



*Melrose 2003*  
**DEPARTMENT OF THE AIR FORCE**  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

26 AUG 2003

MEMORANDUM FOR ALL INTERESTED GOVERNMENT AGENCIES, INDIVIDUALS,  
ORGANIZATIONS, AND PUBLIC AND ACADEMIC REFERENCE  
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FROM: HQ ACC/CEVP  
129 Andrews Street, Suite 102  
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SUBJECT: Final Environmental Assessment (EA) for Use of White Phosphorous Rockets at  
Melrose Air Force Range, Cannon AFB, NM

1. We are pleased to provide you with the Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for use of white phosphorous rockets at Melrose Air Force Range in compliance with the regulations of the President's Council on Environmental Quality. The document is also available on the Cannon AFB website at [www.cannon.af.mil](http://www.cannon.af.mil). This EA analyzes impacts from the proposed rocket use in support of Cannon AFB's Combat Search and Rescue mission. The unique characteristics of white phosphorous rockets permit aircrews to train for realistic rescue operations and target location exercises in support of the Aerospace Expeditionary Force.
2. Libraries are requested to file this document for public access and reference.

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Chief, Environmental Analysis Branch

Attachment  
Final EA and FONSI

**LIBRARY COPY**

# Environmental Assessment for the Use of White Phosphorus Rockets at Melrose Air Force Range, New Mexico



**Air Combat Command  
August 2003**

## ACRONYMS AND ABBREVIATIONS

27 FW	27th Fighter Wing	LANTIRN	Low Altitude Navigation and Targeting Infrared for Night
27 OSS/OSTW	27th Operations Support Squadron/Operations Support Tactical Wing	LATR	Low Angle Tactical Rocket
AAA	anti-aircraft artillery	mg/m <sup>3</sup>	milligrams per cubic meter
AAQS	ambient air quality standards	MK 66	Mark 66
AEF	Aerospace Expeditionary Force	mm	millimeter
AFB	Air Force Base	mph	miles per hour
AFI	Air Force Instruction	MSL	mean sea level
AFR	Air Force Range	MTR	Military Training Route
AGL	above ground level	NAAQS	National Ambient Air Quality Standards
Air Force	United States Air Force	NAS	National Airspace System
AIRFA	American Indian Religious Freedom Act	NEPA	National Environmental Policy Act
AR	Aerial Refueling Track	NHPA	National Historic Preservation Act
ARTCC	Air Route Traffic Control Center	NMDGF	New Mexico Department of Game and Fish
ATC	Air Traffic Control	NO <sub>2</sub>	nitrogen dioxide
ATCAA	Air Traffic Control Assigned Airspace	NPDES	National Pollutant Discharge Elimination System
AUM	animal unit month	NRHP	National Register of Historic Places
BASH	Bird-Aircraft Strike Hazard	NWR	National Wildlife Refuge
C	Celsius	O <sub>3</sub>	ozone
CAA	Clean Air Act	P.L.	Public Law
CATEX	categorical exclusion	P <sub>4</sub> O <sub>10</sub>	phosphorus pentoxide
CEQ	Council on Environmental Quality	P <sub>4</sub> O <sub>6</sub>	phosphorus trioxide
CFR	Code of Federal Regulations	Pb	lead
CO	carbon monoxide	PCPI	per capita personal income
CSAR	Combat Search and Rescue	PM <sub>10</sub>	particulate matter less than 10 micrometers in diameter
DoD	Department of Defense	PSD	Prevention of Significant Deterioration
EA	Environmental Assessment	RCO	Range Control Officer
EBS	Environmental Baseline Survey	RCRA	Resource Conservation and Recovery Act
EIAP	Environmental Impact Analysis Process	ROI	region of influence
EIS	Environmental Impact Statement	SEAD	Suppression of Enemy Air Defenses
EO	Executive Order	SHPO	State Historic Preservation Office
EOD	explosive ordnance disposal	SIP	State Implementation Plan
ESA	Endangered Species Act	SO <sub>2</sub>	sulfur dioxide
F	Fahrenheit	SUA	Special Use Area
FAA	Federal Aviation Administration	U.S.	United States
FL	Flight Level	USACE	United States Army Corps of Engineers
FONSI	Finding of No Significant Impact	USC	United States Code
GFAC/ETAC	Ground Forward Air Controller/Enlisted Tactical Air Controller	USEPA	United States Environmental Protection Agency
GIS	Geographic Information System	USFWS	United States Fish and Wildlife Service
H <sub>2</sub> S	hydrogen sulfide		
H <sub>3</sub> PO <sub>4</sub>	orthophosphoric acid		
H <sub>4</sub> P <sub>2</sub> O <sub>7</sub>	pyrophosphoric acid		
H <sub>5</sub> P <sub>3</sub> O <sub>10</sub>	triphosphoric acid		
HAP	hazardous air pollutant		
HATR	High Angle Tactical Rocket		
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning		
IR	Infra Red		

## FINDING OF NO SIGNIFICANT IMPACT

**NAME OF PROPOSED ACTION.** Use of White Phosphorus (WP) Rockets at Melrose Air Force Range (AFR), New Mexico.

**DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES.** The United States Air Force (Air Force) proposes to use WP rockets on Melrose AFR to support its Combat Search and Rescue (CSAR) mission at Cannon Air Force Base (AFB). WP rockets provide high quality, realistic training for day and night operations. The rockets produce dense smoke suitable for marking targets or rescue locations, obscuring ground activity, and providing an infrared signature visible with night vision devices and infrared targeting systems. The Proposed Action is to achieve required CSAR training by using WP rockets on Melrose AFR existing target areas. Each WP rocket consists of a white phosphorus charge that combusts and emits smoke and heat for approximately one to one and one-half minutes upon impact. Under the Proposed Action, the 27th Fighter Wing (27 FW) F-16 aircrews would use approximately 180 WP rockets the first year to meet the 27 FW CSAR requirements for the 524th Fighter Squadron (524 FS). Subsequent year deployment of WP rockets at Melrose AFR would depend on munitions allocation, funding, mission tasking, and transient use. For the purposes of this environmental assessment (EA), a nominal quantity of up to 500 WP rockets are assumed to be used annually. Cannon AFB munitions and emergency response personnel would receive additional training for the local inventory of WP rockets and the door on Building 2129 at Cannon AFB would be upgraded to comply with storage requirements.

In addition to the Proposed Action, the Air Force evaluated two alternatives: Alternative A—Limited Targets and Alternative B—No Action. Alternative A employs WP rockets on Melrose AFR at the same level of activity as the Proposed Action. The Limited Targets Alternative would include targets on the northern part of the range and selected target aim points in the exclusive use impact area located on the eastern edge of the impact area boundary. An avoidance area would be identified by using approved operational headings, altitudes, and delivery criteria to orient or shift weapons safety footprints away from areas of environmental sensitivity. Alternative A would reduce the opportunity for potential impact to surface water features in the southern portion of the range's impact area. As with the Proposed Action, the final selection of targets and target area aim points would be determined through a comprehensive screening and target analysis with the SAFE-RANGE program and coordination between the environmental resource managers and the range manager. Cannon AFB Building 2129 would require a door upgrade and munitions and emergency personnel would continue to receive training specific to handling WP rockets.

Alternative B, the No Action Alternative, consists of no employment of WP rockets at Melrose AFR in support of the 524 FS CSAR mission. Cannon AFB pilots would be required to train for CSAR mission tasking using remote ranges currently approved for WP rocket use. Allocation levels for the 27 FW would be expected to be the same as described under the Proposed Action. A requirement would still exist for the Cannon AFB door upgrades to Building 2129 and

training of munitions and emergency personnel. WP rockets allocated to the 524 FS could either be transferred to the training location or loaded on the 27 FW aircraft and flown to the deployment/training location depending upon availability and distance to approved ranges, length of deployment, or training cycle.

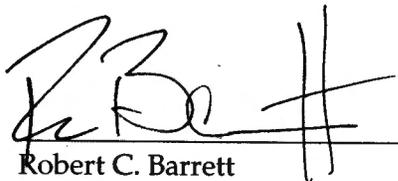
The No Action Alternative would prevent the 27 FW from training with WP rockets locally at Melrose AFR and would constrain the development of the required CSAR capability. Night training with visual acquisition of WP markers and use of infrared targeting systems could not be conducted at Melrose AFR. Joint training opportunities with special operations forces at Melrose AFR would be limited to daylight operations. Overall, quality training in the required CSAR mission would be notably reduced.

**SUMMARY OF ENVIRONMENTAL CONSEQUENCES.** The EA provides an analysis of the potential environmental consequences under the Proposed Action, Alternative A, and the No Action Alternative. Resource areas evaluated in detail to identify potential environmental consequences under the Proposed Action and Alternative A include airspace management, safety, materials management, air quality, physical resources (earth and water), biological resources, cultural resources and socioeconomic/environmental justice.

The EA demonstrates the WP rocket use under the Proposed Action or Alternative A would not result in significant environmental impacts to any resource area. No change in airspace, land use, personnel or range configuration would be required as a result of the use of WP rockets. Therefore, no impacts are expected to airspace and range management, air quality, and socioeconomic/environmental justice resources. WP rocket use would have minimal adverse consequences to safety, materials management, physical, biological, and cultural resources. White phosphorus can create handling safety risks, potential water and soil contamination, and increased fire risk. Cannon AFB would institute a program for training base personnel and educating local fire departments and ranchers using the Melrose AFR for cattle grazing. Grazing leases on Melrose AFR have restrictions that reflect the inherently hazardous nature of grazing on an active range, and no grazing is permitted in any of the impact areas considered for WP rocket use.

Neither the Proposed Action nor Alternative A has construction related activities that would cause ground disturbance. Potential risks to soil and water are minimal as the environmental conditions at Melrose AFR are not conducive for white phosphorus to remain in its reactive state. Alternative A avoids the more environmentally sensitive areas on the south range. The arid grasslands support a diversity of wildlife, but the likelihood of infrequent WP rocket strikes causing an adverse impact on regional wildlife populations is low. In regards to cultural resources, National Register of Historic Places-eligible sites are located outside of the WP rocket target impact area. While the potential exists for a rocket to land outside of the impact area, the probability is extremely low and the probability that the WP rocket would land near a cultural or water resource is even lower, posing minimal risk to these resources. Under Alternative B, the No Action Alternative, there would be no change to current operations on Melrose AFR and there would be no potential environmental consequences to the range.

**CONCLUSION.** Based on the findings of the EA conducted in accordance with the requirements of the National Environmental Policy Act, the Council on Environmental Quality regulations, and Air Force Instruction 32-7061, and after careful review of the potential impacts, I conclude that implementation of the Proposed Action or Alternative A would not result in significant impacts to the quality of the human or the natural environment. Therefore, a Finding of No Significant Impact is warranted, and an Environmental Impact Statement is not required for this action.



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Robert C. Barrett  
Chief, Environmental Division

25 AUG 03  
Date



**Environmental Assessment for the Use of White  
Phosphorus Rockets at Melrose Air Force Range,  
New Mexico**

**Air Combat Command**

**August 2003**

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# EXECUTIVE SUMMARY

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This Environmental Assessment (EA) describes the potential environmental consequences resulting from the use of white phosphorus rockets (WP rockets) on Melrose Air Force Range (AFR), New Mexico, to support the Combat Search and Rescue (CSAR) mission of the 27th Fighter Wing (27 FW) at Cannon Air Force Base (AFB). The proponent of the action is the 27th Operations Support Squadron/Operations Support Tactical Wing (27 OSS/OSTW). Overall, the Proposed Action or alternatives do not result in any significant environmental consequences that would warrant the development of an Environmental Impact Statement (EIS).

## ENVIRONMENTAL IMPACT ANALYSIS PROCESS

This EA has been prepared by the United States Air Force (Air Force), Air Combat Command (ACC) and the 27 FW in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA, and Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process* (32 CFR 989, et seq.).

## PURPOSE AND NEED FOR ACTION

The purpose of WP rocket use at Melrose AFR is for the 27 FW's 524 Fighter Squadron (FS) to effectively and efficiently become fully mission capable in their recently assigned CSAR mission. The 27 FW at Cannon AFB is an integral part of the United States Aerospace Expeditionary Force (AEF). The AEF concept integrates fighters, bombers, support aircraft, and tactical airlift into one functional unit that responds rapidly and decisively to potential crises anywhere in the world. The CSAR mission is just one component of the AEF.

WP rocket use supports AEF and the CSAR mission for multiple reasons. WP rockets provide high quality, realistic training for day and night operations. The rockets produce dense smoke suitable for marking targets or rescue locations, obscuring ground activity, and providing an infrared signature visible with night vision devices and infrared targeting systems. Upon impact and for approximately one to one and one-half minutes after impact, the white phosphorus has the thermal characteristics necessary to be visible by Cannon AFB F-16 aircraft using Melrose AFR.

## PROPOSED ACTION AND ALTERNATIVES

This EA analyzes the Proposed Action, Alternative A—the Limited Target Alternative and Alternative B—the No Action Alternative.

**Proposed Action:** The Proposed Action is to achieve required CSAR training by using targets on Melrose AFR capable of supporting the use of WP rockets. Potential targets available for WP rocket use would be identified by range personnel using the SAFE-RANGE computer program. Under the Proposed Action, the 27 FW F-16 aircrews would use approximately 180 WP rockets the first year to meet the 27 FW CSAR requirements for the 524 FS. Subsequent year deployment of WP rockets at Melrose AFR would depend on munitions allocation, funding, mission tasking, and transient use. For the purpose of this environmental analysis, a nominal



projection of up to 500 WP rockets are assumed to be employed annually by all users of Melrose AFR.

The WP rocket consists of a white phosphorus charge that emits smoke and heat for a short period of time upon impact. The WP rocket is visible to both aircrew and ground personnel during the day and when utilizing night vision devices and infrared targeting.

No change in airspace, land use, personnel or range configuration would be required as a result of the use of the WP rocket. Cannon AFB munitions and emergency response personnel would continue to receive training for the local inventory of WP rockets and the door on Building 2129 at Cannon AFB would be upgraded to comply with storage requirements.

The final selection of targets would be determined through a comprehensive screening and target analysis with the SAFE-RANGE software program and coordination between the environmental resource managers and the range manager. All weapons safety footprints would be contained within the exclusive use impact area and restricted leased land of Melrose AFR.

*Alternative A:* Alternative A employs WP rockets on Melrose AFR at the same level of activity as the Proposed Action to meet 524 FS CSAR requirements. This Limited Targets Alternative would include targets primarily on the northern part of the range and selected target aim points in the exclusive use impact area located on the eastern edge of the impact area boundary. An avoidance area would be identified by using approved operational headings, altitudes, and delivery criteria to orient or shift weapons safety footprints away from areas of environmental sensitivity. Alternative A would reduce the opportunity for potential impact to surface water features in the southern portion of the range's impact area. As with the Proposed Action, the final selection of targets and target area aim points would be determined through a comprehensive screening and target analysis with the SAFE-RANGE program and coordination between the environmental resource managers and the range manager.

*No Action Alternative:* The No Action Alternative, consists of no employment of WP rockets at Melrose AFR in support of the 524 FS CSAR mission. Cannon AFB pilots would be required to train for CSAR mission tasking using remote ranges currently approved for WP rocket use. Allocation levels for the 27 FW would be expected to be the same as described under the Proposed Action. A requirement would still exist for the Cannon AFB door upgrades to Building 2129 and training of munitions and emergency personnel. WP rockets allocated to the 524 FS could either be transferred to the training location or loaded on the 27 FW aircraft and flown to the deployment/training location depending upon availability and distance to approved ranges, length of deployment, or training cycle.

The No Action Alternative would prevent the 27 FW from training with WP rockets locally at Melrose AFR and would constrain the development of the required CSAR capability. Night training with visual acquisition of WP markers and use of infrared targeting systems could not be conducted at Melrose AFR for CSAR mission requirements. Joint training opportunities with special operations forces at Melrose AFR would be limited to daylight operations. Overall, quality training in the required CSAR mission would be notably reduced.



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## SUMMARY OF ENVIRONMENTAL CONSEQUENCES

This EA provides an analysis of the potential environmental consequences associated with WP rocket use. As indicated in Chapter 4.0, WP rocket use would not result in significant impacts to any environmental resource area and would not require new permits from any regulatory agency.

The Proposed Action or alternatives would not have an effect on airspace and range management, air quality, and socioeconomics because no change in the airspace configuration, type of aircraft, or personnel would occur. Safety, physical resources, biological, materials management, and cultural resources would experience a somewhat adverse, but not significant, impact under the Proposed Action or Alternative A. Under Alternative B, the No Action Alternative, there would be no change to current operations on Melrose AFR and there would be no impacts to the range. The effects of WP rocket use for each resource are briefly summarized below.

- **Airspace and Range Management.** Neither the Proposed Action nor Alternative A would result in a change to current use of the airspace supporting range operations. The existing airspace configuration is sufficient to support all required training profiles. Additionally, overall levels of use of the airspace would not change. There are no aspects of the Proposed Action or Alternative A with the potential to cause any impacts on the management and use of these elements of the National Airspace System (NAS).

Certain aspects of either the Proposed Action or Alternative A require a revision or updating of specific range management guidance documents. The land area of the range, in its current configuration, is sufficient to support either action. Detailed weapon safety footprint analysis would be performed for all applicable targets associated with the Proposed Action prior to authorization to begin training. Detailed weapons safety analysis would be accomplished for any newly developed aim points associated with Alternative A. Updated processes and procedures are required for training of personnel who might encounter white phosphorus during their range duties. The use and presence of white phosphorus on the range requires coordination among those Cannon AFB personnel with range responsibilities.

- **Safety.** WP rockets would only be used at approved range locations. Under either the Proposed Action or Alternative A, the wildfire potential could increase. To minimize the risk of fire, WP rockets would not be permitted during periods of high, very high, or extreme fire danger. Any fires ignited by rockets would be suppressed by on-site fire safety personnel. Education of local fire departments regarding white phosphorus would occur to familiarize personnel with the characteristics of white phosphorus. While explosive ordnance disposal (EOD) personnel would dispose of any munitions items that failed to function as designed, additional training measures would be employed. Munitions personnel would require additional training in the handling of WP rockets. An education and briefing program for rancher lessees would be



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developed to alert them to the potential hazards in the restricted leased areas of Melrose AFR.

- **Materials Management.** Under any alternative, Building 2129 would require door modifications to accommodate storage of reactive materials. Waste materials would be handled with updated Melrose AFR procedures. Under either the Proposed Action or Alternative A, range clean up would be accomplished every three months (75 use days) in areas of the greatest concentrations with a boundary-to-boundary clearance every five years. Trained personnel would be responsible for all WP rocket materials and range debris clean up.
- **Air Quality.** Although dense white smoke is produced when WP rockets are employed, no toxic compounds are likely to form in this environment. The U.S. Environmental Protection Agency (USEPA) considers white phosphorus a hazardous air pollutant (HAP). However, projected levels of HAP emissions are not significant compared to major source thresholds. The particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>) emissions associated with the WP rocket use was analyzed. Potential impacts to visibility as a result of PM<sub>10</sub> emissions are expected to be short term and limited in area prior to the rapid dispersion of the material, and would not adversely impact any Prevention of Significant Deterioration (PSD) Class I areas.
- **Physical Resources.** Under the Proposed Action, the use of WP rockets could affect surface water features. However, if white phosphorus were to fall into a stream, it would most likely oxidize into a non-toxic substance. Under Alternative A, surface water features would be avoided to the maximum extent possible.
- **Biological Resources.** The potential for contamination to wetlands and rangelands could occur under either the Proposed Action or Alternative A. However, due to the environmental conditions at Melrose AFR, such as limited water, the soil conditions, and vegetation types, it is unlikely that residual white phosphorus materials would accumulate at a rate to be ingested by wildlife and cattle. In addition, the potential for direct mortality to wildlife within the impact area would be minimal due to the low densities of most wildlife species within the impact area and the anticipated number of rockets that would be used annually. The sensitive species known to occur within the impact area is the black-tailed prairie dog, and it is unlikely that infrequent WP rocket strikes would destroy an entire prairie dog colony or adversely impact the persistence of local or regional prairie dog populations. Burrowing owls and migrating Mountain plovers are associated with prairie dog colonies, but there is a low probability of either species occurring at any given site in or near an impact area. While white phosphorus poses a human health risk, with proper handling procedures and education program, the risks would be minimized. On-range grazing lease agreements reflect the inherent risk of grazing on an active military range. Alternative A has less potential to affect biological resources than the Proposed Action.
- **Cultural Resources.** Under the Proposed Action or Alternative A, no impacts to significant cultural resources on Cannon AFB or Melrose AFR are anticipated. Neither



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of the two National Register of Historic Places (NRHP)-eligible sites in the target impact area are in existing target locations. There are presently no NRHP-eligible resources in the restricted area that lie near the edge of the target impact area. In the unlikely event that unevaluated resources are found to lie within the weapons safety footprint of a given target, the resources would be evaluated to identify whether any are eligible for the NRHP. Compliance with Section 106 of the National Historic Preservation Act is underway through contact with the New Mexico Office of Cultural Affairs. The Air Force also has initiated contact with the Apache, Comanche, and Kiowa tribes to identify any potential concerns associated with the Proposed Action.

- **Socioeconomics and Environmental Justice.** Neither the Proposed Action nor Alternative A would involve any personnel changes or construction activity that would affect socioeconomic resources. WP rockets would only be used in the boundaries of the Melrose AFR. Due to the sparse population in the region surrounding the range and the improbability of a human encounter with WP, the potential for disproportionately high and adverse human health or environmental effects on minority, low-income or youth populations is considered unlikely.



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# 1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

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## 1.1 INTRODUCTION

The United States Air Force (Air Force) proposes to employ white phosphorus rockets (WP rockets) on Melrose Air Force Range (AFR), New Mexico, to support the Combat Search and Rescue (CSAR) mission of the 27th Fighter Wing (27 FW), specifically the 524th Fighter Squadron (524 FS), at Cannon Air Force Base (AFB). The proponent of the action is the Weapons and Tactics Flight of the 27th Operations Support Squadron/Operations Support Tactical Wing (27 OSS/OSTW).

This Environmental Assessment (EA) has been prepared to analyze the potential environmental consequences associated with the Proposed Action and alternatives in accordance with the requirements of the National Environmental Policy Act (NEPA) 42 United States Code [USC] 4321 *et seq.*) and its implementing regulations.

Section 1.2 presents background information on Cannon AFB, Melrose AFR, the CSAR mission, WP rockets, and F-16 aircraft. The purpose and need for the Proposed Action are described in section 1.3. A detailed description of the Proposed Action and alternatives, including the No Action Alternative, is provided in Chapter 2. Chapter 3 describes the existing conditions of various environmental resources that could be affected by the Proposed Action and alternatives. Chapter 4 describes how those resources would be affected by implementation of the Proposed Action and alternatives. Chapter 5 addresses the relationship between short-term uses and long-term productivity. Chapter 6 identifies any irreversible and irretrievable commitment of resources and Chapter 7 addresses any potential cumulative effects of the Proposed Action and alternatives, in conjunction with other recent past, current, and future actions that may be implemented.

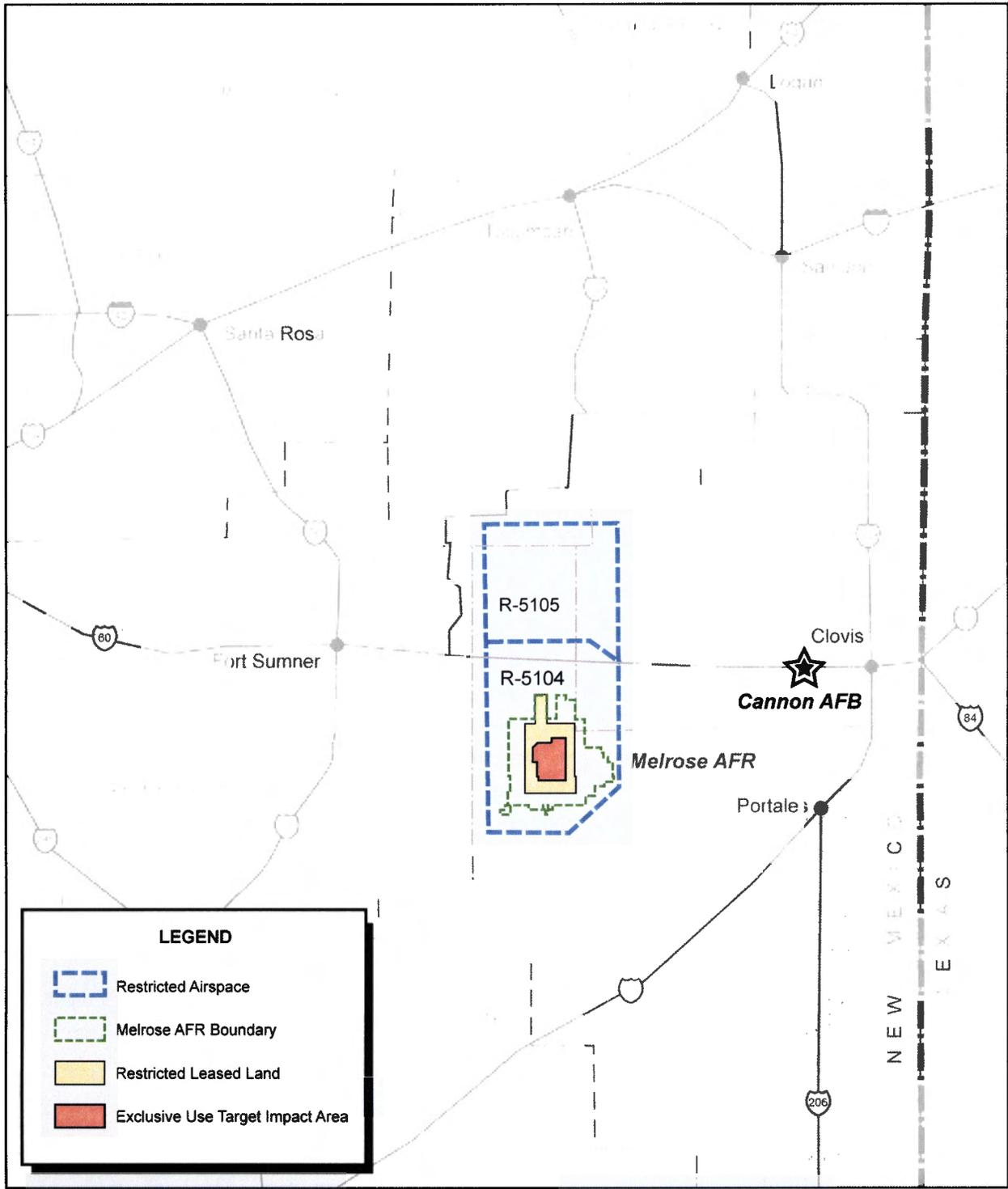
## 1.2 BACKGROUND

### 1.2.1 Cannon AFB and Melrose AFR

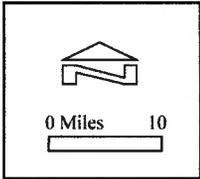
Cannon AFB is located approximately 7 miles west of Clovis, New Mexico and 17 miles west of the Texas-New Mexico state line (Figure 1-1). The base comprises approximately 3,500 acres and administers Melrose AFR, which is located about 40 miles west of Cannon AFB.

#### CANNON AFB

The current site of Cannon AFB, initially called Clovis Army Airfield, has been in use since 1943 during World War II when aircrews trained for an air-to-ground mission. The base was inactivated in 1947 and reactivated in 1951 as Clovis AFB, a Tactical Air Command base. Clovis AFB was renamed Cannon AFB in 1957, in honor of the late General John K. Cannon, a former commander of Tactical Air Command. Throughout the years, this base has played host to



**Figure 1-1**  
**Location of Melrose AFR and Cannon AFB**





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numerous types of aircraft such as B-17s, B-24s, and B-29s, to fighters such as the F-86, F-100, F-111, EF-111 and F-16. The current F-16s of the 27 FW train with a dual air-to-air and air-to-ground mission. This mission now includes CSAR support. Training for the new CSAR mission, described in section 1.2.2, is proposed on Melrose AFR.

### **MELROSE AFR**

Melrose AFR is the primary air-to-ground training range used by aircrews assigned to the 27 FW. Melrose AFR is located on basically flat short-grass prairie and is bounded on two sides by a 200-foot tall mesa. The range is comprised of approximately 66,033 acres of land consisting of an 8,800-acre exclusive use target area and a 57,233-acre restricted use area (Figure 1-2). The land area outside of the 8,800-acre exclusive use impact area is leased out to local farmers and ranchers under varying use restrictions. The Base Civil Engineering Squadron manages the leased land, while the impact area is managed by the 27 OSS/OSTW element of the Operations Support Squadron.

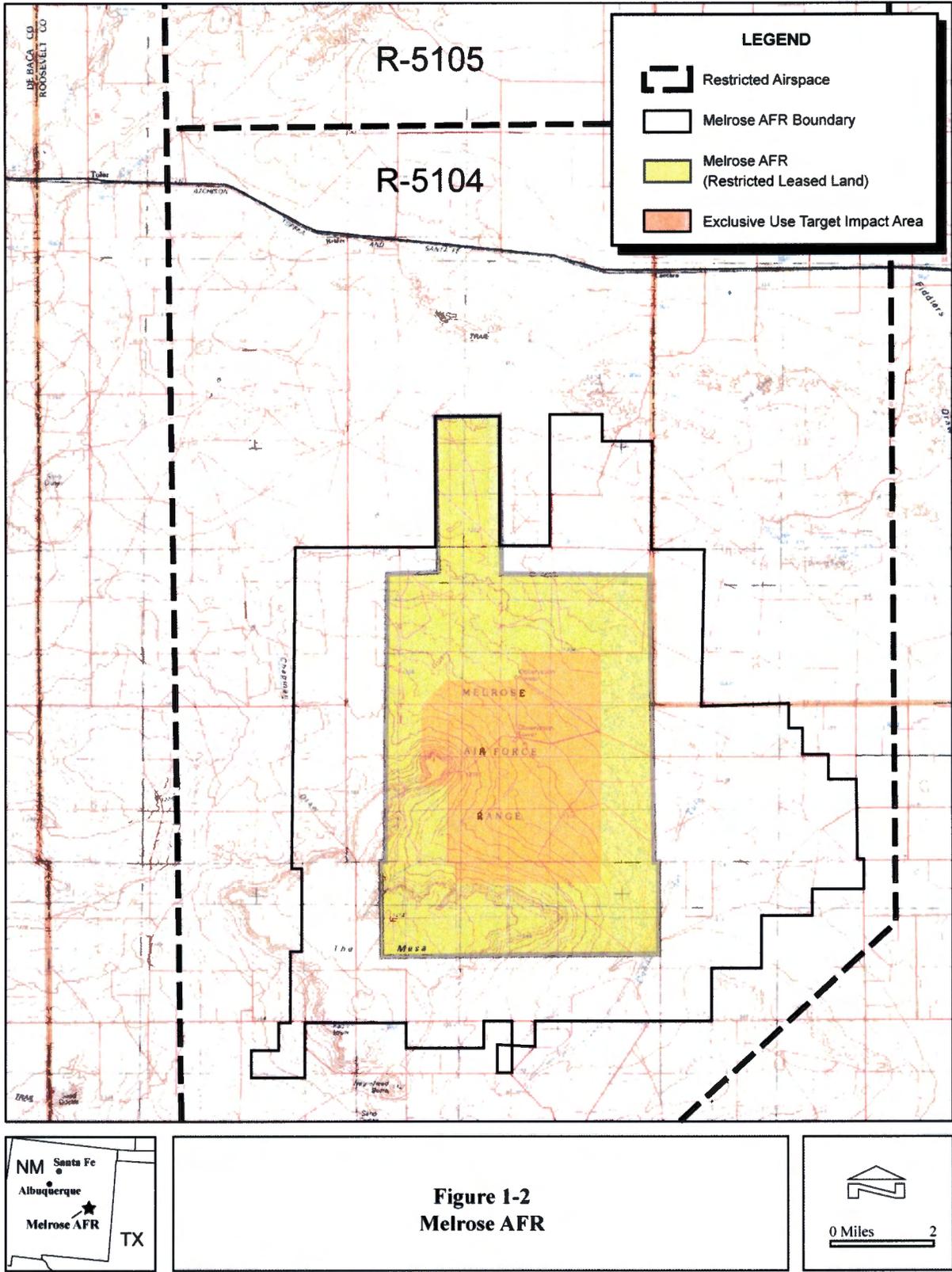
The range has been used for simulated special and conventional weapons delivery. These include practice bombs, inert general purpose bombs up to 2,000 pounds, inert laser guided bombs, inert 2.75-inch rockets, 7.62 millimeter (mm), 27 mm, 20 mm, and 0.50 caliber training practice rounds, and defensive chaff and flares. Live, high explosive bombs are not authorized on Melrose AFR.

The northern half of the range is a standard practice range with a special weapons delivery target, conventional targets, strafe pits, and a skip target. It is used for basic weapons delivery training. The southern half is a tactical range with an array of targets including a simulated airfield complex with associated defenses and support areas, truck convoy, bridge, tunnel, dam, and train with railroad tracks. The tactical range is used for day and night tactical ground attack training.

Melrose AFR was acquired as Air Force-owned real property through the Military Construction Authorization Act of 1967 (Public Law [P.L.] 89-568). Since the Korean War, Air Force, Navy, and Marine Corps units have used Melrose AFR for bombing and gunnery practice. Early in 1952, the Air Force obtained 7,771 acres of land near Melrose, New Mexico. The land served as a bombing range for F-86 aircraft stationed in Clovis AFB (now Cannon AFB). Over the years, faster aircraft with more complex weapon systems increased the requirements for larger and more sophisticated range facilities. Between 1968 and 1989, the Air Force bought more land to expand the range to over 66,000 acres and increase the impact area to 8,800 acres. In addition, Cannon AFB has acquired restrictive easements along the western range boundary prohibiting large gatherings of people and residential development (personal communication, Pate 2003).

### **1.2.2 Combat Search and Rescue Mission**

The current mission of Cannon AFB is to develop and maintain a fighter wing capable of day, night, and all-weather combat operations for war-fighting commanders worldwide. A new mission support requirement, CSAR, has recently been assigned to the 524 FS of the 27 FW. The purpose of the CSAR mission is to rescue military personnel exposed to enemy capture, including downed aircrews. When an aircraft is shot down during combat operations, a major





imperative is to rescue the downed aircrew. Accomplishing this objective entails a myriad of activities, involving many military squadrons and varied support requirements. First, the downed aircrew requiring rescue is located and all threats to their survival identified. Then, a strategy is formulated to determine the aircrew's identification, location, and ultimate rescue. Next, plans for implementing this strategy are developed and defined in terms of specific mission requirements for all elements involved in the search and rescue operation. Then, the mission is implemented. Specific training in all aspects of the search and rescue operation are necessary to achieve ultimate success.

