed the presence of significant resources. It is questionable if domestic livestock grazing would be allowed on the North Range since the carrying capacity in the area is low and would continue to threaten the horses, burros, and other large animals on the Range.

Socio-Economic Impacts:

Socio-economic impacts of the no action alternative would occur at Tonopah, Beatty, and Las Vegas. The population of the area would decrease by 217 in Beatty, 280 at Tonopah, and 3920 at Las Vegas. Based on the 1970 census these changes represent a decrease in population of 19.1, 12.3, and 1.4 percent resprectively for Beatty, Tonopah and Las Vegas. These impact figures may be high since they assume all people affected are married and those military people living in Beatty are an integral part of the community. Therefore, the numbers cited may be considered the worst case conditions.

Loss of income and expenditures to the area would be about $43.2 million; $0.46 million at Beatty, $9.2 at Tonopah, and the remainder at Las Vegas.

It is projected that the alternative would cause unemployment to increase by 112, 80, and 1,184 at Beatty, Tonopah and Las Vegas, respectively. Associated with the decline in income and jobs there would be about 112 homes vacated in Beatty, 80 in Tonopah, and 1,184 in Las Vegas.

From a regional standpoint these impacts probably would not be significant; however, there may be some minor impacts at Beatty and Tonopah. These communities could seek assistance from the President's Economic Adjustment Committee in order to mitigate long-term potential impacts.

There would be impacts experienced at the other Ranges (Luke, China Lake, Fallon, and Hill-Wendover-Dugway) due to not renewing the withdrawl of the Nellis AF Range. These impacts would be associated with aircraft emissions, soil and vegetation destruction due to constructing sites for the range equipment from the Nellis AF Range, and increased noise levels.

REDUCE THE SIZE OF WITHDRAWAL

The Air Force does not consider this a viable alternative for the following reasons:

To effectively analyze this alternative, one must first identify land space on the Nellis AF Range which is not needed by the Air Force.

A brief review of the operations conducted on the South and North Ranges is provided in tables 1-2A and B along with table 1-4. The South Range is composed of 986,568 acres; however, due to the MOU signed with FWS, the Air Force can use only 154,080 acres for air-to-ground activities.

If the remaining 832,488 acres were deleted from the proposed withdrawal, the following impacts to the Nellis AF Range mission would be experienced.

The two air-to-air gunnery ranges would have to be relocated to the North Range or deleted from the Nellis AF Range program since the majority of the land space under these ranges comprise the acreage where the Air Force is prohibited from ground impact. Also there could be some impact to the Air Combat Maneuvering Area. If the Air Force could not get a permit for the tracking instrumentation sub-system sites, the Air Combat Maneuvering Area would have to be relocated. The Nellis AF Range is the only range available to the Air Force in the western United States which has an instrumented Air Combat Maneuvering Arena. Another is being developed on the Luke AF Range and will be operational in FY 1980; however, it would not be able to handle the combined training requirements. There are four air-to-air gunnery ranges available to the Air Force in the west; the two at the Nellis AF Range, one at the Luke AF Range, and one at Leach Lake on Fort Erwin. Loss of the two Nellis AF air-to-air gunnery ranges would put a strain on the users and could also significantly impact operations at Leach Lake and Luke if either had to increase their utilization for their current users.

The possibility of moving the air-to-air ranges and Air Combat Maneuvering Arena onto the North Range would seriously impact the Nellis AF Range mission. In order to accommodate the air-to-air and Combat Maneuvering operations comparable land space would need to be dedicated on the North Range. Otherwise, activities conducted in the airspace would have to cease while air-to-air and combat maneuvering training took place. Current operations on the North Range are not compatible with air operations done on the South Range, thus, they could not share the airspace at the same time.

Red Flag operations in order to provide the required land and airspace. Tactical aircrews who require training during this time must use other Air Force air-to-ground ranges. During the less intense use periods compatible operations are conducted, with some restrictions, by other Federal Agencies; thus, the available land is still utilized.

The North Range contains 1,959,158 acres, of which 537,240 acres have been permitted to DOE (369,280 acres for TTR and 167,960 acres for Pahute Mesa). The MOU's for these areas restrict the type of ground activities conducted by the Air Force; however, the airspace is routinely available for aircraft operations. Because the North Range is a tactical range, aircrews can approach targets from any direction and go through their final ordnance arming operations as they enter the Range. It is not feasible to have aircraft operating with armed ordnance over public land; therefore, the land must be withdrawn and restricted from public use.

With increasing demand for training time and development for new programs, there will be additional demands on the available land space. The TFWC has identified the rquirement to expand the EW threat capability and the need to integrate this training with other tactical threats currently on the North Range to provide more realistic scenarios. In response to this, the TFWC has closed the Caliente EW Range and moved the 27 EW sites onto the North Range. Long range planning indicates a need for about 100 EW sites on the Range in order to meet future training requirements. Due to personnel safety, the EW equipment must be sited at a location no closer than three miles from any target which receives ordnance impacts. Therefore, as the EW program develops, the available land will become more intensely used and will force siting more of the threat equipment in the mountainous areas.

ESTABLISH A NEW RANGE IN ANOTHER AREA

New landspace and airspace of equivalent size would be required to move the Nellis AF Range activity to another area, which may be difficult to find. The Range proper would have to be unpopulated and no more than sparsely populated in the immediate or adjacent area in order to provide for public safety and limit noise impacts. The airspace would have to be free of any commerical airways and would require being designated as a restricted area by the Federal Aviation Administration (FAA). Weather would have to be considered a prime factor if the new Range were to be utilized to the same magnitude as the Nellis AF Range. Nellis enjoys about 361 days per year of weather which meets Visual Flight Rules (VFR). Fewer VFR days would reduce proportionately the available flying time.

Mission Impact:

If the range land could not be obtained witin close proximity to a military installation, it would be necessary to establish a new base to support the operational functions of the units using the Range. The cost of the land (assuming no public land available) and facilities would be in the millions of dollars.

Environmental Impact:

To evaluate the environmental impacts of establishing a new Range the following assumptions are made: land is not available to enlarge any of the existing ranges, no land is available around any existing military installation to develop a new range, a new base would have to be constructed.

At the Nellis AF Range, environmental impacts would be as described in the no action alternative, except that the socio-economic impact of closing Nellis AFB could be significant.

Socio-Economic Impact:

A review of some statistics provided by the Office of Management and Budget, Comptroller Division at Nellis AFB, shows the base to be a significant influence in the Las Vegas area. The base population is 8860, composed of military and civilian employees. These employees have about 15,800 dependents. Additionally, there are 195 civilian contractor personnel employed at the base. Summation of these figures show 24,855 people directly associated with Nellis AFB. The transient pilot training and support population through Nellis swells the above figure by an average of another 1,000 people per month. The population associated with Nellis AFB constitutes the third largest city in Clark County and fifth largest in the state. It hires more employees than the manufacturing-industrial, construction, or transportation sectors in Clark County.

The Nellis AFB resources total more than $1.5 billion and in fiscal year (FY) 1977 had an expenditure of $149.2 million. Contracts awarded in FY-77 totaled $42.9 million, with $11.9 million going to small business and $5.2 million to large business in Nevada. The dollar injection by Nellis AFB employees into the greater Las Vegas economy is estimated to be $31.4 million. Considering the local awarded contracts and the employees injection, a total of $48.5 million flows into the greater Las Vegas economy on a yearly basis.

With the regional economic multiplier being slightly more than two (2), the ultimate impact of Nellis AFB is the creation of approximately $97 million of income for residents of Las Vegas and its environs.

It is anticipated that closing Nellis AFB would result in the loss of 5,430 indirect jobs and reduce Clark County's population by 43,870. Compared to the population data provided in table 2-9, this reduction would represent about 13 percent of Clark County's population.

The socioeconomic impacts could be significant to the area. Assistance to mitigate these impacts is available through the President's Economic Adjustment Committee.

