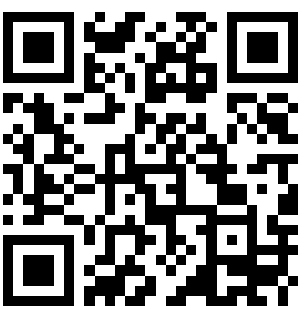

NEW MEXICO

Training Range Initiative

Environmental Impact Statement

October 2006

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
140 FBW	140th Fighter Bomber Wing
150 FW	150th Fighter Wing
27 FW	27th Fighter Wing
50 FBW	50th Fighter Bomber Wing
ACC	Air Combat Command
ACEC	Area of Critical Environmental Concern
ACM	Air Combat Maneuvering
ACT	Air Combat Training
AEF	Aerospace Expeditionary Force
AFB	Air Force Base
AFI	Air Force Instruction
AFOSH	Air Force Occupational Safety and Health
AFR	Air Force Range
AFSC	Air Force Safety Center
AFSOC	Air Force Special Operations Command
AGL	Above Ground Level
Air Force	United States Air Force
AIRFA	American Indian Religious Freedom Act
AMRAAM	Advanced Medium-Range Air-to-Air Missile
AR	Aerial Refueling Track
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
ATCAA	Air Traffic Control Assigned Airspace
ATCT	Air Traffic Control Tower
BASH	Bird-Aircraft Strike Hazard
BFM	Basic Fighter Maneuvering
BLM	Bureau of Land Management
BP	Before Present
BRAC	Base Realignment and Closure
BSA	Basic Surface Attack
CAS	Close Air Support
CD	Compact Disc
CDNL	C-Weighted Day-Night Sound Level
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CSAR	Combat Search and Rescue
dB	Decibel
DCA	Defensive Counter-Air
DEAD	Destruction of Enemy Air Defense
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DTI	Defensive Training Initiative
EA	Environmental Assessment
EAF	Expeditionary Air Force
ECR	Electronic Combat Range
EDD	Economic Development Department
EIS	Environmental Impact Statement
EMNRD	Energy, Minerals, and Natural Resources Department
EO	Executive Order
EOD	Explosive Ordnance Disposal
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FAC	Forward Air Controller
FAC-A	Forward Air Control Airborne
FAR	Federal Aviation Regulation
FL	Flight Level
FONSI	Finding of No Significant Impact
FP	Force Protection
FY	Fiscal Year
HAP	High Accident Potential
HP	High Plains
IAS	Indicated Airspeed
IFR	Instrument Flight Rule
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IR	Instrument Route
J-74	Jet Route J-74
JDAM	Joint Direct Attack Munition
J-SEAD	Joint Suppression of Enemy Air Defenses
L&WCF	Land and Water Conservation Fund
LANTIRN	Low Altitude Navigation and Targeting Infrared for Night
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average Sound Level
LFE	Large-Force Exercise
L_{max}	Maximum Sound Level
LOA	Letter of Agreement
MARSA	Military Assumes Responsibility for Separation of Aircraft
MJU	Multi Jettison Unit
MLRA	Major Land Resource Area
MOA	Military Operations Area
MSL	Mean Sea Level
MTR	Military Training Route
MW	Megawatt
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
nm	Nautical Mile
NMANG	New Mexico Air National Guard
NMDA	New Mexico Department of Agriculture
NMDGF	New Mexico Department of Game and Fish
NMNHP	New Mexico Natural Heritage Program
NMRPTC	New Mexico Rare Plant Technical Council
NMTRI	New Mexico Training Range Initiative
NOA	Notice of Availability
NOTAM	Notice to Airmen
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise Sensitive Area
NWR	National Wildlife Refuge
OHV	Off-Highway Vehicle
P.L.	Public Law
P/CG	Pilot Controller Glossary
PAA	Primary Aircraft Authorization
PC	Pecos-Canadian
PNM	Public Service Company of New Mexico
psf	Pounds Per Square Foot
RCO	Range Control Officer
RMP	Resource Management Plan
ROD	Record of Decision
ROI	Region of Influence
SAT	Surface Attack Tactics
SCS	Soil Conservation Service
SD	Southern Desertic
SEAD	Suppression of Enemy Air Defenses
SEL	Sound Exposure Level
SHPO	State Historic Preservation Office
SID	Standard Instrument Departure
SRMA	Special Recreation Management Area
SUA	Special Use Airspace
TAC	Tactical Air Command
TI	Tactical Intercept
TWD	Tactical Weapons Delivery
U.S.	United States
UNM	University of New Mexico
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
UTBNI	Up To But Not Including
VFR	Visual Flight Rule
VORTAC	Very High Frequency Omni-directional Radio Range and Tactical Navigation Aid
VR	Visual Route
WINDO	Wing Infrastructure Development Outlook
WSA	Wilderness Study Area
WSMR	White Sands Missile Range