F-16 aircrews of the 524 FS need to train for the CSAR mission by performing a very broad scope of activities. These activities range from forward air controller duties (marking and designating targets) to suppression of enemy air defenses (defeating or neutralizing surface-to-air missiles or anti-aircraft artillery) to close air support (providing defensive cover for friendly troops encountering advancing enemy troops). Some, if not all of this training may require use of WP rockets.

### **1.2.3 Description of White Phosphorus Rockets**

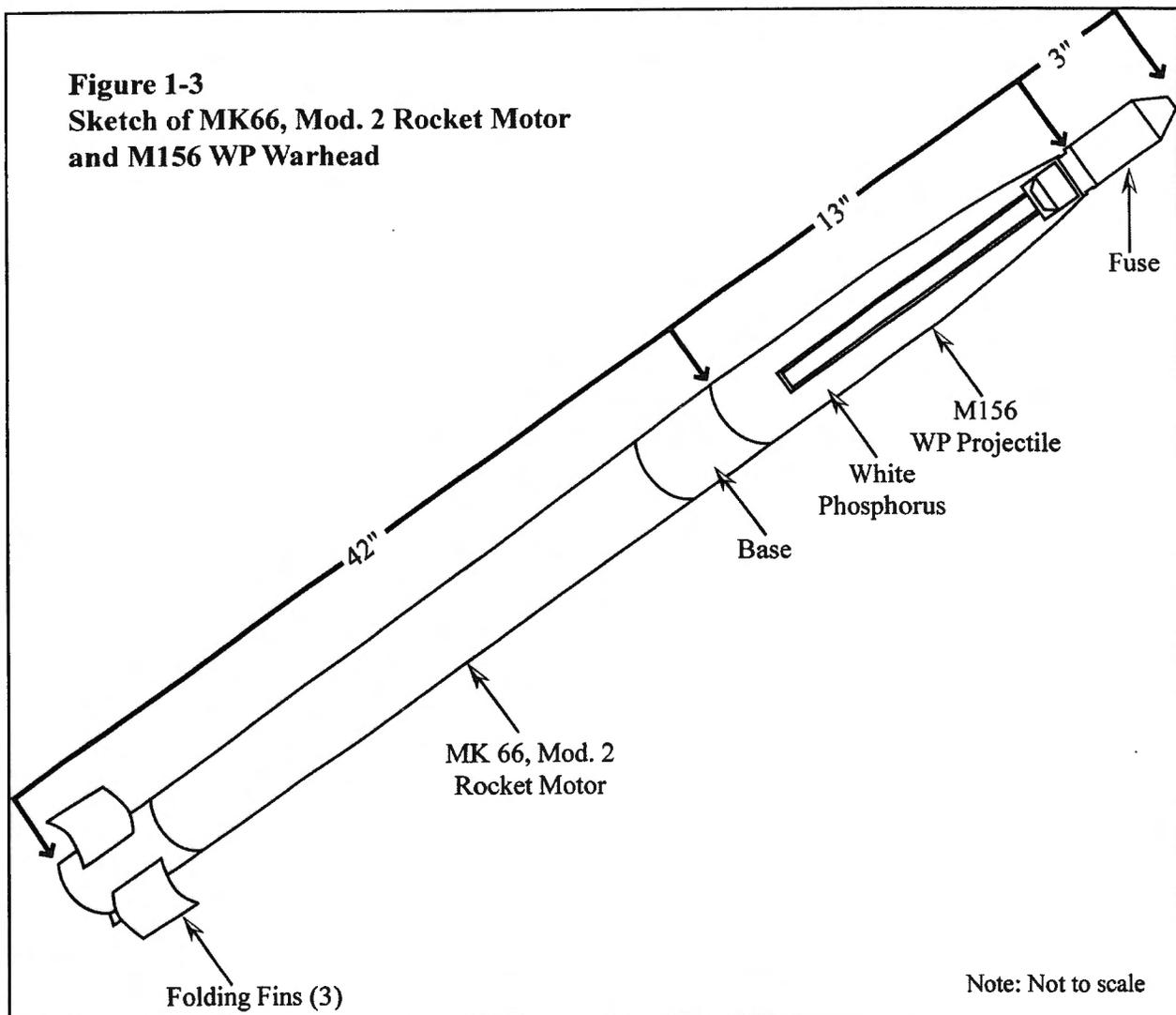
White phosphorus is an element that does not occur naturally. It is manufactured from naturally occurring phosphate rocks. White phosphorus is a colorless to white waxy solid with a garlic-like smell that ignites spontaneously in the air. White phosphorus burns at a temperature of 2,760 degrees Celsius [C] (5,000 degrees Fahrenheit [F] and 273 Kelvin).

White phosphorus is used by the military in various types of ammunition to produce smoke for concealing troop movement and to identify targets. It is also used by industry to produce phosphoric acid and other chemicals for use in fertilizers, food additives, and cleaning compounds. Small amounts of white phosphorus were used in the past in pesticides and fireworks.

The 2.75-inch Wrap-Around Folding Fin Aircraft Rocket (see Figure 1-3) utilizes a Mark 66 (MK 66) Mod 2 rocket motor that can be configured with a variety of projectiles or warheads. The rocket motor is 41.75 inches long without a warhead, and weighs 13.6 pounds. The motor burns for 1.05 to 1.1 seconds and has a velocity at burnout of 2,425 feet per second (approximately 1,800 miles per hour [mph]). The WP warhead is designated M156. When fuzed, the warhead is 16.02 inches long and weighs 9.7 pounds. It contains 2.2 pounds of white phosphorus and 0.125 pounds (2 ounces) of a high explosive burster charge. The warhead can be configured with either an impact fuze or a proximity fuze. Impact fuzes initiate when they strike the ground or some other hard surface; proximity fuzes initiate at some given distance from the ground or the target. When the fuze detonates, it triggers the burster charge. This ruptures the warhead case and scatters phosphorus particles. The exposed phosphorus reacts (ignites) spontaneously when exposed to oxygen, and produces the smoke cloud and the associated thermal signature.



**Figure 1-3**  
**Sketch of MK66, Mod. 2 Rocket Motor**  
**and M156 WP Warhead**



#### 1.2.4 F-16 Aircraft

The F-16 "Fighting Falcon" is a single-seat, single engine, multi-role tactical fighter that first entered operational service in 1979. Since then, the aircraft has been significantly upgraded. The F-16C (single seat) and F-16D (two seats for training) were introduced in 1984, and incorporate improved performance, avionics, and weapons delivery capabilities. The F-16 is armed with a 20 mm, multi-barrel cannon mounted in the fuselage and can carry up to 500 rounds of ammunition. Air-to-air missiles can be mounted on the wingtips. Seven stations on the aircraft can be used to mount mission-required equipment such as additional fuel tanks, air-to-air munitions, air-to-ground munitions, or electronic warfare pods.

The 27 FW, specifically the 524 FS, would use F-16 Block 40 aircraft to accomplish the CSAR mission. The F-16 Block 40's have an improved night/all-weather capability designed to enhance the air-to-ground role. The Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) system is used for terrain-following and forward looking infrared imagery



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displays, as well as target acquisition and weapon's guidance. Regular upgrades to the F-16 fleet are expected to enhance terrain following and forward looking imagery capability.

### **1.3 PURPOSE AND NEED FOR THE ACTION**

The purpose of using WP rockets at Melrose AFR is to provide effective, efficient, and realistic training for 524 FS F-16 aircrews to become fully mission capable in their newly assigned CSAR mission. The 27 FW at Cannon AFB is an integral part of the United States Aerospace Expeditionary Force (AEF). The AEF concept integrates fighters, bombers, support aircraft, and tactical airlift into one functional unit that responds rapidly and decisively to potential crises anywhere in the world. The CSAR mission is one component of the AEF.

The CSAR mission requires location and protection of personnel to be rescued. The WP rockets provide a visual and thermal signature for real world training that is not possible with a spotting rocket. Dense white smoke and intense heat are emitted upon reaction of the white phosphorus with oxygen. The dense smoke aids in marking potential targets or to obscure ground activity. The heat provides a persistent infrared signature visible in the dark to both aircrew and ground personnel utilizing night vision devices. Upon impact and for approximately one and one half minutes after impact (depending on environmental conditions), white phosphorus has the thermal characteristics required to be visible at the target with the infrared pod installed on 27 FW aircraft. The WP rockets would only be used on exclusive use target impact areas within Melrose AFR (refer to Figure 1-2).

Special Operations helicopters and Ground Forward Air Controller/Enlisted Tactical Air Controller (GFAC/ETAC) teams train with the Cannon AFB F-16 aircrews during comprehensive CSAR exercises at Melrose AFR. The unique capabilities of the WP rockets would permit the Air Force to gain invaluable training experience that is critical to the demanding and complex CSAR mission.

Training for the CSAR requires pilots to fulfill a specific number of sorties and different types of flying events. In order to meet the CSAR training requirements, a 24-airplane squadron must have a minimum of 8 to 10 qualified pilots with each pilot annually flying 4 to 6 sorties. For WP rocket employment proficiency, each qualified pilot must perform a familiarization ("FAM") event six times a year and a qualification ("Qual") event 12 times a year. To be "Combat Mission Ready," CSAR qualified pilots perform 12 High Angle Tactical Rocket (HATR) and 6 Low Angle Tactical Rocket (LATR) events per year.



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## **2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES**

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### **2.1 PROPOSED ACTION**

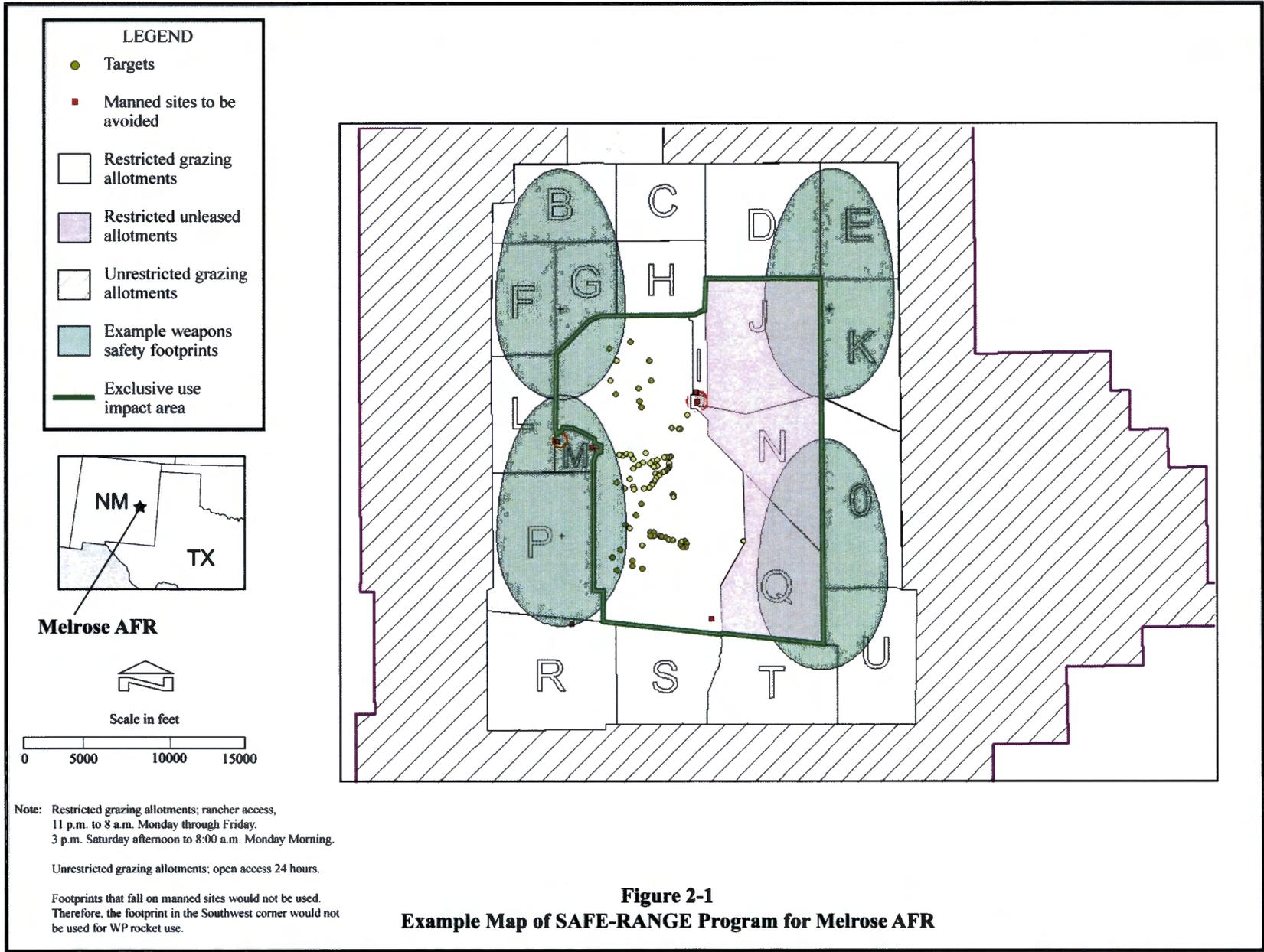
The Air Force proposes to use WP rockets on Melrose AFR to accomplish realistic CSAR training. Cannon AFB-based F-16 aircraft would use Melrose AFR to train in the CSAR mission. Aircrews from the 524 FS would train using WP rockets to identify the location of friendly troops, designate or mark targets for attack or rescue, and otherwise provide close air support.

The Proposed Action is to perform CSAR training using targets on Melrose AFR capable of supporting the use of WP rockets. Potential targets or aim points available for WP rocket use would be identified for mission development by range personnel using the SAFE-RANGE computer program. This software tool provides military personnel the capability to develop and display weapons safety footprint areas on Melrose AFR. The computer model uses Geographic Information System (GIS) overlays, which contain range information such as roads, buildings, water bodies, areas of environmental concern, and any other data that may be important to range managers.

Weapons delivery parameters such as the type of aircraft, the weapon, the flight path, altitude and delivery angle, and the target, are input into the program to develop the weapons safety footprint for a particular target. The output from the program is a map showing the weapons safety footprint for that target. If the range map shows a weapons safety footprint extending beyond range boundaries or in an area preferably avoided, the mission profile would be changed and another target analysis conducted. This process is repeated until a safe mission profile is developed. An example of the map and four notional associated weapons safety footprints from the SAFE-RANGE program are shown on Figure 2-1.

A preliminary screening of target profiles was developed for the Proposed Action. This screening showed that Melrose AFR has targets capable of supporting the WP training requirements with weapons safety footprints contained within range restricted land areas. Under the Proposed Action, range personnel would individually assess specific target-footprint combinations, and specific firing profile guidelines and constraints to identify viable targets. These targets and associated footprints would provide a range of authorized operational profiles for 27 FW aircrews. These targets would be incorporated in applicable range operating procedures (AFI 13-212, Annex A, Cannon AFB Supplement). The Cannon AFB supplemental guidance will be revised and updated in conjunction with the release of the ACC supplement.

Under the Proposed Action, the number of aircraft operating over the range would not change from existing conditions. Different types of training would continue to occur including that for the CSAR mission. Section 1.3 described the training pilots need to fulfill a specific number of sorties and different types of flying events for CSAR training. Each training event would use four to seven WP rockets per sortie.





Under the Proposed Action, projected WP rocket use would be approximately 180 in the first year to meet the 27 FW's 524 FS CSAR mission requirements. Subsequently, it is expected that the number of WP rockets used could increase by a factor of 2 to 3 times the initial year requirement. Funding, munitions allocation, mission tasking, and use by other military services on a transient basis could affect the number of WP rockets used in future years. For the purpose of this environmental analysis, a nominal projection of up to 500 WP rockets are assumed to be employed annually by all users of Melrose AFR.

The Proposed Action is to permit training on all targets capable of supporting use of WP rockets on Melrose AFR, which lies under restricted airspace R-5104 A/B; release altitudes would be from 1,000 up to 23,000 feet mean sea level (MSL) in R-5104 A/B and up to 10,000 feet MSL in R-5105. These restricted airspaces are shown on Figure 2-2. The airspace would continue to be used in its existing configuration. There would be no modification or change to airspace use or its boundaries. The impact angle of the WP rocket could vary from approximately 10 degrees to 90 degrees depending upon the authorized delivery profile. To minimize the risk of fire, WP rockets would not be permitted during periods of high, very high, or extreme fire danger.

A modification to Building 2129 in the munitions storage area at Cannon AFB would require an upgrade to its existing door to meet Air Force explosive safety directives for storage of reactive materials. The WP rockets and warheads cannot be stored with any other reactive materials. The WP rocket is classified as a 1.2 highly explosive munition; therefore, it has a storage compatibility rating of "H."

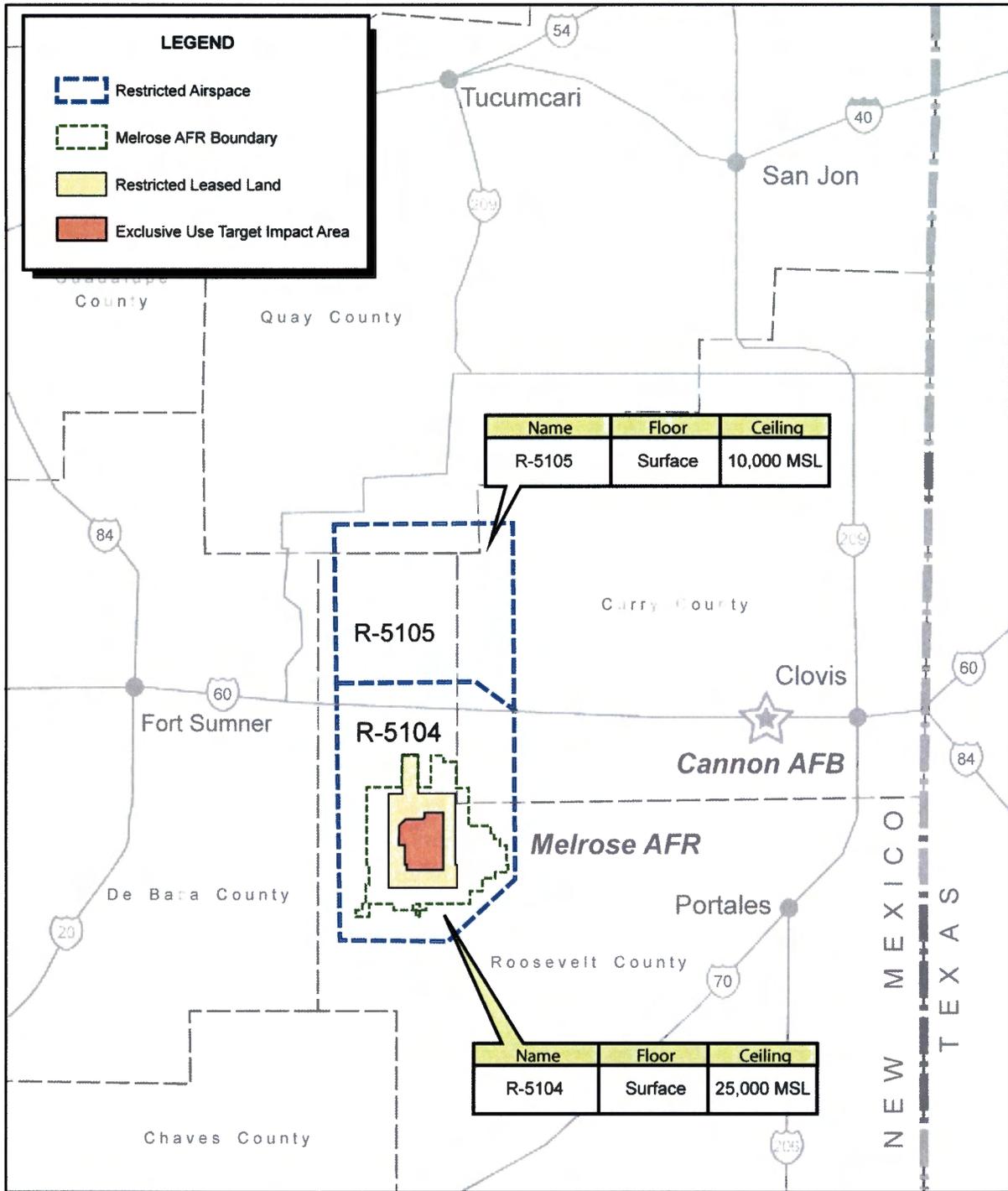
Ammunition and explosives are assigned to one of 13 compatibility groups (A through H, J, K, L, N, and S). Group H is defined as ammunition containing both explosives and WP or other pyrotechnic material. These are ammunition items which contain fillers that are spontaneously flammable when exposed to the atmosphere. Group H items may be stored with Group S items (ammunition posing no significant hazard). If necessary, limited quantities of Group H items may be stored with mission essential items assigned to groups B, C, D, E, F, J, and N. This mixing is approved only when operational considerations or lack of magazine space warrant it, and when safety is not sacrificed. Additionally, other specific segregation requirements may be necessary based on the specific group (U.S. Army 2001).

No change in the number of personnel supporting operations at Cannon AFB or on Melrose AFR would occur under the Proposed Action or alternatives.

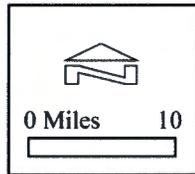
## **2.2 ALTERNATIVE IDENTIFICATION PROCESS**

### **2.2.1 Methodology for Alternative Identification**

The 27 FW identified several operational considerations to support required training for the 524 FS aircrews assigned to the CSAR mission.



**Figure 2-2**  
**Melrose AFR and Associated Airspace for the**  
**Proposed Action and Alternatives**





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### **2.2.1.1 BASIC REQUIREMENTS FOR TRAINING**

Several screening criteria were identified and applied to evaluate alternatives for training. These screening criteria were of two types, exclusionary and evaluative. Exclusionary criteria were conditions that, if not satisfied, indicated the alternative would not meet required training objectives. Evaluative criteria were conditions that, if not satisfied, indicated that the alternative did not satisfy some, or all, of the desired training objectives.

### **2.2.1.2 EXCLUSIONARY CRITERIA**

Criteria designated as exclusionary are as follows:

- Training must support unit's ability to develop a credible CSAR mission capability.
- Training shall not create undue safety hazards to persons or property in the training area.
- Training shall produce an infrared (IR) signature and visual acquisition of the designated target on the ground, thereby supporting training with night vision goggles and the capabilities associated with the aircraft's targeting pod.
- Training munitions must sufficiently provide both visibility and signature persistence. The mechanism or mechanisms used to mark the designated target must be observable using the combined aircraft and human-aided support systems, and must be present for a sufficient period of time to allow exploitation of the information provided by the signature.

### **2.2.1.3 EVALUATIVE CRITERIA**

Criteria designated as evaluative are as follows:

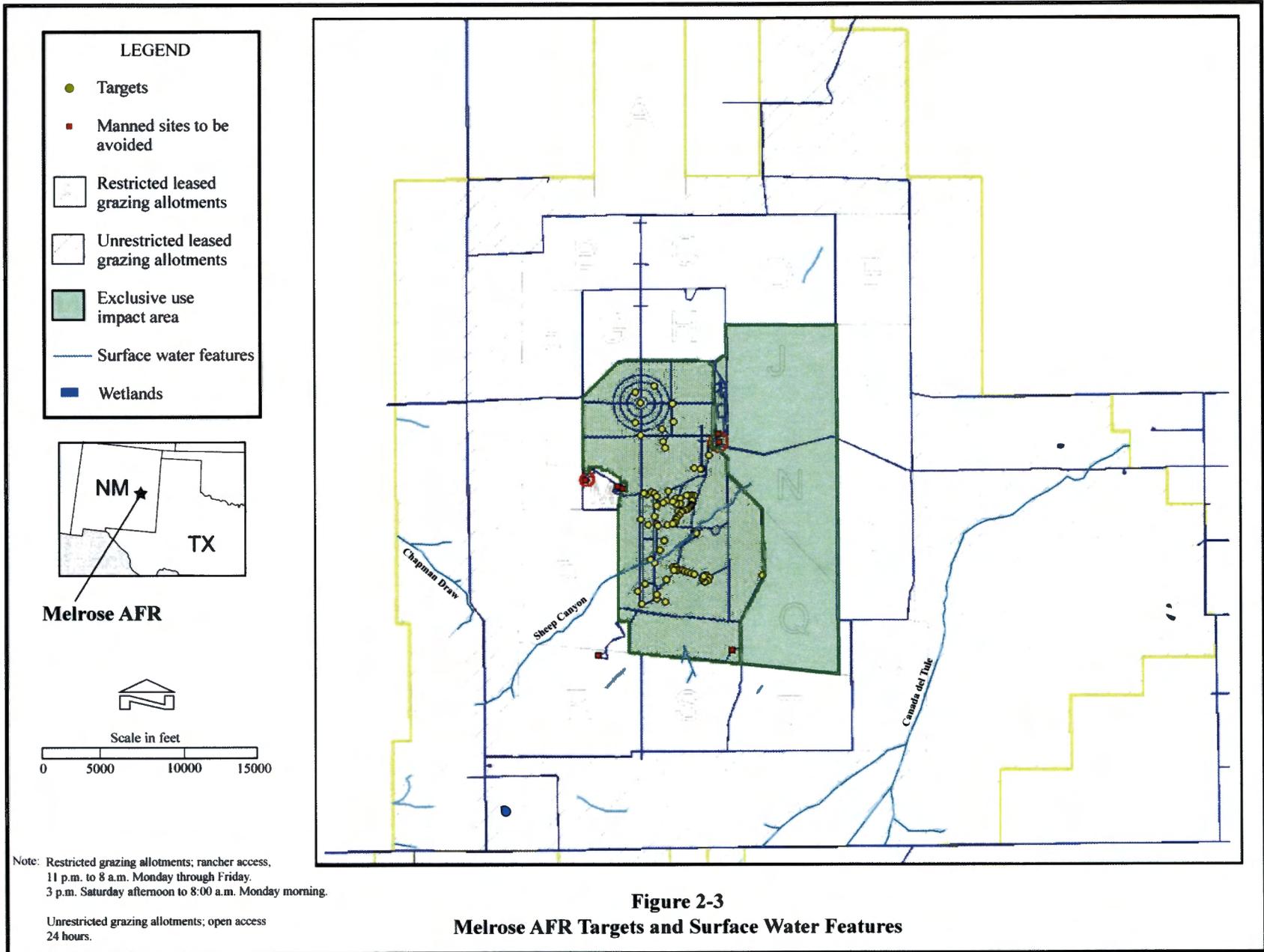
- Training should occur in a locale and environment that maximizes training time (training efficiency) and minimizes unproductive time, such as transit to and from the training location.
- Training should incorporate maximum flexibility, affording aircrews varying challenges in target identification and acquisition, and avoiding "rote" and repetitive situations.
- Training should be conducted in a way that minimizes potentially adverse impacts to human and natural environmental resources.

## **2.2.2 Alternatives to the Proposed Action**

The screening process produced the alternative to the Proposed Action and allowed for detailed environmental analyses.

### **2.2.2.1 ALTERNATIVE A: LIMITED TARGETS**

Alternative A employs the use of WP rockets on the Melrose AFR at the same level of activity projected in the Proposed Action. However, Alternative A would utilize the existing targets and the currently undeveloped east target area that avoids surface water features occurring in the southern portion of the range's impact area (Figure 2-3). This would create an avoidance





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area wherein the authorized weapons safety footprints, driven by approved operational profiles (headings, altitudes, delivery criteria, etc.), would be oriented or shifted away from areas of environmental sensitivity in order to minimize opportunity for potential impact to water resources. In general, the Limited Target Alternative would include targets on the northern part of the range and any target aim points selected in the exclusive use impact area located on the eastern edge of the impact area boundary. This undeveloped target area is currently restricted from grazing and would be available for WP use through establishment of authorized aim points or potentially new targeting areas.

As with the Proposed Action, the final selection of targets and target area aim points meeting the environmental sensitivity criteria would be determined through a comprehensive screening and target analysis with the SAFE-RANGE program and coordination between the environmental resource managers and the range manager. The authorized targets and target aim point areas would be formally integrated into the Cannon AFB Supplement 1 to AFI 13-212, Annex A.

Under this alternative, there would be no change in flight operations or personnel. Modification to Building 2129 in the munitions storage area would be required, as under the Proposed Action, to upgrade the existing door to meet Air Force explosive directives for storage of reactive materials.

#### **2.2.2.2 ALTERNATIVE B: NO ACTION**

For the purposes of this analysis, the No Action Alternative consists of no employment of WP rockets at Melrose AFR in support of the 524 FS CSAR mission. Although the CSAR tasking would remain, Cannon AFB pilots would be required to conduct WP rocket training at other remote ranges currently approved for this type of munition. WP rockets would still be stored at Cannon AFB, thus maintaining the requirement to upgrade Building 2129 to compliance with Air Force explosive directives for storage of reactive materials. Under the No Action Alternative, WP rockets allocated to the 524 FS could either be transferred to the training location or loaded on the 27 FW aircraft and flown to the deployment/training location depending upon availability and distance of the ranges, length of deployment, or training cycle. Allocation levels for the 27 FW would be expected to be the same as described under the Proposed Action and Alternative A. Cannon AFB munitions personnel would be trained in the storage and maintenance of WP rockets while emergency response personnel would receive response training for incidents involving local inventory of WP rockets.

The inability to adequately train with WP rockets locally at Melrose AFR would constrain the 27 FW's development of the required CSAR capability. Night training with visual acquisition of WP markers and use of infrared targeting systems would be impossible. Overall, quality training and pilot proficiency in this area would be notably reduced. Additionally, joint training opportunities with special operations forces at Melrose AFR would be limited to daylight operations.



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### **2.2.3 Alternatives Considered But Not Carried Forward**

The Air Force considered several alternatives to conduct CSAR training for 27 FW's 524 FS aircrews. These alternatives were assessed using the exclusionary and evaluative criteria discussed above and were not carried forward for detailed environmental analyses.

#### **2.2.3.1 AUTHORIZE USE OF WP ROCKETS ON ALL TARGETS ON MELROSE AFR**

Melrose AFR has additional impact areas and targets that could be used for CSAR training but that are not included in the Proposed Action or Alternative A. Increased training flexibility could be achieved by using WP rockets on any impact area or target within Melrose AFR. The preliminary screening criteria using the SAFE-RANGE program identified weapons safety footprints. An example of these footprints is shown in Figure 2-1. The preliminary screening demonstrated that not all impact areas or targets are capable of containing the WP rocket weapons safety footprint or avoiding the manned sites. This alternative would create undue safety hazard to human and natural resources and property outside Melrose AFR property; therefore, it was eliminated from further consideration.

#### **2.2.3.2 USE INERT ROCKETS ON MELROSE AFR FOR CSAR MISSION TRAINING**

An inert rocket is a 2.75 inch rocket with essentially the same size and shape as a WP rocket but without the white phosphorus warhead. These rockets have practice WTU-1B warheads. Inert rockets are authorized for use on Melrose AFR. Inert 2.75-inch rockets provide neither the IR signature nor visual cues vital to successful accomplishment of the CSAR mission described as exclusionary criteria in section 2.2.1.2. This alternative would not result in the 27 FW (524 FS) developing a credible CSAR capability and did not meet operational requirements.

#### **2.2.3.3 USE SMOKE-PRODUCING ROCKETS ON MELROSE AFR FOR CSAR MISSION TRAINING**

A smoke-producing rocket is the same size and shape as a WP rocket but has a M-274 smoke signature warhead. The rocket provides a visual signature in daylight, but does not produce the IR signature nor nighttime visual cues vital to successful accomplishment of the CSAR mission. This alternative would not result in the 524 FS developing a credible CSAR nighttime capability and did not meet operational requirements.

#### **2.2.3.4 USE ILLUMINATING ROCKETS ON MELROSE AFR**

Illuminating 2.75-inch rockets are the same size as WP rockets, have M-257 illumination warheads, and provide an IR signature above the ground. These rockets do not provide the dense smoke and duration of burn needed for CSAR mission training. This alternative does not provide all of the signatures and visual cues necessary to support all phases of a successful mission. This alternative would not meet operational requirements and would not result in the 27 FW (524 FS) developing a credible CSAR capability.

## **2.3 ENVIRONMENTAL IMPACT ANALYSIS PROCESS**

The environmental impact analysis process (EIAP) reviews all information pertinent to the Proposed Action and reasonable alternatives and provides a full and fair discussion of potential



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consequences to the natural and human environment. The process includes involvement with the public and agencies to identify issues for analysis in order to focus the analysis and identify environmental resources potentially affected by the Proposed Action or alternatives.

### **2.3.1 History of Major Environmental Impact Analysis Process Actions Affecting Melrose AFR**

The environmental effects of expansion of Melrose AFR were evaluated in a 1985 Environmental Impact Statement (EIS) that found no significant impacts to land use, vegetation, wildlife, soil, or the surrounding population from range expansion (Air Force 1985). A 1990 EIS evaluating realignment of Cannon AFB (Air Force 1990) and a 1992 EIS evaluating F/EF-111 basing at Cannon AFB (Air Force 1992a) also found that no significant impacts would be expected as a result of target area expansion within Melrose AFR. Based on these findings, a 1992 proposal to construct the East Range Target array within Melrose AFR to meet the needs of the F-111F qualified for a categorical exclusion (CATEX) (Air Force 1992b). East Range Target array construction included a Bunker Complex (six bunkers), DRM Industrial Complex (a parking lot, two bunkers, and a water tower), Railroad Yard (tracks, train, bridge, and yard tower), and six Tank Revetments. An additional action in 1992 to construct access roads from the impact area to the outer perimeter firebreaks also qualified for a CATEX (Air Force 1992c)

A 1995 EA evaluated the effects of the Air Force proposal to accelerate the retirement of the F-111 aircraft and replace them with F-16 aircraft at Cannon AFB (Air Force 1995). This EA found no significant impacts to resources at Melrose AFR from the force structure change.

In 1998, an EA for a proposed force structure change and foreign military sales actions at Cannon AFB evaluated the effects of replacing existing F-16 Block 40 aircraft with F-16 Block 30 aircraft, and establishing Singapore Air Force squadron at Cannon AFB (Air Force 1998). This EA found no significant impacts to resources at Melrose AFR from the action. Further analysis was completed in 2000 under an Environmental Assessment for Force Structure Changes examining the impacts of retaining F-16 Block 40 aircraft as opposed to converting to all Block 30 as originally evaluated in 1998. A Finding of No Significant Impact was approved in March 2000 (Air Force 2000a).