The Nellis AF Range has, to some extent, been irretrievably committed due to unexploded ordnance and radioactive contamination to the point where public safety considerations would probably prevent opening the

Range for unrestricted use. Although range clearance programs, coupled with restricting ordnance deliveries to only defined targets, would prevent a new Range from having completed restrictions, there would be some areas that would be committed in an irretrievable manner. There would be increased air pollutant emissions from the aircraft and ground mobile equipment, impacts to the soil and watershed, vegetation, wildlife and possibly cultural resources. Some of these impacts may not be significant in the new location, however, these impacts may be more pronounced than they are on the Nellis AF Range due to the conditioning effect from about forty years of use.

JOINT USE

The Nellis Air Force Range is a major DOD range and is currently providing joint-use for DOD activities. The Range is used by the Air Force, Navy, Army, Marine Corps, National Guard, and Reserve Forces. Joint use agreements with DOE for use of the TTR and Pahute Mesa area have been in effect for some time. To protect animals and wildlife on the Range from DOD activities, MOUs have been negotiated with BLM and FWS for the Wild Horse Range and Desert National Wildlife Range, respectively.

Other joint uses of the Range such as grazing, mining, and recreation are not compatible with the operations presently conducted in the area.

New, compatible joint-uses of the Range is acceptable to the Air Force; however, they must be reviewed by BLM, FWS, and the Air Force with the operational and environmental consequences documented prior to a final decision being made.

The environmental impacts of continued joint-use would be as described in the proposed action.

CHAPTER IX

CONSULTATION AND COORDINATION

During the preparation of the draft environmental statement, the Air Force/BLM team was in contact with other Federal offices, State and local agencies, interest groups and individuals. Communications ranged from formal written comments to informal personal contact.

On 23 May 1977, a letter was sent out asking for general comments and identification of potential environmental impacts concerning the proposed action.

A Range operational briefing was conducted on August 23, 1977, in Reno, Nevada. The briefing was provided to Federal and State agencies to assist their review of potential impacts and to provide feedback to the environmental team on areas in the draft statement which needed additional documentation.

Notice was published in the Federal Register, Vol. 42, No. 179, September 15, 1977, concerning the Air Force and BLM action to prepare the environmental impact statement on the withdrawal renewal. At about the same time coverage was provided through local news media.

Coordination has been established with FWS concerning Section 7 of the Endangered Species Act.

A meeting was held on March 4, 1978, at the BLM state office to discuss wilderness and areas of critical environmental concerns on the Nellis AF Range. Representatives of the Sierra Club, Nevada Outdoor Recreation Association, and the University of Nevada, Reno, Recreation Department participated in the meeting.

A public hearing will be held in Las Vegas, Nevada. The date, time, and location will be published in the Federal Register and local news media. If sufficient interest dictates, additional hearings will be held in Lincoln and Nye Counties.

Upon publication of the draft environmental impact statement, interested agencies, organizations, and individuals will receive a copy of the document and comments will be requested. The BLM has compiled an extensive mailing list as a result of public and intergovernmental responses during preparation of the draft. The State Clearinghouse and local public libraries will be provided appropriate copies. Copies will also be on file in the State and Las Vegas District Office of the BLM as well as at Nellis AFB for public review. Copies of selected correspondence and a list of agencies and interest groups who were contacted follows. Also indicated in the list are those who will receive a copy of the draft statement.

FEDERAL AGENCIES

U.S. Department of Agriculture*
Forest Service, Region IV *
Soil Conservation Service *

U.S. Department of Interior
Fish and Wildlife Service*
National Park Service*
Bureau of Mines*
Bureau of Land Management*
Geological Survey*
Bureau of Reclamation*
Heritage Conservation and Recreation Service*
Bureau of Indian Affairs*

U.S. Department of Commerce
National Oceanic and Atmospheric Administration

U.S. Department of Health, Education, and Welfare
Regional Office HEW (IX)
Advisory Council on Historic Preservation*

U.S. Department of Energy*

U.S. Department of Defense
Corps of Engineers
Air Force*

U.S. Federal Aviation Agency*
Veterans Administration

U.S. Environmental Protection Agency Regional Office IX*

U.S. Department of Housing and Urban Development
Regional Office (IX)
Federal Housing Administration

STATE OF NEVADA AGENCIES

State of Nevada Clearinghouse*

Fish and Game Department*

State Historic Preservation Officer, Reno

Bureau of Mines

*These will receive a copy of the draft environmental impact statement.

COUNTY

Clark County Commissioners*
Nye County Commissioners*
Lincoln County Coimmissioners*
Clark County Regional Planning Commission*
Nye County Planning Commission*
Nye County District Attorney

MUNICIPALITIES

Mayor, Las Vegas, NV*
Mayor, North Las Vegas, NV*
Mayor, Tonopah, NV*
Mayor, Beatty, NV*

CONGRESSIONAL DELEGATION

Senator Howard W. Cannon
Senator Paul Laxalt
Representative James Santini

State Legislators

Assemblymen
Bill D. Brady
Lloyd W. Mann
Douglas R. Bremmer
Peggy Cavnar
Michael T. Fitzpatrick
Marion Bennett
Lonnie Chaney
Robbie Robinson
Mike Malone
John M. Vergiels
James J. Banner
Jan Stewart
Karen W. Hayes
Darrell Tanner
Nicholas Horn
Harley L. Harman
Robert E. Price
Thomas J. Hickey
Paul W. May, Jr.
Robert G. Craddock
Nash M. Sena
John E. Jeffrey
Jack F. Fielding
John M. Polish

Senators

James I. Gibson
Eugene V. Echols
Mike Sloan
Jean Ford
Richard E. Blakemore
Keith Ashworth
Mel Close, Jr.
Wilbur Faiss
Floyd R. Lamb
Don W. Ashworth
Joe Neal
William Hernstadt

Governor of Nevada

Honorable Robert List

INEREST GROUPS

Nevada National Guard*
Air Force Association, Reno Chapter
Air Force Association, Las Vegas Chapoter
Las Vegas Chamber of Commerce
North Las Vegas Chamber of Commerce
Las Vegas Sierra Club*
Sierra Club, National Office, San Francisco*
Sierra Club, Toiyabe Chapter
Sierra Club, Sacramento, CA
Sierra Club, Regional Wilderness Coordinator
Sierra Club, Southwest Office
Natural Resources Defense Council*
National Wildlife Federation, Western Regional Office*
National Wildlife Federation, Washington, D.C.*
Nevada Wildlife Federation
Nevada Outdoor Recreation Association*
Friends of Nevada Wilderness
Desert Protective Council
Wilderness Society*
Foresta Institute
Izaak Walton League of America
Nevada Open Space Council
Audubon Society, Lahonton Chapter
Red Rocks Audubon Society*
League of Women Voters, Nevada
League of Women Voters, Las Vegas*
Northern Nevada Native Plant Society*
American Horse Protection Association*
National Wild Horse Association*
Wild Horse Organized Assistance/International Association for the Protection of Wild Horses and Burros*
Archaeo-Nevada Society

Southern Nevada Museum Association
Nevada Archaeological Association
Nevada State Historical Society*
Governor's Advisory Mining Board*
Nevada Mining Association
Exploration Geologists of Nevada
Geological Society of Nevada
Nevada Miners and Prospectors
Nevada Prospectors Association
Attorneys Evans, Kitchell, and Jenckes*
Southern Nevada Conservation Council*
Las Vegas Jeep Club
Motorcycle Racing Association of Nevada
Southern Nevada Off-Road Enthusiasts
Nevada Cattlemen's Association
Nevada Farm Bureau
Nevada Woolgrowers Assocation
University of Nevada, Max D. Fleischmann College of Agriculture, Reno, NV.
Renewable Natural Resources, University of Nevada, Reno, NV.
Desert Research Institute, University of Nevada, Reno, NV.
Desert Research Institute, Las Vegas, NV.