Cover Sheet

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR NEW MEXICO TRAINING RANGE INITIATIVE

a. *Responsible Agency:* United States Air Force (Air Force)

b. *Cooperating Agency:* Federal Aviation Administration (FAA)

c. *Proposals and Actions:* This Final Environmental Impact Statement (EIS) analyzes the potential environmental consequences of a proposal to modify the training airspace near Cannon Air Force Base (AFB), New Mexico. The proposal would improve airspace for training primarily New Mexico-based pilots. The existing airspace no longer suffices to train aircrews in all of the tactics they will be expected to use in combat. Cumulative actions include Base Realignment and Closure (BRAC) plans to have the 27th Fighter Wing (27 FW) leave Cannon in 2008 and the new Air Force Special Operations Command (AFSOC) mission designation at Cannon AFB and Melrose Air Force Range (AFR). The New Mexico Training Range Initiative (NMTRI) airspace proposal laterally expands the east and west borders of the Pecos Military Operations Area (MOA) respectively, lowers the floor of the Pecos South Low MOA to 500 feet above ground level (AGL) making the airspace symmetrical. The proposed NMTRI airspace will provide a 21st century block of airspace for training New Mexico-based aircrews, including the New Mexico Air National Guard (NMANG). NMTRI would greatly enhance combat training, combat effectiveness, and survivability. A Proposed Action, Alternatives A and B were comprehensively evaluated in the Draft EIS and reviewed by the public and agencies. Following that review, the Air Force identified Alternative A with mitigations as the preferred alternative, as presented in this Final EIS. Alternative A modifies the configuration of existing airspace (including expanding the size, operational altitudes, and usefulness of the Pecos MOA complex); aligns the northern border of the Pecos MOA south of Jet Route J-74 (J-74); does not move J-74; does not create the Capitan MOA, but creates a mitigated Capitan ATCAA to connect the existing Beak and Pecos ATCAAs; permits supersonic training above 10,000 feet above mean sea level (MSL) or approximately 5,000 to 6,000 feet AGL; and extends the use of specific defensive countermeasures (chaff and flares) to the new and modified airspace. Under the preferred alternative, deconfliction methods would be coordinated typically twice per month for large scale exercises in activated Sumner North and Capitan ATCAAs. The Draft EIS Proposed Action and Alternative B included rerouting J-74 and a different Capitan MOA/ATCAA. Under the No-Action Alternative, aircrews would continue to train in the existing airspace with defensive chaff and flares and fly at supersonic speeds above 30,000 feet MSL.

d. *Inquiries:* For future information on this Final EIS, contact NMTRI EIS Project Manager, Mr. Michael H. Jones, HQ ACC/A7ZP, 129 Andrews Street, Suite 102, Langley AFB, VA 23665-2769. Telephone inquiries may be made to Cannon AFB Public Affairs at (505) 784-4131. The Final EIS may be found at www.a7zpintegratedplanning.org and www.cannon.af.mil. The Air Force is allowing a 30-day review period following the Final EIS publication. Although the Air Force is not required to respond to public comments received during this period, comments will be considered in determining any final decisions.