A similar block change was evaluated in 2002 wherein 18 older Block 30 aircraft would be replaced with 18 newer Block 50 aircraft. The action received a categorical exclusion in July 2002. As with the above described actions, this block change did not result in any demonstrable changes to Melrose AFR (Air Force 2002a).

In 2001, the Air Force proposed to provide F-16 pilots at Cannon AFB with the capability to train with chaff and flares within portions of Cannon AFB managed airspace (Air Force 2001a). This EA found no significant impacts to environmental resources on or off Melrose AFR from the action.

### **2.3.2 Scope of Resource Analysis**

The Proposed Action and Alternative A would involve a change in the type of munitions used on Melrose AFR, specifically the addition of WP rockets to support the CSAR mission. Neither the Proposed Action nor alternatives would change the number of aircraft, sorties, or personnel



at Cannon AFB. The Proposed Action or Alternative A involves no new construction or ground-disturbing activities at Cannon AFB other than a modification to an existing structure. Alternative A includes a location suitable for employment of WP rockets to the east of the current impact area. Chapter 3.0 presents the affected environment for those resources listed above and Chapter 4.0 addresses the environmental consequences of implementing the action alternatives. The use of WP rockets has the potential to affect several environmental resources, including airspace and range management, safety, materials management, air quality, physical resources, cultural resources, biological resources, and socioeconomics. A comparison of environmental consequences is presented at the end of this chapter (refer to section 2.4).

### **2.3.2.1 RESOURCES ELIMINATED FROM DETAILED CONSIDERATION**

Several environmental resources in this EA were found to be unlikely to experience environmental consequences if either the Proposed Action or Alternative A were implemented. These resources include Noise, Land Use and Visual, and Recreation. A brief explanation of the reasons why each resource has been eliminated from further consideration in this EA is provided below.

*Noise.* Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. No change in aircraft operations or personnel would occur to alter the noise levels. Although launched rockets exceed the speed of sound and create noise, rocket noise in isolated locations on the range would not be substantively different from the noise of current munitions.

*Land Use and Visual.* Melrose AFR has the capability to be used as both a conventional and tactical range. Implementation of the Proposed Action or Alternative A would not change land uses, practices, ownership, or the visual environment.

*Recreation.* Recreational activities are not permitted on Melrose AFR. Implementation of the Proposed Action would not change personnel and no expansion of Melrose AFR or Cannon AFB would occur that could affect recreation in the area.

### **2.3.3 Public and Agency Involvement**

In January 2003, the Air Force initiated the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) and contacted local, state, tribal, and federal agencies to inform them of the Air Force intent to prepare an EA for the proposed use of WP rockets on Melrose AFR (refer to Appendix A). Through this process, the Air Force obtained information regarding pertinent environmental issues the agencies felt should be addressed in the environmental impact analysis and collected data to be used in the analysis. Community leaders and legislative representatives from potentially affected communities in New Mexico were contacted. Agency consultations were also undertaken with regard to cultural resources and biological resources, primarily for compliance with the Endangered Species Act (ESA) (refer to Appendix A).

The Air Force prepared and published newspaper advertisements announcing the availability of the Draft EA for public and agency review. The notice of availability appeared in the DeBaca County News on May 8, the Cannon AFB Mach Meter on May 9, and the Portales News



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Tribune and Clovis News Journal on May 11. In addition, the 27 FW Public Affairs office distributed a news release to the media outlets. The Draft EA was also posted on the Cannon AFB website at [www.cannon.af.mil](http://www.cannon.af.mil).

A public comment period on the Draft EA extended from May 13 to June 23, 2003. Appendix A includes agency letters received during this period. The Final EA is available to the public at area libraries (Clovis-Carver Public Library; Clovis Community College Library; Eastern New Mexico University, Golden Library; Portales Public Library; and Fort Sumner Public Library), at Cannon AFB Library and on the Cannon AFB website.

A notice of availability for the Final EA and Finding of No Significant Impact appeared in the area newspapers mentioned above in addition to a news release to local media outlets.

### **2.3.4 Regulatory Compliance**

This EA has been prepared in accordance with NEPA of 1969 (42 USC 4321-4347), Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] §§ 1500-1508), and Air Force Instruction (AFI) 32-7061, *Environmental Impact Analysis Process* (32 CFR 989, et seq.). The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. If the analyses presented in this EA indicate that implementation of the Proposed Action would not result in significant environmental impacts, then a Finding of No Significant Impact (FONSI) could be issued.

The analysis of environmental resource areas considers all applicable federal, state, and local regulations within Chapters 3 and 4 of this document. Certain areas of federal legislation have been given particular consideration, including the ESA; the Clean Air Act (CAA) amendments of 1990; the National Historic Preservation Act (NHPA); the Clean Water Act, and Executive Order (EO) 11990 on the Protection of Wetlands. None of these acts present particular problem areas under the Proposed Action or alternatives. Other state and federal regulations used for this analysis are presented in Appendix B.

The Emergency Planning and Community Right to Know Act (EPCRA), 40 CFR Part 372, requires facilities to report when the facility has manufactured, processed, or otherwise used a toxic chemical in excess of an applicable threshold quantity of that chemical. Air Force range operations fall into the "otherwise used" category. Exceeding a threshold quantity does not restrict the use of the chemical; it only has to be reported. The typical reporting threshold quantity is 10,000 pounds per year, but there are lower thresholds for chemicals of special concern. For example, the threshold for lead and lead compounds is 100 pounds per year (see section 4.3.1.1).

The Department of Defense (DoD) has developed the Toxic Release Data Delivery System (TRI-DDS) program to calculate toxic emissions from munitions use. The program contains a munitions composition report for individual weapons. By entering the number of any particular weapon expended on the range, the program calculates the chemical emission, in pounds, of each chemical component of the weapon. The Munitions Composition Report for the WP rocket motor and WP projectile is presented in Appendix C.



The Melrose AFR Management Office currently provides the Cannon AFB EPCRA program manager with monthly reports on the number and types of weapons used on the range. The number of WP rockets used on the range would be tracked through this office.

Implementation of the Proposed Action or Alternative A may involve concurrence from regulatory agencies. Compliance with the ESA involves communication with the Department of the Interior (delegated to the United States Fish and Wildlife Service [USFWS]) in cases where a federal action could affect the listed threatened or endangered species, species proposed for listing, or species that are candidates for listing. A letter was sent to the appropriate USFWS agencies and their state counterparts informing them of the Proposed Action and alternatives and requesting data regarding applicable protected species. Since no adverse effects are anticipated, further consultation is not anticipated.

The preservation of cultural resources falls under the purview of State Historic Preservation Office (SHPO), as mandated by the NHPA and its implementing regulations. A letter was sent to the New Mexico Office of Cultural Affairs informing them of the Proposed Action and alternatives and a Draft EA has been provided.

Appendix A includes copies of relevant coordination letters. Appendix D includes a list of protected species provided by interested agencies.

### 2.3.5 Permit Requirements

This EA has been prepared in compliance with NEPA; other federal statutes, such as the CAA and the Clean Water Act; EOs, and applicable state statutes and regulations. Table 2-1 summarizes applicable federal, state, and local permits and the potential for change to the permits due to the Proposed Action or alternatives.

Table 2-1. Environmental Related Permitting

<i>Permit</i>	<i>Resource</i>	<i>Proposed Action</i>	<i>Alternative A</i>	<i>Alternative B: No Action</i>
Title V Operating Permit	Air	○	○	○
Cannon AFB National Pollutant Discharge Elimination System (NPDES) Waste Water Treatment	Waste Water	○	○	○
Cannon AFB NPDES Storm Water	Storm Water	○	○	○
Cannon AFB Non Discharge (Sludge Disposal)	Waste Water	○	○	○
Cannon AFB Hazardous Waste Permit	Hazardous Waste	○	○	○
Underground Storage Tank Registration Certification	UST	○	○	○

Note: 1. Permit for Construction Sites Disturbing More than 2 Acres.

○ = Permit change potentially needed.

○ = No permit change needed.

● = Permit change needed.



Because of the nature of this action, no new permits are required. A list of existing Cannon AFB permits was compiled and reviewed during the EA process. The existing Part B Operating Permit for open detonation at Melrose AFR may require a change due to a potential increase in the quantity of munitions requiring treatment. Table 2-2 summarizes management actions and procedures that will need to be reviewed, coordinated, and/or updated to ensure Air Force compliance with applicable instructions, guidance, and directives.

**Table 2-2. Summary of Management Actions Required**

<i>Action</i>	<i>Proposed Action</i>	<i>Alternative A: Limited Targets</i>	<i>Alternative B: No Action Alternative</i>
Review airspace configuration for requirements suitability	○	○	○
Review land ownership/land control for range sufficiency	○	●	○
Conduct detailed target/weapon application analysis using SAFE-RANGE program	●	●	○
Review fire suppression processes and procedures for both the range and base	●	●	● <sup>1</sup>
Coordinate with EOD personnel and review EOD processes and procedures for both the range and the base	●	●	● <sup>1</sup>
Review range clean-up and decontamination processes and procedures	●	●	○
Review range maintenance processes and procedures	●	●	○
Review requirements and proposed activities to ensure continued conformance with the Military Munitions Rule	●	●	○
Coordinate specific aspects of the changed-use of the range with unit natural resource managers	●	●	○
Coordinate specific aspects of the changed-use of the range with unit cultural resource managers	●	●	○
Update documentation in Cannon AFB Supplement 1 to AFI 13-212 as required, to reflect updated, new, or modified procedures developed through coordination with all range support staff	●	●	○

● = Action may be required.

○ = No action required.

● = Action required.

Note: 1. Applies to existing base storage of WP rockets.



In addition to this EA being prepared for the decisionmaker and the interested public, this EA is a tool for Air Force personnel to ensure compliance with all regulatory requirements from proposal through project implementation.

## 2.4 COMPARISON OF ALTERNATIVES

Table 2-3 summarizes the potential environmental consequences of the Proposed Action and alternatives, based on the detailed impact analyses presented in Chapter 4.

**Table 2-3. Summary of Potential Environmental Consequences**

<i>Resources</i>	<i>Proposed Action</i>	<i>Alternative A: Limited Targets</i>	<i>Alternative B: No Action Alternative</i>
Airspace and Range Management	○	○	○
Safety	-	-	○
Materials Management	○	○	○
Air Quality	○	○	○
Physical Resources	-	○	○
Biological Resources	-	○	○
Cultural Resources	-	-	○
Socioeconomics and Environmental Justice	○	○	○

Consequences:

○ = No change.

+ = Beneficial or not discernible.

- = Adverse but not significant.

## **3.0 AFFECTED ENVIRONMENT**

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This chapter presents information on environmental conditions for resources potentially affected by the alternatives described in Chapter 2. Under NEPA, the analysis of environmental conditions only addresses those areas and environmental resources with the potential to be affected by the Proposed Action or alternatives. Locations and resources with no potential to be affected need not be analyzed. The environment includes all areas and lands that might be affected, as well as the natural, cultural, and socioeconomic resources they contain or support.

### **3.1 AIRSPACE AND RANGE MANAGEMENT**

#### **3.1.1 Definition of the Resource**

Airspace management is defined as the direction, control, and handling of flight operations in the volume of air that overlies the geopolitical borders of the United States (U.S.) and its territories. Airspace is a resource managed by the Federal Aviation Administration (FAA), which has established policies, designations, and flight rules to protect aircraft in the airfield and en route environment, in Special Use Airspace (SUA) areas identified for military and other governmental activities, and other military training airspace. Management of this resource considers how airspace is designated, used, and administered to best accommodate the individual and common needs of military, commercial, and general aviation. Due to the multiple and sometimes competing demands, the FAA considers all aviation airspace requirements in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System (NAS) can best be structured to satisfy all user requirements.

The FAA has designated four types of airspace above the U.S; Controlled, Special Use, Other, and Uncontrolled airspace.

Controlled airspace is categorized to identify airspace that is controlled, airspace supporting airport operations, and designated airways affording en route transit from place to place. The classes also dictate pilot qualification requirements, rules of flight that must be followed, and the type of equipment necessary to operate within that airspace.

SUA requires confinement of participating aircraft or place operating limitations on non-participating aircraft. Prohibited Areas, Restricted Areas, Warning Areas, and Military Operations Areas are examples of SUA.

Other airspace consists of advisory areas, areas that have specific flight limitations or designated prohibitions, areas designated for parachute jump operations, Military Training Routes (MTRs), and Aerial Refueling Tracks (ARs). This category also includes Air Traffic Control Assigned Airspace (ATCAA). When not required for other needs, ATCAA is airspace authorized for military use by the managing Air Route Traffic Control Center (ARTCC), usually to extend the vertical boundary of SUA.

The airspace directly associated with the proposals being assessed in this document includes SUA and other airspace. The volume of airspace encompassed by each specific element



constitutes the region of influence (ROI) for airspace management in this document. The airspace ROI consists of the Restricted Areas R-5104A/B and R-5105 and associated ATCAAs (refer to Figure 2-2).

Range management involves the development and implementation of those processes and procedures required by AFI 13-212, Volumes 1, 2, and 3, to ensure that Air Force ranges are planned, operated, and managed in a safe manner, that all required equipment and facilities are available to support range use, and that proper security for range assets is present. Specific direction on different range activities is contained in AFI 13-212, Volume 1, *Range Planning and Operations*, Volume 2, *Range Construction and Maintenance*, and Volume 3, *SAFE-RANGE Program Methodology* (Air Force 2001b). The focus of range management is on ensuring the safe, effective, and efficient operation of Air Force ranges. The overall purpose of range management is to balance the military's need to accomplish realistic testing and training with the need to minimize potential impacts of such activities on the environment and surrounding communities (Air Force 2001b). The ROI for range management is that geographic area consisting of Air Force-owned land comprising the Melrose AFR.

Specifically, the airspace ROI considered in this EA is the area encompassed by the airspace that directly supports training activities on Melrose AFR.

### 3.1.2 Existing Conditions

A Restricted Area is designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. Entry into restricted airspace without approval from the using or controlling agency is prohibited. Aircrews from Cannon AFB perform air-to-ground training on Melrose AFR. Restricted airspace R-5104 A/B and R-5105 supports training activities on Melrose AFR. This airspace is described in Table 3-1.

**Table 3-1. Restricted Area Identification and Description**

Airspace	ALTITUDES		HOURS OF USE		Controlling ARTCC
	Minimum	Maximum	From	To	
R-5104A	Surface	18,000 MSL	8:00 a.m. (Mon-Fri)	Midnight (Mon-Fri)	Albuquerque
R-5104B	18,000 MSL	23,000 MSL	As requested in conjunction with R-5104A		Albuquerque
R-5105	Surface	10,000 MSL	8:00 a.m. (Mon-Fri)	Midnight (Mon-Fri)	Albuquerque

Source: Air Force 2000b; Department of Defense 2003.

An ATCAA extends SUA upward to an assigned altitude to accommodate higher altitude training requirements. The Melrose ATCAA is the airspace from Flight Level (FL) 230 (approximately 23,000 feet MSL) to FL 300 (approximately 30,000 feet MSL), or as assigned by Albuquerque Center within the boundaries of R-5104 A/B. When required, the Range Control Officer (RCO) requests activation of the ATCAA from Albuquerque Center. When use of the



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ATCAA is no longer required, the RCO returns the airspace to Albuquerque Center (Air Force 2000b).

Melrose AFR is a Class A range. Class A ranges are manned, have a ground-based scoring capability, and a RCO who controls aircraft using the range (Air Force 2001b). Overall responsibility for the operation of the Melrose AFR Complex, which consists of the Melrose Weapons Range and the Melrose Electronic Combat Range rests with the Commander, 27 FW. The 27 Operations Group (OG) Commander, through the 27 OSS/CC, is responsible for operational control of the range (Air Force 2000b).

Range operations require that the surface area encompassing the weapon safety footprints (as defined in SAFE-RANGE) be protected by purchase, lease, or other restriction to ensure the safety of personnel, structures, and the public from expended rockets, missiles, or target debris (Air Force 2001b). Additional information pertaining to the SAFE-RANGE program is contained in the safety section of this EA. The lands associated with the Melrose AFR Complex meet these requirements.

Range managers are required to assess risks associated with weapons employment and establish mission parameters that minimize potential safety hazards. Specific weapon safety footprints must be assessed against each intended target to ensure that they can be safely employed (Air Force 2001b). These assessments have been accomplished by 27 FW staff, and allowable ordnance delivery profiles have been documented in Cannon AFB Supplement 1 to AFI 13-212 (Air Force 2000b).

Cannon AFB Supplement 1 to AFI 13-212 also assigns responsibilities and provides direction regarding range scheduling, maintenance, explosive ordnance disposal, and range decontamination and debris disposal.

## **3.2 SAFETY**

### **3.2.1 Definition of Resource**

WP rocket use includes fire, explosive, and flight safety issues. Human safety is addressed in section 3.6, Biological Resources. Fire safety addresses the potential for fires on the range. Explosive safety includes issues associated with the storage and handling of the WP rockets. The primary public concern with regard to flight safety is the potential for aircraft accidents. Flight safety considerations include aircraft mishaps and bird-aircraft strikes.

Safety issues are discussed in terms of Air Force-established mishap categories. The Air Force defines four classes of safety mishaps: Class A, B, C, and D. Class A safety mishaps, the most serious, result in a loss of life or permanent total disability, a total cost in excess of \$1 million, or destruction of an aircraft. Class B and C safety mishaps result in lesser costs or less severe injuries. Class D safety mishaps are not applicable to aircraft-related mishaps (Air Force 2001c).

Two ROIs exist for the safety analysis. The first ROI constitutes the Cannon AFB munitions storage and loading areas. The second ROI encompasses the restricted land areas (exclusive use target impact area and restricted leased land) at Melrose AFR.



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### 3.2.2 Existing Conditions

#### 3.2.2.1 FIRE SAFETY

Fire safety applies to Melrose AFR and includes a discussion of fire equipment and procedures that affect the management of the range to support the 27 FW mission.

##### *CANNON AFB*

The Air Force enforces standards specifying the amount and type of fire and crash equipment and personnel required for a base. These standards are based on the number and type of aircraft as well as the nature and size of buildings on base. Cannon AFB fire and emergency services meet these standards. To meet any extraordinary requirements that might arise, the Cannon AFB Fire Department has established mutual aid support agreements with the nearby communities of Clovis, Portales, Texico, House, and Melrose (Air Force 1997a).

##### *MELROSE AFR*

The 27 FW Fire Department provides an on-site fire response and suppression capability on Melrose AFR. Fire Department response units are on site any time the range is active. While the assigned fire suppression equipment has proven to be adequate, large earth-moving equipment, which is on site to support range operations, is also available for fire suppression requirements. In addition, the 27 FW Fire Department is a party to mutual aid support agreements with city and volunteer fire departments near the base and Melrose AFR. The range senior fire official consults with the Melrose RCO to evaluate regional fire risk daily. They monitor weather and fire conditions from resources available on the Southwest Area Fire Intelligence website and provide recommendations to operations personnel. These recommendations address the need to alter flight operations and, if the risk is excessive as determined on a situational basis, impose restrictions on range operations. These restrictions could range from limiting the type of ordnance used to the complete curtailment of ordnance use. All aircrews must review and adhere to fire restrictions regarding the use of ordnance on the range. Melrose AFR suspends use of flares or other pyrotechnics when the range fire danger rating is high, very high, or extreme (personal communication, Ford 2003).

New Mexico normally experiences two fire seasons annually that correspond to the two driest times of the year. The worst of the two seasons is usually the windy spring season when the state receives almost no rain, live vegetation is starved for moisture, and strong dry winds occur. Fires during this season are most often caused by human activity or lightning from dry thunderstorms (thunderstorms with little or no rain). The second fire season usually begins with another dry period during the fall, when many grasses and other small plants begin to die and dry out, providing ready fuel for fire. Atmospheric moisture levels are reduced and dry thunderstorms again become a fire threat (New Mexico State University 2000). Based on the records kept by New Mexico's Forestry Division for the years 1996-2000, the state averaged 792 wildfires that consumed approximately 153,700 acres in state and private lands annually.

Melrose AFR has experienced fires resulting from spotting charges and flares. Defensive flares dropped from aircraft has caused one known fire. In that instance, an aircraft inadvertently



released a flare below the minimum 700 feet above ground level (AGL) release altitude for the range. In general, fires that have occurred on the range tend to be small and remain contained within the target impact areas, which are generally devoid of vegetation or are surrounded by firebreaks. In addition to on-site fire spotting and fire suppression capabilities, fire risk on the range can be managed by controlled burning and development and maintenance of fire breaks. Fire risk is reduced by suspending the use of heat- and spark-producing ordnance when fire risk is elevated (Air Force 1997a).

Melrose AFR is divided into three distinct areas (Figure 3-1). The first area is the exclusive use target impact area. This is the area where ordnance is actually expended and is the area that contains the majority of ordnance debris and residue. The area is fenced and access to this area is strictly controlled and monitored by the Air Force range control officer. The second area, outside of the impact area, is the restricted leased land and is considered as a buffer zone for range safety requirements. Cattle grazing is permitted in this fenced area on a restricted basis. Lessees can only access the restricted leased land between 11:00 p.m. and 8:00 a.m. Monday through Friday and from 3:00 p.m. Saturday afternoon to 8:00 a.m. Monday morning. Signage is posted on the fences around the boundaries of these two areas. The third and outermost area is also leased for grazing, but on an unrestricted basis. Lessees can access the unrestricted leased land 24 hours a day.

Although remote, there is always the possibility that ordnance could significantly miss a target, either through human error or equipment malfunction. However, a more likely possibility is that inert ordnance would impact the ground, and then bounce, slide, or tumble along the ground, sometimes for great distances. Based on extensive data collection and analyses, weapons safety footprints have been developed that describe (at a 95 percent confidence level) the geographic area that will contain 99.99 percent of delivered ordnance and its associated debris. These footprints are specific to ordnance type, aircraft type, and delivery methods and profiles.

A computer model, SAFE-RANGE, facilitates the application of these footprints to specific conditions. As discussed in Chapter 2, targets on Melrose AFR have been assessed for various types of ordnance, aircraft, and delivery types and flight profiles so that applicable footprints are contained in the target impact area on the range. Once approved, these operations are documented in Cannon AFB's supplement to Air Force Instruction dealing with weapons ranges.

Currently, the 27 FW Fire Department is a party to mutual aid support agreements with city and volunteer fire departments near the base and Melrose AFR. Cannon AFB would continue mutual aid support agreements and other assistance to local communities, and receive support from them if required. As it has in the past, the 27 FW can work with non-military fire departments to alert private citizens about the potential for injury should they handle or disturb aircraft or rocket debris. These agreements minimize the human health risks and risk from wildfires. The base commander would continue to be able to direct the base fire department to assist in any local or regional fire emergency.

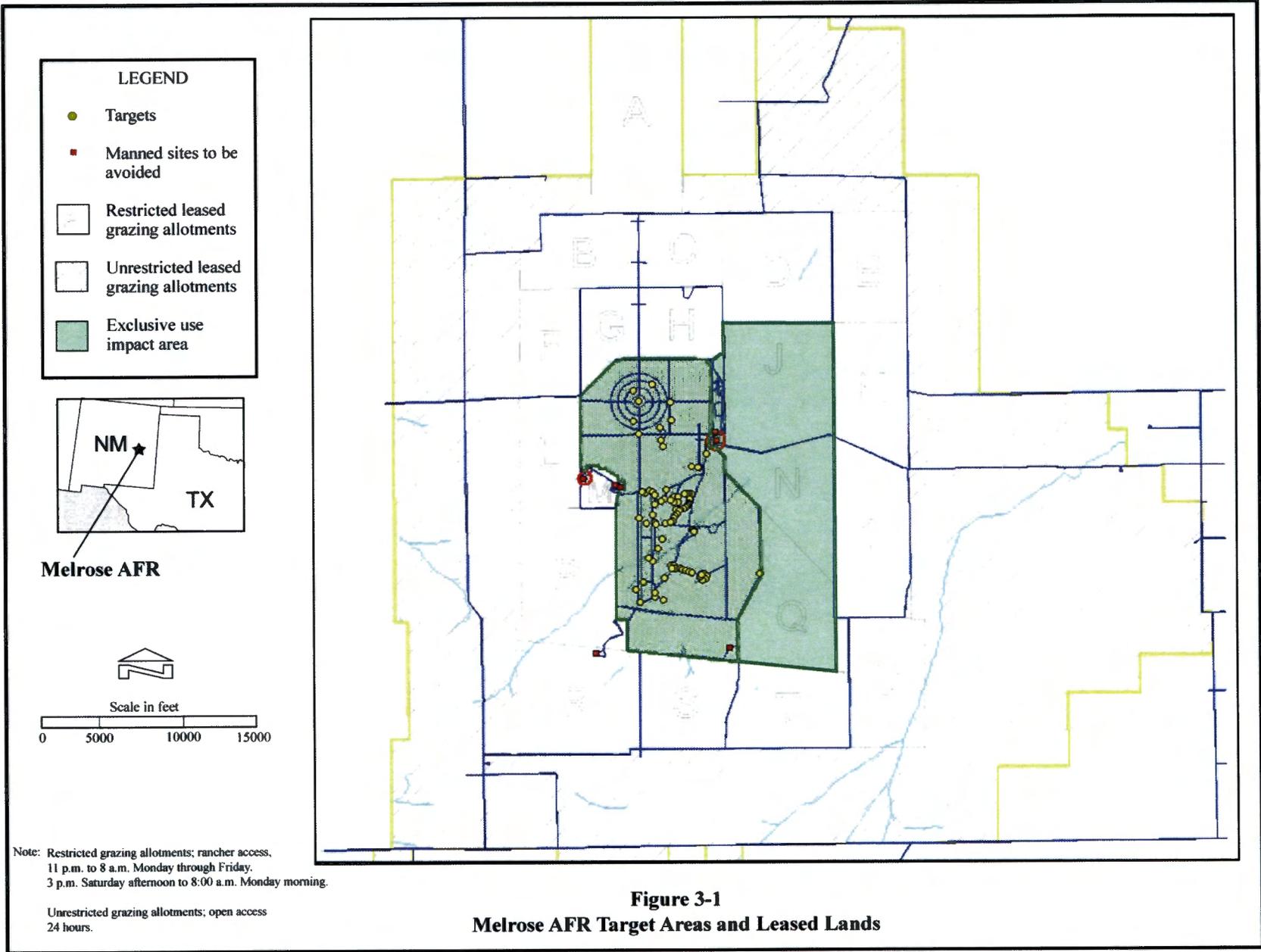


Figure 3-1  
Melrose AFR Target Areas and Leased Lands



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### 3.2.2.2 EXPLOSIVE SAFETY

Both live and inert munitions are stored and handled at Cannon AFB. Inert training ordnance accounts for the vast majority of training materials. All munitions are handled and stored in accordance with Air Force Explosive Safety Directives, and trained, qualified personnel using Air Force approved technical data carry out all munitions maintenance. All storage facilities are approved for the specific ordnance involved. Munitions are not stored at Melrose AFR.

The Air Force imposes procedures for arming and de-arming munitions and ordnance. All such activities occur on four defined arm/de-arm pads. An arm/de-arm pad is located at the end of each runway and at the specified distance for safety away from incompatible land uses. Air Force safety procedures require safeguards on weapons systems and ordnance that ensure against inadvertent releases. Munitions are not dispensed from aircraft on Cannon AFB or in the airspace in the immediate vicinity of Cannon AFB.

### 3.2.2.3 FLIGHT SAFETY

Based on historical data of mishaps at all installations, and under all conditions of flight, the military services calculate Class A mishap rates per 100,000 flying hours for each type of aircraft in the inventory. The Class A mishap rate for F-16 aircraft is 3.39 mishaps per 100,000 flying hours.

The 27 FW maintains a detailed mishap plan that assigns agency responsibilities and prescribes functional activities necessary to react to aircraft crashes, whether on or off base, including Melrose AFR (Air Force 2002b). The plan describes processes and procedures to be followed to provide a rapid response.

It is impossible to predict the precise location of an aircraft accident, should one occur. Major considerations in any accident are loss of life and damage to property. The aircrew's ability to exit from a malfunctioning aircraft is dependent on the type of malfunction encountered. The probability of an aircraft crashing into a populated area is extremely low but it cannot be totally discounted. Several factors are relevant: both ROIs and immediate surrounding areas have relatively low population densities; pilots of aircraft are instructed to avoid direct overflight of population centers at very low altitudes; and the limited amount of time the aircraft is over any specific geographic area reduces the possibility that impact of a disabled aircraft in a populated area would occur. Cannon AFB has experienced two Class A mishaps in the past 30 months. One aircraft crashed on private land in the vicinity of Fort Sumner, New Mexico; the other aircraft crashed on Melrose AFR. Neither accident resulted in injury to persons or animals on the ground (personal communication, Dodson 2002).

Secondary effects of an aircraft crash include the potential for fire and environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. For example, a Class A mishap in highly vegetated areas during a hot, dry summer would have a higher risk of igniting extensive fires than in barren and rocky areas during winter. If an aircraft crashed, it may release hydrocarbons in the form of petroleum, oils, or lubricants. Hydrocarbons not consumed in a fire could contaminate soil and water. The potential for contamination is dependent on several factors. The porosity of the



surface soils will determine how rapidly contaminants are absorbed. The specific geologic structure in the region will determine the extent and direction of the contamination plume. The locations and characteristics of surface and ground water in the area will also affect the extent of contamination to those resources.

F-16 aircraft carry a small quantity of hydrazine in a sealed canister that is designed to withstand crash impact damage. The hydrazine is part of the aircraft's emergency power unit used as an emergency generator and alternate hydraulic power source. In any crash that is severe enough to rupture the canister, it is most likely that fire will also be involved. The hydrazine will also burn and be completely decomposed. In the unlikely event that the hydrazine should be released but not be consumed by fire, impacts on soils and groundwater are likely to be of minor consequence. Emergency teams responding to an accident would immediately neutralize any residue present, rendering it harmless.

Aircraft mishaps due to bird strikes are a serious concern to flight safety. Aircraft may encounter birds at altitudes up to 30,000 feet; however, 95 percent of all bird-strikes occur in the airfield environment below 3,000 feet AGL. Cannon AFB and its local airspace environment contain few habitats or features that commonly attract large numbers of birds. In addition, the base aggressively minimizes bird-aircraft strike potential through its Bird Aircraft Strike Hazard (BASH) Program (Air Force 2000c). Cannon AFB natural resource managers continue to work closely with on-base BASH personnel as well as the Air Force BASH team to minimize the risk of bird-aircraft strikes (personal communication, Davis 2003). These two factors have kept the number of bird-aircraft strikes low. Cannon AFB has experienced an average of approximately four bird-aircraft strikes per month over the past 5 years. In most cases the pilot was not aware of the strike and did not know when or where the strike occurred. No strikes have been documented at Melrose AFR in the past year (personal communication, Zahnley 2002).

### **3.3 MATERIALS MANAGEMENT**

#### **3.3.1 Definition of the Resource**

This section considers the transportation and storage of military munitions used on F-16 aircraft assigned to Cannon AFB. The disposal of munitions that cannot be used due to expired shelf life, physical damage, or other reasons will also be addressed.

Two ROIs exist for the materials management section. The first ROI is the Cannon AFB munitions storage and loading area. The second ROI is Melrose AFR.

#### **3.3.2 Existing Conditions**

##### **3.3.2.1 CANNON AFB**

Military munitions, including practice bombs, rockets, ammunition, chaff, flares, and their associated systems are currently stored, maintained, and handled at Cannon AFB. Inert training ordnance accounts for the vast majority of these materials. The munitions are shipped to the base and stored in munitions storage facilities designed and approved for such materials. Munitions are transported to the flight line and loaded on the aircraft prior to training missions. After the mission, any unused munitions are removed from the aircraft and returned to the



storage facility. Munitions that cannot be used because of factors such as expired shelf life or damage are returned to the supply depot responsible for their disposal. Final disposal of unusable munitions does not occur at Cannon AFB.

### **3.3.2.2 MELROSE AFR**

Melrose AFR is the primary munitions training range for Cannon AFB. The range is also used by other Air Force and Department of Defense organizations for munitions training. The range is operated by a contractor, who monitors and maintains the televised ordnance scoring system, bombing and gunnery targets, access roads, and other range infrastructure. Range debris typically consists of metal pieces from inert ordnance, targets, and training ammunition. In accordance with Air Force requirements, targets on the range with the greatest concentrations of ordnance are cleared every 3 months or 75 use-days, annually, and a complete boundary-to-boundary clearance is accomplished every 5 years. Trained explosive ordnance disposal (EOD) personnel inspect all ordnance debris. Flares that do not ignite and/or burn completely and chaff bundles that do not disperse properly may also be disposed of during range cleanup. The EOD team has primary responsibility for ensuring that all inert ordnance and ordnance residue have been rendered "safe" (i.e., no longer capable of igniting, burning, or exploding) prior to removal and disposal (Air Force 1998). Emergency Planning and Community Right-to-Know Act (EPCRA) establishes reporting thresholds for the use of certain chemicals. For example, the reporting requirement for white phosphorus is 10,000 pounds; the reporting threshold for lead is 100 pounds. The Melrose AFR Management Office currently provides the Cannon AFB program manager with monthly reports on the number and types of weapons used on the range.

## **3.4 AIR QUALITY**

### **3.4.1 Definition of the Resource**

*Federal Air Quality Standards.* Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state ambient air quality standards. Under the authority of the Clean Air Act (CAA), the United States Environmental Protection Agency (USEPA) has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety.

These federal standards, known as the National Ambient Air Quality Standards (NAAQS), represent the maximum allowable atmospheric concentrations and were developed for six "criteria" pollutants: ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), respirable particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb). Based on measured ambient criteria pollutant data, the USEPA designates areas of the United States as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (nonattainment). Upon achieving attainment, areas are redesignated as maintenance areas for a period of 10 or more years. Areas are designated as unclassifiable for a pollutant when there is insufficient ambient air quality data for the USEPA to form a basis of



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attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS.

White phosphorus is regulated by the USEPA as one of 188 Hazardous Air Pollutants (HAPs) designated by Section 112 of the CAA. Rather than setting ambient air quality standards for HAPs, the USEPA regulates emissions of toxic air pollutants from a published list of source categories that must meet control technology requirements for these toxic air pollutants. Major stationary sources of HAPs is defined in 40 CFR 70 as those sources that emit more than 10 tons of a single HAP or 25 tons of all HAPs combined. White phosphorus munitions are not one of the listed source categories.