LIBRARIES

University of Nevada, Las Vegas, NV.*
Washoe County Library*
Clark County Library District Headquarters*
    Decatur Branch*
    Las Vegas City*
    West Las Vegas*
    Indian Springs Branch*
Beatty Community Library*
Getchell Main Library, Reno, NV.*
Goldfield Public Library*
Lincoln County Library, Pioche, NV.*
    Caliente Branch*
North Las Vegas Public Library*
Tonopah Public Library*

UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
NEVADA OPERATIONS OFFICE
P. O. BOX 14100
LAS VEGAS, NEVADA 89114

JUN 21 1977

Department of the Air Force
Headquarters Tactical Air Command
Attention: Director
of Engineering and Construction
Langley Air Force Base, Virginia 23665

Dear Sir:

Reference is made to your memorandum of May 23, 1977, concerning the preparation of an environmental statement to support the withdrawal and continued use of public lands located in Clark, Nye, and Lincoln Counties, Nevada by the U.S. Air Force. Members of my staff have already consulted with officials at Nellis Air Force Base regarding this subject.

The successful withdrawal of the public lands in question are of mutual interest to ERDA and the Tactical Air Command. Please be assured that my staff will cooperate with you in the preparation of this environmental statement. I suggest a more suitable arrangement for achieving the preparation of the environmental statement would be for appropriate members of my staff to provide operational and environmental inputs to Nellis Air Force Base rather than directly to your office. Arrangements have already been made to do this using Major M. W. Toth as the principal point of contact. This should save a great deal of duplication of effort and provide a much speedier and closer working relationship for preparation and review.

Dr. E. M. Douthett and Mr. Ross Kinnaman of my Physical Sciences Division would be the point of contact for the Nevada Operations Office. Please feel free to contact them (702/734-3491) directly if you wish to discuss this arrangement.

Sincerely,

Mahlon E. Gates
Manager

cc: Maj. M. W. Toth
Nellis AFB
H. F. Mueller, NOAA/WSNSO
Las Vegas, NV
E. D. Campbell, ERDA/NV, BSD

Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

June 2, 1977

Mr. William A. Duffy
Director of Engineering and Construction
Headquarters Tactical Air Command
Department of the Air Force
Langley Air Force Base, Virginia 23665

Dear Mr. Duffy:

This is in response to your May 23, 1977, notice of intent to prepare an environmental impact statement on the continued use of approximately 3,000,000 acres of public lands located in Clark, Nye and Lincoln Counties of Nevada for use by the United States Air Force as air combat maneuvering, gunnery and bombing range.

As part of its planning process the USAF should arrange to have the areas to be impacted by the undertaking surveyed to identify cultural properties eligible for inclusion in the National Register of Historic Places. After the survey is complete, if the USAF determines, in consultation with the Nevada State Historic Preservation Officer, that the undertaking will result in an effect on any property included in or eligible for inclusion in the National Register it is required to afford the Council an opportunity to comment on the undertaking pursuant to Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f, as amended, 90 Stat. 1320) in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800).

Subsequently, the environmental statement prepared for the undertaking should assess its impact on historic and cultural resources. If any of these properties are included in or eligible for inclusion in the National Register the environmental documentation should demonstrate contact with the Council and include a copy of its comments.

Should you have questions or require additional assistance in this matter, please contact Michael H. Bureman of the Council's staff at

P. O. Box 25085, Denver, Colorado 80225, telephone number (303) 234-4946, an FTS number.

Sincerely yours,

Michael H. Berman

for Louis S. Wall
Assistant Director, Office
of Review and Compliance

United States Department of the Interior

FISH AND WILDLIFE SERVICE
LLOYD 500 BUILDING, SUITE 1692
500 N.E. MULTNOMAH STREET
PORTLAND, OREGON 97232

May 19, 1978

Memorandum

TO: State Director, Nevada Bureau of Land Management,
Reno, Nevada

FROM: Acting Assistant Regional Director, Federal Assistance,
Region 1, Portland, Oregon (AFA-SE)

SUBJECT: Request for Informal Consultation - Section 7 - Endangered Species Act - Nellis Range Withdrawal

Due to the large number of species known and suspected to occur on or adjacent to the Nellis Range it is our opinion that a study should be conducted to:

1) Determine all candidate and proposed threatened or endangered (T/E) plant species which occur on the Nellis Range.

2) Delineate the exact locations of such populations.

3) Gather sufficient biological data on the populations of these species for use in making sound management decisions and to make determinations on current impacts to the subject species.

Such a study should be for at least one full collecting season during an average moisture year and prior to any activities that might jeopardize the existence of the subject species.

EG&G Inc., under the direction of Dr. William A. Rhoads, 130 Robin Hill Road, Goleta, California 93017 has done extensive studies on the Nevada Test Site and would be a qualified contractor to conduct such studies.

Seventeen critically endangered Nevada species (ATTACHMENT 1) have been submitted to the Nevada State Forester and Fire Warden, by the Northern Nevada Native Plant Society, for protection under the provisions of Nevada State Law, NRS 527-050.

Several of the T/E species identified in your letter are high on our priority list for official listing.

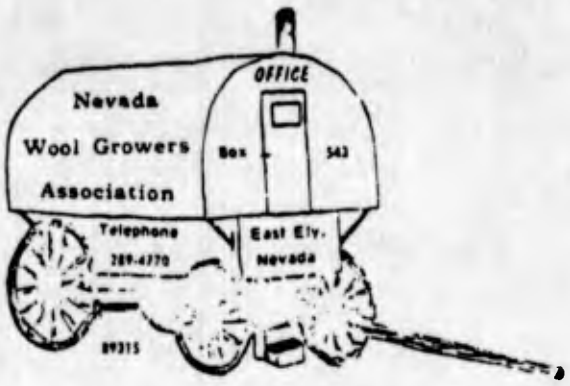
The solicitor for the Department of Interior has issued a negative opinion on mitigation of impacts to Critical Habitat of threatened or endangered species. This should be taken into consideration in your statement on page two of your letter regarding mitigation.

The Fish and Wildlife Service may be conducting some botanical studies this year on the Desert National Wildlife Range adjacent to the Nellis withdrawal area. If and when these studies are complete we can provide you with a copy of these data. However, this study will be preliminary in nature and is not intended to serve as a detailed study since minimal funds are available this year.

We are enclosing copies of status reports on three of the thirty-seven species and this information should supplement the data in your files (ATTACHMENT 2). We lack sufficient data to render a complete biological opinion. These data can only be obtained by field inventories. After these studies are conducted we suggest that informal consultation be re-initiated or as final rulemakings appear on the subject species formal consultation be requested.

The Service would appreciate a response to this biological opinion outlining your intent and objectives in providing protection for the plant taxa involved.

Attachments



June 30, 1977

Mr. William A. Duffy
Director of Engrg & Const.
HQ TAC /DEEV
Langley AFB, VA 23665

Dear Sir:

In reference to your letter pertaining to continued use of public lands for an Air Force Base, please find the following:

We strongly object to withdrawal of the range if the multiple use concept can not be administered. We feel we can get along with using the land as long as multiple use is maintained. Sections of the land in Nye, Lincoln, and Clark County to which you are referring have a great economical impact on the livestock industry for most of the producers in Southern and Eastern Nevada.

As long as you use the parts above the ground and the livestock can use the forage produce on the ground, we do not object to this type of proposal. If you have any questions, please feel free to contact us.

Sincerely yours,

Ray Staley

Ray Staley
President

RS:jw

LAW OFFICES
McCANDLESS & BARRETT
1707 H STREET, N.W.
WASHINGTON, D.C. 20006

OBERT C. McCANDLESS
AVID M. BARRETT
AY L. HANNA

USSELL J. GASPAR

SUITE 1005
(202) 223 6440

June 22, 1977

William A. Duffy
Director of Engineering
and Construction
Department of the Air Force
Headquarters, Tactical Air Command
Langley A.F.B., Virginia 23665

Dear Mr. Duffy:

Thank you for your letter of May 23, concerning the preparation of an environmental impact statement for the Nellis Air Force Range. Of particular concern to our client, the American Horse Protection Association, is the effect that the operation of the Air Force range will have on the wild horses that roam a portion of the public lands in question. For this reason, we would urge that the environmental impact statement examine the negative impacts of Air Force operations on the wild horses in great detail, with a view toward minimizing or eliminating those impacts.