e. *Designation:* Final Environmental Impact Statement

f. *Abstract:* This Final EIS has been prepared in accordance with the National Environmental Policy Act. The Draft EIS public and agency review identified potentially significant airspace impacts from creating a Capitan MOA/ATCAA, moving J-74, and the use of certain types of defensive training flares. This EIS identifies actions taken to remove or reduce the potential for these environmental consequences. The preferred alternative has no Capitan MOA, no relocated J-74, and no flares other than M-206 (or equivalent). The reduced size Capitan ATCAA and Sumner North ATCAA would be used typically twice monthly. This Final EIS discusses cumulative actions, responds to public and agency comments and addresses the environmental consequences for the airspace, noise, safety, physical resources, biological resources, cultural resources, land use and recreational resources, socioeconomics, and environmental justice. The preferred alternative, Alternative A, would have few effects on airspace and noise and no noticeable environmental effects on other resources. The Draft EIS Proposed Action or Alternative B would have greater environmental consequences to airspace. The No-Action Alternative would limit realistic training for New Mexico-based aircrews. The preferred NMTRI alternative, Alternative A, provides realistic training for F-16 pilots to practice combat tactics they currently use in war, a capability that does not exist in the current airspace configuration.

New Mexico Training Range Initiative
Environmental Impact Statement

October 2006

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The following appendices may be found on a CD attached to the inside back cover of this document. Hard copies of the appendices have been provided to the repositories (Roswell Public Library, Portales Public Library, Clovis-Carver Public Library, Fort Sumner Public Library, and Vaughn Public Library) and are also available to the public upon request.

TABLES

FIGURES

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EXECUTIVE SUMMARY

This Final Environmental Impact Statement (EIS) analyzes the potential environmental consequences of a proposal to improve military training airspace and provide realistic training for pilots to practice combat tactics they currently use in war, a capability that does not exist in the current airspace configuration, and airspace that will continue to fill a vital Air Force requirement. These airspace improvements are called the New Mexico Training Range Initiative (NMTRI). NMTRI includes modifying the configuration of existing airspace, creating new airspace, authorizing supersonic flight 10,000 feet above mean sea level (MSL) in the airspace, or about 5,000 to 6,000 feet above ground level (AGL), and expanding the use of defensive countermeasures (chaff and flares) into the new and modified airspace. The resulting airspace would allow pilots to train in the full range of missions and tactics they require to prepare for combat, including supersonic simulated weapons delivery and defensive maneuvers.

This Final EIS incorporates public and agency comments on the Draft EIS, identifies a Preferred Alternative consisting of Alternative A with mitigating measures, and expands the cumulative effects section. This Final EIS is issued by the United States Air Force (Air Force) and our cooperating agency, the Federal Aviation Administration (FAA). This document has been prepared in accordance with the National Environmental Policy Act (NEPA) and its implementing regulations. This Final EIS with public and agency comments on the Draft EIS (Draft EIS January 2005) will be considered in decision making regarding the NMTRI proposal.

PURPOSE AND NEED

The primary purpose of NMTRI is to provide military training airspace that is configured, sized, and capable of supporting effective and realistic training for the full range of F-16 missions. In June 2006, Air Force Special Operations Command (AFSOC) was designated as the new mission for Cannon Air Force Base (AFB) and Melrose Air Force Range (AFR). This will mean an aircraft and mission change at Cannon AFB. Although Air Combat Command (ACC) has scheduled the last F-16 aircraft to leave Cannon in 2008, the Air Force has a requirement for NMTRI airspace. Currently, 27th Fighter Wing (27 FW) has 50 F-16 pilots training for a combat deployment to Iraq and NMTRI airspace would greatly enhance their combat training, combat effectiveness, and survivability in war. Another 25 pilots will continue to train in NMTRI airspace in preparation for combat later in 2007 and Cannon AFB F-16 aircrews will continue to train in Cannon's airspace well into Fiscal Year 2008. After the 27 FW aircraft depart Cannon AFB, the 150th Fighter Wing (150 FW) (New Mexico Air National Guard [NMANG]) F-16s at Albuquerque, New Mexico will continue to train in the airspace. Other users will also continue to use the NMTRI airspace to train their crews, including A-10s, B-1Bs, B-52s, C-130s, F-15s, F/A-18s, F-22As, and Tornados, on an infrequent basis. It is the nation's best interest to chart NMTRI airspace as expeditiously as possible to enhance our national security. NMTRI would address the following deficiencies