**State Air Quality Standards.** Under the CAA, state and local agencies may establish ambient air quality standards (AAQS) and regulations of their own, provided that these are at least as stringent as the federal requirements. For selected criteria pollutants, the State of New Mexico has established its state AAQS, which are somewhat more stringent than the federal standards (New Mexico Administrative Code 2002a). New Mexico AAQS are more restrictive than federal standards for CO, NO<sub>2</sub>, and SO<sub>2</sub>. New Mexico does not have state standards for PM<sub>10</sub>, O<sub>3</sub>, and Pb. In addition, New Mexico regulates emissions of total suspended particulates, hydrogen sulfide (H<sub>2</sub>S), and total reduced sulfur, three pollutants for which there are no federal standards. A summary of the federal and New Mexico AAQS that apply to the proposed project area is presented in Table 3-2.

**State Implementation Plan.** For non-attainment regions, the states are required to develop a State Implementation Plan (SIP) designed to eliminate or reduce the severity and number of NAAQS violations, with an underlying goal to bring state air quality conditions into (and maintain) compliance with the NAAQS by specific deadlines. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS in each state.

**Prevention of Significant Deterioration (PSD).** Section 162 of the CAA further established a national goal of preventing degradation or impairment in federally designated Class I areas. Class I areas are defined as those areas where any appreciable degradation in air quality or associated visibility impairment is considered significant. As part of the PSD program, Congress assigned mandatory Class I status to all national parks, national wilderness areas (excluding wilderness study areas or wild and scenic rivers), and memorial parks greater than 5,000 acres. Class II areas are those where moderate, well-controlled growth could be permitted. Class III areas are those designated by the governor of a state as requiring less protection than Class II areas. No Class III areas have yet been so designated. The PSD requirements affect construction of new major stationary sources in the PSD Class I, II, and III areas and are a pre-construction permitting system.

**Visibility.** CAA Section 169A established the additional goal of prevention of further visibility impairment in the PSD Class I areas. Visibility impairment is defined as a reduction in the visual range and atmospheric discoloration. Determination of the significance of an activity on visibility in a PSD Class I area is typically associated with evaluation of stationary source



**Table 3-2. New Mexico and Federal Ambient Air Quality Standards**

Air Pollutant	Averaging Time	New Mexico AAQS	FEDERAL (NAAQS)	
			Primary	Secondary
Carbon Monoxide (CO)	8-hour	8.7 ppm	9 ppm	---
	1-hour	13.1 ppm	35 ppm	---
Nitrogen Dioxide (NO <sub>2</sub> )	AAM	0.05 ppm	0.053 ppm	0.053 ppm
	24-hour	0.10 ppm	---	---
Sulfur Dioxide (SO <sub>2</sub> )	AAM	0.02 ppm	0.030 ppm	---
	24-hour	0.10 ppm	0.14 ppm	---
	3-hour	---	---	0.50 ppm
Particulate Matter (PM <sub>10</sub> )	AAM	---	50 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
	24-hr	---	150 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
Particulate Matter (PM <sub>2.5</sub> ) <sup>(a)</sup>	AAM	---	15 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>
	24-hour	---	65 µg/m <sup>3</sup>	65 µg/m <sup>3</sup>
Total Suspended Particulates (TSP)	AGM	60 µg/m <sup>3</sup>	---	---
	30-day	90 µg/m <sup>3</sup>	---	---
	7-day	110 µg/m <sup>3</sup>	---	---
	24-hr	150 µg/m <sup>3</sup>	---	---
Hydrogen sulfide (H <sub>2</sub> S)	1-hr <sup>(d)</sup>	0.010 ppm	---	---
	½-hr <sup>(e)</sup>	0.100 ppm	---	---
	½-hr <sup>(f)</sup>	0.030 ppm	---	---
Total Reduced Sulfur <sup>(b)</sup>	½-hr <sup>(d)</sup>	0.003 ppm	---	---
	½-hr <sup>(e)</sup>	0.010 ppm	---	---
	½-hr <sup>(f)</sup>	0.003 ppm	---	---
Ozone (O <sub>3</sub> ) <sup>(c)</sup>	1-hour	---	0.12 ppm	0.12 ppm
	8-hour	---	0.08 ppm	0.08 ppm
Lead (Pb) and Lead Compounds	Calendar Quarter	---	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>

Notes: AAM = Annual Arithmetic Mean; AGM = Annual Geometric Mean.

ppm = parts per million; µg/m<sup>3</sup> = micrograms per cubic meter.

- (a) The PM<sub>2.5</sub> standard (particulate matter with a 2.5 micron diameter) was promulgated in 1997, and will be implemented over an extended time frame. Areas will not be designated as in attainment or nonattainment of the PM 2.5 standard until the 2003 – 2005 timeframe.
- (b) Total reduced sulfur does not include H<sub>2</sub>S.
- (c) The 8-hour Ozone standard was promulgated in 1997, and will eventually replace the 1-hour standard. The USEPA plans to implement this standard beginning in 2004. During the interim, the 1-hour ozone standard will continue to apply to areas not attaining it.
- (d) Entire state except for the Pecos-Permian Air Basin (AQCR 155), which includes De Baca, Chaves, Curry, Quay, and Roosevelt counties.
- (e) Within the Pecos-Permian Air Basin.
- (f) Within corporate limits of municipalities in the Pecos-Permian Air Basin, or within 5 miles of the corporate limits of municipalities having a population greater than 20,000 and within the Pecos-Permian Air Basin.

Sources: 40 Code of Federal Regulations 50; New Mexico Administrative Code 20.2.3.



contributions. The USEPA is implementing a Regional Haze rule for PSD Class I areas that will also address contributions from mobile sources and pollution transported from other states or regions. Emission levels are used to qualitatively assess potential impairment to visibility in PSD Class I areas. Decreased visibility may potentially result from elevated concentrations of PM<sub>10</sub> and SO<sub>2</sub> in the lower atmosphere.

**General Conformity.** CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with the each state's SIP for attainment of the NAAQS. In 1993, the USEPA issued the final rules for determining air quality conformity. Federal activities must not:

- (a) cause or contribute to any new violation;
- (b) increase the frequency or severity of any existing violation; or
- (c) delay timely attainment of any standard, interim emission reductions, or milestones in conformity to an SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS.

General conformity applies only to nonattainment and maintenance areas. If the emissions from a federal action proposed in a nonattainment area exceed annual thresholds identified in the rule, a conformity determination is required of that action. The thresholds become more restrictive as the severity of the nonattainment status of the region increases. The State of New Mexico Environmental Improvement Board has implemented the federal general conformity regulations in Title 20, Chapter 2, Part 98 of the state's Air Quality Regulations.

### **3.4.2 Existing Conditions**

The ROI for air quality is the airspace affected by the Proposed Action. This consists of the Melrose AFR in Curry and Roosevelt counties.

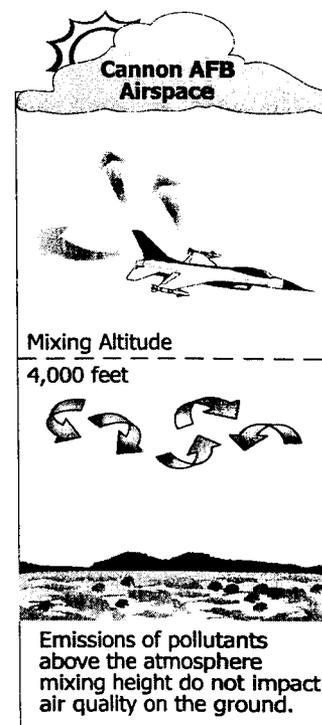
**Climate.** The general climate for this area is semi-arid, with light precipitation, abundant sunshine, and low relative humidity. The area undergoes the basic climatic trend of four seasons. The down-slope warming of air from the mountains tends to modify and temper the air masses, which pass over this area from the west and northwest. Winds with a northwesterly component blow down slope and enhance atmospheric ventilation. Winds with a component from the south and east blow upslope and lead to increased cloud formation and precipitation.

Winds in southeastern New Mexico are often gusty and can average 10 mph or greater. Wind speeds are typically highest during March and April. Based on a 10-year period, the prevailing surface wind direction is from the west. These west winds occur primarily from October to May. In the warmer months, the winds tend to be from the south. The annual mean wind speed is approximately 12 mph. Monthly averages range from 10 mph to 14 mph with spring being the windiest season. Frontal winds may exceed 30 mph for several hours and reach peak speeds of more than 50 mph (Western Regional Climate Center 2003a, 2003b; DeBruin et al. 1995).



The atmosphere in the region is generally well mixed. The seasonal and annual average mixing heights can vary from 400 feet in the morning to 4,000 feet in the afternoon. The morning mixing heights are usually low, due to nighttime heat loss from the ground, which produces surface-based temperature inversions. After sunrise, these inversions quickly break up, and solar heating of the earth's surface results in good vertical mixing in the lower layers of the atmosphere. Relative humidity ranges from 60 percent during mornings to 30 percent during afternoons.

Dust is frequently entrained into the atmosphere in this region of the country because of gusty winds and the semi-arid climate. The Texas Panhandle-eastern New Mexico area is considered one of the worst areas in the United States for windblown dust. Occasionally this windblown dust is of sufficient quantity to restrict visibility. Most of the seasonal dust storms occur in March and April, when the wind speeds are typically high (National Oceanic and Atmospheric Administration 1998a, 1998b; NewMexico.org 2003).



**Attainment Status.** The Proposed Action and Alternative A would involve the use of white phosphorus within Curry and Roosevelt counties. According to federally published attainment status for New Mexico in 40 CFR 81.332, Roosevelt County is designated as in attainment, better than the national standards, or unclassified for CO, NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>10</sub>, O<sub>3</sub>, and Pb. Based on recent monitoring data, the USEPA projects that the entire state of New Mexico will be in attainment of the new 8-hour ozone and particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>) NAAQS when designations are made in 2004 or 2005 (USEPA 2002).

**PSD Class I Areas.** Mandatory PSD Class I areas for the State of New Mexico are listed under 40 CFR 81.421. The nearest PSD Class I area is the Salt Creek Wilderness Area, located approximately 60 miles south of the Melrose AFR.

**Current Emissions.** The number and type of aircraft operations, ground vehicles, and stationary sources would not change as a result of the Proposed Action. Therefore, emissions associated with aircraft operations, ground vehicles, and stationary sources would be the same as the baseline emissions and are not quantified here.

Currently, no WP rockets are used at the Melrose AFR. Therefore, no emissions of white phosphorus or white phosphorus smoke are present in the ROI.

### 3.5 PHYSICAL RESOURCES (EARTH AND WATER)

#### 3.5.1 Definition of Resource

Physical resources consist of both earth and water resources of an area. These include the analysis of soils and surface water features potentially affected by the Proposed Action. Wetlands present within the ROI are addressed in section 3.6, Biological Resources. The ROI for



physical resources includes the exclusive use target impact area, as depicted in Figure 1-2 as well as the larger restricted leased area collectively known as Melrose AFR.

### 3.5.2 Existing Conditions

Within this region of New Mexico, precipitation averages about 12 inches per year, most of which occurs during summer thunderstorms. Regional drainage consists of poorly developed ephemeral streams due to the low annual precipitation and high evaporation rates (Air Force 2001a, Air Force 1997b). The most prominent surface water features on Melrose AFR occur in the long shallow valleys of the Canada del Tule and Sheep Canyon draws and several smaller drainages carrying runoff from the Mesa. The Canada del Tule seasonal draw carries runoff from the southeastern half of the range and flows through it in the northeasterly direction. Historically, the draw carried water to Tule Lake, located northeast of the range; however, due to the numerous impoundments along its course, flow has decreased and evidence of surface water flow north of Sundale Valley Road is difficult to identify. The Sheep Canyon drainage area consists of one major ephemeral drainage that flows northeast from the Mesa (the topographical high point on Melrose AFR) (Air Force 2001a).

These drainages do not typically contribute actual flow to the three river valleys into which they eventually drain (the Red, the Brazos, or the Colorado). This is due to the fact that much of the precipitation that falls is lost to infiltration and/or evaporation (Air Force 1996a).

Stormwater runoff from the southeastern half of Melrose AFR is generally carried by the Canada del Tule draw and the Mesa is drained from the northeast by the Sheep Canyon drainage. Much of the runoff on Melrose AFR is captured in numerous impoundments that are used as sources of water for livestock.

Other surface water features on Melrose AFR include four periodically flooded wetlands (outside the restricted lease area), 10 wildlife guzzlers (three of which are on the impact area), 23 steel-rimmed stock tanks, and five other small man-made impoundments used to support livestock operations (inside the restricted lease area). The steel-rimmed tanks average about 19 feet in length and 18 inches in depth. They are all located in the restricted leased land. The other small impoundments are less than 0.01 acre and average about 8 feet in depth. Wetlands are discussed in more detail in section 3.6, Biological Resources.

The semi-arid climate of the region contributes to the development of thin topsoil with low organic content, underlain at relatively shallow depths by a leached clay-carbonate hardpan or "caliche." Caliche forms as calcium carbonate and is leached from overlying sediments. Within the region, tightly cemented layers of caliche are present in a number of soil horizons as well as in the Ogallala aquifer below (Air Force 2001a, Air Force 1997b).

The soils comprising the Melrose AFR can be generally characterized as slightly alkaline to alkaline (pH of 7.1 to 8.2) though these values range from a low of 6.6 to a high of 9.0. The majority of the soils contained within the Melrose AFR are characterized as deep to moderately deep in profile and are moderately well to well drained. Additionally, the soils are characterized by typically coarse textured material. Generally speaking, the soils underlying the bombing range have very poor water-holding capacities, as consistent with the relative lack



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of surface water features within the region. As a consequence, depth to groundwater generally exceeds 100 feet (North Plains Groundwater District 2003).

Melrose AFR is underlain by several hundred feet of unconsolidated sediments deposited over sandstone known as the Triassic redbeds. This stratum forms the base of the Ogallala aquifer, which is developed within the overlying sediments. The Ogallala Formation sediments are comprised of unconsolidated poorly sorted gravel, sand, silts, and clays (Air Force 2001a, Air Force 1997b).

## **3.6 BIOLOGICAL RESOURCES**

### **3.6.1 Definition of the Resource**

The term biological resources is used in this discussion to refer to both natural and human-related living resources. Natural living resources include native and exotic organisms, and the habitats, including wetlands, within which they occur. Human-related living resources is a category developed specifically for this document and includes people and domesticated species associated with human activities (agricultural plants and livestock).

The ROI for biological resources for the Proposed Action and alternatives consists of all lands within Melrose AFR.

#### **3.6.1.1 NATURAL LIVING RESOURCES**

Natural plant and animal life are typically referred to as vegetation and wildlife, respectively. Assemblages of plant and animal species within a defined area and linked by ecological processes are referred to as natural communities. The existence and conservation of these resources are intrinsically valuable; they also provide aesthetic, recreational, and socioeconomic values to society. This section focuses on plant and animal species or vegetation types that typify or are important to the function of the ecosystem, are of special societal importance, or are protected under federal or state law or statute. For purposes of the analysis, natural biological resources will be organized into three major categories: (1) vegetation and habitat, including wetlands; (2) wildlife; and (3) species with special protection status defined below. Because of the broad area under consideration, a habitat-level perspective will govern both descriptions of existing conditions and analyses.

*Vegetation and habitat* includes all existing terrestrial plant communities except for species with special protection status. The composition of plant species within a given area often defines ecological communities and determines the types of wildlife that may be present.

*Wetlands* are considered special category sensitive habitats and are subject to regulatory authority under Section 404 of the Clean Water Act and Executive Order (EO) 11990, *Protection of Wetlands*. They include jurisdictional and non-jurisdictional wetlands. Jurisdictional wetlands are those defined by the United States Army Corps of Engineers (USACE) and USEPA as those areas that meet all the criteria defined in the USACE's *Wetlands Delineation Manual* (Environmental Laboratory 1987) and are under the jurisdiction of the USACE. Non-jurisdictional wetlands include wetlands that fail to meet this requirement.



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*Wildlife* includes all vertebrate animals with the exception of those with special protection status. Typical animals include terrestrial vertebrate species groups such as snakes, lizards, songbirds, waterfowl, raptorial birds, hoofed animals, carnivores, rodents, bats, and other small mammals. Under particular circumstances, significant invertebrate species or species groups such as mollusks (e.g., snails) or insects may be included in discussions. The attributes and quality of available habitats determine the composition, diversity, and abundance patterns of wildlife species assemblages, or communities. Each species has its own set of habitat requirements and inter-specific interactions driving its observed distribution and abundance. Community structure is derived from the net effect of the diverse resource and habitat requirements of each species within a geographic setting. An assessment of habitat types and area affected by the Proposed Action or Alternative A can be used to determine the potential consequences for wildlife populations.

*Species with special protection status* are defined as those plant and animal species listed as threatened, endangered, candidates, or species of concern by the USFWS, as well as species with special state protection status. The Endangered Species Act (ESA) protects federally listed, threatened, and endangered plant and animal species. Species that have been proposed for listing as threatened or endangered by the USFWS do not receive full protection under the ESA until the listing becomes effective. Consultation with USFWS for species proposed for listing is required only if a proposed action is determined to jeopardize the continued existence of the species. Candidate species are species that the USFWS is considering for listing as federal threatened or endangered but for which a proposed rule has not yet been developed. Although candidates do not benefit from legal protection under the ESA, the USFWS encourages federal agencies to consider candidate species in their planning process as they may be listed in the future. In some instances, candidate species may be emergency listed if the USFWS determines that the species population is at risk due to a potential or imminent impact. Species of concern are species for which available information supports tracking of trends or threats. Similar definitions of threatened and endangered apply at the state level. Often state and federal lists have considerable overlap. State categories do not provide federal protection under the ESA but do provide a context for evaluating the sensitivity of habitats or communities. All migratory birds are protected under the Migratory Bird Treaty Act (16 USC 703), and EO 13186 directs federal agencies to develop Memoranda of Understanding with USFWS when federal activities may adversely affect migratory birds.

### **3.6.1.2 HUMAN RESOURCES**

The biological resource section includes an analysis of the human-related activities such as agriculture and ranching. Human resources are defined as a category of living things that are components of the uniquely human environment. People and their associated domestic plants and animals will be discussed and evaluated as biological entities in this section, independent of their social or cultural contexts. In addition to the agricultural and ranching uses of the region, it is also important to note that many Native Americans ascribe value to a variety of plant and animal resources. Cultural and social contexts of human land use are discussed in sections 3.7 and 3.8.



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## 3.6.2 Existing Conditions

### 3.6.2.1 VEGETATION AND HABITAT

Melrose AFR lies within the Southwest Plateau and Plains Dry Steppe and Shrub Province ecoregion (Bailey 1995). The landform is flat to slightly rolling with natural communities dominated by arid grasses and scattered shrubs and small trees. The primary land use activity outside of the target impact area is livestock grazing with agricultural cultivation in the northern sections. Vegetation on Melrose AFR can be generally described as short grass prairie, dominated by herbaceous plants and grasses. Common species include blue grama (*Bouteloua gracilis*), side-oats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), tobosa (*Hilaria mutica*), buffalograss (*Buchloe dactyloides*), and broom snakeweed (*Gutierrezia sarothrae*) along Canada del Tule. Prickly pear and cholla (*Opuntia* spp.) occur throughout Melrose AFR.

### 3.6.2.2 WETLANDS

In a 1996 wetland delineation report for Melrose AFR, two ponds/impoundments, four wetlands, and intermittent streams and drainages were delineated as jurisdictional waters. No jurisdictional wetlands are located within the target impact areas or the restricted leased area. Scattered earthen stock tanks occur in areas supporting grazing. No permanently flooded areas are located on the range. In general, wetlands have been impacted to varying degrees by cattle grazing (Air Force 1996a).

### 3.6.2.3 WILDLIFE

For the purposes of describing vertebrate species found on Melrose AFR, Parmenter et al. (1994) classified the plant community types they identified into five major habitat types: mixed-species grasslands, mesquite-grasslands, sand-hill shrublands, old agricultural fields, and areas under current cultivation (i.e., wheat fields). Varying numbers of wildlife species are found in these habitats. Commonly found throughout the range are habitat generalists such as the ornate box turtle (*Terrapene ornata ornata*), western hognose snake (*Heterodon nasicus*), coachwhip (*Masticophis flagellum*), mourning dove (*Zenaida macroura*), common nighthawk (*Chordeiles minor*), western meadowlark (*Sturnella neglecta*), lark sparrow (*Chondestes grammacus*), horned lark (*Eremophila alpestris*), Cassin's sparrow (*Aimophila cassinii*), black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), silky pocket mouse (*Perognathus flavus*), northern grasshopper mouse (*Onychomys leucogaster*), Ord's kangaroo rat (*Dipodomys ordii*), coyote, and pronghorn (*Antilocapra americana*) (Parmenter et al. 1994).

The most widespread habitat on Melrose AFR is mixed-species grassland that, in addition to the generalists listed above, supports a number of grassland specialists. The lowest species diversities are found in the sand hills, old agricultural, and wheat field habitats. Common species found there are prairie lizard (*Sceloporus undulatus*), Texas horned lizard (*Phrynosoma cornutum*), mourning dove, cactus wren (*Campylorhynchus brunneicapillus*), brown-headed cowbird (*Molothrus ater*), and vesper sparrow (*Pooecetes gramineus*) (Parmenter et al. 1994).



### 3.6.2.4 SPECIES WITH SPECIAL PROTECTION STATUS

USFWS identified a total of 13 federal endangered, threatened, proposed, or candidate species or species of concern potentially occurring on or near Melrose AFR based on occurrence records for Curry and Roosevelt counties (USFWS 2003). From this list, one species is listed as endangered, one as threatened, one as proposed threatened, and three are candidates for listing as proposed endangered or threatened. The remainder are federal species of concern. The State of New Mexico lists a total of five species as threatened. The New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division, has authority over state-protected plant species in New Mexico. According to the agency database, no rare plants are known to occur in Roosevelt or Curry Counties (New Mexico Rare Plant Technical Council 1999).

No federally listed mammal species are known to occur within the ROI. Federal Candidate mammals that are known to occur on Melrose AFR include the swift fox (*Vulpes velox*) and the black-tailed prairie dog (*Cynomys ludovicianus*). Black-tailed prairie dogs occur in 13 to 15 large colonies in many areas of Melrose AFR. Based on aerial photographs, these colonies appear to have increased in area since the early 1990s and currently occupy about 2,000 acres collectively (personal communication, Davis 2002). In New Mexico, the swift fox historically occurred in the short grass prairie or plains-mesa grassland east of the Pecos River. New Mexico Department of Game and Fish (NMDGF) surveys have found swift fox throughout its historical range, with the exception of cropland areas of eastern Curry and Roosevelt Counties (Harrison and Schmitt 1997). The black-footed ferret (*Mustela nigripes*) has not been documented in the state since 1934; in 1991 it was considered extirpated from the state (NMDGF 2001). A certified black-footed ferret survey was conducted at Melrose AFR in 2000 and no black-footed ferrets or signs of black-footed ferrets were found (personal communication, Davis 2003).

Extensive surveys of Melrose AFR in 1993 and 1994 found no other species of plant, amphibian, reptile, or mammal that was or is currently listed as threatened, endangered, or sensitive (Parmenter et al. 1994, DeBruin et al. 1995). Three bird species that are considered species of concern by the USFWS were observed: ferruginous hawk (*Buteo regalis*), white-faced ibis (*Plegadis chihi*), and loggerhead shrike (*Lanius ludovicianus*) (Parmenter et al. 1994). Ferruginous hawks have used at least three nest locations on Melrose AFR in recent years, but nest sites are not used every year and were not occupied in 2002 (personal communication, Davis 2002). One nest east of the impact areas was active in early 2003 (personal communication, Davis 2003).

Mountain plovers (*Charadrius montanus*), which have been proposed for listing by USFWS as a threatened species, are occasional visitors to Melrose AFR, but are not known to breed or winter on the range (personal communication, Davis 2003). Mountain plovers nest in late March through August in habitats characterized by short grass and bare ground, including grazed areas, cultivated lands, and prairie dog colonies (USFWS 1999). Breeding habitat is found in many Rocky Mountain and Great Plains states, and plovers winter in California, Arizona, Texas, and Mexico (USFWS 1999). Plovers were not detected during the 1993-94 breeding season surveys of Melrose AFR (Parmenter et al. 1994). Several groups of mountain plovers were observed on the range in surveys conducted during the spring migration period in 1998 (ACC 1999). Two groups were found in the southern portion of Melrose AFR, one near a stock



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tank and one in a dry playa. Plovers were also seen on two subsequent days on a prairie dog colony in the east impact area. Breeding activity was not subsequently observed on the range (personal communication, Davis 2003). Although suitable nesting habitat exists on Melrose AFR, mountain plover use of the range appears to be limited to transient use during spring migration, which typically occurs in March and April (NMDGF 2003). Cannon AFB is currently developing annual surveys for mountain plovers on Melrose AFR, including the impact areas (personal communication, Crow 2003).

The federally endangered interior least tern (*Sterna antillarum athalassos*) is known to breed southwest of Melrose AFR along the Pecos River at Bitter Lake National Wildlife Refuge (NWR). Interior least terns have bred annually at, or in the vicinity of, Bitter Lake NWR since 1949 and are not known to breed elsewhere in New Mexico. The birds nest and forage predominantly along playa habitats on the refuge. Since 1989, the number of interior least terns at Bitter Lake NWR has ranged from three to seven breeding pairs. Least terns also occur as rare vagrants at other wetlands in the state, including Bosque del Apache NWR and in Eddy County (USFWS 1990, BLM 1997, NMDGF 2001).

The federally threatened bald eagle (*Haliaeetus leucocephalus*) is a transient and winter habitat user along portions of the Pecos River, but does not occur within Melrose AFR or its associated airspace.

The western burrowing owl (*Athene cunicularia hypugaea*) is considered a sensitive species by the Bureau of Land Management and U.S. Forest Service and is protected under the Migratory Bird Treaty Act. Burrowing owls are year-round residents in Roosevelt County (NMDGF 2003) and are known to nest on Melrose AFR, but the number of nests on the range is not known (personal communication, Davis 2002, 2003). Burrowing owls were observed in mixed grassland habitat types during 1993 wildlife surveys on the range (Parmenter et al. 1994). Nest burrows are frequently found on prairie dog towns or in association with other burrowing mammals such as badgers (NMDGF 2003).

Lesser prairie chickens (*Tympanuchus pallidicinctus*) are a USFWS candidate species and a New Mexico sensitive species. Although the species is known to nest in southern Roosevelt County (Massey 2001), prairie chickens were not found on Melrose AFR during surveys in 1993 (Parmenter et al. 1994), 1998 (ACC 1999), or 2003 (personal communication, Davis 2003).

The sand dune lizard (*Sceloporus arenicolus*), a federal candidate and state threatened species, is not likely to occur within the region of influence for the Proposed Action. The nearest suitable habitat for sand dune lizards is found in moving sand dunes adjacent to the northern boundary of the range (personal communication, Davis 2003), and the species was not detected during extensive wildlife surveys conducted on the range in 1993 (Parmenter et al. 1994).

As part of an ongoing review of the Cannon AFB Integrated Natural Resource Management Plan and other documents, Cannon AFB natural resource managers are currently coordinating with USFWS and NMDGF regarding protected species (including migratory birds) on Melrose AFR (personal communication, Davis 2003). The number of migratory birds or other birds lost to bird-aircraft strikes annually is low, with approximately four bird-aircraft strikes per month



for the past 5 years. Cannon AFB natural resource managers continue to work closely with on-base BASH personnel as well as the Air Force national BASH team to minimize the risk of bird-aircraft strikes (personal communication, Davis 2003).

### **3.6.2.5 HUMAN RESOURCES**

Melrose AFR comprises 66,033 acres of which 8,800 acres are exclusive use impact areas and the remaining 57,233 acres are leased for agricultural uses under varying restrictions (Air Force 2001a). The agricultural areas act as a buffer zone around the training range. The buffer zone also contains range support facilities, including a fire station, maintenance areas, and a camera station for monitoring ordnance practice. There are no permanent civilian residences located within the range or its buffer zone.

The predominant agricultural use is grazing. Grazing allotments are located within 2 of the 3 management areas of Melrose AFR (Figure 3-1). The inner exclusive use area is restricted to military activity only and does not permit grazing. The second and third areas, where land is leased, provide approximately one animal unit month (AUM) per 40 acres. The second area, where restricted grazing is permitted, surrounds the exclusive use area and generally restricts human access to nights, weekends, and holidays. Lease agreements specify all restrictions and further limit access during special military exercises. The third management area is a buffer area that generally permits ranchers and lessees unrestricted access to grazing allotments (see section 3.2.2.1, Fire Safety for details on range management areas and access restrictions).

## **3.7 CULTURAL RESOURCES**

Cultural resources are prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activities considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. Cultural resources are typically divided into three major categories: archaeological resources, architectural/engineering resources, and traditional resources.

Archaeological resources are locations where prehistoric or historic activity measurably altered the earth or produced deposits of physical remains (e.g., arrowheads, bottles). Architectural/engineering resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. They generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP). Traditional resources are associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. They may include archaeological resources, locations of historic events, sacred areas, sources of raw materials, topographic features, traditional hunting or gathering areas, and native plants or animals. Significant cultural resources are evaluated for adverse impacts from a federal undertaking. Significant cultural resources are generally those that are eligible or potentially eligible for inclusion in the NRHP. Traditional resources also may be identified as significant by Native American or other ethnic groups. The ROI for cultural resources consists of Melrose AFR.



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## Historical Setting

The earliest remains of human activity in the region date to 12,000 years before present (BP) and are associated with the hunting of large game animals. Gradually subsistence activity shifted from reliance on hunting larger game to a broader-based hunting and foraging strategy as the climate changed from a grassland environment to a drier, desert shrub environment. Ceramics came into use; the practice of agriculture developed; and more permanent, substantial residential structures (e.g., pueblos) were built (Air Force 1996b).

Spanish explorers entered the region beginning in the mid 16th century, following exploration routes along the Pecos River and other areas. They encountered Native American groups, probably Apachean people, who had ranged onto the southern Plains in search of buffalo. By the early 1600s, Apachean groups occupied the region on a permanent basis. Apache occupation continued until the mid-18th century when the Comanche people entered the region. Comanche raids against eastern pueblo and Spanish settlements led to military campaigns by the Spanish, defeating the Comanches in the 1780s. Kiowa groups also traversed the region, using the same lands as the Comanche for hunting and raiding from the 1790s until the 1870s (Air Force 1996b).

In 1810, a treaty between the Spanish and the Mescalero Apache included a reservation for the Mescalero. The treaty was renewed by the Mexican government in 1832. In the following decades, Mescalero encounters with the American military led to additional short-term treaty and reservation arrangements. After a period of instability following the American Civil War, a new reservation was established in 1873 for the Mescalero and Chiricahua Apache at its present location near the Sacramento Mountains, approximately 110 miles southwest of Melrose AFR.

American military forts were established by the early 1860s to defend routes of travel through the region (Air Force 1996b). Cattle ranching began after 1865, with American ranchers establishing extensive ranches during the 1880s, including in the Melrose AFR area. The Goodnight-Loving trail followed the Pecos River valley to markets in states to the north; the Stinson Trail entered the region from Texas to the east. Growth in the cattle ranching industry was driven, in part, by the expansion of railroads throughout the region (Air Force 1996b). Small towns, such as Taiban and others in the Melrose AFR area, grew up along the rail lines.

A modern military presence was established in the region during World War II with the founding of Clovis Army Air Field in 1942 as a tactical training facility for bomber aircrews. In 1957, Clovis Air Base was renamed Cannon AFB. Melrose AFR was used continuously beginning in 1952, although some earlier uses were reported during World War II. A range control tower at Melrose AFR is from the Cold War era. The range was expanded several times over the decades to accommodate Air Force training needs (Air Force 1996b).

### 3.7.1 Existing Conditions

#### 3.7.1.1 IDENTIFIED CULTURAL RESOURCES

Three archaeological sites have been recorded at Cannon AFB; all are ineligible for the NRHP (Air Force 1996b). An architectural survey of the pre-1946 buildings at Cannon AFB identified



12 NRHP-eligible facilities including a hanger, various storage facilities, and a reservoir. Building 2129, which was constructed in 1961, was not identified as eligible for the NRHP during an inventory at the base (Geo-Marine 1996). Architectural reconnaissance of 116 Cold War-era facilities at Cannon AFB identified a number of resources, but did not formally evaluate their NRHP eligibility (Mariah Associates 1997).

Archaeological inventories covering more than 45,000 acres have been conducted within Melrose AFR since 1981 (Air Force 2000d; Air Force 2002c). More than 200 archaeological sites, ranging in age from before 7,500 years ago to the 20th century have been recorded on the range (Geo-Marine 2000). More than 50 of these are considered eligible or potentially eligible for the NRHP, although none are listed. Inventories have identified more than 20 archaeological resources within, or bordering the Melrose AFR target impact area. Two archaeological sites within the impact area have been recommended as eligible for the National Register (LA 66373 and 133088). However, these sites are not in areas where existing targets are located (personal communication, Chandler 2003).

Thirty-seven archaeological sites have been recorded in the restricted area surrounding the target impact area. Of these sites, 28 have been evaluated as ineligible for the NRHP, one is eligible (LA 111994), and eight are of unknown eligibility. The Cold War resources at Melrose AFR included an observation tower and Facility 3125 (Mariah Associates 1997). Neither was considered eligible for the National Register.

No traditional resources have been identified to date within Melrose AFR. Native American groups with historic ties to the area include the Apache, Comanche, and Kiowa. The nearest reservation is the Mescalero Apache Reservation, located approximately 110 miles southwest of Melrose AFR near Ruidoso, New Mexico. The Jicarilla Apache Reservation is 195 miles northwest of the range. The Comanche and Kiowa tribes are located near Lawton, Oklahoma, approximately 300 miles northeast of Melrose AFR. The Air Force has initiated contact with the Apache, Comanche, and Kiowa tribes to identify potential concerns associated with the Proposed Action (refer to Appendix A).

## **3.8 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE**

### **3.8.1 Definition of Resource**

Socioeconomic resources for this analysis are characterized in terms of population and employment, with a particular emphasis on minority, low-income and youth populations. The ROI consists of Roosevelt and Curry counties in eastern New Mexico. Melrose AFR is located within both Roosevelt and Curry counties; Cannon AFB is located entirely within Curry County. Socioeconomic and environmental justice information will be presented for both counties.

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs federal agencies to address environmental and human health conditions in minority and low-income communities. The concept of environmental justice ensures that environmental studies address whether actions of federal agencies disproportionately impact the human health and environmental conditions in minority and low-income communities. The



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approach applied in this section is in accordance with the *Interim Guide for Environmental Justice with the Environmental Impact Analysis Process* (Air Force 1997c).