I would appreciate receiving a copy of the draft environmental impact statement when it is completed.

Thank you for your cooperation and assistance.

Very truly yours,

McCANDLESS & BARRETT

By Russell J. Gaspar

RJG:dsl

INTERNATIONAL SOCIETY FOR THE PROTECTION OF MUSTANGS & BURROS

June 16, 1977

Commander William A. Duffy
Director of Engineering and Construction
Department of the Air Force
Headquarters Tactical Air Command
Langley Air Force Base, Virginia 23665

RE: DEEV

Dear Commander Duffy:

Thank you very much for your request for comments upon the Environmental Impact Statement on the continued withdrawal and use by the Air Force of Nellis Air Force Range. This organization can only comment our concerns as they apply to the wild horses.

Under a joint agreement with the Bureau of Land Management the portion of the North Range known as the Nevada Wild Horse Range, supports a substantial number of wild free-roaming horses, in an environment relatively safe from harassment and capture. It is one of only a few such areas in existence. We understand that the Northern Boundary of the Nevada Wild Horse Range is currently being fenced in order to contain the horses within their boundary and to restrict illegal livestock entry. When this fencing is complete it would be our recommendation that the Bureau of Land Management determine the actual use and adjust the horse population to what the resource can support. The horses do not appear to be affected by the operations in either the North or South Ranges. We would hope that the Air Force continues its' policies that have insured the safety and well-being of the horse population in the Wild Horse Range.

This organization strongly recommends the continuance of withdrawal of these lands for the purposes as described in the operations sheet.

Most sincerely,

Dawn Y. Lappin (Mrs.)

NEVADA HISTORICAL SOCIETY

Founded 1904

1650 North Virginia Street
Telephone 784-6397
Reno Nevada 89503

June 1, 1977

William A. Duffy
Director of Engineering and Construction
Headquarters, Tactical Air Force
Langley Air Force, VA 23665

Dear Mr. Duffy:

Reference is made to your letter to the Society dated May 23, 1977, subject: Continued Withdrawal of Public Lands for Use as the Nellis Air Force Range.

I am concerned that the Environmental Impact Statement mentioned in the subject letter properly study the historic sites within the Range and properly evaluate the impact of gunnery activity on these fragile and irreplaceable bits of Nevada's heritage.

Would you please advise what individuals or organizations are conducting the cultural resource inventory portions of the EIS for you and what methods are employed to identify and protect these sites?

Thank you for your attention.

Sincerely,

John M. Townley
Director

copies to: Dr. Robert Elston, NAS
Dr. Donald Fowler, NAS

OFFICE OF THE MAYOR

WILLIAM H. BRIARE

June 21, 1977

Mr. William A. Duffy
Director of Engrg. & Const.
Department of the Air Force
Headquarters Tactical Air Command
Langley Air Force Base, Virginia, 23665

RE: Continued withdrawal of public lands for use as Nellis Air Force Range.

Dear Mr. Duffy:

It gives me great pleasure to furnish comments for inclusion in the Environmental Impact Statement on the proposed continued use of public lands located in Clark and Nye Counties in the State of Nevada.

The City of Las Vegas is very proud to have Nellis Air Force Base as a part of Nevada's largest community. The impact and contributions to all of Southern Nevada by the personnel of Nellis Air Force Base is of great significance both economically and socially.

Nellis Air Force Base has very important missions to perform and requires large areas of public lands to accomplish their objectives. To even consider a possible reduction is unthinkable.

The City of Las Vegas sincerely hopes that the continued use of public lands comprising the Nellis Air Force Range will be approved for an indefinite period.

Sincerely,

William H. Briare

William H. Briare
Mayor of Las Vegas

WHB:phc

KEN O'CONNELL
Executive Vice President

GREATER LAS VEGAS CHAMBER OF COMMERCE

June 22, 1977

Mr. William A. Duffy, Dir. of Engrg. & Const.
Department of the Air Force
Headquarters Tactical Air Command
Langley Air Force Base, Va. 23665

RE: Continued Withdrawal of Public Lands for Use as the Nellis Air Force Range

Dear Mr. Duffy:

The Greater Las Vegas Chamber of Commerce is pleased to be given the opportunity to go on record in support of the continued withdrawal of public lands located in Clark, Nye and Lincoln Counties of Nevada for use by the United States Air Force for air combat maneuvering and for a gunnery and bombing range.

The existance of Nellis Air Force Base in the Las Vegas Valley has provided an abundance of favorable publicity for our area. We are proud that the "Home of the Fighter Pilot" is in our community.

We understand that the activity on the Nellis Air Force Range is continuously growing, e.g., the much publicized Red Flag operation. Any increase in range activity has a significant impact on the community. We have always cooperated to meet the demands required to support Nellis Air Force Base through manpower, housing and other resources.

The Greater Las Vegas Chamber of Commerce is willing to assist in a positive manner to obtain continued withdrawal of public lands for the Nellis Air Force Range.

Sincerely,

Charles L. Ruthe
President
KO:CLR:el

THE STATE OF NEVADA
EXECUTIVE CHAMBER
CARSON CITY, NEVADA 89710

MIKE O'CALLAGHAN
GOVERNOR

June 14, 1977

William E. Rains
Colonel, U.S. Air Force
Headquarters Tactical Air Command
Langley Air Force Base, Virginia 23365

Dear Colonel Rains:

Thank you for your notification concerning the Environmental Impact Statement being prepared by the Army Corps of Engineers on behalf of the Department of the Air Force (application M-16095).

The State of Nevada is interested in being continuously advised of the progress being made on the Draft EIS and I hereby designate Mr. Bruce Arkell, State Planning Coordinator, as the state liaison officer for this purpose. A major concern of this Administration is the large amount of land withdrawn for single purpose uses throughout the state. I hope that during your preparation of the EIS all consideration will be given to making appropriate reductions in the size of the currently withdrawn area, without jeopardizing the mission of the Air Force. This would then, presumably, free the released land for other uses.

Also of concern is the Tonopah Test Range facility. This program is important to the economy of southern Nevada and was used as a major basis for the state's objection to the installation of the Project Seafarer on land withdrawn by Nellis Air Force Base. Currently the lease between the Tonopah Test Range and Nellis Air Force Base is being negotiated and the EIS should provide for continuation of the lease, under terms that will be acceptable to the Tonopah Test Range people.

Thank you for advising us of the status of this project. In the future, please provide all additional comments and inquiries directly to Mr. Arkell.

Sincerely,

Mike O'Callaghan
Governor of Nevada

NORMAN S. HALL, *Assistant Director*

Address Reply to
Nye Bldg., 201 So. Fall Street
Carson City, Nevada 89701
Telephone (702) 885-4360

Governor

LANDS
FORESTRY
STATE PARKS
WATER RESOURCES
CONSERVATION DISTRICTS
OIL AND GAS CONSERVATION
STATE ENVIRONMENTAL COMMISSION
COLORADO RIVER RESOURCES

STATE OF NEVADA

Department of Conservation and Natural Resources

OFFICE OF THE DIRECTOR
CARSON CITY, NEVADA 89701

July 13, 1977

Mr. William A. Duffy
Director of Engineering and
Construction Headquarters
Tactical Air Command
Department of the Air Force
Langley Air Force Base, Virginia 23665

Dear Mr. Duffy:

This is in response to your letter of May 23, 1977. Notice of intent to prepare an environmental impact statement on the continued use of approximately three million acres of public lands located in Clark, Nye, and Lincoln Counties of Nevada for use by the United States Air Force as air combat maneuvering, gunnery, and bombing range. We recognize that our response to the proposal postdates your comment deadline, but the Nevada State Historic Preservation Office was not directly notified by the Air Force as to the proposed actions. Since one of the primary responsibilities of this office is to serve as a coordinating agency for all projects that may or will affect the historical or cultural resources of the state of Nevada, we feel compelled to comment on the proposed project regardless of the review deadline.