1) The current Pecos airspace complex has multiple constraints to realistic F-16 operational training. The current airspace volume forces pilots to train using non-optimal air-to-air and air-to-ground tactics.
2) Pilots are precluded from training in the supersonic regime at altitudes under 30,000 feet MSL even though supersonic flight is required in combat at such altitudes.
3) The presence of commercial traffic above 30,000 feet MSL forces pilots to become accustomed to "administratively disregarding" high altitude radar contacts. Establishment

of such habits during training can lead to hesitation during combat, with potentially catastrophic results.

4) The current training airspace contains multiple corners and segmented pieces of airspace that cannot be used to stage simulated attacks. Pilots develop the habit of ignoring these areas, and do not aggressively search the entire airspace volume for potential threats, as would be required in combat. Such a habit, if carried over into combat, can result in potentially catastrophic consequences.

5) The limitations to the Pecos airspace complex restrict usability of the Melrose AFR where critical training occurs.

NMTRI would correct these deficiencies and fully support the realistic training mission of F-16 squadrons into Fiscal Year (FY) 2008. Cannon AFB-based aircraft and NMANG F-16s, as well as other military users, would have substantially improved training if NMTRI were implemented. The NMTRI airspace configuration would satisfy operational requirements by providing airspace that allows for representative engagement distances with hostile forces. Figure ES-1 presents a top down view of the existing airspace and depicts the fragmented condition of the current airspace. Figure ES-2 illustrates how the Preferred Alternative, Alternative A, airspace modifications would produce airspace that is sized and configured to support effective and realistic training.

The Alternative A modifications to the Pecos Military Operations Area (MOA) and associated Air Traffic Control Assigned Airspace (ATCAA) would support training that employs tactics and employment of weapons at supersonic speeds above 10,000 feet MSL (approximately 5,000 to 6,000 feet AGL). The creation of a limited use Capitan ATCAA with the Pecos MOA/ATCAA modifications would provide adequate airspace to conduct an average of twice monthly realistic large force exercises of approximately 20 aircraft. NMTRI would also extend the deployment of specific defensive countermeasures, chaff and flares, to allow training with defensive tactics in the new and modified airspace.

Alternative A, The Draft EIS Proposed Action, and Alternative B

This Final EIS analyzes Alternative A, the Draft EIS Proposed Action, Alternative B, and the No-Action Alternative. Each is described below.

Alternative A: Alternative A is the Air Force's Preferred Alternative. Alternative A would expand the size, operational altitudes, and usefulness of the Pecos MOA and associated ATCAA. Specific elements of Alternative A include the following:

1) Modify the existing airspace. Modifications would include expanding the Pecos MOA laterally to the east, west, and south to coincide with the existing Sumner ATCAA boundary, resulting in a consistent floor of 500 feet AGL; expand the Sumner ATCAA to the north to be over the Pecos MOA and conform with the existing northern boundary of the Pecos MOA for use twice per month and twice per week during low airspace demand as defined by FAA Albuquerque Center; adjusting the Pecos MOA/Sumner North ATCAA to consistently align 5 nautical miles (nm) south of Jet Route J-74 (J-74); and no change in the J-74 location.

FIGURE ES-1. EXISTING AIRSPACE WITH MULTIPLE AIRSPACE BLOCKS, BELOW IS A THREE DIMENSIONAL VIEW OF EXISTING AIRSPACE AS SEEN FROM THE SOUTHEAST LOOKING NORTHWEST.