In addition to environmental justice issues are concerns pursuant to EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. This EO directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

For purposes of this analysis, minority, low-income and youth populations are defined as follows:

- *Minority Population*: Persons of Hispanic origin of any race, Blacks, American Indians, Eskimos, Aleuts, Asians, or Pacific Islanders.
- *Low-Income Population*: Persons living below the poverty level, estimated based on a 1990-equivalent annual income of \$12,674 for a family of four persons.
- *Youth Population*: Children under the age of 18 years.

Estimates of these three population categories were developed based on data from the U.S. Bureau of the Census. Total and minority population figures are based on recent demographic data released from Census 2000 (U.S. Bureau of the Census 2000a). The census does not report minority population, per se, but reports population by race and by ethnic origin. These data were used to estimate minority populations potentially affected by implementation of the Proposed Action. Low-income and youth population figures were also drawn from the Census 2000 Profile of General Demographic Characteristics (U.S. Bureau of the Census 2000a).

### **3.8.2 Existing Conditions**

#### **3.8.2.1 POPULATION AND EMPLOYMENT**

The 2000 census established the ROI population as 63,062 persons, an increase of approximately 7 percent from the 1990 population of 58,909 (U.S. Bureau of the Census 2000a). Of the 33 counties in New Mexico, Curry ranked 12th with a 2000 population of 45,044 persons and Roosevelt ranked 22<sup>nd</sup> with a population of 18,018 persons. Over 50 percent of the ROI population resides in the City of Clovis, which is home to Cannon AFB. The population of Clovis was 32,667 persons in 2000, 5.5 percent more than the 1990 population of 30,954. The population of Portales, the population center in Roosevelt County, was 11,131 persons in 2000 compared to 10,690 persons in 1990.

According to the 2000 Census, there were 23,405 households in the ROI with an average household size of 2.62 persons. Population density in the state averages 15.0 persons per square mile (U.S. Bureau of the Census 2000b). Curry County has a higher density, 32.0 persons per square mile; this is mainly due to the presence of the population center of Clovis, 1458.9 persons per square mile. The population density of Roosevelt County, in which Melrose AFB is located, is a sparse 7.4 persons per square mile, with nearly two thirds of the persons living in the city of Portales.



The economy of the two-county region is supported by a combination of government and services employment. The civilian labor force in the ROI amounted to 26,333 persons in 2000 (U.S. Bureau of the Census 2000a). Over time, employment in the region has experienced ups and downs. The total number of employed persons was 26,513 in 1980, increasing to 28,945 workers in 1990. Total employment in the ROI decreased to 24,433 workers in 2000.

The unemployment rate, following national trends, rose to 7.2 percent in 2000, up from less than 6.0 percent in the early 1990s. Approximately 2,630 workers in the ROI were employed by the military in 2000, representing about 10 percent of the available workforce. In 2000, Curry County had a per capita personal income (PCPI) of \$20,978 and Roosevelt County had a PCPI of \$18,213, compared to the state and national averages of \$21,931 and \$29,469, respectively (U.S. Bureau of Economic Analysis 2003).

### 3.8.2.2 ENVIRONMENTAL JUSTICE

Based on 2000 Census data (see Table 3-3), the incidence of persons and families in the ROI with incomes below the poverty level was just slightly higher than state levels (U.S. Bureau of the Census 2000a). In the ROI during 2000, 20.0 percent of persons and 25.3 percent of children were living below the poverty level, compared to 18.4 percent of persons and 24.7 percent of children in the State of New Mexico as a whole.

Minority persons represent 40.1 percent of the ROI population. Hispanic or Latino persons account for most of the minority population in the ROI, representing 31.2 percent of the ROI population and 77.8 percent of the minority population. By comparison, minority persons represent 55.3 percent of the state population, with Hispanic or Latino persons accounting for 76.1 percent of the state minority population. The youth population, which includes children under the age of 18, accounts for 28.0 percent of both the ROI and state population.

The ROI for Melrose AFR does not contain a disproportionate number of individuals who are minority, fall below the poverty level, or are children.

**Table 3-3. 2000 Population and Environmental Justice Data**

Area	Population	MINORITY PERSONS		PERSONS BELOW POVERTY		CHILDREN UNDER 18	
		Number	Percent	Number	Percent	Number	Percent
State of New Mexico	1,819,046	1,005,551	55.3	328,933	18.4	508,574	28.0
Curry County	45,044	18,583	41.3	8,327	19.0	13,561	30.1
Roosevelt County	18,018	6,719	37.3	3,928	22.7	5,060	28.1
Total ROI	63,062	25,302	40.1	12,255	20.0	18,621	29.5

Notes: 1. The U.S. Census calculates percent low-income for individual counties based on total county populations that differ slightly from the county populations reported in the first column.  
 2. Population figures for the each category are from different reporting years as described in the previous section. Therefore, except for minority population, the percentage figures are not based on the total population presented in this table but from the relevant data year.

Source: U.S. Bureau of the Census 2000a.

## **4.0 ENVIRONMENTAL CONSEQUENCES**

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The analysis presented in this chapter is based on an examination of the potential consequences of the Proposed Action or Alternative A (Chapter 2) on the baseline conditions (Chapter 3). The relationship between short-term uses and long-term productivity is presented in Chapter 5. The irreversible and irretrievable commitment of resources are discussed in Chapter 6.

### **4.1 AIRSPACE AND RANGE MANAGEMENT**

The type, size, shape, and configuration of individual airspace elements in a region are based upon, and are intended to satisfy, competing aviation requirements. Potential impacts could occur if air traffic in the region and/or the Air Traffic Control (ATC) systems were encumbered by changed flight activities associated with CSAR training using WP rockets.

Air Force ranges are managed in accordance with requirements and procedures prescribed by AFI 13-212. These subjects address a wide range of considerations that include land ownership and control, weapons employment safety, range scheduling, range maintenance, EOD, range decontamination and debris disposal, and environmental stewardship of the range. Potential impacts could occur if some aspect of the Proposed Action or alternatives prevented, or significantly limited the ability of the range manager to comply with stipulated requirements.

#### **4.1.1 Environmental Consequences**

##### **4.1.1.1 PROPOSED ACTION**

The Proposed Action represents no change to current use of the airspace supporting range operations. The existing airspace configuration is sufficient to support all required training profiles. Additionally, overall levels of use of the airspace would not change. There are no aspects of this alternative with the potential to cause any impacts on the management and use of these elements of the NAS.

In terms of range management, the Proposed Action does represent some changes in current range use. There are no significant issues involving land area sufficiency (i.e., adequate area within the boundaries of Melrose AFR to contain the WP rocket footprints). Work with the SAFE-RANGE program confirmed that WP rocket footprints resulting from a variety of delivery profiles and selected targets could be accommodated on Melrose AFR. Prior to authorization to employ WP rockets on the range, range personnel will conduct a comprehensive and detailed SAFE-RANGE analysis for each target to confirm the range of acceptable delivery profiles that avoid manned sites and result in contained weapons safety footprints. At that time, range personnel will ensure that all suitable and viable targets, along with the authorized delivery profiles are documented and incorporated into Range Management guidance.

The use of white phosphorus does constitute the introduction of a new type of ordnance. In addition to the training that would be required for fire fighters, maintenance personnel, EOD technicians, and other range staff engaged in range residue clearance and decontamination that could come into contact with white phosphorus, specific policies and procedures may require



documentation in Cannon Supplement 1 to AFI 13-212. If there are any unique procedures applicable to white phosphorus required for compliance with the Military Munitions Rule, these, too, should be documented. Finally, unit Natural and Cultural Resource Management Plans should be reviewed and coordinated to ensure that any specific white phosphorus issues regarding these resources have been adequately considered and addressed.

#### **4.1.1.2 ALTERNATIVE A: LIMITED TARGETS**

Under Alternative A, some potentially environmentally sensitive target areas on Melrose AFR would be excluded from use. Additionally, some new aim points would be certified through the use of SAFE-RANGE analysis of WP rockets along the eastern edge of the current impact area. A preliminary screening of basic elements of this alternative showed that the existing airspace, in its current configuration, would be fully capable of supporting all training requirements. Since no changes in levels of use of the airspace would result, and no airspace configuration changes would be required for this alternative, there would be no impacts on the management and use of these elements of the NAS.

In terms of range management, although there would be some change from current use, there are no significant issues involving land area sufficiency (i.e., adequate area within the boundaries of Melrose AFR to contain the WP rocket footprints). Preliminary screening with the SAFE-RANGE program confirmed that WP rocket footprints resulting from a variety of delivery profiles, aim points, and selected targets could be accommodated on Melrose AFR. Prior to authorization to employ WP rockets on the range under Alternative A, a comprehensive and detailed SAFE-RANGE analysis will be conducted for aim points to determine the range of acceptable delivery profiles that avoid manned sites and result in contained weapons safety footprints. The final selection of targets and target area aim points meeting the environmental sensitivity criteria would be determined through coordination between the environmental resource managers and the range manager. At that time, range personnel will document all suitable and viable targets and aim points, along with the authorized delivery profiles, and incorporate the results into Range Management guidance (Cannon AFB Supplement 1 to AFI 13-212).

Similar to the Proposed Action alternative, training would be required for fire fighters, maintenance personnel, EOD technicians, and other range staff engaged in range residue clearance and decontamination that could come into contact with white phosphorus. As discussed, specific policies and procedures may require documentation in Cannon Supplement 1 to AFI 13-212. If there are any unique procedures applicable to white phosphorus required for compliance with the Military Munitions Rule, these, too, should be documented. Under this alternative, unit Natural and Cultural Resource Management Plans should be reviewed and coordinated to ensure that any specific white phosphorus issues regarding management plans for these resources, especially in the new-use area, have been adequately considered and addressed.



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### 4.1.1.3 ALTERNATIVE B: NO ACTION

Under the No Action Alternative, the 27 FW (524 FS) aircrews would not train on Melrose AFR with WP rockets. There would be no change to current operations on Melrose AFR. Management and use of the airspace supporting operations on the range would remain unchanged.

Since the No Action Alternative represents no change from current use of Melrose AFR, overall range management would continue as under current operations.

## 4.2 SAFETY

The assessment of impacts focuses on how and to what degree the alternatives could affect safety issues, based on an initial annual use of 180 WP rockets and eventually up to 500 WP rockets per year. WP rockets would be stored at Cannon AFB and potentially employed on Melrose AFR. Existing programs, processes, and procedures were considered in this EA to determine their adequacy to manage potential risks. The results of previous investigations of potential safety risks associated with the use of WP rockets were also considered.

### 4.2.1 Environmental Consequences

#### 4.2.1.1 PROPOSED ACTION

Primary concerns pertaining to the use of WP rockets center around fire risk at Melrose AFR and the potential hazards to humans and animals that could result from unexploded rockets or unburned white phosphorus on the ground. There are also concerns about the fire and explosive safety of WP rockets during storage and handling. Human health and safety issues are addressed in section 4.6, Biological Resources.

#### **CANNON AFB**

**Fire Safety.** Emergency response procedures for fire, rescue, and emergency medical personnel would be amended to include information on the fire and health risks posed by white phosphorus. The stocks of extinguishing agents for burning metals would be increased to handle the slightly increased fire potential resulting from the increased use and storage of white phosphorus.

**Explosive Safety.** Munitions maintenance personnel would receive training in handling the rockets and would be certified to attach the projectiles to rocket motors, store and inspect white phosphorus rockets, and transport the rockets to the flightline. The WP projectile is classified as a 1.2 highly explosive munition, therefore, as described in section 2.1, it is rated a storage compatibility rating of "H." WP projectiles and rockets may be stored in the same building but cannot be stored with any other reactive materials (Air Force 2001d; DoD 1999). Assembly of WP rockets would occur at the base. Cannon AFB has identified a building that would meet compatibility storage requirements, but with some modifications (i.e., upgrading of door). Building 2129 in the munitions storage area would be modified to meet Air Force Explosive Safety Directives for storage of reactive materials.



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On the flightline, the arm and de-arm pads are adequate for the handling of WP rockets. The area is set up for forward-firing ordnance such as WP rockets or any other type of rocket. Properly handled and using approved procedures, these WP projectiles and rockets would not present a significantly greater explosive risk than any other type of rocket/projectile combination.

### ***MELROSE AFR***

***Fire Safety.*** In the rare case of an accident involving an aircraft carrying WP rockets, fire and rescue personnel would risk exposure to burning white phosphorus. Range emergency response and rescue procedures would be amended to address this risk.

Combustible material in the vicinity of a target, including natural vegetation, would likely be consumed by the fire. To minimize the fire damage potential, Range Operations personnel would continue to monitor weather and fire conditions from resources available on the Southwest Area Fire Intelligence website and provide recommendations to operations personnel. As currently in practice on Melrose AFR, these recommendations would address the need to alter flight operations, and modify or cease ordnance use, to include firing rockets. In accordance with existing procedures, Melrose AFR would suspend use of the rockets when the range fire danger rating is high, very high, or extreme (personal communication, Ford 2003).

Currently, the 27 FW Fire Department is a party to mutual aid support agreements with city and volunteer fire departments near the base and Melrose AFR. Cannon AFB would continue mutual aid support agreements and other assistance to local communities, and receive support from them if required. If the 27 FW (524 FS) does begin to use white phosphorus, supporting non-military fire departments would be briefed and trained on specific response and suppression requirements if white phosphorus were to ignite a fire. As it has in the past, the 27 FW can work with non-military fire departments to alert private citizens on the potential for injury if they handle or disturb aircraft or rocket debris. These agreements minimize the human health risks and risk from wild land fires. The base commander would continue to be able to direct the base fire department to assist in any local or regional fire emergency.

The MK 66 rocket motor is extremely high reliability rate (> 99 percent) and the SAFE-RANGE procedures make it very unlikely a rocket would land outside the restricted target impact area or that flammable residue from an exploding WP projectile would spread beyond the range impact boundaries. However, the possibility of an off-range incident or fire cannot be ignored. Such an event could expose private citizens and livestock to the fire and, possibly, pieces of unburned white phosphorus. In the event an off-range rocket impact causes a fire, the range would immediately be closed and EOD and Fire Department personnel sent to the site.

Phosphorus burns and may produce a crust that prevents air from contacting it and sustaining the burn. When the crust is disturbed, the phosphorus could re-ignite. An EOD specialist at Goldwater Range, Arizona, reported approximately 20 percent of the WP rockets had some unburned trace residual amounts of white phosphorus. The ignitable residue is typically found trapped in the remains of the rocket motor cup on the forward end where the warhead is attached. An EOD specialist will typically expose the unburned white phosphorus to air with a



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shovel, allowing the white phosphorus to ignite and burn (personal communication, Domme 2002).

Because white phosphorus combusts in the presence of oxygen, it is not common for white phosphorus to remain on the surface after a rocket functions, but it is possible. Small pieces of white phosphorus may crust over when burning and go out. The pieces can re-ignite if the crust is scraped away (by an animal or a person) and could start a fire. Should this happen when the range is closed, fire department personnel may not be present. The fire could spread beyond the impact boundaries and affect leased and private land before being discovered. The risk of such a fire cannot be totally eliminated, but it can be reduced by properly maintaining fire breaks and alerting the public to the possibility.

**Explosive Safety.** WP projectiles are designed to burst open on impact, ignite, and burn with a very intense flame. The MK 66 Mod 2 rocket, regardless of the projectile, has a stated 92 percent reliability. In actual practice the reliability is even greater. Out of approximately 45,000 motors tested last year, approximately 200 failures (failures denoting no launch or launch that veered off course; 99 percent reliability) were noted (personal communication, Dutcher 2003).

Prior to use of WP rockets, the SAFE-RANGE program would be used to assess weapons safety footprints to determine all acceptable targets and delivery profiles. The SAFE-RANGE program would take into account the weapons delivery parameters such as flight paths, altitude, and delivery angles per target. The weapons safety footprint would be used to determine whether employing a WP rocket would result in a risk or concerns (e.g., the weapons safety footprint extending beyond Melrose AFR). If the analysis indicates an unacceptable risk, the mission profile would be changed and another analysis accomplished. This process is repeated until safe mission profiles are developed for targets or aim points.

Adherence to handling and safety procedures, community education, and the use of targets that keep the rockets' safety footprint on the range are projected to produce no significant safety risks from WP rocket training.

An education and briefing program for the ranchers/lessees would be developed to alert them to the potential hazards in the restricted impact area. Considering the reliability of the rockets and the education program, risk associated with unexploded rockets or crusted unconsumed amounts of white phosphorus on the ground, is extremely low.

**Flight Safety.** Management of day-to-day flying operations would be similar to actions currently in practice by the RCO at Melrose AFR. The total number of operations on the range would not be affected by this proposal. Flight safety mishap rates would not change from existing conditions. WP rocket use would not change the potential for an aircraft accident. The launcher and rockets can be jettisoned from the aircraft, but this would only occur in an attempt to prevent a crash. If the launcher and rockets impact off-range, emergency response procedures would be undertaken. Existing aircraft crash response and recovery procedures for both on-base and off-base/range incidents would be amended to include procedures for handling white phosphorus. The flight safety risks posed by WP rocket use would not be significant because of the low accident rate for the F-16 and the flight and rocket safety procedures used by the 27 FW.



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#### 4.2.1.2 ALTERNATIVE A: LIMITED TARGETS

CSAR training would be accomplished using targets primarily on the northern part of the range and aim points in impact areas on the eastern side of the range.

##### ***CANNON AFB***

***Fire Safety.*** On-base stocks of extinguisher agents for metal fires would be increased to handle the slight increase in fire risks. Emergency response personnel would be trained for response to white phosphorus fires. There would not be significant impacts to fire safety.

***Explosive Safety.*** Munitions maintenance personnel would require training in the handling, storage, and inspection of WP rockets. WP rockets would be stored and assembled on base. The door in the munitions storage building (Building 2129) would be modified to accommodate WP rockets. Flightline arm and de-arm pads are adequate for handling WP rockets. There would not be any significant explosive safety risks from WP rocket use.

##### ***MELROSE AFR***

***Fire Safety.*** The number and use of WP rockets would be the same for Alternative A as for the Proposed Action. Fire risks would be managed in accordance with the Cannon Supplement to AFI 13-212, Weapons Ranges. Firebreaks on the eastern boundary of the range would be evaluated and restored as required. Ongoing coordination between the base fire department and 27 FW operations and training staff would minimize fire risk.

***Explosive Safety.*** Under this alternative, aim points in the new eastern impact areas may be used for CSAR training and rocket employment against some targets may be constrained. These aim points would remain in the restricted land area of the range. This would result in minimizing the potential for environmental impacts, specifically to surface water features. Generally, current targets in the southern portion of the range would be avoided because of the presence of sensitive surface water features. The SAFE-RANGE assessment would be used to assure that the footprint remains contained within the restricted area of the range. No significant impacts to explosive safety on the range would occur.

WP MK 66 Mod 2 rockets have an approximate 99 percent reliability rate. Range Operations would monitor weather and fire conditions using the Southwest Area Fire Intelligence website for fire danger rating to make operations recommendations regarding modifying or ceasing ordnance use on Melrose AFR. The SAFE-RANGE program would be used to determine acceptable targets and delivery profiles. Explosive safety consequences would be similar to those under the Proposed Action including unburned phosphorus risks, safety procedures, and community education. An education and briefing program for the ranchers/lessees would be provided to alert them to any potential WP hazards in the areas leased for restricted grazing. Considering the reliability of the rockets and the education program, risk associated with unexploded rockets on the ground is extremely low. Therefore, no significant impact is anticipated.

***Flight Safety.*** Day-to-day flying operations and the total number of operations on Melrose AFR would not change under Alternative A. Accident and incident rates would not change and the



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number of rockets fired would be the same as the Proposed Action. Flight safety procedures and emergency response procedures would not change. Flight safety risks associated with F-16 aircraft using WP rockets would not be significant.

#### **4.2.1.3 ALTERNATIVE B: NO ACTION**

If this alternative is selected, WP rockets would not be used for CSAR mission training on Melrose AFR. The CSAR tasking would remain and Cannon AFB pilots would travel to ranges approved for WP rockets to train. WP rockets would be stored and maintained at Cannon AFB in existing facilities with improvements to the door. Whether the rockets would be loaded on 27 FW (524 FS) F-16 aircraft at Cannon AFB and flown to the deployment/training location or the munitions allocations were transferred to the training location for loading on F-16 aircraft would depend on availability of the ranges, distance to the ranges, and length of the deployment. Cannon AFB munitions maintenance personnel would be trained in the storage and maintenance of WP rockets and emergency response personnel would receive training in how to respond to incidents involving WP rockets.

### **4.3 MATERIALS MANAGEMENT**

Materials management programs were reviewed to determine the significance of anticipated increases in any materials usage and transport. The results of previous investigations and ongoing research on the environmental effects of WP rockets were also considered to determine potential impacts resulting from implementation of the Proposed Action or alternatives.

Management issues associated with the proposed use of WP rockets involve considerations about the capability of storage facilities, transportation systems, and disposal processes to handle the added demand. Spill reporting requirements are also an issue that must be considered. Environmental concerns about the use of WP rocket use in a new geographic areas include the potential toxicity to humans and livestock and the potential for harm to the natural environment. These are addressed in section 4.6, Biological Resources. Concerns including the potential for fires and the possibility of an unexploded rocket igniting after being handled or disturbed on the ground are addressed in section 4.2, Safety.

#### **4.3.1 Environmental Consequences**

##### **4.3.1.1 PROPOSED ACTION**

The Proposed Action is that 27 FW (524 FS) aircrews would employ approximately 180 WP rockets on Melrose AFR the first year. Depending upon funding, munitions allocation, mission tasking, and transient use, the number of WP rockets employed in subsequent years may be up to 2 to 3 times that amount. For the purpose of this analysis, a nominal annual use of up to 500 WP rockets is assumed. The munitions storage area at Cannon AFB is adequate to handle the storage and assembly of rockets. However, building 2129 would require modification to accommodate the storage of the WP rocket. Additional transportation and other logistic support would be incremental throughout the year. WP rockets do not have a shelf life but undergo a 4-year periodic inspection cycle (personal communication, Teconchuk 2003). Existing processing and disposition procedures are adequate to manage these increased demands, and no significant environmental impacts are anticipated.



The Military Munitions Rule, Title 40 CFR Part 266, sets forth proper management of waste military munitions, identifies when munitions become a solid waste, and defines whether waste is hazardous subject to regulations under the Resource Conservation and Recovery Act (RCRA). For regulatory purposes munitions are not a solid waste when the munitions are used for training of military personnel, EOD personnel, and emergency response specialists. The recovery and collection for on-range treatment/destruction of unexploded ordnance and munitions fragments during range clearance activities are an intrinsic part of training and are not regulated under RCRA.

The USEPA has listed white phosphorus as a HAP. The USEPA requires that spills or accidental releases into the environment of one pound or more of a HAP be reported to the USEPA. When used on Melrose AFR, the release of white phosphorus would not be considered a "spill," because it would be used for its intended purpose. If a rocket were to land off range, the materials would be handled as a hazardous waste requiring immediate proper treatment and/or disposal. If the off-range munition is not promptly rendered safe and/or retrieved, it would potentially be subject to RCRA corrective action. If the remedial action were infeasible, the range operator would maintain record of the event for as long as any threat remains. The record would include the type of munition and its location (to the extent the location is known). Releases of one pound or more of white phosphorus during on-base storage or handling or as the result of an aircraft accident would also be handled as a solid waste.

Implementation of the Proposed Action would increase the amount of toxic chemicals used on the range. For example, the WP rocket motor and M-42 fuze contains about 0.21 pounds of lead (see appendix C). Firing 180 rockets would release about 37.8 pounds of lead per year ( $180 \times 0.21$ ), which is below the 100-pound reporting threshold. Five hundred rockets would contain about 105 pounds of lead ( $500 \times 0.21$ ), just over the reporting threshold. The increases would be added to current toxic chemical usages reported by the 27 CES/CEV to determine if a reporting threshold had been met. It is unlikely that any other reporting thresholds would be met since they are typically much higher. For example, the reporting threshold for copper is 10,000 pounds per year. The release of toxic chemicals to both the air and ground during the firing of WP rockets would be low and would not cause significant impacts to the environment (see sections 4.4.1.1 for air quality, and 4.5.1.1 for soils.)

In accordance with Air Force requirements, targets on the range with the greatest concentrations of ordnance are cleared every 3 months or 75 use-days, annually, and a complete boundary-to-boundary clearance is accomplished every 5 years. Trained EOD personnel would inspect all ordnance debris (refer to section 4.2.1.1).

#### **4.3.1.2 ALTERNATIVE A: LIMITED TARGETS**

CSAR training would be accomplished using targets on primarily the northern part of the range and aim points in impact areas on the eastern side of the range. The munitions storage area at Cannon AFB is adequate to handle the storage and assembly of rockets. Modifications of the door on the munitions storage facility would be required to accommodate WP rocket use. The existing processing and disposition procedures are adequate to manage the increased demands, and no significant environmental impacts are anticipated.



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Implementation of Alternative A would slightly increase the amount of toxic chemicals used on the range. However, the release of toxic chemicals to both air and ground during the firing of WP rockets would be low and would not cause significant impacts to the environment. In accordance with Air Force requirements, targets on the range with the greatest concentrations of ordnance would be cleared every 3 months or 75 use-days, and a complete boundary-to-boundary clearance is accomplished every 5 years. Trained EOD personnel would inspect all ordnance debris.

No impacts to materials management areas would occur under Alternative A.

#### **4.3.1.3 ALTERNATIVE B: NO ACTION**

If this alternative is selected, WP rockets would not be used on Melrose AFR for CSAR training. WP rockets would be stored and maintained at Cannon AFB in an existing munitions storage facility. Cannon AFB munitions maintenance personnel would be trained in the storage, maintenance, and inspection of WP rockets. Emergency response personnel would waive training in how to respond to incidents involving WP rockets. No significant impacts to material management would occur.

### **4.4 AIR QUALITY**

Air emissions resulting from the Proposed Action were evaluated in accordance with federal, state, and local air pollution standards and regulations. Air quality impacts would be significant if they:

- increase ambient air pollution concentrations above any NAAQS;
- contribute to an existing violation of any NAAQS;
- interfere with or delay timely attainment of NAAQS; or
- impair visibility within any federally mandated federal Class I area.

According to USEPA's General Conformity Rule in 40 CFR Part 51, Subpart W, any proposed federal action that has the potential to cause violations in a NAAQS nonattainment or maintenance area must undergo a conformity analysis. A conformity analysis is not required if the Proposed Action and Alternative A occurs within an attainment area. Since Roosevelt County is designated as attainment for all criteria pollutants, a conformity determination is not required and was not performed.

As described in section 3.4.1, Section 169A of the CAA established the PSD regulations to protect the air quality in regions that already meet the NAAQS. Certain national parks, monuments, and wilderness areas have been designated as PSD Class I areas, where appreciable deterioration in air quality is considered significant. The nearest PSD Class I area is approximately 60 miles from the region potentially affected by the Proposed Action. Therefore, the Proposed Action would be unlikely to have a significant impact on any PSD Class I areas.

The analysis of air quality impacts was limited to changes in emissions due to the use of WP rockets within the Melrose AFR. Baseline aircraft sorties and ground vehicle traffic would not be changed and no stationary sources would be added as a result of the Proposed Action. It is



assumed that all white phosphorus combustion products and residual components fall onto the ground within the ROI and are not carried into other areas.

#### **4.4.1 Environmental Consequences**

##### **4.4.1.1 PROPOSED ACTION**

The white phosphorus in military projectiles burns spontaneously when exposed to air and produces a dense white smoke made up of various oxides of phosphorus, including phosphorus pentoxide ( $P_4O_{10}$ ) and phosphorus trioxide ( $P_4O_6$ ). These oxides react rapidly with moisture to form a mixture of phosphoric acids, including orthophosphoric acid ( $H_3PO_4$ ), pyrophosphoric acid ( $H_4P_2O_7$ ), triphosphoric acid ( $H_5P_3O_{10}$ ), and higher polyphosphates with 2-12 phosphorus atoms per formula unit (National Research Council 1999).

The USEPA considers white phosphorus an HAP. However, as discussed below, projected levels of HAP emissions are not significant compared to major source thresholds cited in section 3.4.1. Typically, concentrations of white phosphorus smoke are expressed as orthophosphoric acid equivalents, assuming that the smoke consists entirely of  $H_3PO_4$ . This assumption results in a conservatively large estimate of smoke mass because  $H_3PO_4$  has the highest smoke to phosphorus mass ratio or "yield factor" (3.2 to 1) of any of the combustion products. The actual mass of smoke emitted from WP rockets on a battlefield or training range depends on the relative humidity of the atmosphere because the combustion products are hydroscopic, meaning that water is absorbed into the smoke particles. The yield factor increases with increasing moisture in the atmosphere, from 3.5 to 1 for relative humidity of 10 percent to 7.9 to 1 for relative humidity of 90 percent. Typically, the relative humidity in New Mexico is no higher than 70 percent, for which the yield factor is reported to be 5.1 to 1 (U.S. Army 1986).

White phosphorus smoke is typically deposited as phosphoric acid or phosphate compounds on land and water. White phosphorus reacts rapidly in air. If the particulate phosphorus is coated with a protective layer of oxides, however, further oxidation may not occur, increasing the lifetime of the elemental phosphorus in the air and on the ground after deposition. It is estimated that up to 10 percent of the phosphorus from WP rockets enters the atmosphere as unburned, elemental phosphorus, which is a federal regulated HAP. Phosphine, another HAP, has been found in white phosphorus smoke at levels equivalent to 0.02 percent of the total phosphorus in the warhead.

Smoke particle diameters range from 1-2 micrometers. Upon ignition, white phosphorus burns at a temperature of 2,760 degrees C (5,000 degrees F). As a consequence, the smoke from a WP rocket tends to pillar, i.e., rise due to the heat, forming a vertical screen, especially in conditions of high relative humidity. The smoke tends to disperse within 5-10 minutes, with faster dispersion resulting from increased turbulence, atmospheric instability, and wind speeds. The USEPA estimated that exposure concentrations could reach 202 milligrams per cubic meter ( $mg/m^3$ ), as orthophosphoric acid, 100 meters downwind from deployment and approximately  $1.4 mg/m^3$  5,000 meters downwind. The USEPA does not expect community exposures to be severe at a distance of greater than 300 meters downwind; however, particularly sensitive



individuals might experience respiratory irritation at distances up to 5,000 meters (U.S. Army 1986; National Research Council 1999).

Based on a yield factor of 5.1 to 1 (assuming 70 percent relative humidity), a nominal 500 WP rockets (at 2.2 pounds of phosphorus per rocket) could produce 5,600 pounds (2.8 tons) of white phosphorus smoke. Emissions of elemental phosphorus would be 110 pounds or less per year, and emissions of phosphine would be approximately 0.2 pounds per year. These levels of HAP emissions are not significant compared to major source thresholds cited in section 3.4.1.

If it were conservatively assumed that all of the white phosphorus would combust and be released as PM<sub>10</sub> as described in the previous paragraphs, then this proposed action would result in an estimated increase of 2.8 tons per year. The PM<sub>10</sub> emissions from white phosphorus usage are below the significant emission rate threshold of 15 tons per year under New Mexico's PSD regulations (NMAC 2002b) and are less than 0.02 percent of the total PM<sub>10</sub> emissions from stationary sources in New Mexico, which USEPA reported as 16,895 tons per year for calendar year 1997 (USEPA 1997). It is likely that the frequent high winds in eastern New Mexico would distribute these emissions over a wide area and result in insignificant changes in the ambient air quality. Potential impacts to visibility are expected to be short term and limited in area prior to the rapid dispersion of the pollutants, and are not expected to adversely impact any of the PSD Class I areas in the region.

Based on the Munitions Composition Report (Appendix C), a minor amount of lead is also contained in each rocket: an estimated 0.10725 pounds of lead in each rocket motor and 0.10250 pounds of lead and lead compounds in each M42 rocket fuze. If it is assumed that all of the lead contained in the rocket components is released into the atmosphere, then a nominal 500 WP rockets could produce an estimated 105 pounds (0.053 tons) of lead emissions per year.

Lead, which is regulated as a NAAQS, has a maximum allowable ambient concentration of 1.5 µg/m<sup>3</sup> (Table 3-2). Just over 50 percent of these lead emissions (53.6 pounds) from the WP rockets will be released well above the ground during the rocket motor burn, as the rocket is propelled from the aircraft toward the range. These emissions from the rocket engine will be released in a stream of buoyant hot gases along the rocket's trajectory, and will be widely dispersed before they reach the ground. The remaining lead emissions (51.3 pounds) will be released during the detonation of the fuze when the rockets impact the ground. These very low emissions of lead will be spread out over the range during the year, and will result in insignificant (and transitory) increases in ambient concentrations of lead.

#### **4.4.1.2 ALTERNATIVE A: LIMITED TARGETS**

The annual number of WP rockets under Alternative A would be the same as the number used under the Proposed Action. Based on a yield factor of 5.1 to 1 (assuming 70 percent relative humidity) a nominal 500 WP rockets could produce 5,600 pounds (2.2 tons) of PM<sub>10</sub>. Emissions of elemental phosphorus would be 110 pounds or less per year, and emissions of phosphine would be approximately 0.2 pounds per year. These levels of HAP emissions are not significant compared to major source thresholds cited in section 3.4.1. The estimated increase in PM<sub>10</sub>



emissions would be in addition to the baseline emissions of PM<sub>10</sub> from stationary sources at Cannon AFB, reported as 3.7 tons per year (Air Force 1998).

These emissions represent the total emissions over a 1-year period from white phosphorus usage over the entire ROI, and are approximately 15 percent of the PM<sub>10</sub> emissions from the F-16 aircraft that are flying the sorties, and less than 0.02 percent of the total PM<sub>10</sub> emissions in New Mexico during the same year (USEPA 2001). It is likely that the frequent high winds in eastern New Mexico would distribute the emissions over a wide area and result in insignificant changes in the ambient air quality. Potential impacts to visibility are expected to be short term and limited in area prior to the rapid dispersion of the material, and are not expected to adversely impact any of the PSD Class I areas in the region.

#### **4.4.1.3 ALTERNATIVE B: NO ACTION**

Under the No Action Alternative, WP rockets would not be used in the Melrose AFR. Air emissions would be identical to those of the baseline conditions presented in section 3.4.

### **4.5 PHYSICAL RESOURCES (EARTH AND WATER)**

Potential impacts to physical resources stem from the release and breakdown of principal and residual components associated with the WP rockets and can include impacts to soil and water chemistry. If the chemical breakdown of the WP rockets do not result in toxic concentrations within the environment, then the impact is considered insignificant. A discussion of the potential consequences to wetlands is presented in section 4.6.1.1.

#### **4.5.1 Environmental Consequences**

##### **4.5.1.1 PROPOSED ACTION**

The weapons safety footprints for the Proposed Action allow for the deployment of WP rockets at all target areas that meet the SAFE-RANGE screening described in section 2.2.1. The impact area for the Proposed Action could include areas that contain surface water features.