The environmental impact statement under preparation should very carefully address the cultural resources in the area to be affected by the proposed Air Force actions. If the areas impacted in the past and those to be impacted in the future have not been surveyed for historical and archaeological sites, then this should certainly be done as a part of your preliminary environmental assessment. Only those resources that have been recognized and assessed can be effectively managed. Toward this end, professional archaeologists and historians should be consulted with, in order to develop a cultural resource management plan for the Nellis Bombing and Gunnery Range. In this way, future destruction of cultural resources can be avoided.

An archaeological or historical site is a nonrenewable resource which should not be destroyed or despoiled capriciously. The type and level of damage the proposed activities would have on Nevada's very fragile and vulnerable cultural resource base is total and, from our point of view, unacceptable.

In respect to legislation relating to the proposed undertaking, we suggest you review the requirements placed on federal agencies by Executive Order 11593, Section 106 of the National Historic Preservation Act, and "Procedures for the Protection of Historical and Cultural Properties" (36CFR, Part 800).

If we can be of assistance to you during your environmental impact statement preparation or compliance procedures, please call us.

Sincerely,

Kimberly Wood
State Historic Preservation Officer

...HALL, *Director*
...ROBINSON, *Assistant Director*
...L. LITTLE, *Assistant Director*
Address Reply to

Capitol Complex
Nye Bldg., 201 S. Fall Street
Carson City, Nevada 89710
Telephone (702) 885-4360

MIKE O'CALLAGHAN
Governor

DIVISIONS
Conservation Districts
Environmental Protection
Forestry
Historic Preservation and Archeology
State Lands
Mineral Resources
State Parks
Water Planning
Water Resources

COMMISSIONS
State Conservation Commission
State Environmental Commission

STATE OF NEVADA

Department of Conservation and Natural Resources

OFFICE OF THE DIRECTOR
CARSON CITY, NEVADA 89710

August 26, 1977

Mr. E. I. Rowland, Director
Nevada State Office
Bureau of Land Management
Room 3008, Federal Building
300 Booth Street
Reno, Nevada 89509

Dear Mr. Rowland:

Subject: SCHEDULED PREPARATION OF AN ENVIRONMENTAL STATEMENT ON A PROPOSAL TO RENEW WITHDRAWAL FROM PUBLIC USE THE NELLIS AIR FORCE BASE GUNNERY AND BOMBING RANGE.

In a letter to William A. Duffy dated July 13, 1977, this office provided initial comment on the proposed action. At that time, however, we did not have a copy of the environmental statement preparation plan, a copy of which you provided us. In reviewing this plan and our original letter (we have included a copy) we have one additional comment. On page five of the plan it is stated that due to a data gap, a Class I survey will be conducted. Since a Class I survey entails only a literature search, it cannot remedy a data gap but only further define it. Therefore, it seems far more relevant that a Class II survey be completed. This would provide a far more reliable model for assessing the nature and distribution of cultural resources. In discussing this matter with Robert York of the BLM, he indicated that this had been a major topic of discussion and was near resolution.

If we may be of further assistance in the preparation or review of this cultural resource inventory plan, please feel free to contact us.

Sincerely,

Kimberly Wood

Kimberly Wood
State Historic Preservation Officer

KW:CZ:ba

Attachment

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P.O. Box 4850, Reno, NV 89505

June 15, 1977

William A. Duffy
Director of Engrg & Const
Department of the Air Force
Headquarters Tactical Air Command
Langley Air Force Base, VA 23665

Dear Mr. Duffy:

We have reviewed your letter of May 23, 1977, concerning the preparation of an Environmental Impact Statement for continued withdrawal of public lands for use as the Nellis Air Force Range.

One comment we have is that you should have a statement about Prime and Unique Farmland, such as, "At this time, the SCS has not made a study of the area, but based on knowledge of this area, they do not feel that there is any Prime or Unique Farmland on Nellis Air Force Range. As funds permit, they will make an official determination."

We would also like to see some comment on any measures you have taken, or planned, for conservation of soil and water on the Range.

Thank you for the opportunity to have input into the E.I.S. process. If we can provide you with technical assistance, please contact me.

Sincerely yours,

GERALD THOLA
State Conservationist

CHAPTER X

CONSIDERATIONS THAT MUST BE BALANCED AGAINST ADVERSE ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

The Nellis AF Range is a major DOD range and the most sophisticated in the United States today. It is used by all the military services. The complex provides conventional air-to-ground, supervised and unsupervised tactical air-to-ground, and air-to-air ranges. Electronic warfare sites presently on the Range provide an electronic environment for aircrews that simulates an environment typical of that expected in a potential enemy target area. The environment includes electronic emissions from simulated enemy surface-to-air missile radar, antiaircraft artillery radars, early warning and ground based jamming type radar units. The Air Combat Maneuvering Instrumentation capability provided is computerized to facilitate better training of aircrews by providing computer playback of the combat duel.

The Air Force's most sophisticated war type scenario, Red Flag, is conducted on the Nellis AF Range; the only range available to conduct this type training. Additionally, the Range provides facilities for aircraft and aircraft equipment operational testing and evaluations which are used to develop procedures for the aircrews to obtain maximum utilization of aircraft and equipment.

The land space provided at the Nellis AF Range and the climate of southern Nevada were major factors in developing the Range to provide the current level of capability. Although no new lands would be withdrawn as a result of the renewal, the restrictions on the existing Range would continue. Department of Energy operations in the Pahute Mesa area and on the TTR are also a vital asset to the national defense program and would continue to use the land if the proposed withdrawal were approved.

The Nellis AF Range overlaps the Wild Horse Management Area and the DNWR. Continued withdrawal of the Nellis AF Range, along with the proposed construction activities would, impact an additional 7600 acres of soil and vegetation. This represents 0.26 percent of the total Range acreage. When added to the present impacted acreage, the total impact to soils and vegetation would be 0.67% of the Range acreage.

Protection of the area's air quality and water resources is of vital concern. It has been concluded that the proposed action will not significantly impact either of these resources. The commitment to replace older type aircraft with less polluting aircraft would provide additional steps to preserve clean air. Utilizing water conservation, proper solid waste disposal, and sound construction techniques should assist in maintaining good water quality for the area.

The Range has been impacted since the early 1940s with live ordnance. Although range clearance programs are conducted to remove unexploded ordnance from the surface, it would be difficult to provide

100 percent assurance that all ordnance has been removed. Consequently, the land has been committed to some extent and prohibits public use until advanced techniques are developed to provide both surface and subsurface clearance without the grave environmental consequences which would be experienced with today's technology. If the Range were moved to a new location the impact of unexploded ordance would exist but not to the magnitude experienced at Nellis. Ordnance deliveries would be confined to maintained targets rather than to natural features which were used by aircrews in the early history of the Nellis AF Range.

From a socio-economic standpoint, renewal of the withdrawal would continue to provide some economic stability for the area; however, there may be some minor impacts in the Beatty area. It may be possible to mitigate the community impacts and not strain the economic base of the area. Future mineral surveys of the Range may show mineral deposits that could be vital national resources. When it becomes necessary to mine these minerals, the Range withdrawal may have to be modified or a mineral management plan developed.

Review of the above conditions indicates continued withdrawal of the Nellis AF Range is more environmentally sound than any other alternative available to the Air Force.