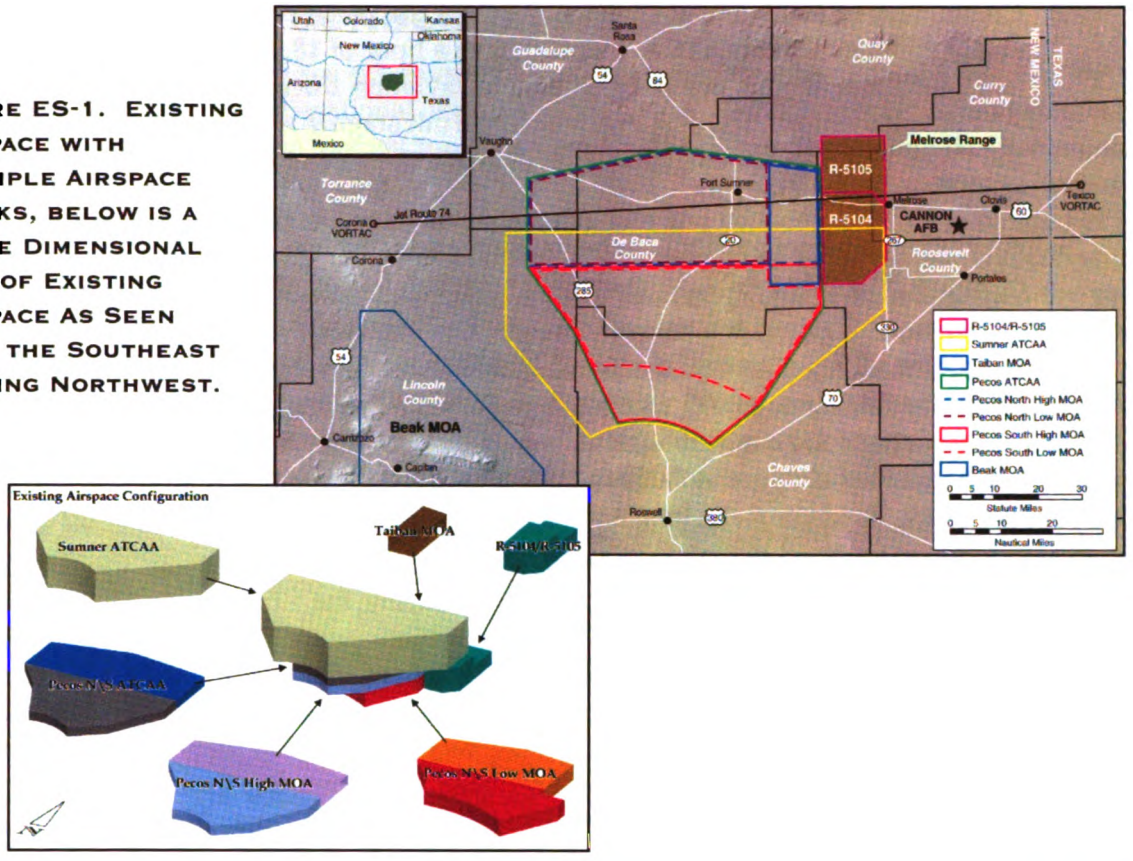
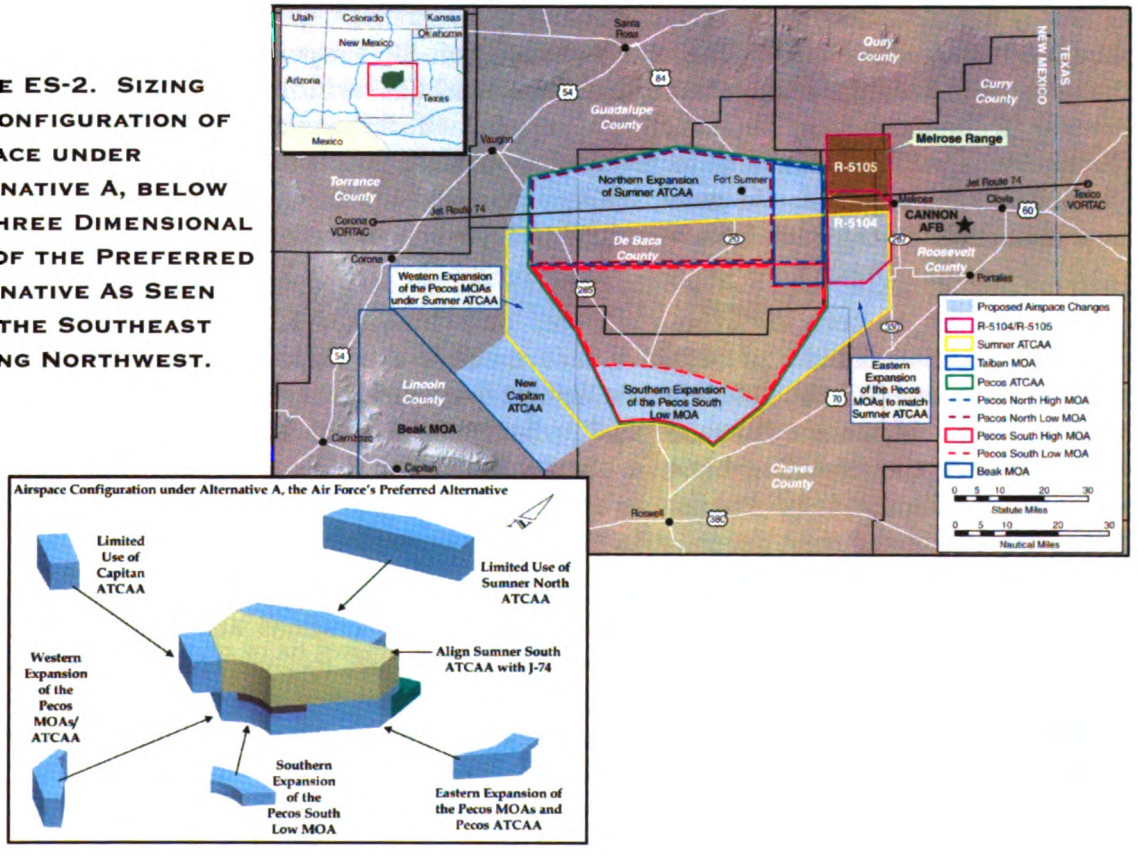