When white phosphorus is burned the resulting byproducts are residual unburnt white phosphorus and a number of oxides of phosphorus that react with the moisture present in air to form a number of phosphorus-containing acids in the smoke (U.S. Department of Health and Human Services 1997). Because the unexploded rocket rate of WP rockets is less than 0.04 percent, it is reasonable to assume that the majority of the white phosphorus contained in the rocket is combusted and the amount remaining in the environment is therefore minimal. In addition, targets on the range with the greatest concentrations of ordnance are cleared every 3 months or 75 use-days, annually, and a complete boundary-to-boundary clearance is accomplished every 5 years.

Implementation of the Proposed Action would increase the amount of toxic chemicals used on the range. These chemicals are listed in Appendix C. These increases would be added to current toxic chemical usages reported by the 27 CES/CEV to determine if a reporting threshold had been met. It is unlikely that any of reporting thresholds would be met except for lead which would only be met if all 500 rockets were used annually (refer to section 4.3.1.1). The



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release of toxic chemicals to the land during the firing of WP rockets would be low and would not cause significant impacts to the environment.

### ***SURFACE WATER***

White phosphorus is a non-polar compound that does not dissolve readily in deep or anerobic water conditions. White phosphorus contained in shallow surface water bodies is likely to volatilize quickly (U.S. Department of Health and Human Services 1997). Eagle River Flats, Alaska, studies found white phosphorus to persist in deep surface waters. Deeper waters have limited dissolved oxygen concentrations and therefore limited potential to oxidize the white phosphorus. White phosphorus residual levels were found to be very low or non-detectable in intermittent pond areas and mudflats (Walsh et al. 1995).

Phosphoric acids are weak acids with low toxicity. In high concentrations, they can reduce the hardness of surface waters (i.e., remove calcium and magnesium ions) and increase aquatic plant productivity. It is unlikely that phosphoric acid concentrations in surface waters on Melrose AFR would increase to the level that these effects would be seen as a result of white phosphorus deposition and oxidation, under the Proposed Action.

The surface water features within the ROI consist of intermittent drainages, temporarily flooded wetlands, shallow wildlife guzzlers, stock tanks, and man-made impoundments. Due to the oxidation process occurring in these types of waterbodies, it is unlikely that significant concentrations of white phosphorus would remain. Given the small amount of white phosphorus that could possibly reach water bodies and the natural decontamination from seasonal drying cycles in intermittent streams and many stock ponds, accumulation of white phosphorus in surface waters of Melrose AFR is unlikely to affect surface water chemistry.

### ***SOILS***

White phosphorus was found to volatilize rapidly (within 24 hours) in unsaturated sediments characteristic of the arid soils of Melrose AFR. White phosphorus residue from incomplete combustion was found to persist in saturated sediments characteristic of boggy salt marshes (Walsh et al. 1995). Boggy salt marsh conditions do not exist on Melrose AFR. Given the arid climate and resultant arid soils associated with the Melrose AFR, impacts to soils are expected to be minimal and insignificant.

#### **4.5.1.2 ALTERNATIVE A: LIMITED TARGETS**

Under this alternative, aim points in the eastern area of the range could be developed. Use of other existing targets primarily in the southern portion of the range would be constrained, thereby avoiding surface water features. White phosphorus residual levels have been found to be very low or non-detectable in intermittent pond areas and mudflats (Walsh et al. 1995). Although white phosphorus materials could persist in sediments of shallow waters, most likely the concentrations would not be significant due to the oxidation process. As a result, the limited potential for contamination of surface water associated with the Proposed Action is further limited under Alternative A.



The same number of WP rockets will be deployed under Alternative A as compared to the Proposed Action. Given the arid climate and resultant soils associated with Melrose AFR, impacts to soils are expected to be minimal. White phosphorus was found to volatilize rapidly (within 24 hours) in unsaturated sediments characteristic of the arid soils of Melrose AFR (U.S. Department of Health and Human Services 1997).

#### **4.5.1.3 ALTERNATIVE B: NO ACTION**

Under the No Action Alternative, WP rockets would not be authorized for use on Melrose AFR and range use would continue as it is defined today. Impacts to physical resources would not occur under this alternative.

### **4.6 BIOLOGICAL RESOURCES**

Although common mechanisms of potential effects are shared by all living resources, different approaches are used for evaluating impacts to humans and other living resources. Each of these approaches is described below.

Determination of the significance of potential impacts to non-human living resources (e.g., habitat, wildlife, livestock; see section 3.6.1 for definition) is based on (1) the importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and (4) the duration of ecological ramifications. Impacts to resources are significant if species or habitats of high concern are adversely affected over relatively large areas or disturbances cause reductions in population size or distribution of a species of high concern.

Impacts to humans (biological or health related) are not considered significant if no measurable risk to human health occurs. Impacts would be considered significant if measurable effects on health occurs or if a statistically detectable increased risk to human health would occur.

#### **4.6.1 Environmental Consequences**

##### **4.6.1.1 PROPOSED ACTION**

General issues and concerns under the Proposed Action are associated with both the physical and chemical impacts of WP rocket use. Potential physical effects include direct impacts of rockets as well as fire risk and fire frequency changes on arid rangelands. Fire risk is discussed under Safety (section 4.2). Impacts associated with chemical aspects of WP rockets are primarily related to contamination of rangelands or wetlands with white phosphorus residue. Discussion of these aspects and their potential impacts are presented within the framework of specific resources. Lead and other toxic chemicals are also a concern. However, as discussed in section 4.3.1.1 and 4.4.1.1, these chemicals are not expected to exceed a significant threshold. In addition, as white phosphorus is not expected to accumulate in surface water or in vegetation, it is unlikely that wildlife and livestock on the range would ingest quantities that could cause mortality. Therefore the analysis focuses on impacts associated with white phosphorus.



**Wetlands and Surface Water Features.** Impacts to aquatic habitats would be related to the chemical properties of white phosphorus and its potential for accumulation in small isolated water bodies or wetland areas. As summarized in section 4.5.1.1, white phosphorus that is submerged in water with moderate to high levels of dissolved oxygen, temperature, or pH (i.e., alkaline water), rapidly reacts with water and oxygen through hydrolysis and oxidation to form phosphine and phosphoric acids (U.S. Department of Health and Human Services 1997). Under most conditions, phosphine volatilizes rapidly and is released to the atmosphere. Phosphoric acids are weak acids with low toxicity. In high concentrations, they can reduce the hardness of surface waters (i.e., remove calcium and magnesium ions) and increase aquatic plant productivity. It is unlikely that phosphoric acid concentrations in surface waters on Melrose AFR would increase to the level that these effects would be seen as a result of white phosphorus deposition and oxidation, under the Proposed Action.

In anoxic (low oxygen) conditions, white phosphorus may be deposited in the sediment and persist in its elemental form for extended periods of time (U.S. Department of Health and Human Services 1997). White phosphorus particles are not incendiary while submerged, but may pose a poisoning risk to wildlife if ingested. Upon exposure to air, however, white phosphorus reacts with oxygen and moisture in the air, leaving non-toxic residues.

Wetland areas comprise a small percentage (<1) of the area to be exposed to potential impacts with WP rockets. The majority of the area of effect comprises relatively flat, arid rangeland with few permanent drainages. The probability of a white phosphorus rocket or white phosphorus particle settling in an aquatic environment would be low. There would be little opportunity for dabbling waterfowl, wading birds, or other bottom feeding wildlife to encounter or gather white phosphorus particles. Given the small amount of white phosphorus that could possibly reach water bodies and the natural decontamination from seasonal drying cycles in intermittent streams and many stock ponds, accumulation of white phosphorus in surface waters of Melrose AFR is unlikely to affect surface water chemistry.

**Direct impact.** Direct impacts to biological or human resources with WP rockets could result in wildlife or livestock mortality or damage to property. Because of the SAFE-RANGE program, combined with high rocket reliability rates (>99 percent) and standard range safety procedures, it is highly unlikely that a rocket would land outside the restricted target impact boundaries, as discussed in section 4.2 (Safety). Therefore, wildlife and human resources outside of the impact area would be unlikely to be affected. The potential for direct mortality to wildlife within the impact area would be low due to the low densities of most wildlife species within the impact area.

At least one small black-tailed prairie dog colony is found within the impact area that would be used for white phosphorus rocket training. Prairie dogs are sedentary and occur in high densities relative to most other wildlife species. A white phosphorus rocket strike in or near a colony could result in mortality of prairie dogs and temporary damage to prairie dog habitat. Prairie dog colonies on Melrose AFR have increased in area in recent years, indicating an increasing population, and there are currently at least 13 colonies on Melrose AFR, most of them outside of the impact area. Black-tailed prairie dog colonies have been found to form a



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metapopulation structure, with unoccupied colonies recolonized by dispersing animals from other colonies (Roach et al. 2001). It is unlikely that infrequent WP rocket strikes would cause prairie dog mortality in sufficient numbers to destroy an entire colony or to adversely impact the persistence of local or regional prairie dog metapopulations.

Two other species that are associated with prairie dog colonies are the mountain plover and burrowing owl. Plovers are found on Melrose AFR in small, sparsely distributed groups during spring migration in March and April. Burrowing owls are year-round residents, but occur in low densities where they are found. A WP rocket strike in or near a prairie dog colony or other occupied habitat could result in mortality of individual mountain plovers or burrowing owls. Because there is a low probability of either species occurring at any given site in or near the impact area, the likelihood of infrequent WP rocket strikes causing an adverse impact on regional populations is low.

Cannon AFB has grazing lease agreements that reflect the inherently hazardous nature of grazing livestock on Melrose AFR. The use of WP rockets could marginally increase the possibility of livestock mortality associated with grazing on an active bombing range.

**Fire potential.** White phosphorus rockets are designed to ignite on impact. Vegetation in the vicinity of an aim point is likely to be burned, resulting in a loss of native vegetation in the target area over time. Most native species of the high plains have adapted to lightning and man-made fires that regularly sweep through the area. Melrose AFR target impact areas are generally devoid of vegetation or are surrounded by firebreaks (Air Force 2001a). Nevertheless, any additional potential for fire is of concern for both native species and livestock. To minimize the risk of wildfire, white phosphorus rocket use would not be permitted during periods of high, very high, or extreme fire danger, and fires ignited by rockets would be suppressed by on-site fire safety personnel (see section 4.2, Safety).

Fires from all sources (natural and human caused) are a regular constituent of the natural environment. The frequency of these fires may increase slightly within the impact area as a result of white phosphorus rocket use. However, should a fire occur from any source, Cannon AFB has in place a rapid response capability that could assist. When fires occur, they can result in substantial short-term damage to vegetation, rangeland infrastructure such as fencing, and species unable to avoid the grassland fires. Mule deer fawns may be particularly vulnerable to fire during their first weeks of life until their running ability develops. However, mule deer use and fawning areas are concentrated in the northern portions of Melrose AFR, away from the impact areas. It is unlikely that local or regional mule deer populations would be adversely affected by fires because of the distance of mule deer use areas from target areas, the low probability of white phosphorus rocket impacts outside of the impact areas, and the rapid fire response program in place at Melrose AFR.

The vegetation and wildlife species have demonstrated the ability to recover from infrequent fires. In addition, any damage from a fire that could be traced to a white phosphorus rocket would be handled in accordance with the Air Force procedures for damage claims.



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## ***HUMAN HEALTH IMPACTS***

Military personnel may be exposed to white phosphorus through inhalation and through the skin. White phosphorus is extremely toxic to humans, while other forms of phosphorus are much less toxic. Inhalation exposure has resulted in respiratory irritation and coughing or, over chronic exposure, a condition known as phossy jaw that involves poor wound healing in the mouth and a breakdown of the jaw bone (U.S. Department of Health and Human Services 1997). Ingestion can cause effects on the gastrointestinal system, kidneys, liver, cardiovascular system, and central nervous system. Dermal exposure to white phosphorus in humans may result in severe burns, which are necrotic, yellowish, fluorescent under ultraviolet light, and have a garlic-like odor. USEPA has classified white phosphorus as a non-carcinogen.

Exposure vectors would be through inhalation after a rocket has exploded, through clean-up efforts, or accidentally kicking unburned (crusted) white phosphorus. It is unlikely that range personnel or the general public would inhale white phosphorus smoke. As WP rockets are classified as a live munitions, target areas would be unmanned. Melrose AFR is signed and protected by fencing and security is enforced to restrict trespassing. No personnel would be within the weapons safety footprint, the white phosphorus smoke would dissipate before drifting outside of this area. EOD personnel would have to take extra precautions during annual range cleanup, particularly if destroying unexploded ordnance. Because these personnel would be trained in handling and disposing of white phosphorus prior to range cleanup, their risk exposure would be minimized.

White phosphorus has been known to form a crust that contains unburned white phosphorus. Since under the Proposed Action the weapons safety footprint for the WP rocket would be contained within the existing restricted impact area, exposure could only occur to authorized military personnel. The education and briefing program would minimize this risk of exposure. Annual cleanup in areas of the range with the greatest concentrations of ordnance would decrease the accumulation potential of WP rockets. In addition, rockets are tracked if they veer off range. Therefore, in the unlikely event of a rocket veering off course, range personnel would immediately track the rocket and notify cleanup personnel.

### **4.6.1.2 ALTERNATIVE A: LIMITED TARGETS**

Both the Proposed Action and Alternative A include the use of 180 WP rockets for the first year and up to 500 WP rockets annually in the future on Melrose AFR. Under Alternative A, target areas would be selected to avoid areas with high environmental sensitivity. Areas of high sensitivity for biological resources could include wetlands, surface water features, or known locations of listed species or species of special concern. Under this alternative, targets whose safety footprints include such areas, most notably the surface water features in the southern portion of the range, would not be used for WP rocket training. Specific avoidance areas will be coordinated between the Natural Resources manager and the range manager.

***Wetlands and Surface Water Features.*** Under Alternative A, white phosphorus rockets would not be fired at targets whose safety footprints included wetlands or surface water features. The probability of deposition or accumulation of white phosphorus in these areas, which would be



low under the Proposed Action, would be negligible under Alternative A. The consequent risk of contamination of wetland sediments or ingestion of white phosphorus particles by wildlife or livestock would also be negligible.

**Direct impact.** Direct impacts to biological or human resources with WP rockets could result in wildlife or livestock mortality or damage to property. However, the potential for direct mortality to wildlife within the impact area would be low due to the low densities of most wildlife species there. Because of the SAFE-RANGE program, high rocket reliability rates, and standard range safety procedures, it is marginally possible that a rocket would land outside the existing restricted target impact boundaries. Therefore, the risk to wildlife and human resources outside of the impact area would be minimal.

**Fire potential.** Under Alternative A, vegetation in the vicinity of the target area is likely to be burned, resulting in a loss of native vegetation in the target area over time, although Melrose AFR target areas are generally devoid of vegetation or are surrounded by firebreaks (Air Force 2001b). To minimize the risk of wildfire, WP rocket use would not be permitted during periods of high, very high, or extreme fire danger, and fires ignited by rockets would be suppressed by on-site fire safety personnel. The concentration of WP rocket training in the northern portion of the range would allow fire control agencies to more rapidly respond, thereby reducing fire risk further.

#### **4.6.1.3 ALTERNATIVE B: NO ACTION**

Under the No Action Alternative, rocket use would continue at Melrose AFR at current levels but would not include white phosphorus projectiles. Impacts to wildlife, habitats, livestock, crops, and humans within the Melrose AFR would not change from the current conditions.

### **4.7 CULTURAL RESOURCES**

A number of federal regulations and guidelines have been established for the management of cultural resources. Section 106 of the NHPA, as amended, requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties are cultural resources that are listed in, or eligible for listing in, the NRHP. Eligibility evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Under federal law, impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have been identified as important to Native Americans as outlined in the American Indian Religious Freedom Act (AIRFA) and EO 13007 Indian Sacred Sites. DoD *American Indian and Alaska Native Policy* (1999) provides guidance for interacting and working with federally-recognized American Indian governments. DoD policy requires that installations provide timely notice to, and consult with, tribal governments prior to taking any actions that may have the potential to significantly affect protected tribal resources, tribal rights, or American Indian lands.

Analysis of potential impacts to cultural resources considers direct impacts that may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual



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or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. Indirect impacts generally result from increased use of an area.

#### **4.7.1 Environmental Consequences**

##### **4.7.1.1 Proposed Action**

At Cannon AFB, limited renovation (door replacement) of Building 2129 (constructed in 1961) is not expected to impact architectural resources under the Proposed Action. The building is not considered eligible for the NRHP (Air Force 1996b). Impacts to archaeological or traditional resources on base also are not expected.

At Melrose AFR, impacts to significant cultural resources within the target impact area are not likely. Most of the archaeological sites identified within this area have been determined ineligible for the NRHP (personal communication, Chandler 2003). Two sites (LA 66373 and LA 133088) have been recommended as eligible for the NRHP. However, neither of these sites is in an area with existing targets (personal communication, Chandler 2003), and they are not expected to be impacted under the Proposed Action. Impacts to cultural resources could occur in the restricted area if the resources are located within the weapons safety footprint of targets near the edge of the impact area. There are presently no NRHP-eligible restricted area resources that lie near the edge of the target impact area. However, several archaeological resources are of undetermined eligibility. In the unlikely event that these resources are found to lie within the weapons safety footprint of a given target, the resources would be evaluated to identify whether any are eligible for the NRHP. Compliance with Section 106 of the NHPA is underway through contact with the New Mexico Office of Cultural Affairs (refer to Appendix A). The Air Force also has initiated contact with the Apache, Comanche, and Kiowa tribes to identify any potential concerns associated with the Proposed Action (refer to Appendix A).

##### **4.7.1.2 Alternative A: Limited Targets**

At Cannon AFB, impacts to cultural resources are expected to be the same as those described for the Proposed Action. The limited renovation of Building 2129 would not change under this alternative.

At Melrose AFR, impacts to significant cultural resources within the target impact area are not expected. All but two of the archaeological sites in this area have been determined ineligible for the NRHP. The two NRHP-eligible sites (LA 66373 and LA 133088) are not in areas with existing targets (personal communication, Chandler 2003). In addition, the selection of limited target locations to avoid areas of environmental sensitivity would further reduce the potential for impacts to these two sites. Impacts to cultural resources in the restricted area also are not expected. Although there are archaeological resources in some locations surrounding the target impact area, the selection of limited target locations to avoid areas of environmental sensitivity would reduce the potential that these resources would fall within the weapons safety footprint of a given target. Compliance with Section 106 of the NHPA is underway through contact with



the New Mexico Office of Cultural Affairs (refer to Appendix A). The Air Force also has initiated contact with the Apache, Comanche, and Kiowa tribes to identify any potential concerns associated with this action.

#### **4.7.1.3 Alternative B: No Action**

Under the No Action Alternative, WP rockets would not be authorized for use on Melrose AFR and range use would continue as it exists today. Impacts to cultural resources are not expected under this alternative. Resources would continue to be managed in compliance with federal law and Air Force regulation.

### **4.8 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE**

Demographics, employment, race, ethnicity, poverty status, and age characteristics of populations in the New Mexico counties associated with the region surrounding Melrose AFR were analyzed to assess the potential for socioeconomic or environmental justice impacts. Areas containing relatively high environmental justice-related populations were given special consideration to address any potential for disproportionately high or adverse human health or environmental effects on these communities.

Hispanic and Latino persons represent the largest minority group in the ROI, but they account for a smaller proportion of the ROI population than for the State of New Mexico as a whole. The youth population in the ROI is similar, in proportion, to the state level and is concentrated in the urban areas of Clovis and Portales, rather than in the vicinity of the range. No Native American communities are located within the vicinity of Melrose AFR. Potential impacts to traditional resources are discussed in section 4.7, Cultural Resources.

#### **4.8.1 Environmental Consequences**

##### **4.8.1.1 PROPOSED ACTION**

The Proposed Action does not involve any changes that would affect the socioeconomic resources of the ROI, such as personnel changes or changes in sorties or airspace configuration. Consequently, no socioeconomic impacts are anticipated as a result of implementing the Proposed Action. Due to the sparse population in the region surrounding the range and the improbability of a human encounter with white phosphorus, the potential for disproportionately high and adverse human health or environmental effects on minority, low-income or youth populations is considered unlikely. Human health and safety issues associated with the Proposed Action and alternatives are addressed in sections 3.2 and 4.2, Safety, and sections 3.6 and 4.6, Biological Resources.

##### **4.8.1.2 ALTERNATIVE A: LIMITED TARGETS**

This alternative does not involve any changes that would affect the socioeconomic resources of the ROI. There are no proposed personnel changes, no change in sorties, or airspace reconfiguration. Consequently, no socioeconomic impacts are anticipated as a result of implementing this alternative. No environmental justice impacts are expected. Due to the sparse population in the region surrounding the range and the improbability of a human



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encounter with white phosphorus, the potential for disproportionately high and adverse human health or environmental effects on minority, low-income, or youth populations is considered unlikely.

#### **4.8.1.3 ALTERNATIVE B: NO ACTION**

Under the No Action Alternative, activities at Melrose AFR would remain unchanged from current conditions. Consequently, no socioeconomic or environmental justice impacts are expected.



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## **5.0 RELATIONSHIP BETWEEN SHORT-TERM USES AND LONG-TERM PRODUCTIVITY**

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Pursuant to NEPA CEQ regulations (40 CFR Section 1502.16), an EIS must consider "...the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity." Special attention should be given to impacts that narrow the range of beneficial uses of the environment in the long-term or pose a long-term risk to human health or safety. This section evaluates short-term benefits of the proposed alternatives compared to long-term productivity derived from not pursuing the proposed alternatives.

Due to the nature of the proposal, neither Proposed Action nor Alternative A is projected to impact airspace uses, range management, socioeconomic, or environmental justice. Munitions materials usage, management, and disposal, minor modifications to Building 2129, and transportation and logistics support will not affect land productivity. Air emissions are also short term and will not affect long-term productivity in the regional air shed. Fire and explosive impacts to safety, biological resources, air quality, soil and water chemistry, and biological resources are either negligible or short term and temporary with the ability of short-term recovery and, therefore, will not hinder long-term productivity of the land.

With respect to cultural resources, long-term preservation of the 19 archaeological resources located outside the identified targets could be impacted through direct or indirect damage from training with WP rockets. Artifacts or features could corrode as a result of contact with phosphoric acid or other chemicals from the WP rockets. These resources could also suffer long-term consequences from range fires, fire suppression actions, or impacts from EOD actions due to WP rocket use. The Air Force will continue to consult with the SHPO on ways to avoid, reduce, or mitigate any potential adverse effects.

Although deposits of elemental white phosphorus could persist in stock ponds for the long term, the probability that a rocket will land outside the target area is less than one percent. The probability that residual white phosphorus would land in or near a stock pond is even lower as is the probability that the white phosphorus will contaminate the environment in elemental form. Since the probability of elemental phosphorus persistent in stock ponds at a destructive level is so low, it is unlikely there will be any impacts on long-term use or productivity of the ponds or surrounding vegetation and wildlife.



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## **6.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

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NEPA CEQ regulations require environmental analysis to identify "...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented" (40 CFR Section 1502.16). CEQ guidelines describe primary irreversible and irretrievable resource commitments as uses of nonrenewable resources throughout a project that may be irreversible if removal of the resources occurs and cannot be replaced within a reasonable time frame (e.g., extinction of a threatened or endangered species) or if obstruction of the use of resources occurs after the project (e.g., building over a cultural site).

Secondary impact can result from environmental accidents or developments associated with a project such as explosive fires or highway improvements that provide access to previously inaccessible areas (CEQ Guidelines 15126(e)).

For the Proposed Action or Alternative A, any potential environmental consequences are short term and temporary, or longer lasting, but negligible.

Training operations would continue and involve consumption of nonrenewable resources, such as gasoline used in vehicles, and jet fuel used in aircraft. Use of WP rockets and other ordnance would involve commitment of white phosphorus and other chemicals. Through range training, approximately 390 to 1,100 pounds of white phosphorus could be combusted each year. None of these activities would be expected to significantly decrease the availability of minerals or petroleum resources.

Personal vehicle use by the personnel continuing to support the existing missions would consume fuel, oil, and lubricants. The Proposed Action would not increase their use and their current use is not expected to significantly affect the availability of the resources.

The possible irreversible commitment of resources that could occur would be if either of the two archaeological sites recommended for the NRHP, which are located within the impact area but outside the identified targets, were irreversibly impacted through direct or indirect damage from WP rockets. The Air Force will continue to consult with the SHPO on ways to avoid, reduce, or mitigate any potential adverse effects.



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## **7.0 CUMULATIVE EFFECTS**

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CEQ regulations (40 CFR Section 1508.7) stipulate that the cumulative effects analysis within an EA should consider the potential environmental impacts resulting from “the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions,” commonly referred to as “cumulative effects.” This section provides (1) the definition of cumulative effects, (2) a description of past, present, and reasonably foreseeable actions relevant to cumulative effects, (3) an assessment of the nature of interaction of the Proposed Action and alternatives with other actions, and (4) an evaluation of cumulative effects potentially resulting from these interactions.

### **7.1 DEFINITION OF CUMULATIVE EFFECTS**

The first step in assessing cumulative effects involves defining the scope of other actions and their interrelationship with the Proposed Action and alternatives (1997 CEQ guidance, *Considering Cumulative Effects*). The cumulative effects analysis should evaluate the interaction of multiple actions. Cumulative effects most likely arise when a relationship or synergism exists between a proposed action and alternatives and other actions occurring in close proximity or during a similar time period.

This EA analysis addresses three questions to identify cumulative effects:

1. Is there a potential that the Proposed Action will interact with elements of past, present, or reasonably foreseeable actions?
2. If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?
3. If such a relationship exists and there are potentially significant impacts that are not identified when the Proposed Action is considered alone, what are those impacts.

The cumulative effects analysis incorporates details from others actions that have a potential to interact with the Proposed Action. Incorporation of these details provides decisionmakers with adequate information to address incremental and cumulative environmental consequences.

### **7.2 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS**

This EA provides decisionmakers with not only the cumulative effects of the Proposed Action but also the incremental contribution of past, present, and reasonably foreseeable actions.

#### **7.2.1 Past Actions Relevant to the Proposed Action and Alternatives**

Cannon AFB is an active military installation that undergoes continuous change in mission and in training requirements. This process of change is consistent with the United States defense policy that must be ready to respond to threats to American interests throughout the world.

In 1985, Melrose AFR expanded resulting in no significant impacts to land use, vegetation, wildlife, soil, or the surrounding population (Air Force 1985). Cannon AFB was then realigned



by the Air Force in 1990 and F/EF-111 was based at Cannon AFB in 1992 (Air Force 1990, Air Force 1992a). Two EISs and Records of Decision were issued for these realignment actions. Cannon AFB constructed the East Range Target array and access roads from the impact areas to the outer perimeter firebreaks in the range expansion area to meet the needs of F-111F. The East Range Target array was composed of bunkers, a parking lot, water tower, railroad yard (tracks, train, bridge, and yard tower), and six tank revetments (Air Force 1992b, Air Force 1992c).

In 1995 and 1998, force structure changes occurred at Cannon AFB replacing the F-111 aircraft with F-16 aircraft (Air Force 1995), and the existing F-16 Block 40 aircraft with F-16 Block 30 aircraft and establishing a combined U.S./Singapore Air Force squadron at Cannon AFB (Air Force 1998). The correlating EAs for both force structure changes found no significant impacts to resources at Melrose AFR from the action. In 2000, a force structure change EA evaluated retaining some F-16 Block 40 aircraft as opposed to converting to all Block 30 aircraft. A FONSI was approved in March 2000. In 2001 the Air Force provided Cannon AFB F-16 pilots the capability to train with chaff and flares within portions of Cannon AFB managed airspace (Air Force 2001a). No significant impacts were found in either the airspace or at Melrose AFR.

A block change was evaluated in 2002 wherein 18 older Block 30 aircraft would be replaced with 18 newer Block 50 aircraft. This action received a categorical exclusion in July 2002. As with the above-described actions, this block change did not result in any demonstrable changes to Melrose AFR.

## **7.2.2 Present Actions Relevant to the Proposed Action and Alternatives**

Cannon AFB, like any other major institution, has continued new construction, facility improvements, and infrastructure upgrades. Currently, Cannon AFB is proposing to privatize on-base military family housing. This would involve conveying a number of housing units to a private contractor. The contractor would conduct renovation, demolition, and construction, over a 7-year period. The demolition/construction would be conducted in phases in order to keep as many units as possible filled during the project. An Environmental Baseline Survey is in the process of being completed and an EA is currently being prepared.

## **7.2.3 Reasonably Foreseeable Actions that Interact with the Proposed Action and Alternatives**

This category includes State and Federal management agencies whose actions have a potential to coincide, either partially in time or geographic extent, with the Proposed Action. Information on these actions is included to determine whether these actions would, if implemented, incrementally affect environmental resources in the project's region of influence. The Air Force is the primary agency undertaking a project action that affects Melrose AFR.

A proposal known as the New Mexico Training Range Initiative (NMTRI) is under early development to enhance the combat capability for the F-16s of the 27 FW. Consideration is being given to modifying existing or creating new airspace and to proposing authorization of supersonic operations in some pieces of airspace to maximize training efficiency and opportunities. Once a formal proposal is finalized, the action will be environmentally assessed to determine the potential environmental impacts.



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## 7.3 ANALYSIS OF CUMULATIVE IMPACTS

The following analysis examines how the impacts of the actions presented above might be affected by those resulting from the Proposed Action, whether such a relationship would result in potentially significant impacts not identified when the Proposed Action or alternatives are considered together, and identifies what those impacts might be.

This analysis of Chapter 4.0, Environmental Consequences, considers the cumulative effects of the Proposed Action, Alternative A, or Alternative B—the No Action Alternative. Chapter 4 described the effects of Alternative A to be almost nearly the same as the Proposed Action (with the potential for slightly less consequences to water resources). Alternative B, the No Action Alternative, represents status quo conditions and would not represent any change from the current conditions.

Cannon AFB and Melrose AFR are active military resources that undergo changes in mission and in training requirements in response to defense policies, current threats, and tactical and technological advances. The base and the range, like any other major institution (e.g., university, industrial complex), require new training components, construction, facility improvements, infrastructure upgrades, and maintenance and repairs. All of these factors (i.e., mission changes, training updates, housing reconstruction, and facility improvements) will continue to occur before, during, and after the Proposed Action if it is selected.

In 2001, the expansion of F-16 pilot training to include chaff and flares was evaluated in a separate EA and no significant impacts were identified. When the 2001 action is considered in conjunction with the Proposed Action no significant impacts are anticipated. Chaff and flares residual materials are inert and have extremely low probability of landing near WP rockets. If these materials were to come in contact with one another, the flares will have extinguished before coming into contact with the WP rockets and the materials will be spent and will not react with the rockets. Neither chaff nor burned-out flares would react with the rockets.

Since NMTRI is not a formal proposal, there is no reliable predictability between it and the use of WP rockets at Melrose AFR. Generally, any changes from the NMTRI final proposal to airspace or training profiles would serve to complement the Range's overall utility. Any NMTRI proposed action or alternatives would be analyzed in a separate environmental document. NMTRI preliminary discussions suggest that this action would not incrementally affect environmental resources on Melrose AFR.

Base actions described in section 7.2 for 1990, 1992, 1995, 1998, 2000, 2002, and the currently proposed privatization of military housing affect very specific areas on base or replace existing aircraft. Likewise, the elements being considered in the NMTRI proposal may affect airspace units in the vicinity of Melrose AFR, but not directly on the range.

The proposed use of WP rockets would not affect Cannon AFB and would not impact aircraft or adjacent airspace use. The combined effects of all actions, to the degree currently known and assessed, would remain insignificant for most resource categories. None of these on-base and range actions would be expected to result in more than negligible impacts individually or cumulatively when combined with the proposal to utilize WP rockets.