APPENDIX A

DESCRIPTION OF NELLIS AFR WITHDRAWAL

Tps. 1 - 44E - all
Tps. 2 - 44E - all
Tps. 3 - 44E - all
Tps. 4 - 44E - all
Tps. 1 - 45E - all
Tps. 2 - 45E - all
Tps. 3 - 45E - all
Tps. 4 - 45E - all
Tps. 1 - 46E - all
Tps. 2 - 46E - all
Tps. 3 - 46E - all
Tps. 4 - 46E - all
Tps. 1 - 47E - all
Tps. 2 - 47E - all
Tps. 3 - 47E - all
Tps. 4 - 47E - all
Tps. 1 - 48E - all
Tps. 2 - 48E - all
Tps. 3 - 48E - all
Tps. 4 - 48E - all
Tps. 1 - 49E - all
Tps. 2 - 49E - all
Tps. 3 - 49E - all
Tps. 4 - 49E - all
Tps. 5 - 49E - all
Tps. 6 - 49E - all
Tps. 7 - 49E - all
Tps. 8 - 49E
  Secs. 1-11, 14-23, 26-35
  Secs. 12, 13, 24, 25, 36, excl of that w/d by PLO 2568
Tps. 9 - 49E
  Secs. 2-11, 14-23, 26-35
  Secs. 1, 12, 13, 24, 25, 36, excl of that w/d by PLO 2568
Tps. 10 - 49E
  Secs. 2-11, 14-23, 26-35
  Secs. 1, 12, 13, 24, 25, 36, excl of that w/d by PLO 2568
Tps. 11 - 49E
  Secs. 2-11, 14-23, 26-35
  Secs. 1, 12, 13, 24, 25, 36, excl of that w/d by PLO 2568
Tps. 12 - 49E
  Secs. 2, 11, 14-23, 26-35
  Secs. 1, 12, 13, 24, 25, 36, excl of that w/d by PLO 2568
Tps. 1 - 50E - all
Tps. 2 - 50E - all
Tps. 3 - 50E - all

Tps. 4 - 50E - all
Tps. 5 - 50E - all
Tps. 6 - 50E - all
Tps. 7 - 50E - all
Tps. 8 - 50E
  Secs. 1-6
  Secs. 7, 8, 9, 10, 11, 12, excl of that w/d by PLO 2568
Tps. 2 - 51E - all
Tps. 3 - 51E - all
Tps. 4 - 51E - all
Tps. 5 - 51E - all
Tps. 6 - 51E - all
Tps. 7 - 51E - all
Tps. 8 - 51E
  Secs. 1-6
  Secs. 7, 8, 9, 10, 11, 12, excl of that w/d by PLO 2568
Tps. 3 - 51-1/2E - all
Tps. 4 - 51-1/2E - all
Tps. 3 - 52E - all
Tps. 4 - 52E - all
Tps. 5 - 52E - all
Tps. 6 - 52E - all
Tps. 7 - 52E - all
Tps. 8 - 52E
  Secs. 1-6
  Secs. 7, 8, 9, 10, 11, 12, excl of that w/d by PLO 2568 and 805
Tps. 3 - 53E - all
Tps. 4 - 53E - all
Tps. 5 - 53E - all
Tps. 6 - 53E - all
Tps. 7 - 53E - all
Tps. 8 - 53E
  Sec. 1-6
  Secs. 7, 8, 9, 10, 11, 12, excl of that w/d by PLO 805
Tps. 8 - 54E
  Secs. 4-9, 16-21, 28-33
Tps. 4 - 54E
  Secs. 4-9, 16-21, 28-33
Tps. 5 - 54E - all
Tps. 6 - 54E - all
Tps. 7 - 54E
  Sec. 1-34
  Secs. 35-36, excl of that w/d by PLO 1382
Tps. 8 - 54E
  Secs. 3-6
  Secs. 2, 7, 8, 9, 10, 11, 35, 36, excl of that w/d by PLO's 805 and 1382
Tps. 9 - 54E
  Secs. 1, 12, 13, 24, 25, 36
  Secs. 2, 11, 14, 23, 26, 35, excl of that w/d by PLO 805
Tps. 10 - 54E
  Secs. 1, 12, 13, 24, 25, 36
  Secs. 2, 11, 14, 23, 26, 35, excl of that w/d by PLO 805

Tps. 11 - 54E
  Secs. 1, 12, 13, 24, 25, 36
  Secs. 2, 11, 14, 23, 26, 35, excl of that w/d by PLO 805
Tps. 12 - 54E
  Secs. 1, 12, 13, 24, 25, 36
  Secs. 2, 11, 14, 23, 26, 35, excl of that w/d by PLO 805
Tps. 13 - 54E
  Secs. 10-15, 22-27, 34-36
  Secs. 9, 16, 21, 28, 33, excl of that w/d by PLO 805
Tps. 14 - 54E
  Secs. 1-3, 10-15, 22-27, 34-36
  Secs. 4, 9, 16, 21, 28, 33, excl of that w/d by PLO 805
Tps. 5 - 55E
  Secs. 2-11, 14-23, 26-35
Tps. 6 - 55E
  Secs. 2-11, 14-23, 26-35
Tps. 7 - 55E
  Secs. 2-11, 14-23, 26-30
  Secs. 31, 32, 33, 34, 35, 36, excl of that w/d by PLO 1382
Tps. 8 - 55E
  Secs. 31-36, excl of that w/d by PLO 1382
Tps. 9 - 55E - all
Tps. 10 - 55E - all
Tps. 11 - 55E - all
Tps. 12 - 55E - all
Tps. 13 - 55E - all
Tps. 14 - 55E - all
Tps. 7 - 55-1/2E
  Secs. 31, 32, 33, excl of that w/d by PLO 1382
Tps. 8 - 55-1/2E
  Secs. 4, 9, 16, 21, 28, 31, 32, 33, excl of that w/d by PLO 1382
Tps. 9 - 55-1/2E - all
Tps. 10 - 55-1/2E - all
Tps. 11 - 55-1/2E - all
Tps. 12 - 55-1/2E - all
Tps. 13 - 55-1/2E - all
Tps. 14 - 55-1/2E - all
Tps. 8 - 56E - all
Tps. 9 - 56E - all
Tps. 10 - 56E - all
Tps. 11 - 56E - all
Tps. 12 - 56E - all
Tps. 13 - 56E - all
Tps. 14 - 56E - all
Tps. 8 - 57E - all
Tps. 9 - 57E - all
Tps. 10 - 57E - all
Tps. 11 - 57E - all
Tps. 12 - 57E - all
Tps. 13 - 57E - all

Tps. 14 - 57E - all
Tps. 8 - 58E - all
Tps. 9 - 58E - all
Tps. 10 - 58E - all
Tps. 11 - 58E - all
Tps. 12 - 58E - all
Tps. 13 - 58E - all
Tps. 14 - 58E - all
Tps. 8 - 59E - all
Tps. 9 - 59E - all
Tps. 10 - 59E - all
Tps. 11 - 59E - all
Tps. 12 - 59E - all
Tps. 13 - 59E - all
Tps. 14 - 59E - all
Tps. 16 South, Range 54 East, Section 1, N1/2, Section 2, N1/2, Section 3, N1/2 and Section 4, NE1/4; Township 16 South, Range 55 East, Section 1, N1/2, Section 2, N1/2, Section 3, N1/2, Section 4, N1/2, Section 5, N1/2 and Section 6, N1/2; Township 16 South, Range 55-1/2 East, Section 1, N1/2 and Section 2, N1/2 (PLO 4986 does not have an expiration date.)

Township 16 South Range 56 East, Section 8, Tract 42C

Township 5 South, Range 44 East, partly unsurveyed, Sections 1 and 2; Sections 10 to 16, inclusive; Sections 20 to 36, inclusive;
Township 6 South, Range 44 East, unsurveyed;
Township 7 South, Range 44 East, unsurveyed, Sections 1 to 5, inclusive; Sections 8 to 16, inclusive; Sections 22 to 26, inclusive, Sections 35 and 36;
Township 8 South, Range 44 East, unsurveyed, Section 1;
Townships 5 to 7 South, Range 45 East, unsurveyed;
Township 8 South, Range 45 East, unsurveyed, Sections 1 and 18, inclusive; Sections 20 and 27, inclusive; Sections 35 and 36;
Townships 5 to 8 South, Range 46 East, unsurveyed;
Township 9 South. Range 46 East, unsurveyed, Sections 1 to 6, inclusive; Sections 8 to 15, inclusive; Sections 23 and 24;
Townships 5 to 8 South, Range 47 East, unsurveyed;
Township 9 South, Range 47 East, unsurveyed, Sections 1 to 30, inclusive; Sections 33 and 36, inclusive;
Township 10 South, Range 47 East, Sections 1, 2, and 12;
Townships 5 to 9 South, Range 48 East, unsurveyed;
Township 10 South, Range 48 East, unsurveyed, Sections 1 and 17, inclusive, Sections 21 and 26, inclusive; Section 36.