FIGURE ES-2. SIZING AND CONFIGURATION OF AIRSPACE UNDER ALTERNATIVE A, BELOW IS A THREE DIMENSIONAL VIEW OF THE PREFERRED ALTERNATIVE AS SEEN FROM THE SOUTHEAST LOOKING NORTHWEST.



2) Create a new limited use Capitan ATCAA to connect the Pecos ATCAA and Beak ATCAA. The Capitan ATCAA would have a floor of 18,000 feet MSL, a ceiling of 32,000 feet MSL, and would not impede general aviation during the typically twice monthly ATCAA activation. The ATCAA would permit staging and ingress with maneuvers into the Pecos complex for exercises such as when approximately 20 aircraft would use it for large-force exercises (LFEs).

3) Authorize supersonic flight in the existing and modified airspace from the current level of above 30,000 feet MSL to above 10,000 feet MSL, or approximately 5,000 to 6,000 feet AGL.

4) Expand the use of RR-188 chaff and M-206 flares into the new and modified airspace at 2,000 feet AGL or 5,000 feet AGL when the National Fire Danger Rating System indicates high fire conditions or above. Chaff and flares are currently authorized for use in the existing airspace at 2,000 feet AGL up to and including high fire conditions.

The preferred alternative, Alternative A, reflects changes in airspace dimensions and proposed scheduling that have resulted from review of public comments on the Draft EIS and coordination between the Air Force and the FAA during the EIS process. Comments received from the public and agencies during the public comment period on the Draft EIS helped define the airspace consequences and presented additional information on defensive flare training within the airspace. The preferred alternative clarifies that only M-206 (or equivalent) flares would be used in the MOA/ATCAAs and only used above 2,000 feet AGL at lower than high fire conditions and above 5,000 feet AGL at high or above fire conditions. The preferred alternative deletes the Pecos ATCAA replacing it with the Sumner North and Sumner South ATCAAs. The new Sumner North/South ATCAA border will be established 5 nautical miles (nm) south and parallel to J-74 to ease aircraft ingress into Melrose AFR.