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**APPENDIX A**  
**PUBLIC AND AGENCY COORDINATION**

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### Distribution List for Final EA

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Bureau of Indian Affairs, Intermountain Region, Regional Director, P.O. Box 26567, Albuquerque, NM 87125  
Bureau of Reclamation, Regional Director, P.O. Box 36900, Billings, MT 59107  
Clovis-Carver Public Library, 701 N. Main St., Clovis, NM 88101-6658  
Clovis Community College Library, 417 Schepps Blvd., Clovis, NM 88101-8345  
Comanche Nation, Johnny Wauqua, Chairman, P.O. Box 908, Lawton, OK 73502  
Eastern New Mexico University, Golden Library, ENMU, Station 32, Portales, NM 88130  
Federal Aviation Administration, Mr. Dave Wingert, 8000 Louisiana Blvd. NE, Albuquerque, NM 87109  
Federal Aviation Administration Southwest Region, Mr. Clyde Dehart, ASW-900/AF Representative, Fort Worth, TX 76193-0001  
Federal Aviation Administration Southwest Region, Ruth Leverenz, Director, 2601 Meacham Boulevard, Fort Worth, TX 76137-4298  
Fort Sumner Public Library, 220 Sumner Avenue, Fort Sumner, NM 88119  
Kiowa Tribe, Billy Evans Horse, Chairman, P.O. Box 369, Carnegie, OK 73015  
National Park Service, Christine Turk, Environmental Program Leader, P.O. Box 25287, Denver, CO 80225-0287  
Natural Resources Conservation Service, 6200 Jefferson N.E., Albuquerque, NM 87109-3734  
New Mexico Aviation Division, Mike Rice, Aviation Director, 1550 Pacheco, Santa Fe, NM 87505-1149  
New Mexico Department of Agriculture, Mr. Frank DuBois, Box 30005, Dept 3189, Las Cruces, NM 88003  
New Mexico Department of Game and Fish, Lisa Kirkpatrick, Chief, P.O. Box 25112, Santa Fe, NM 87507  
New Mexico Department of Parks and Recreation, Mr. David Skazik, P.O. Box 1147, Santa Fe, NM 87501  
New Mexico Energy, Minerals and Natural Resources Department, 1220 S. St. Francis Dr., Santa Fe, NM 87505  
New Mexico Environment Department, Mr. Ron Curry, Cabinet Secretary, Harold Runnels Building, 1190 St. Francis Dr., Santa Fe, NM 87505-4182  
New Mexico Office of Cultural Affairs, Historic Preservation Division, Ms. Jan Biella, 228 E. Palace Ave., Santa Fe, NM 87501  
New Mexico State Heritage Program, UNM Biology Department, Kristine Johnson PhD, Director, MSC03 2020, 1 U of NM, Albuquerque, NM 87131  
New Mexico State Land Office, Mr. Patrick Lyons, Commissioner of Public Lands, P.O. Box 1148, Santa Fe, NM 87504  
Portales Public Library, 218 S. Avenue B, Portales, NM 88130  
U.S. Department of Agriculture, Forest Service, Harv Forsgren, Regional Forester, 333 Broadway SE, Albuquerque, NM 87102  
U.S. Department of the Interior, Bureau of Land Management, Mr. Richard Whitely, Deputy State Director, P.O. Box 27115, Santa Fe, NM 87502  
U.S. Department of the Interior, Bureau of Land Management, 2909 W. Second St., Roswell, NM 88201  
U.S. Department of the Interior, National Park Service, Nancy Skinner, Chief, P.O. Box 728, Santa Fe, NM 87504

U.S. Department of the Interior, Office of the Secretary, Office of Environmental Policy and Compliance, Mr. Glenn Sekavec, P.O. Box 649, Albuquerque, NM 87103

U.S. Department of the Interior, U.S. Fish and Wildlife Service, Ms. Joy Nicolopolus, 2105 Osuna NE, Albuquerque, NM 87113

U.S. Department of the Interior, U.S. Fish and Wildlife Service, Field Supervisor, 2105 Osuna NE, Albuquerque, NM 87113

U.S. Department of the Interior, U.S. Fish and Wildlife Service, Regional Director (ES), P.O. Box 1306, Albuquerque, NM 87103

Jeff Ashley, Floyd, NM 88118-9601

Commissioner Tim Ashley, 700 N. Main Street, Suite 10, County Courthouse, Clovis, NM 88101-6664

Carolyn Beverage, Elida, NM 88116

The Office of Senator Jeff Bingaman, Suite 101, 119 East Marcy, Santa Fe, NM 87501

Commissioner Thomas Clark, 101 West First, County Courthouse, Portales, NM 88130

Commissioner Gene Creighton, 101 West First, County Courthouse, Portales, NM 88130

Bill Crenshaw, Taiban, NM 88132

Honorable Anna Crook, State Representative District 64, 1041 Fairway Terrace, Clovis, NM 88101

Commissioner Charles Davis, 101 West First, County Courthouse, Portales, NM 88130

Thomas Davis, Portales, NM 88130

The Office of Senator Pete Domenici, 140 Federal Building, Roswell, NM 88201

El Bigote Cattle Co., LLC, Fort Sumner, NM 88119-0058

M.S. Gresham, Portales, NM 88130

Commissioner Paul Grider, 101 West First, County Courthouse, Portales, NM 88130

Paul Grider, Melrose, NM 88124

Russell Grider, Clovis, NM 88124

Jim Grizzle, Clovis, NM 88101

Commissioner Pete Hulder, 700 N. Main Street, Suite 10, County Courthouse, Clovis, NM 88101-6664

The Honorable Stuart Ingle, District 27, 2106 West University Drive, Portales, NM 88130

The Honorable David Lansford, City of Clovis, P.O. Box 760, Clovis, NM 88101

The Honorable Raymond Lopez, Village of Ft. Sumner, P.O. Box 180, Ft. Sumner, NM 88119

D.W. Luce, Melrose, NM 88124

The Honorable Orlando Ortega, Jr., City of Portales, 2011 W. Boxwood, Portales, NM 88130

Alan or Alva Parker, Portales, NM 88130

Commissioner Edwin Perales, Curry County, 700 N. Main Street, Suite 10, County Courthouse, Clovis, NM 88101-6664

The Office of Governor Bill Richardson, State of New Mexico, Office of the Governor, State Capital Building, Santa Fe, NM 87503

Clinton Rogers, Floyd, NM 88118

Kenneth Simons, Greenville, TX 75403

Commissioner Albin Smith, 700 N. Main Street, Suite 10, County Courthouse, Clovis, NM 88101-6664

Commissioner Kathryn Tate, 700 N. Main Street, Suite 10, County Courthouse, Clovis, NM 88101-6664

The Office of Representative Tom Udall, Clovis City Hall, 321 North Connelly, Clovis, NM 88101

The Honorable Mario Urioste, District 63, 2105 E. Brady, Clovis, NM 88101

**Sample Interagency and Intergovernmental Coordination for  
Environmental Planning (IICEP) Letters**



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

16 JAN 2003

MEMORANDUM FOR U.S. Department of the Interior  
Bureau of Land Management  
Mr. Richard Whitely, Deputy State Director  
P.O. Box 27115  
Santa Fe NM 87502

FROM: HQ ACC/CEVP  
129 Andrews St., Suite 102  
Langley AFB VA 23665-2769

SUBJECT: Use of White Phosphorous Rockets at Melrose Air Force Range

1. The United States Air Force (Air Force) is in the process of preparing an Environmental Assessment (EA) to analyze the potential environmental impacts of a proposal to use white phosphorous rockets on Melrose Air Force Range (AFR), New Mexico. This proposal is intended to support the Combat Search and Rescue (CSAR) mission of Cannon AFB, maintain qualified CSAR pilots and support the joint training with Army and Special Operations Forces.
2. The proposed action would use the existing Melrose AFR and associated restricted airspace. A change in airspace or airspace use is not anticipated for this project. The attachment provides a general overview of the project area.
3. In an effort to analyze the potential impacts of this proposed action, the Air Force or its contractors may contact you in their data collection efforts. In advance, we thank you for your assistance in this activity. If you have any specific information or questions about the white phosphorous rocket proposal, we would like to hear from you. Please contact Capt Jeff Sandrock at Cannon AFB Public Affairs, 505/784-4131. We anticipate a draft EA will be made available for public and agency comment in May 03.

*Alton Chavis*

ALTON CHAVIS  
Chief, Environmental Analysis Branch

Atch  
Map of Affected Area



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

MEMORANDUM FOR New Mexico Office of Cultural Affairs  
Historic Preservation Division  
228 E. Palace Ave.  
Santa Fe NM 87501  
Att: Jan Biella, Interim Director

16 JAN 2003

FROM: HQ ACC/CEVP  
129 Andrews St., Suite 102  
Langley AFB, VA 23665-2969

SUBJECT: Use of White Phosphorous Rockets Melrose Air Force Range

1. The United States Air Force (Air Force) is in the process of preparing an Environmental Assessment (EA) to analyze the potential environmental impacts of a proposal to use white phosphorus rockets on Melrose Air Force Range (AFR), New Mexico. The purpose of this correspondence is to initiate the Section 106 process of the National Historic Preservation Act (NHPA) in the potentially affected area of eastern New Mexico. Attachment 1 provides a general overview of the project area.
2. We will use information collected for the EA to identify historic properties and consider effects to them, if any. This information will be coordinated with your office according to the steps outlined in 36 CFR 800.3 through 36 CFR 800.7.
3. This proposal is intended to support the Combat Search and Rescue mission of Cannon AFB, maintain qualified CSAR pilots, permit key night vision device training with Infrared capability, and to support the joint training with Army and Special Operations Forces. The proposed action would use the existing Melrose AFR and associated restricted airspace. A change in airspace or airspace use is not required for this project.
4. We are beginning the process of identifying applicable cultural resources information for areas on the range and under the restricted airspace (R-5104 and R-5105). We would appreciate any assistance you could provide in identifying this important information, as well as any concerns you may have about the potential effects of the proposal on significant cultural resources. Further, we would appreciate your identifying a point of contact for any follow-up questions we may have concerning the data you provide.
5. Please send this information to our representative at: Science Applications International Corporation (SAIC), WP Rocket Use EA, 405 South 8<sup>th</sup> St. Suite 301, Boise, Idaho, 83702, Attn: Ms. Claudia Druss, Senior Archaeologist. We anticipate a draft EA will be available for public and agency review in May 03.

*Alton Chavis*

ALTON CHAVIS  
Chief, Environmental Analysis Branch

Attachment:  
Map of Affected Areas



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

16 JAN 2003

MEMORANDUM FOR U.S. Department of the Interior  
U.S. Fish and Wildlife Service  
2105 Osuna NE  
Albuquerque NM 87113  
Att: Ms. Joy Nicolopolus

FROM: HQ ACC/CEVP  
129 Andrews Street, Suite 102  
Langley AFB VA 23665-2769

SUBJECT: White Phosphorous Rocket Use for Cannon Air Force Base (AFB), New Mexico

1. The United States Air Force (Air Force) is in the process of preparing an Environmental Assessment (EA) to analyze the potential environmental impacts of a proposal to use white phosphorous rockets on Melrose Air Force Range (AFR), New Mexico. This proposal is intended to support the Combat Search and Rescue (CSAR) Mission of Cannon AFB, maintain qualified CSAR pilots, and support the joint training with Army and Special Operations Forces.
2. The proposed action would use the existing Melrose AFR and associated restricted airspace in Curry and Roosevelt Counties. A change in airspace or airspace use is not anticipated for this project. The attachment provides a map of the project area.
3. The EA will analyze the potential effects of this proposed action on environmental resources. Pursuant to the Endangered Species Act and the National Environmental Policy Act, we are requesting information regarding federally listed or proposed species that may be present in the potentially affected area. If any of this information is available digitally, we would appreciate receiving it in that format. Further, we would appreciate your identifying a point of contact for any follow-up questions we may have concerning the data you provide.
4. Please send this information to our representative at: Science Applications International Corporation (SAIC), WP Rocket Use EA, 405 South 8<sup>th</sup> St. Suite 301, Boise, Idaho, 83702. Attn: Michele Fikel, Project Manager. If you have any questions about the proposal, please contact Capt Jeff Sandrock at Cannon AFB Public Affairs, 505/784-4131. We anticipate a draft EA will be available for public and agency review in May 03.

*Alton Chavis*  
ALTON CHAVIS  
Chief, Environmental Analysis Branch

Atch  
Map of Affected Area



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

16 JAN 2003

HQ ACC/CC  
129 Andrews Street, Suite 102  
Langley AFB VA 23665-2769

The Honorable David Lansford  
City of Clovis  
P.O. Box 760  
Clovis NM 88101

Dear Mayor Lansford

The United States Air Force (Air Force) is preparing an Environmental Assessment (EA) to analyze the potential environmental impacts of a proposal to use white phosphorous rockets on the Melrose Air Force Range (AFR), New Mexico. This proposal is intended to support the Combat Search and Rescue (CSAR) mission at Cannon AFB, and support joint training with Army and Special Operations Forces.

The proposed action would use the existing Melrose AFR and associated restricted airspace. A change in airspace or airspace use is not anticipated for this project. The attachment provides a general overview of the project area.

We thank you, in advance, for your consideration on this proposal and request comments or information be forwarded to Capt. Jeff Sandrock, Public Affairs, 27 FW/PA, 100 D. L. Ingram Boulevard, Suite 204, Cannon AFB NM 88103. Capt. Sandrock may also be reached at (505) 784-4131 should you desire to contact him directly. We anticipate a draft EA will be made available for public and agency comment in May 03.

*Alton Chavis*  
ALTON CHAVIS  
Chief, Environmental Analysis Branch

Attachment  
Map of Affected Area



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

16 JAN 2003

Apache Tribe of Oklahoma  
Henry Kostzuta, Chairman  
P.O. Box 1220  
Andarko, OK 73005

Dear Mr. Kostzuta:

The United States Air Force (Air Force) is in the process of preparing an Environmental Assessment (EA) to analyze the potential environmental impacts of a proposal to use white phosphorus rockets on Melrose Air Force Range (AFR), New Mexico. This proposal is intended to support the Combat Search and Rescue (CSAR) mission of Cannon AFB, maintain qualified CSAR pilots and support the joint training with Army and Special Operations Forces.

The proposed action would use the existing Melrose AFR and associated restricted airspace. A change in airspace or airspace use is not anticipated for this project. The attachment provides a general overview of the project area.

We thank you, in advance for your consideration on this proposal and request comments or information be forwarded to Capt Jeff Sandrock, Public Affairs, 27 FW/PA, 100 D.L. Ingram Boulevard, Suite 204 Cannon AFB NM 88103. Capt. Sandrock may also be reached at (505) 784-4131 should you desire to contact him directly. We anticipate a draft EA will be made available for public and agency comment in May 03.

Sincerely,

A handwritten signature in cursive script that reads "Alton Chavis".

ALTON CHAVIS  
Chief, Environmental Analysis Branch

Atch:  
Map of Affected Area



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

16 JAN 2003

Kiowa Tribe  
Billy Evans Horse, Chairman  
P.O. Box 369  
Carnegie, OK 73015

Dear Mr. Horse:

The United States Air Force (Air Force) is in the process of preparing an Environmental Assessment (EA) to analyze the potential environmental impacts of a proposal to use white phosphorus rockets on Melrose Air Force Range (AFR), New Mexico. This proposal is intended to support the Combat Search and Rescue (CSAR) mission of Cannon AFB, maintain qualified CSAR pilots and support the joint training with Army and Special Operations Forces.

The proposed action would use the existing Melrose AFR and associated restricted airspace. A change in airspace or airspace use is not anticipated for this project. The attachment provides a general overview of the project area.

We thank you, in advance for your consideration on this proposal and request comments or information be forwarded to Capt Jeff Sandroek, Public Affairs, 27 FW/PA, 100 D.L. Ingram Boulevard, Suite 204 Cannon AFB NM 88103. Capt. Sandroek may also be reached at (505) 784-4131 should you desire to contact him directly. We anticipate a draft EA will be made available for public and agency comment in May 03.

Sincerely,

*Alton Chavis*  
ALTON CHAVIS  
Chief, Environmental Analysis Branch

Atch:  
Map of Affected Area



DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

16 JAN 2003

Comanche Nation  
Johnny Wauqua, Chairman  
P.O. Box 908  
Lawton, OK 73502

Dear Mr. Wauqua:

The United States Air Force (Air Force) is in the process of preparing an Environmental Assessment (EA) to analyze the potential environmental impacts of a proposal to use white phosphorus rockets on Melrose Air Force Range (AFR), New Mexico. This proposal is intended to support the Combat Search and Rescue (CSAR) mission of Cannon AFB, maintain qualified CSAR pilots and support the joint training with Army and Special Operations Forces.

The proposed action would use the existing Melrose AFR and associated restricted airspace. A change in airspace or airspace use is not anticipated for this project. The attachment provides a general overview of the project area.

We thank you, in advance for your consideration on this proposal and request comments or information be forwarded to Capt Jeff Sandrock, Public Affairs, 27 FW/PA, 100 D.L. Ingram Boulevard, Suite 204 Cannon AFB NM 88103. Capt. Sandrock may also be reached at (505) 784-4131 should you desire to contact him directly. We anticipate a draft EA will be made available for public and agency comment in May 03.

Sincerely,

*Alton Chavis*  
ALTON CHAVIS  
Chief, Environmental Analysis Branch

Atch:

Map of Affected Area

*Global Power For America*

## **Agency Responses**



BILL RICHARDSON  
GOVERNOR

STATE OF NEW MEXICO  
**OFFICE OF CULTURAL AFFAIRS**  
**HISTORIC PRESERVATION DIVISION**

LA VILLA RIVERA BUILDING  
228 EAST PALACE AVENUE  
SANTA FE, NEW MEXICO 87501  
(505) 827-6320

February 4, 2003

Ms. Claudia Druss  
Senior Archaeologist  
Science Applications International Corp.  
WP Rocket Use EA  
405 South 8<sup>th</sup> St, Suite 301  
Boise, ID 83702

Re: *Use of White Phosphorous Rockets - Melrose Air Force Range. Curry, Quay and Roosevelt, Counties, New Mexico.*

Dear Ms. Druss:

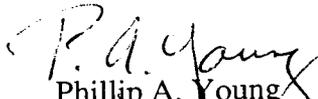
Thank you for bringing the above referenced project to our attention. We received your memorandum on 31 January 2003, informing us that you are in the process of collecting information for the preparation of an Environmental Assessment (EA).

The Historic Preservation Division will assist you with Section 106 reviews, under the National Historic Preservation Act, that can be used for your cultural resource evaluations in an EA. Since you are in the identification of resources stage of this project we are enclosing a list of sites on the National Register of Historic Places or the New Mexico State Register Cultural Properties within the three counties shown on the map you provided (R-5104 and R-5105).

To assist you with the identification of archaeological resources within the Area of Potential Effect (APE), we are enclosing an agreement for the use of the Archaeological Records Management Section (ARMS), if you do not already have one in place. ARMS can provide secure statewide archaeological research information on-line. We recommend that you contact the ARMS Manager, Tim Seaman, at 505-476-1277 regarding the use of their services for the identification, location and type of known archaeological resources within the proposed APE.

If you have any further questions regarding our eligibility determinations or our comments, please contact James Hare at (505) 827-7411, or Phil Young at (505) 827-6314.

Sincerely,

  
Phillip A. Young  
Staff Archaeologist

  
James K. Hare  
Architectural Historian

Enclosures

Cc: Alton Chavis, Dept. of the Air Force, HQ ACC/CEVP, 129 Andrews St., Suite 102,  
Langley AFB, VA 23665-2969

Log # 66991

ARMS User Agreement

Year: \_\_\_\_\_

Institution: \_\_\_\_\_

Contact: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_

Phone/Fax/EMail: \_\_\_\_\_

Application Status (complete part A or part B):

A.  Institutional application (check all that apply):

- This institution holds a federal or State permit for performing archeological work within New Mexico.
- This institution is involved with the protection and preservation of cultural resources.
- This institution is involved in academic research.

B.  Individual application (check all that apply):

- I have a degree in archeology, anthropology, history, or a closely related field, or city planning or equivalent training, from an accredited educational institution.
- I am a bona fide representative of an agency or institution or private entity which holds a federal or State permit for performing archeological work within New Mexico.
- I am a bona fide representative of an agency or institution or private entity involved with the protection and preservation of cultural resources.
- I am an academic researcher affiliated with an accredited educational or research institution.

As a representative of the undersigned institution, I do hereby request access to the State of New Mexico archeological records repository (ARMS), as required by State Regulation 4 NMAC 51.3.2.10.1. I understand that information contained in these records is confidential. In consideration of access to this information, I agree to:

- supply one (1) copy of any research publication resulting from the use of these records to ARMS;
- credit ARMS in the body of any publication resulting from the use of these records;
- supply a list of employees authorized to use ARMS each year, and report any changes in this list within 30 days;
- report any change in address or status to ARMS within 30 days.
- use the information only in compliance with applicable state and federal laws and regulations, including the New Mexico Cultural Properties Act of 1978 [NMSA 1978, §§18-6-1 to 18-6-17 (Repl. Pamp. 1987 & Cum. Supp. 1990)], Federal Regulation 36-CFR-800, and the Archeological Resources Protection Act of 1979 [16 U.S.C. §470aa et. seq.].

I understand that the misuse of such information will be subject to prosecution under these laws and regulations. This agreement is considered by both parties to be a binding contract.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
user (if applicable)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
institutional approval (if applicable)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
ARMS approval

## *NM State and National Register Properties by County*

<i>County</i>	<i>Name Of Property</i> <i>City</i>	<i>Address</i>	<i>SR #</i>	<i>SR Date of Listing</i>	<i>NR Date of Listing</i>
Curry	<b>Santa Fe Passenger Depot, Clovis</b> Clovis	221 W. First St.	1614	8/18/1995	2/14/1995
Curry	<b>Dillon, Dr. Fred A., House</b> Clovis	1400 Axtell St.	1488	7/8/1988	
Curry	<b>Clovis Central Fire Station</b> Clovis	320 Mitchell St.	1381	5/15/1987	7/2/1987
Curry	<b>Clovis City Hall and Fire Station, 1908</b> Clovis	308 Pile St.	1380	5/15/1987	7/16/1987
Curry	<b>First Methodist Church of Clovis</b> Clovis	622 Main St.	1379	5/15/1987	7/2/1987
Curry	<b>Curry County Courthouse</b> Clovis	700 Block, Main St.	1274	5/9/1986	6/18/1987
Curry	<b>Hotel Clovis</b> Clovis	210 Main St.	1109	0/17/1984	2/27/1984
Curry	<b>Clovis Post Office (Old)</b> Clovis	Fourth & Mitchell St.	1108	0/17/1984	2/27/1984
Curry	<b>Clovis Baptist Hospital</b> Clovis	515 Prince St.	837	0/23/1981	2/5/1982
Curry	<b>Atchison, Topeka &amp; Santa Fe Railway Depot</b> Texico	Highway 70	727	8/24/1979	
Curry	<b>Railway Express Agency Building (Clovis) (REMOVED SR)</b> Clovis	Connelly St.	421	1/22/1975	

<i>County</i>	<i>Name Of Property</i>	<i>SR #</i>	<i>SR Date of Listing</i>	<i>NR Date of Listing</i>
	<i>City</i> <i>Address</i>			
Quay	<b>Arch Hurley Conservancy District Office Building</b> Tucumcari                      101 E. High St.	1599		2/16/1994
Quay	<b>Metropolitan Park Bathhouse and Pool Hist. Dist.</b> Tucumcari                      S. Frontage Road, I-40	1618	1/26/1996	3/15/1996
Quay	<b>State maint. Route 66, San Jon to Tucumcari</b> San Jon                      I-40	1675	5/9/1997	1/19/1997
Quay	<b>Montgomery House</b> Tucumcari                      401 South First St.	1692	7/18/1997	
Quay	<b>State maint. Route 66, Montoya to Cuervo</b> Cuervo                      I-40	1676	5/9/1997	1/19/1997
Quay	<b>Quay County Courthouse</b> Tucumcari                      Third St.	1280	5/9/1986	

## *NM State and National Register Properties by County*

<i>County</i>	<i>Name Of Property</i> <i>City</i>	<i>Address</i>	<i>SR #</i>	<i>SR Date of Listing</i>	<i>NR Date of Listing</i>
<b>Roosevelt</b>	<b>Portales Woman's Club</b> Portales	309 W. First St.	1503	5/12/1989	
<b>Roosevelt</b>	<b>Administration Building (ENMU)</b> Portales	University Place, ENMU	1468	7/8/1988	9/22/1988
<b>Roosevelt</b>	<b>Roosevelt County Courthouse</b> Portales	100 W. Second St.	1278	5/9/1986	
<b>Roosevelt</b>	<b>Bank of Portales</b> Portales	123 Main St.	1111	0/17/1984	2/27/1984
<b>Roosevelt</b>	<b>Portales Main Post Office</b> Portales	116 W. First St.	106		2/23/1990
<b>Roosevelt</b>	<b>Anderson Basin NHL</b> Portales		2	2/20/1968	0/15/1966

## *NM State and National Register Properties by County*

<i>County</i>	<i>Name Of Property</i>	<i>Address</i>	<i>SR #</i>	<i>SR Date of Listing</i>	<i>NR Date of Listing</i>
<b>Quay</b>	<b>Blue Swallow Motel</b>		1575	9/17/1993	1/22/1993
	Tucumcari	815 E. Tucumcari Blvd.			
<b>Quay</b>	<b>San Jon Site</b>		145	1/9/1970	
	San Jon	State Road 39			
<b>Quay</b>	<b>Baca-Goodman House (REMOVED SR &amp; NR)</b>		268	2/21/1973	8/14/1973
	Tucumcari	Aber & Third St.			
<b>Quay</b>	<b>McFarland Brothers Bank</b>		481	12/3/1976	
	Logan	Corner First & Martinez St.			
<b>Quay</b>	<b>Shollenbarger Merchantile Company Building</b>		483	12/3/1976	
	Logan	Main St.			
<b>Quay</b>	<b>Richardson's Store</b>		525	9/24/1977	1/16/1978
	Montoya				
<b>Quay</b>	<b>Nara Visa School</b>		930	8/25/1983	0/31/1983
	Nara Visa	Highway 54			
<b>Quay</b>	<b>Redwood Lodge, Tucumcari</b>		1788	2/18/2000	
	Tucumcari	1502 W. Tucumcari Blvd.			
<b>Quay</b>	<b>Rock Island-Southern Pacific Passenger Depot</b>		1512	9/29/1989	
	Tucumcari	Second St & Railroad Ave			
<b>Quay</b>	<b>Neon Signs Along Route 66 in New Mexico</b>		1811	4/5/2002	
	Various towns	Various locations			
<b>Quay</b>	<b>Route 66, state maintained: Palomas to Montoya</b>		1577	9/17/1993	3/24/1994
	Montoya	I-40 Frontage Road			
<b>Quay</b>	<b>Route 66, Locally Maintained: Glenrio to San Jon</b>		1578	9/17/1993	3/24/1994
	San Jon	Texas Border to San Jon			



IN REPLY REFER TO:

# United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
Post Office Box 649  
Albuquerque, New Mexico 87103

February 10, 2003

Mr. Alton Chavis  
Chief, Environmental Analysis Branch  
HQ ACC/CEVP  
129 Andrews Street, Suite 102  
Langley AFB, VA 23665-2769

Dear Mr. Chavis:

This is in response to your memorandum of January 16, 2003, regarding the preparation of an Environmental Assessment for the proposed use of white phosphorous rockets on Melrose Air Force Range in New Mexico. The U.S. Department of the Interior (DOI) does not, normally, review nor provide comment on Environmental Assessments. If this issue should proceed to a level requiring an Environmental Impact Statement to satisfy the requirements of the National Environmental Policy Act, the DOI routinely reviews and provides comments on those documents. In that regard, we would ask you to please forward the appropriate drafts to the DOI at the following address:

U.S. Department of the Interior  
Office of the Secretary  
Office of Environmental Policy & Compliance  
1849 C Street, N.W. PEP (MS2340)  
Washington, DC 20240

As an alternative, at this time we recommend that you consult directly with the following DOI Bureaus regarding this proposal and during the development of the proposed project in order that they may provide you assistance from their areas of jurisdiction and/or special expertise.

Regional Director  
Bureau of Indian Affairs  
P.O. Box 26567  
Albuquerque, NM 87125

Bureau of Land Management  
State Director  
P.O. Box 27115  
Santa Fe, NM 87502

Regional Director (ES)  
U.S. Fish & Wildlife Service  
P.O. Box 1306  
Albuquerque, NM 87103

Regional Director  
Intermountain Region  
National Park Service  
P.O. Box 25287  
Denver, CO 80225

Regional Director  
Bureau of Reclamation  
P.O. Box 36900  
Billings, MT 59107

Field Office Manager  
Bureau of Land Management  
2909 West Second Street  
Roswell, NM 88201

Field Supervisor (ES)  
U.S. Fish & Wildlife Service  
2105 Osuna NE  
Albuquerque, NM 87113

We trust the above information will be of assistance as you continue with your proposed project. If you have any other questions in this matter or need additional information, please feel free to contact us at the above address or phone (505) 766-3565.

Sincerely,



Stephen R. Spencer  
Acting Regional Environmental Officer

GOVERNOR  
Bill Richardson



STATE OF NEW MEXICO  
DEPARTMENT OF GAME & FISH

One Wildlife Way  
PO Box 25112  
Santa Fe, NM 87504

STATE GAME COMMISSION  
Tom Arvas, Chairman  
Albuquerque, NM

Alfredo Montoya, Vice-Chairman  
Alcalde, NM

David Henderson  
Santa Fe, NM

Jennifer Atchley Montoya  
Las Cruces, NM

Peter Pino  
Zia Pueblo, NM

Guy Riordan  
Albuquerque, NM

Leo Sims  
Hobbs, NM

DIRECTOR AND SECRETARY  
TO THE COMMISSION  
Larry G. Bell

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For basic information or to order free publications: 1-800-862-9310.

April 15, 2003

Michele Fikel, Project Manager  
Science Applications International Corp.  
405 S. 8<sup>th</sup> St.  
Boise, ID 83702

Re: Use of White Phosphorous Rockets at Melrose Bombing Range  
NMGF Doc. No. 8598

The New Mexico Department of Game and Fish has reviewed the scoping letter for the above-referenced project. As part of the upcoming Environmental Assessment (EA), we recommend that the EA analyze the potential effects of the proposed action on the following species:

- Lesser Prairie Chicken (*Tympanuchus pallidicinctus*);
- Sand Dune Lizard (*Sceloporus arenicolus*);
- Black-tailed Prairie Dog (*Cynomys ludovicianus*)
- Burrowing Owl (*Athene cunicularia*)
- Fire effects as a result of this proposed project on deer, particularly fawns, during fawning season.

For your information, we have enclosed a copy of New Mexican Wildlife of Concern for Roosevelt and Curry Counties (Biota Information System of New Mexico (BISON-M). New Mexico Dept. of Game and Fish electronic database, Version 04 January 2002, Santa Fe, New Mexico). Species accounts and habitat associations can be accessed from the BISON-M database via the World-wide Web at <http://nmnhp.unm.edu/bisonm/bisonquery.php> or <http://fwie.fw.vt.edu/states/nm.htm>

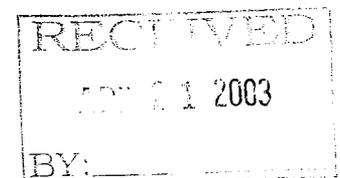
We appreciate the opportunity to comment on this project. Should you have any questions regarding our comments, please contact Mark Watson, Habitat Specialist, of my staff at 476-8115, or <[mdwatson@state.nm.us](mailto:mdwatson@state.nm.us)>.

Sincerely

Lisa Kirkpatrick, Chief  
Conservation Services Division

LK/MLW

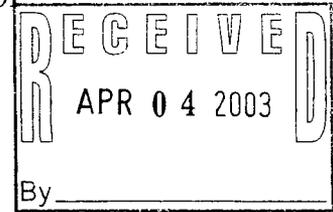
CC: Joy Nicholopoulos (Ecological Services Field Supervisor, USFWS)  
Alexa Sandoval (Southeast Area Habitat Specialist, NMGF)  
Mark Watson (Conservation Services Habitat Specialist, NMGF)





## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
New Mexico Ecological Services Field Office  
2105 Osuna NE  
Albuquerque, New Mexico 87113  
Phone: (505) 346-2525 Fax: (505) 346-2542



April 2, 2003

Cons. # 2-22-03-I-267

Michele Fikel, Project Manager  
Science Applications International Corporation  
405 S. 8<sup>th</sup> Street, Suite 301  
Boise, Idaho 83702

Dear Ms. Fikel:

Thank you for your March 18, 2003, letter requesting information on threatened or endangered species or important wildlife habitats that could be affected by the White Phosphorus Rocket Use Project. The proposed project involves the use of white phosphorus rockets to support combat search and rescue mission training. It is located on Melrose Air Force Range, Roosevelt County, New Mexico.

We have enclosed a current list of federally endangered, threatened, proposed, and candidate species, and species of concern that may be found in Roosevelt County, New Mexico.<sup>1</sup> Under the Endangered Species Act, as amended (Act), it is the responsibility of the Federal action agency or its designated representative to determine if a proposed action "may affect" endangered, threatened, or proposed species, or designated critical habitat, and if so, to consult with us further. If your action area has suitable habitat for any of these species, we recommend that species-specific surveys be conducted during the flowering season for plants and at the appropriate time for wildlife to evaluate any possible project-related impacts. Please keep in mind that the scope of federally listed species compliance also includes any interrelated or interdependent project activities (*e.g.*, equipment staging areas, offsite borrow material areas, or utility relocations) and any indirect or cumulative effects.

Candidates and species of concern have no legal protection under the Act and are included in this document for planning purposes only. We monitor the status of these species. If significant declines are detected, these species could potentially be listed as endangered or threatened. Therefore, actions that may contribute to their decline should be avoided. We recommend that candidates and species of concern be included in your surveys.

---

<sup>1</sup> Additional information about these species is available on the Internet at <http://nmrareplants.unm.edu>, <http://nmnhp.unm.edu/bisonnm/bisonquery.php>, and <http://ifw2es.fws.gov/endangeredspecies>.

Michele Fikel, Project Manager

2

Under Executive Orders 11988 and 11990, Federal agencies are required to minimize the destruction, loss, or degradation of wetlands and floodplains, and preserve and enhance their natural and beneficial values. We recommend you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act if your proposed action could impact floodplains or wetlands. These habitats should be conserved through avoidance, or mitigated to ensure no net loss of wetlands function and value.

The Migratory Bird Treaty Act (MBTA) prohibits the taking of migratory birds, nests, and eggs, except as permitted by the U.S. Fish and Wildlife Service. To minimize the likelihood of adverse impacts to all birds protected under the MBTA, we recommend construction activities occur outside the general migratory bird nesting season of March through August, or that areas proposed for construction during the nesting season be surveyed, and when occupied, avoided until nesting is complete.

We suggest you contact the New Mexico Department of Game and Fish, and the New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division for information regarding fish, wildlife, and plants of State concern.

Thank you for your concern for endangered and threatened species and New Mexico's wildlife habitats. In future correspondence regarding this project, please refer to consultation # 2-22-03-I-267. If you have any questions about the information in this letter, please contact Chris Perez at the letterhead address or at (505) 346-2525, ext. 4745.

Sincerely,



Joy E. Nicholopoulos  
State Supervisor

Enclosure

cc: (w/o enc)

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico  
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry  
Division, Santa Fe, New Mexico



**BILL RICHARDSON**  
GOVERNOR

*State of New Mexico*  
**ENVIRONMENT DEPARTMENT**  
*Office of the Secretary*  
*Harold Runnels Building*  
*1190 St. Francis Drive, P.O. Box 26110*  
*Santa Fe, New Mexico 87502-6110*  
*Telephone (505) 827-2855*



**RON CURRY**  
SECRETARY

**DERRITH WATCHMAN-MOORE**  
DEPUTY SECRETARY

June 23, 2003

Brenda W. Cook  
Headquarters Air Combat Command/CEVP  
129 Andrews Street, Suite 102  
Langley AFB VA 23665-2769

Dear Ms. Cook:

**RE: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR USE OF WHITE PHOSPHOROUS ROCKETS AT MELROSE AIR FORCE RANGE, CANNON AFB (CAFB), NM**

This transmits New Mexico Environment Department (NMED) staff comments concerning the above-referenced Draft Environmental Assessment (DEA) .

#### Surface Water Quality

The U.S. Environmental Protection Agency (USEPA) may require National Pollutant Discharge Elimination System (NPDES) Storm Water Multi-sector General Permit (see **Federal Register/Vol. 65, No. 210/Monday, October 30, 2000**) coverage for this type of facility. Waste deposition areas, soil remediation activities, etc. likely qualify as potential sources of pollution which may affect the quality of storm water discharges, from activities that meet the USEPA definition of "industrial activities" under Sector K and/or L.

Among other things, this permit requires that a Storm Water Pollution Prevention Plan (SWPPP) be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained to prevent, to the extent practicable, pollutants in storm water runoff from entering waters of the U.S.

Although there appears to be little potential to discharge pollutants to "waters of the United States" from the proposed activities, it is likely that Cannon Air Force Base (CAFB) already has NPDES Storm Water Multi-sector General Permit coverage for, at least, the Melrose

Brenda W. Cook  
June 23, 2003  
Page 2

Range. The permittee should amend the existing Storm Water Pollution Prevention Plan to incorporate any additional activities and pollutant controls dictated by this proposed action.