T15S, R57E
Secs. 1 - 36 Inc.
T16S, R57E
Secs. 1 - 36, Inc.
T15S, R58E
Secs. 1 - 36, Inc.

T16S, R58E
Secs. 1-7 Inc; NW1/4S1/2 Sec. 8; W1/2 Sec. 16; Sec. 17-21 Inc;
SW1/4 Sec. 22; Sec. 27-34, Inc.
T17S, R58E
Sec. 1-4 Inc; NE1/4 Sec. 5; Sec. 9 (NE1/4); N1/2, N1/2 SW1/4,
SE1/4 SW1/4, SE1/4, all Sec. 10; Sec. 11 and 12, Inc; NW1/4 Sec. 13;
N1/2, NE1/4 SE1/4, SE1/4 of Sec. 14; NE1/4 NE1/4 Sec. 15.
T16S, R58E, unsurveyed
NE1/4 Sec. 8; Sec. 9-10 and 15; E1/2 Sec. 16; N1/2, SE1/4 of Sec. 22.

GRAND TOTAL FOR WITHDRAWAL - 2,945,725.57 ACRES

APPENDIX B

GLOSSARY

Acre-foot - The amount of water necessary to cover one acre to a depth of one foot, equaling 43,560 cubic feet.

Air-to Air - Relating to activities which occur solely in the air.

Air-to-ground (surface) - Relating to those activities which originate in the air and terminate on the ground.

Alluvium - Clay, silt, sand, and gravel or other rock material transported by flowing water and deposited in comparatively recent geologic time.

Alluvial fan - A low, outspread, relatively flat to gently sloping mass of loose rock material, shaped like an open fan, deposited by a stream at the place where it issues from a canyon or wash onto a plain or valley.

Animal-unit-month - Pounds of forage or feed required to sustain an animal unit (one cow or five sheep) for a period of 30 days.

Background zone - That portion of the visual landscape lying from the middleground limits out to infinity. Color and texture are subdued in these areas, which are primarily concerned with the two-dimensional shape of landform against the sky.

Basin and range - A geographic area, including most of Nevada and portions of adjacent states, which is characterized by numerous paralleled mountain ranges and intervening valleys.

Biotite schist - A crystalline rock that can be readily split or cleaved because of having a foliated or parallel structure, generally secondary, and developed by shearing and recrystallization under pressure in which the biotite is a mica mineral containing silicates of iron, magnesium, potassium and aluminum.

Caliche - A secondary deposit of calcareous material found a few feet below the present or former buried ground surface.

Cenozoic - An era of geological history that extends from the beginning of the Tertiary period to the present time, or a period covering about 63,000,000 years.

Colluvium - Loose and incoherent deposits accumulated at the foot of a slope.

Cultural Resources - Objects, structures, sites, and districts that pertain to native peoples or other communities; they are generally classified as either historic or prehistoric (archaeologic).

Curie - A quantity of radioactive material which undergoes 37 billion disintegrations per second. (For example, one gram of Co-60 is equal to 1130 curies, one gram of Pu-239 is 0.061 curies, and one gram of Cs-137 is equal to 87 curies.)

Dacite - An extrusive or shallow intrusive rock, sometimes partly glassy, composed of a plagioclase and quartz, with biotite, hornblende, or pyroxene.

Dipersion - Pertains to the meterological aspects which define how a substance; solid, liquid, or gas, is mixed in the atmosphere.

Electronic Warfare - Use of equipment to detect and to defeat enemy radar systems.

Fault - A fracture or a zone of closely associated fractures along which rocks on one side have been displaced in a plane parallel to the fracture with respect to those on the other side.

Foreground - That portion of the visual landscape lying generally from one-quarter to one mile beyond the viewer.

Fugitive dust - Any dust particles which become airborne other than those being emitted by a stack or chimney.

Granite - A course-grained igneous rock formed essentially of quartz and feldspar (orthoclase, microcline, plagioclase).

Gneissia quartz monzonite - A laminated or foliated igneous rock composed of plagioclase orthoclase and quartz together with hornblende and a little biotite.

Ground water - That water in the natural environment which is below the ground surface; subsurface water as opposed to surface water.

Ground zero - In respect to nuclear explosions, that point which coincides with the center of the explosion.

Hardpan - See caliche.

Hydrophilous vegetation - Plants growing in water.

Inert ordnance - Ordnance which does not contain explosives, except for the spotting charge that is employed to signal the aircrew on the accuracy of the drop.

Insolation - The rate of delivery of all direct solar energy per unit of horizontal surface.

Interfluve - The district between adjacent streams flowing in the same direction.

Isotope - Forms of the same element having identical chemical properties but differing in their atomic masses and their nuclear properties.

Live Ordnance - Ordnance filled with explosives.

Megaton - One million tons; used to express the energy released in a nuclear explosion.

Memorandum of Understanding - An agreement established between two or more parties identifying their respective responsibilities.

Mesozoic - An era of geological history that extends from the Daleozoic to the Cenozoic era. Generally considered to be that time between 230 million and 63 million years B.C.

Mixing height - The height above the surface through which relatively vigorous vertical mixing occurs.

Microcurie - One millionth part of a curie. It represents the quantity of radioactive material that undergoes 2.22 million disintegrations per minute. See Curie.

Middle ground - That portion of the visual landscape lying generally between the limits of the foreground (about one mile) to eight miles beyond the viewer. Overall patterns of vegetation and earthform constitute texture which is no longer distinguishable in human size features.

Niche - A habitat supplying the factors necessary for the existence of an organism or species.

Noble gas - Gaseous elements (helium, neon, argon, krypton, xenon, and radon) in the periodic table which chemically are relatively inert. Certain nuclear reactions result in the production of radioactive isotopes of these gases.

Paleontological - Pertains to the science dealing with the life of past geological periods as known from fossil remains.

Perennial yield - The amount of groundwater which can be removed from a hydrographic area each year without depleting the groundwater reservoir.

Precambrian - A period of geological history prior to the Cambrian period of the Paleozoic era. A time period covering from the beginning of earth up to 600 million years B.C.

Quaternary - A subelement of the Cenozoic era and covers a period of one million years B.C. to the present time.

Radioactive - Exhibiting the property of spontaneously emitting particles (alpha, beta, neutrons) or radiant energy (gamma rays) by the disintegration of atomic nuclei.

Rhyolitic - Pertains to a very acid volcanic rock that is the lava form of granite.

Riparian - Vegetation related to or living on the bank of a natural watercourse or lake.

Scenario - The plot or staging of a war type exercise.

Sortie - A landing and take-off of an aircraft.

Subsidence crater - A depression formed at the surface of the ground by an underground nuclear explosion if the chimney collapse has progressed to the surface.

Stability - A term relating the wind speed and insolation (incoming solar radiation) factors to determine dispersion characteristics of the atmosphere.

Safe separation distance - The distance personnel must maintain from a radiation source to control exposure within an acceptable level.

Tertiary - A period of geological time in the Cenozoic era which ranges from 63 million years to one million years B.C.

Tuff - A compacted layered pyroclastic rock formed by the deposition of ash and dust expelled into the atmosphere from a volcanic vent.

Venting - The prompt escape to the atmosphere of gases and solid residues from an underground explosion.

Wild Weasel Aircraft - A specialized aircraft designed to counter, suppress, and destroy enemy threat systems.