#### Air Quality

The proposed project is in an area that is currently in attainment for all National Ambient Air Quality Standards (NAAQS). Although potential exists in the project for increase of air emissions, the project should not result in non-attainment or violation of air quality standards.

The United States Environmental Protection Agency (EPA) considers white phosphorus a Hazardous Air Pollutant (HAP), although white phosphorus munitions are not included in the published list of source categories that must meet control technology standards for HAPs. When white phosphorus rockets are used, dense white smoke is created; however, no toxic compounds are expected to form in the environment and projected HAP emissions are not significant compared to major source thresholds.

Particulate matter less than 10 micrometers in diameter (PM<sub>10</sub>) associated with use of white phosphorus rockets has potential to cause short-term, limited effects on visibility. It is likely that frequent high winds would result in insignificant changes in the ambient air quality. An increase in PM<sub>10</sub> emissions is not expected to adversely affect any Class I areas in the region or result in exceeding the PM<sub>10</sub> NAAQS.

The Air Quality Bureau does not anticipate any air quality related problems as a result of the proposed project.

#### Hazardous Wastes

The DEA fails to discuss the applicability of RCRA, the HWA, and their Operating Permit at Melrose Air Force Range to their proposed actions. Appendix B lists several Federal statutes and regulations, but does not list any New Mexico statutes and/or regulations, nor does the DEA address CAFB's hazardous waste permit for the Melrose Air Force Range. NMED regulations that CAFB is potentially subject to include, but are not limited to: the Hazardous Waste Act, the Hazardous Waste Management Regulations, the Solid Waste Management Regulations, and the Water Quality Control Commission Regulations.

White phosphorus rockets are "military munitions", as defined in 20.4.1.100 NMAC, incorporating 40 CFR 260.10 (Definitions). According to 20.4.1.700 NMAC, incorporating 40 CFR 266.202(d), military munitions are at least solid waste and "...therefore, is potentially subject to RCRA corrective action authorities under sections 3004(u) and (v), and 3008(h), or imminent and substantial endangerment authorities under section 7003, if the munition lands off-range and is not promptly rendered safe and/or retrieved. Any imminent and

Brenda W. Cook  
June 23, 2003  
Page 3

*substantial threats associated with any remaining material must be addressed. If remedial action is infeasible, the operator of the range must maintain a record of the event for as long as any threat remains. The record must include the type of munition and its location (to the extent the location is known)."*

CAFB should address their regulatory obligations under the above noted regulations and should specifically discuss the regulatory status of discarded military munition components that land off-range from Melrose Air Force Range.

Please, let us know if you have any questions. We appreciate the opportunity to comment on this document.

Sincerely,



Gedi Cibas, Ph.D.  
Environmental Impact Review Coordinator

NMED File No. 1730ER



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
New Mexico Ecological Services Field Office  
2105 Osuna NE  
Albuquerque, New Mexico 87113  
Phone: (505) 346-2525 Fax: (505) 346-2542

June 17, 2003

Cons. # 2-22-03-I-0267

Ms. Brenda W. Cook  
Headquarters Air Combat Command/CEVP  
129 Andrews Street, Suite 102  
Langley AFB, Virginia 23665-2769

Dear Ms. Cook:

Thank you for your May 13, 2003, letter requesting comments on the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact for use of white phosphorous rockets (WP rockets) at Melrose Air Force Range. The project is located in Roosevelt County, New Mexico.

The United States Air Force (Air Force) proposes to employ WP rockets on Melrose Air Force Range, New Mexico, to support the Combat Search and Rescue mission of the 27<sup>th</sup> Fighter Wing, specifically the 524<sup>th</sup> Fighter Squadron, at Cannon Air Force Base. The Air Force has not determined the effects of the proposed use of WP rockets on federally listed species.

The proposed mountain plover (*Charadrius montanus*) is found on the Melrose Range, but only during the spring migration. We recommend that presence/absence surveys be conducted for mountain plover during the spring. If mountain plovers are found within the impact area during specific time periods, please consider seasonal bombing restrictions in your alternatives as a mechanism of reducing or alleviating impacts.

We appreciate the thorough analyses provided in the EA and your efforts to protect endangered and threatened species. In future communications regarding this project, please refer to consultation #2-22-03-I-0267. If we can be of further assistance, please contact Santiago R. Gonzales of my staff at (505) 761-4755.

Sincerely,

Joy E. Nicholopoulos  
State Supervisor

Ms. Brenda W. Cook

2

cc:

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico

Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry  
Division, Santa Fe, New Mexico

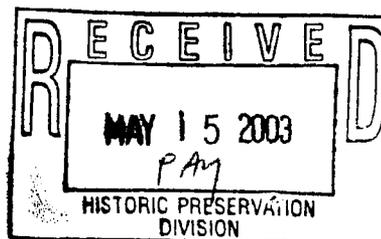


DEPARTMENT OF THE AIR FORCE  
HEADQUARTERS AIR COMBAT COMMAND  
LANGLEY AIR FORCE BASE VIRGINIA

MEMORANDUM FOR: Jan V. Biella, Deputy State Historic Preservation Officer 13 MAY 2003  
Historic Preservation Division  
New Mexico Office of Cultural Affairs  
La Villa Rivera Building  
228 East Palace Avenue  
Santa Fe, New Mexico 87501

FROM: HQ ACC/CEVP  
129 Andrews Street, Suite 102  
Langley AFB VA 23665-2769

067846



SUBJECT: Draft Environmental Assessment (EA) for Use of White Phosphorous Rockets at Melrose Air Force Range, Cannon AFB, NM

1. We are pleased to provide you with the Draft Environmental Assessment (EA) and Draft Finding of No Significant Impact (FONSI) for use of white phosphorous rockets at Melrose Air Force Range in compliance with the regulations of the President's Council on Environmental Quality. The document is also available on the Cannon AFB website at [www.cannon.af.mil](http://www.cannon.af.mil). This EA analyzes impacts from the proposed rocket use in support of Cannon AFB's Combat Search and Rescue mission. The unique characteristics of white phosphorous rockets permit aircrews to train for realistic rescue operations and target location exercises in support of the Aerospace Expeditionary Force.

2. We request your concurrence with the Air Force's conclusion of no significant effects to cultural resources. All comments are requested by close of business June 23, 2003. If additional information is needed, please contact:

Capt Michael Garcia  
27 FW/PA  
100 South D. L. Ingram  
Cannon AFB NM 88103  
Telephone: (505) 784-4131

COMMENTS

*P. Ingram* 06/09/03  
for NM State Historic Preservation Officer

Correspondence and comments should be sent to:

Ms. Brenda W. Cook  
Headquarters Air Combat Command/CEVP  
129 Andrews Street, Suite 102  
Langley AFB VA 23665-2769

*Thank you for providing a copy for our review.*

*Alton Chavis*  
ALTON CHAVIS  
Chief, Environmental Analysis Branch

Attachment  
Draft EA

*Global Power For America*

GOVERNOR  
Bill Richardson



STATE OF NEW MEXICO  
DEPARTMENT OF GAME & FISH

One Wildlife Way  
PO Box 25112  
Santa Fe, NM 87504

STATE GAME COMMISSION  
Tom Arvas, Chairman  
Albuquerque, NM

Alfredo Montoya, Vice-Chairman  
Alcalde, NM

David Henderson  
Santa Fe, NM

Jennifer Atchley Montoya  
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DIRECTOR AND SECRETARY  
TO THE COMMISSION  
Bruce C. Thompson

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June 2, 2003

Ms. Brenda W. Cook  
Headquarters Air Combat Command/CEVP  
129 Andrews Street, Suite 102  
Langley AFB, VA 23665-2769

Re: White Phosphorous Rocket Use at Melrose Bombing Range, Draft Environmental  
Assessment. NMGF Doc. No.8667

Dear Ms. Cook:

The New Mexico Department of Game and Fish (Department) has reviewed the above-referenced project (DEA). The Department provided comments on 15 April 2003 in response to your scoping letter. We recommended that the potential for adverse effects of this project on five species be analyzed in the DEA. We believe the DEA does provide adequate information for these species, except for the potential impact of phosphorous rocket-caused fires on Mule Deer fawns.

The Department recommends implementation of *Alternative A: Limited Targets*, under which target areas would be selected to avoid areas with high environmental sensitivity, such as wetlands, surface water features, or known locations of listed species or species of special concern. Executive Orders 11988 and 11990 require that federal agencies minimize the destruction, loss or degradation of wetlands and floodplains, and the Migratory Bird Treaty Act prohibits the taking of birds, nests and eggs except by permit. *Alternative A*, as opposed to the *Proposed Action*, provides the highest level of protection to wildlife and important habitats. This alternative would minimize the potential for direct phosphorous rocket impacts on Black-tailed Prairie Dog colonies, and species of concern associated with prairie dog colonies such as Mountain Plovers and Burrowing Owls, all of which are known to occur on Melrose Bombing Range.

We appreciate the opportunity to comment on this project, and look forward to the opportunity to sign a completed Integrated Natural Resource Management Plan for Cannon Air Force Base and Melrose Bombing Range. Should you have any questions regarding our comments, please contact Mark Watson, Habitat Specialist, of my staff at 476-8115, or <[mwatson@state.nm.us](mailto:mwatson@state.nm.us)>.

Sincerely

A handwritten signature in cursive script that reads "Lisa Kirkpatrick". The signature is written in black ink and is positioned above the printed name.

Lisa Kirkpatrick, Chief  
Conservation Services Division

LK/MLW

CC: Joy Nicholopoulos (Ecological Services Field Supervisor, USFWS)  
Tod Stevenson (Assistant Director, NMGF)  
Alexa Sandoval (Southeast Area Habitat Specialist, NMGF)  
Mark Watson (Conservation Services Habitat Specialist, NMGF)

**APPENDIX B**  
**RELEVANT STATUTES, REGULATIONS, AND GUIDELINES**

# RELEVANT STATUTES, REGULATIONS AND GUIDELINES

## GENERAL

*National Environmental Policy Act (NEPA) of 1969 (Public Law [PL] 91-190, 42 United States Code [USC] 4347, as amended).* Requires federal agencies to take the environmental consequences of proposed actions into consideration in their decision-making process. The intent of NEPA is to protect, restore or enhance the environment through well informed federal decisions. The Council on Environmental Quality (CEQ) was established under NEPA to implement and oversee federal policy in this process.

**32 CFR 989, et seq., *Environmental Impact Analysis Process*** (formerly known as Air Force Instruction [AFI] 32-7061). Air Force implementation of the procedural provisions of NEPA and CEQ regulations.

**AFPD 32-70, *Environmental Quality***. Requires that the Air Force comply with applicable federal, state, and local environmental laws and regulations, including NEPA. Executive Order (EO) 11514, Protection and Enhancement of Environmental Quality, as amended by EO 11991, sets policy directing the federal government in providing leadership in protecting and enhancing the environment.

***Intergovernmental Coordination Act and EO 12372, Intergovernmental Review of Federal Programs***, require federal agencies to cooperate with and consider state and local views in implementing a federal proposal. AFI 32-7061 requires the proponents to implement a process known as Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), which is used for the purpose of agency coordination and implements scoping requirements.

## AIRSPACE

***Federal Aviation Act of 1958***. Created the Federal Aviation Administration (FAA) and charges the FAA Administrator with ensuring the safety of aircraft and the efficient utilization of the National Airspace System, within the jurisdiction of the United States.

***Federal Aviation Regulation Part 71 (1975)***. Delineates the designation of federal airways, area low routes, controlled airspace, and navigational reporting points.

***Federal Aviation Regulation Part 73 (1975)***. Defines special use airspace and prescribes the requirements for the use of that airspace.

***Federal Aviation Regulation Part 91 (1990)***. Describes the rules governing the operation of aircraft within the United States.

*FAA Handbook 7400.2C.* Prescribes policy, criteria, and procedures applicable to rulemaking and non-rulemaking actions associated with airspace allocation and utilization, obstruction evaluation and marking airport airspace analyses, and the establishment of air navigation aids.

*FAA Handbook 7110.65.* Prescribes air traffic control procedures and phraseology for use by personnel providing air traffic control services in the United States.

## **SAFETY**

*AFI 32-2001 The Fire Protection Operations and Fire Prevention Program (1 April 1999).* Defines the requirements for Air Force installation fire protection programs, including equipment, response times, and training.

*AFI 32-3001 Explosive Ordnance Disposal Program (1 October 1999).* Regulates and provides procedures for explosives safety and handling. Defines criteria for quantity distances, clear zones, and facilities associated with ordnance.

*AFI 91-202 The US Air Force Mishap Prevention Program (1 August 1998).* Establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information.

*AFI 91-301, Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOSH) Program implements AFD 91-3,* Occupational Safety and Health by outlining the AFOSH Program. The purpose of the AFOSH Program is to minimize loss of Air Force resources and to protect Air Force people from occupational deaths, injuries, or illnesses by managing risks.

*Air Force Manual 91-201, Safety: Explosives Safety Standards* establishes safety standards, provides planning guidance, and defines safety requirements for explosives operations of any kind (including testing, disassembling, modifying, storing, transporting, and handling explosives or ammunition) at Air Force facilities.

*Department of Defense Flight Information Publication.* Indicates locations of potential hazards (e.g., bird aggregations, obstructions, and noise sensitive locations under military airspace and defines horizontal and/or vertical avoidance measures. Updated monthly to present current conditions.

## **MATERIALS MANAGEMENT**

*Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and the Superfund Amendments and Reauthorization Act (SARA) of 1986.* Provides liability and compensation for cleanup and emergency response from hazardous substances discharged into the environment and the cleanup of hazardous disposal sites.

*Resource Conservation and Recovery Act (RCRA) of 1976.* Regulates the storage, transportation, treatment, and disposal of hazardous waste that could adversely affect the environment.

*Solid Waste Disposal Act (SWDA) and Amendments of 1980.* Amends RCRA with additional regulation of energy and materials conservation and the establishment of a National Advisory Council.

*AFI 32-4002 Facility Hazardous Emergency Planning and Response (1 December 1997).*

*AFI 32-7005 Facility Environmental Protection Committee (25 February 1994).*

*AFI 32-7042 Hazardous Waste Management and Regulation (12 May 1994).*

*AFI 32-7080 Pollution Prevention Program (12 May 1994).*

*AFI 32-7086 Hazardous Material Management (1 August 1997).*

*Military Munitions Rule, Title 40 CFR Part 266, Subpart M, "Military Munitions."*

*Cannon FAB Plan 32-2, Hazardous Waste Management Plan, 28 August 2000.*

*New Mexico Administrative Code, Title 20 Part 4.1.100, Adoption of 40 CFR Part 260, Hazardous Waste Management and Part 4.1.700, Adoption of 40 CFR Part 266.202, Military Munitions.*

## **PHYSICAL RESOURCES**

*Federal Water Pollution Control Act of 1948.* Establishes procedures and programs for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's water's, thus protecting habitat conditions in aquatic and wetland ecosystems.

*Clean Water Act of 1977 (33 USC 1251-1387).* Requires a National Pollution Discharge Elimination System (NPDES) permit for all discharges into waters of the United States to reduce pollution that could affect any form of life. Section 404 of this act regulates development in streams and wetlands and requires a permit from the U.S. Army Corps of Engineers.

*EO 19988 Floodplain Management (1977).* Requires that governmental agencies, in carrying out their responsibilities, provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains.

## **BIOLOGICAL RESOURCES**

*EO 11990 Protection of Wetlands (1977).* Requires the governmental agencies, in carrying out their responsibilities, provide leadership and take action to minimize the destruction,

loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. Factors to be considered include conservation and long-term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, and wildlife.

***North American Wetlands Conservation Act (16 USC 4401-4412).*** Supports the management and preservation of waterfowl by funding the implementation of the North American Waterfowl Management Plan and the Tripartite Agreement on wetlands between Canada, the U.S., and Mexico.

***Lacey Act of 1900 (16 USC 3371-13378).*** Brings the unlawful taking of fish, wildlife, and plants under federal jurisdiction by prohibiting specimens taken illegally from being shipped across state boundaries.

***Migratory Bird Treaty Act of 1918 (16 USC 701-715s).*** Establishes protection for migratory birds and their parts (including eggs, nests, and feathers) from hunting, capture, or sale.

***Fish and Wildlife Coordination Act of 1958 (16 USC 661-666c as amended).*** Provides for conservation and management of fish and wildlife by encouraging cooperation between the U.S. Fish and Wildlife Service and other federal, state, public, and private agencies.

***Wilderness Act of 1964 (16 USC 1131).*** Directs the Secretary of the Interior to review every roadless area greater than or equal to 5,000 acres and every roadless island (regardless of size) within National Wildlife Refuge and National Park Systems and to recommend to the President the suitability of each such area or island for inclusion in the National Wilderness Preservation System. The act provides criteria for determining suitability and establishes restrictions on activities that can be undertaken on designated areas.

***Fish and Wildlife Conservation Act of 1980 (16 USC 2901-2911 as amended).*** Promotes state programs, and authorizes funding for grants, aimed at developing and implementing comprehensive state non-game fish and wildlife management plans.

***Bald Eagle Protection Act of 1940 (16 USC 668-668c).*** Protects Bald and Golden eagles by prohibiting the take, possession, or transportation of these species, dead or alive, and includes protection of their nests and eggs.

***Endangered Species Act of 1973 (16 USC 1531-1544, as amended).*** Establishes measures for the conservation of plant and animal species listed, or proposed for listing, as threatened or endangered, including the protection of critical habitat necessary for their continued existence.

## **AIR QUALITY**

***Clean Air Act (Title 40 CFR parts 50 and 51) amended in 1977 and 1990.*** Dictates the National Ambient Air Quality Standards (NAAQS) must be maintained nationwide. Delegates

authority to state and local agencies to enforce the NAAQS and to establish air quality standards and regulations of their own. Section 169A states that a national goal is to prevent any further impairment of visibility within federally mandated Class I areas such as National Parks and Wilderness Areas from man-made sources of air pollution.

***EO 12088 Federal Compliance with Pollution Control Standards (1988).*** Requires the head of each executive agency to be responsible for ensuring that all necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to federal facilities and activities under the control of the agency.

## **CULTURAL RESOURCES**

***National Historic Preservation Act of 1966, as amended.*** Provides the principal authority used to protect historic properties, establishes the National Register of Historic Places (NRHP), and defines, in Section 106, the requirements for federal agencies to consider the effects of an action on properties listed on, or eligible for, the NRHP.

***Protection of Historic and Cultural Properties (36 CFR section 800).*** Provides an explicit set of procedures for federal agencies to meet their obligations under the National Historic Preservation Act including inventorying resources and consultation with State Historic Preservation Officers (SHPOs) and federally recognized tribes.

***Native American Grave Protection and Repatriation Act of 1990 (25 USC 3001-3013).*** Requires protection and repatriation of Native American burial items found on, or taken from, federal or tribal lands, and requires repatriation of burial items controlled by federal agencies or museums receiving federal funds.

***Archaeological Resources Protection Act (ARPA) of 1979 (16 USC section 470aa-47011).*** Ensures the protection and preservation of archaeological sites on federal or Native American lands and establishes a permitting system to allow legitimate scientific study of such resources.

***American Indian Religious Freedom Act of 1978 (42 USC section 1996).*** States that it is the policy of the United States to protect and preserve for American Indians their inherent right of freedom to believe, express, and exercise the traditional religions including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites.

***EO 13007 Indian Sacred Sites (1996).*** Requires that, to the extent practicable, federal agencies accommodate access to, and ceremonial use of, sacred sites by Native American religious practitioners, and to avoid adversely affecting the physical integrity of sacred sites.

*EO 13084 Consultation and Coordination with Indian Tribal Governments (1998)*. Requires that federal agencies have an effective process to permit elected officials and other representatives of Indian tribal governments to provide meaningful and timely input in the development of regulatory policies on matters that significantly or uniquely affect their communities.

*AFI 32-7065 Cultural Resource Management (1994)*. Sets guidelines for protecting and managing cultural resources on lands managed by the Air Force.

*Department of Defense (DoD) American Indian and Alaska Native Policy (21 November 1999)*.

This policy emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis and requires an assessment, through consultation, of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the services.

## **ENVIRONMENTAL JUSTICE**

*EO 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1995)*. Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. The essential purpose of EO 12898 is to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

*EO 13045 Protection of Children from Environmental Health Risks and Safety Risks (1998)*. This Executive Order directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

*AF Guidance, Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (November 1997)*. Provides guidance for implementation of EO 12898 in relevant Air Force environmental impact assessments.

**APPENDIX C**  
**MUNITIONS COMPOSITION REPORT**

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## Munitions Composition Report

<u>Selected Munitions Item</u>		
<b>Nomenclature:</b> RCKT MTR 2.75IN MK66 MOD2		
<b>DODIC/NALC:</b> J147	<b>NSN:</b> 1340011541679	<b>Weight (lb):</b> 13.6000

Material	Weight (lb)
2-Nitrodiphenylamine	1.4300E-1
Candelilla wax	7.1500E-3
Charcoal	2.7619E-3
Copper	3.2999E-2
Diazodinitrophenol	4.9604E-6
Di-n-propyl-adipate	1.1440E-1
Insulation, electrical	3.3304E-4
Iron	6.2060E-7
Lacquer	4.4092E-6
Lead	1.0725E-1
Lead (in brass, bronze, or stainless steel)	5.4967E-6
Manganese powder	4.3651E-3
Nitrocellulose	3.6465E0
Nitroglycerin	2.7599E0
Potassium chlorate	1.6535E-6
Potassium nitrate	1.3207E-2
Resorcylic Acid	3.9325E-2
Salicylic acid	1.0582E-1
Solvent	3.9683E-5
Sulfur	1.8486E-3
Tin plate	1.0000E-2
Triacetin	1.9305E-1
Zinc	6.2149E-5

Note: Factors given in scientific notation. For example, 1.28E-4 equals  $1.28 \times 10^{-4}$  or 0.000128, and 4.56E+3 equals  $4.56 \times 10^3$  or 4560.

## Munitions Composition Report

<b>Selected Munitions Item</b>		
Nomenclature: RCKT 2.75IN SMK WP W/WH D M156 W/FUZE M42		
DODIC/NALC: H486	NSN: 1340009359161	Weight (lb): 20.7060

Material	Weight (lb)
2-Ethylhexanoic Acid	4.2000E-2
2-Nitrodiphenylamine	1.2000E-1
Aluminum	7.7663E-1
Antimony sulfide	1.5543E-5
Barium nitrate	2.0723E-5
Beryllium	5.3709E-6
Bismuth	9.2065E-5
Boron, elemental	1.4550E-9
Calcium resinate	1.8519E-6
Candelilla wax	1.2000E-2
Carbon	1.6132E-2
Charcoal	2.7619E-3
Chromium	2.9597E-3
Cobalt	5.6835E-7
Copper	5.7570E-2
Diazodinitrophenol	4.9604E-6
Diethylphthalate	6.3000E-1
Fibrous glass	3.5000E-2
Graphite	1.8519E-6
Insulation, electrical	3.3304E-4
Iron	8.1407E0
Lacquer	4.4092E-6
Lead	3.0092E-2
Lead (in brass, bronze, or stainless steel)	2.6322E-5
Lead azide	3.4039E-4
Lead salicylate	7.2000E-2
Lead styphnate	4.1447E-5
Magnesium	7.1890E-3
Manganese	4.1498E-2
Manganese powder	4.3651E-3
Nickel	1.9704E-4
Nitrile rubber compound	7.5266E-4
Nitrocellulose (N 12.6%)	3.0000E0
Nitrogen	2.9101E-8
Nitroglycerin	2.0940E0

Note: Factors given in scientific notation. For example, 1.28E-4 equals 1.28x10<sup>4</sup> or 0.000128, and 4.56E+3 equals 4.56x10<sup>3</sup> or 4560.

## Munitions Composition Report

### Selected Munitions Item

**Nomenclature:** RCKT 2.75IN SMK WP W/WHD M156 W/FUZE M42

**DODIC/NALC:** H486

**NSN:** 1340009359161

**Weight (lb):** 20.7060

Material	Weight (lb)
Phosphorus (in metal alloy)	3.3761E-3
Phosphorus (yellow or white)	2.2000E0
Potassium chlorate	1.6535E-6
Potassium nitrate	1.3207E-2
RDX	9.0770E-2
Rubber	1.6064E-2
Silicon	4.6955E-3
Solvent	3.9683E-5
Stearic acid	2.8168E-4
Sulfur	6.4396E-3
Tetracene	5.1809E-6
Tin	1.0500E-3
Tin plate	1.0000E-2
Titanium	9.2835E-4
Trinitrotoluene	4.6859E-2
Vanadium	2.0750E-4
Wax	1.2015E-3
Wool felt	2.6742E-4
Zinc	8.6130E-3

Note: Factors given in scientific notation. For example, 1.28E-4 equals  $1.28 \times 10^{-4}$  or 0.000128, and 4.56E+3 equals  $4.56 \times 10^3$  or 4560.

## Munitions Composition Report

<b><u>Selected Munitions Item</u></b>		
Nomenclature: WHD 2.75IN RCKT SMK WP M156 W/FUZE M427		
DODIC/NALC: H855	NSN: 1340007825848	Weight (lb): 9.7000

Material	Weight (lb)
Aluminum	6.6138E-1
Antimony sulfide	1.5543E-5
Barium nitrate	2.0723E-5
Beryllium	5.3709E-6
Bismuth	9.2065E-5
Boron, elemental	1.4550E-9
Calcium resinate	1.8519E-6
Carbon	1.4952E-2
Chromium	2.4458E-3
Cobalt	5.6835E-7
Copper	2.6888E-2
Graphite	1.8519E-6
Iron	7.0751E0
Lead	9.2065E-5
Lead (in brass, bronze, or stainless steel)	1.0518E-5
Lead azide	3.4039E-4
Lead styphnate	4.1447E-5
Magnesium	6.5640E-3
Manganese	3.5683E-2
Nickel	2.6191E-6
Nitrile rubber compound	7.5266E-4
Nitrogen	2.9101E-8
Phosphorus (in metal alloy)	2.9082E-3
Phosphorus (yellow or white)	2.2000E0
RDX	9.0770E-2
Rubber	1.0637E-3
Silicon	3.6330E-3
Stearic acid	2.8168E-4
Sulfur	4.0527E-3
Tetracene	5.1809E-6
Titanium	7.4085E-4
Trinitrotoluene	4.6859E-2
Vanadium	2.0750E-4
Wax	1.2015E-3
Wool felt	2.6742E-4

Note: Factors given in scientific notation. For example, 1.28E-4 equals 1.28x10<sup>4</sup> or 0.000128, and 4.56E+3 equals 4.56x10<sup>3</sup> or 4560.

## Munitions Composition Report

**Selected Munitions Item**

**Nomenclature:** WHD 2.75IN RCKT SMK WP M156 W/FUZE M427

**DODIC/NALC:** H855

**NSN:** 1340007825848

**Weight (lb):** 9.7000

Material	Weight (lb)
Zinc	5.9734E-3

Note: Factors given in scientific notation. For example, 1.28E-4 equals  $1.28 \times 10^{-4}$  or 0.000128, and 4.56E+3 equals  $4.56 \times 10^3$  or 4560.

**APPENDIX D**  
**FEDERAL AND STATE LISTED AND CANDIDATE PLANT**  
**AND ANIMAL SPECIES AND SPECIES OF CONCERN**

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FEDERAL ENDANGERED, THREATENED,  
PROPOSED, AND CANDIDATE SPECIES  
AND SPECIES OF CONCERN IN NEW MEXICO  
Consultation Number 2-22-03-I-267  
April 2, 2003

Roosevelt County

ENDANGERED

Black-footed ferret (*Mustela nigripes*)\*\*

THREATENED

Bald eagle (*Haliaeetus leucocephalus*)

PROPOSED THREATENED

Mountain plover (*Charadrius montanus*)

CANDIDATE

Black-tailed prairie dog (*Cynomys ludovicianus*)

Lesser prairie chicken (*Tympanuchus pallidicinctus*)

Sand dune lizard (*Sceloporus arenicolus*)

SPECIES OF CONCERN

Swift fox (*Vulpes velox*)

Western red bat (*Lasiurus blossevillii*)

American peregrine falcon (*Falco peregrinus anatum*)

Arctic peregrine falcon (*Falco peregrinus tundrius*)

Baird's sparrow (*Ammodramus bairdii*)

Yellow-billed cuckoo (*Coccyzus americanus*)

Sandhill goosefoot (*Chenopodium cycloids*)

## Index

- Endangered = Any species which is in danger of extinction throughout all or a significant portion of its range.
- Threatened = Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.
- Candidate = Candidate Species (taxa for which the Service has sufficient information to propose that they be added to list of endangered and threatened species, but the listing action has been precluded by other higher priority listing activities).
- Species of Concern = Taxa for which further biological research and field study are needed to resolve their conservation status OR are considered sensitive, rare, or declining on lists maintained by Natural Heritage Programs, State wildlife agencies, other Federal agencies, or professional/academic scientific societies. Species of Concern are included for planning purposes only.
- \* = Introduced population
- \*\* = Survey should be conducted if project involves impacts to prairie dog towns or complexes of 200-acres or more for the Gunnison's prairie dog (*Cynomys gunnisoni*) and/or 80-acres or more for any subspecies of Black-tailed prairie dog (*Cynomys ludovicianus*). A complex consists of two or more neighboring prairie dog towns within 4.3 miles (7 kilometers) of each other.
- \*\*\* = Extirpated in this county
- † = May occur in this county from re-introductions in Colorado. Analysis for this species is not required.

## New Mexican Wildlife of Concern - Roosevelt County

Common Name	SCIENTIFIC NAME	FWS..	NM...	FS.	BLM..	NM...	FWS.
		ESA	WCA	R3	NM	Sen	SOC
Texas Horned Lizard	Phrynosoma cornutum	-	-	S	S	-	S
Sand Dune Lizard	Sceloporus arenicolus	C	T	-	S	-	S
Desert Kingsnake	Lampropeltis getula splendida	-	-	S	-	-	-
Texas Longnose Snake	Rhinocheilus lecontei	-	-	S	-	-	-
Desert Massasauga	Sistrurus catenatus edwardsii	-	-	S	-	-	-
Mississippi Kite	Ictinia mississippiensis	-	-	S	-	-	-
Bald Eagle	Haliaeetus leucocephalus	T mg	T	S	-	-	-
Swainson's Hawk	Buteo swainsoni	-	-	S	-	-	-
Ferruginous Hawk	Buteo regalis	-	-	S	S	-	S
American Peregrine Falcon	Falco peregrinus anatum	m	T	S	-	-	-
Lesser Prairie-chicken	Tympanuchus pallidicinctus	CW	-	-	S	S	-
Western Snowy Plover	Charadrius alexandrinus nivosus	-	-	S	-	-	-
Mountain Plover	Charadrius montanus	PT	-	S	-	S	-
Long-billed Curlew	Numenius americanus americanus	-	-	S	-	-	-
Yellow-billed Cuckoo	Coccyzus americanus occidentalis	-	-	S	-	-	-
Flammulated Owl	Otus flammeolus	-	-	S	-	-	-
Burrowing Owl	Athene cucularia hypugaea	-	-	-	S	-	S
Loggerhead Shrike	Lanius ludovicianus	-	-	-	S	-	S
Gray Catbird	Dumetella carolinensis ruficrissa	-	-	S	-	-	-
American Redstart	Setophaga ruticilla tricolora	-	-	S	-	-	-
Baird's Sparrow	Ammodramus bairdii	-	T	S	S	-	S
McCown's Longspur	Calcarius mccownii	-	-	S	-	-	-
Least Shrew	Cryptotis parva	-	T	-	-	-	-
Western Red Bat	Lasiurus blossevillii	-	-	S	-	S	-
Eastern Red Bat	Lasiurus borealis	-	-	S	-	S	-
Black-tailed Prairie Dog	Cynomys ludovicianus ludovicianus	CW m	-	-	-	S	-
Swift Fox	Vulpes velox velox	-	-	S	-	S	-
Ringtail	Bassariscus astutus	-	-	S	-	S	-
Western Spotted Skunk	Spilogale gracilis	-	-	-	-	S	-
Sandhill White-tailed Deer	Odocoileus virginianus texana	-	-	-	-	S m	-

NATIVE WILDLIFE APPARENTLY NO LONGER OCCURRING IN RIO ARRIBA COUNTY

Gray Wolf	Canis lupus	
Black-footed Ferret	Mustela nigripes	(extirpated from NM)
Merriam's Elk	Cervus elaphus merriami	(extinct)
American Bison	Bos bison	

## New Mexican Wildlife of Concern - Curry County

Common Name.....	SCIENTIFIC NAME.....	FWS..	NM...	FS.	BLM..	NM...	FWS.
		ESA	WCA	R3	NM	Sen	SOC
Texas Horned Lizard	<i>Phrynosoma cornutum</i>	-	-	S	S	-	S
Desert Kingsnake	<i>Lampropeltis getula splendida</i>	-	-	S	-	-	-
Texas Longnose Snake	<i>Rhinocheilus lecontei</i>	-	-	S	-	-	-
Mississippi Kite	<i>Ictinia mississippiensis</i>	-	-	S	-	-	-
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T mg	T	S	-	-	-
Swainson's Hawk	<i>Buteo swainsoni</i>	-	-	S	-	-	-
Ferruginous Hawk	<i>Buteo regalis</i>	-	-	S	S	-	S
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	m	T	S	-	-	-
Lesser Prairie-chicken	<i>Tympanuchus pallidicinctus</i>	CW	-	-	S	S	-
Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	-	-	S	-	-	-
Mountain Plover	<i>Charadrius montanus</i>	PT	-	S	-	S	-
Burrowing Owl	<i>Athene cunicularia hypugaea</i>	-	-	-	S	-	S
Loggerhead Shrike	<i>Lanius ludovicianus</i>	-	-	-	S	-	S
Gray Catbird	<i>Dumetella carolinensis ruficrissa</i>	-	-	S	-	-	-
Black-tailed Prairie Dog	<i>Cynomys ludovicianus ludovicianus</i>	CW m	-	-	-	S	-
Swift Fox	<i>Vulpes velox velox</i>	-	-	S	-	S	-
Ringtail	<i>Bassariscus astutus</i>	-	-	S	-	S	-

### NATIVE WILDLIFE APPARENTLY NO LONGER OCCURRING IN CURRY COUNTY

Gray Wolf	<i>Canis lupus</i>	
Black-footed Ferret	<i>Mustela nigripes</i>	(extirpated from NM)
Merriam's Elk	<i>Cervus elaphus merriami</i>	(extinct)
American Bison	<i>Bos bison</i>	