Withdrawal - Withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of Federal land from one department, bureau or agency to another department, bureau

APPENDIX C

REFERENCES

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2 - United States Air Force. Environmental Protection - Pollution Abatement and Environmental Quality, AFR 19-1, Department of the Air force, Washington, D.C., January 1978.

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6 - United States Air Force. Weapons Ranges & Air Force Manual 50-46, Nellis AFB Supplement 1. Nellis AFB, Nevada, December 1976.

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10 - Holzworth, George C., Mixing Heights, Wind Speeds and Potential for Urban Air Pollution Throughout the Contiguous United States, EPA Publication No. AP-101, dated Janaury 1972.

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14 - United States Air Force/PREV, Handbook for Environmental Impact Analysis, Interim Environmental Planning Bulletin No. 11., USAF, Washington, D.C., June 1976.

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18 - BLM, Social-Economic Profile - Including Eureka, Lander, and Nye Counties, Nevada, Bureau of Land Management, Nevada State Office, April 1976.

19 - U.S. Department of Commerce, State Projection of Income, Employment, and Population to 1990, Survey of Current Business, April 1974.

20 - U.S. Department of Interior, Final Environmental Statement for Second Stage Southern Nevada Water Project, Bureau of Reclamation, Washington, D.C., June 1977.

21 - Nevada State Engineer's Office, Division of Water Resources, Water for Nevada, Special Report: Input-Output Economic Models, Carson City, Nevada, 1974.

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APPENDIX D

Excerpts from FLPMA and the Engle Act

Federal Land Policy and Management Act of 1976 (PL 94-579).

WITHDRAWALS

Sec. 204. (a) On and after the effective date of this Act the Secretary is authorized to make, modify, extend, or revoke withdrawals but only in accordance with the provisions and limitations of this section. The Secretary may delegate this withdrawal authority only to individuals in the Office of the Secretary who have been appointed by the President, by and with the advice and consent of the Senate.

(b)(1) Within thirty days of receipt of an application for withdrawal, and whenever he proposes a withdrawal on his own motion, the Secretary shall publish a notice in the Federal Register stating that the application has been submitted for filing or the proposal has been made and the extent to which the land is to be segregated while the application is being considered by the Secretary. Upon publication of such notice the land shall be segregated from the operation of the public land laws to the extent specified in the notice. The segregative effect of the application shall terminate upon (a) rejection of the application by the Secretary, (b) withdrawal of lands by the Secretary, or (c) the expiration of two years from the date of the notice.

(2) The publication provisions of this subsection are not applicable to withdrawals under subsection (e) hereof.

(c)(1) On and after the dates of approval of this Act a withdrawal aggregating five thousand acres or more may be made (or such a withdrawal or any other withdrawal involving in the aggregate five thousand acres or more which terminates after such date of approval may be extended) only for a period of not more than twenty years by the Secretary on his own motion or upon request by a department or agency head. The Secretary shall notify both Houses of Congress of such a withdrawal no later than its effective date and the withdrawal shall terminate and become ineffective at the end of ninety days (not counting days on which the Senate or the House of Representatives has adjourned for more than three consecutive days) beginning on the day notice of such withdrawal has been submitted to the Senate and the House of Representatives, if the Congress has adopted a concurrent resolution stating that such House does not approve the withdrawal. If the committee to which a resolution has been referred during the said ninety day period, has not reported it at the end of thirty calendar days after its referral, it shall be in order to either discharge the committee from further consideration of such resolution or to discharge the committee from consideration of such resolution with respect to the Presidential recommendation. A motion to discharge may be made only by an individual favoring the resolution, shall be highly privileged (except that it may not be made after the committee has

reported such a resolution), and debate thereon shall be limited to not more than one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to. If the motion to discharge is agreed to or disagreed to, the motion may not be made with respect to any other resolution with respect to the same Presidential recommendation. When the committee has reprinted, or has been discharged from further consideration of a resolution, it shall at any time thereafter be in order (even though a previous motion to the same effect has been disagreed to) to move to proceed to the consideration of the resolution. The motion shall be highly privileged and shall not be debatable. An amendment to the motion shall not be in order, and it shall not be in order to move to reconsider the vote by which the motion was agreed to or disagreed to.

(2) With the notices required by subsection (c)(1) of this section and within three months after filing the notice under subsection (e) of this section, the Secretary shall furnish to the committees -

(1) a clear explanation of the proposed use of the land involved which led to the withdrawal;

(2) an inventory and evaluation of the current natural resource uses and values of the site and adjacent public and nonpublic land and how it appears they will be affected by the proposed use, including particularly aspects of use that might cause degradation of the environment, and also the economic impact of the change in use on individuals, local communities, and the Nation;

(3) an identification of present users of the land involved, and how they will be affected by the proposed use;

(4) an analysis of the manner in which existing and potential resource uses are incompatible with or in conflict with the proposed use, together with a statement of the provisions to be made for continuation or termination of existing uses, including an economic analysis of such continuation or termination;

(5) an analysis of the manner in which such lands will be used in relation to the specific requirements for the proposed use;

(6) A statement as to whether any suitable alternative sites are available (including cost estimates) for the proposed use or for uses such a withdrawal would displace;

(7) a statement of the consultation which has been or will be had with other Federal departments and agencies, with regional, State, and local government bodies, and with other appropriate individuals and groups;

(8) a statement indicating the effect of the proposed uses, if any, on State and local government interests and the regional economy;

(9) a statement of the expected length of time needed for the withdrawal;

(10) the time and place of hearings and of other public involvement concerning such withdrawal;

(11) the place where the records on the withdrawal can be examined by interested parties; and

(12) a report prepared by a qualified mining engineer, engineering geologist, or geologist which shall include but not be limited to information on: general geology, known mineral deposits, past and present mineral production, mining claims, mineral leases, evaluation of future mineral potential, present and potential market demands.

The Act of Feb. 28, 1958 (PL 85-337), Known as the "Engle Act."

Sec. 2. No public land, water, or land and water area shall, except by Act of Congress hereafter be (1) withdrawn from settlement, location, sale, or entry for the use of the Department of Defense for defense purposes; (2) reserved for such use; or (3) restricted from operation of the mineral leasing provisions of the Outer Continental Shelf Lands Act (67 Stat. 462), if such withdrawal, reservation, or restriction would result in the withdrawal, reservation, or restriction of more than five thousand acres in the aggregate for any one defense project or facility of the Department of Denfense since the date of enactment of this Act or since the last previous Act of Congress which withdrew, reserved, or restricted public land, water, or land and water area for that project or facility, whichever is later.

Section 3. Any application hereafter filed for a withdrawal, reservation, or restriction, the approval of which will, under section 2 of this Act, require an Act of Congress, shall specify -

(1) the name of the requesting agency and intended using agency;

(2) location of the area involved, to include a detailed description of the exterior boundaries and excepted areas, if any, within such proposed withdrawal, reservation, or restriction;

(3) gross land and water acreage within the exterior boundaries of the requested withdrawal, reservation, or restriction, and net public land, water, or public land and water acreage covered by the application;

(4) the purpose or purposes for which the area is proposed to be withdrawn, reserved, or restricted or if the purpose or purposes are classified for national security reasons, a statement to that effect;

(5) whether the proposed use will result in contamination of any or all of the requested withdrawal, reservation, or restriction area and if so, whether such contamination will be permanent or temporary;

(6) the period during which the proposed withdrawal, reservation, or restriction will continue in effect;

(7) whether, and if so to what extent the proposed use will affect continuing full operation of the pubic land laws and Federal regulations relating to conservation, utilization, and development of mineral resources, timber and other material resources, water resources, and scenic, wilderness, and recreation and other values; and

(8) if effecting the purpose for which the area is proposed to be withdrawn, reserved, or restricted, will involve the use of water in any State, whether, subject to existing rights under the law, the intended using agency has acquired, or proposes to acquire, rights to the use thereof in conformity with State laws and procedures relating to the control, appropriation, use, and distribution of water.