Draft EIS Proposed Action: The designation "Draft EIS Proposed Action" is used throughout this Final EIS to facilitate understanding of the Final EIS by individuals who participated in the review of the Draft EIS. The Draft EIS Proposed Action would have included expanding the Pecos MOA/ATCAA laterally to the east, west, and south to coincide with the Pecos and Sumner ATCAA boundaries; moved J-74; permitted supersonic flight above 10,000 feet MSL; and included training with defensive chaff and flares in the new and modified airspace.

Alternative B: Alternative B would modify the existing airspace by expanding the Pecos MOA/ATCAA to coincide with the Pecos and Sumner ATCAA boundaries; moved J-74; expanded the Pecos MOA/ATCAA; not created the Capitan MOA/ATCAA; flown at supersonic speeds above 10,000 feet AGL; and deployed defensive chaff and flares in the new and modified airspace. Because the Capitan MOA/ATCAA would not be created under Alternative B, the transition between the Beak MOA and Pecos MOA would continue to be supported by temporarily establishing a narrow corridor for use in Large Force Exercises. Such a corridor does not permit defensive or offensive maneuvering.

No-Action: Under the No-Action Alternative, no change would be made to the current airspace. Military training that includes supersonic operations above 30,000 feet MSL and defensive chaff and flare use would continue as it occurs today. The No-Action Alternative would continue the training inefficiencies resulting from the segmented configuration of the existing airspace. Scheduling issues associated with joint military and civil use of the current airspace configuration would also continue.

ENVIRONMENTAL CONSEQUENCES

NEPA requires focused analyses on environmental resource areas potentially affected by an alternative. Based on the operational requirements of the NMTRI proposal, environmental considerations, and public and agency inputs on the Draft EIS, specific potential consequences to environmental resources are considered in this Final EIS. The consequences of airspace changes, the potential consequences of sonic booms, and the consequences of expanded chaff and flare use were analyzed for each environmental resource. The expected geographic scope of potential consequences, known as the Region of Influence (ROI), was determined for each resource. The Draft EIS also addressed the air traffic study area, north of the Pecos MOA/ATCAA, where the relocation of J-74 was considered prior to public and agency review of the Draft EIS. The following summarizes potential direct and indirect environmental consequences for each environmental resource. A cumulative effects analysis is presented in Chapter 5.0 of this EIS. That analysis concludes that there are no potentially significant impacts when the Proposed Action or alternatives are considered with relevant past, present, and reasonably foreseeable actions. This EIS recognizes that the AFSOC beddown is a reasonably foreseeable action. There are no cumulative impacts between NMTRI and AFSOC that need to be understood before making the decision on NMTRI. The AFSOC beddown will be analyzed in an EIS as stated in a Notice of Intent published in the *Federal Register* on August 24, 2006.

AIRSPACE AND RANGE MANAGEMENT

Specific concerns of airspace management focus on effects of airspace changes to non-military users of the airspace. The FAA is responsible for approval and creation of the Capitan ATCAA or expansion of the Sumner ATCAA to the north. Under Alternative A, civil aviation flights would be able to fly under the twice monthly activation of the Capitan ATCAA with a floor of 18,000 feet MSL. The Preferred Alternative, Alternative A, MOA airspace changes would not exclude other users of the airspace who would continue to fly through the military airspace under "see and avoid" rules. Private pilots expressed a desire for improved communication about military aircraft training within the existing, modified, and new airspace. 27 FW F-16 training activity, addressed in the cumulative section of this EIS would continue to benefit from NMTRI airspace into FY 2008 and 150 FW and other users would continue to benefit from this realistic training airspace. Lights out training is not currently conducted by 27 FW F-16s in the Pecos MOA. However, under a Letter of Agreement (LOA) between the Albuquerque ARTCC and the 27 FW, the 27 FW could perform lights out training if needed.

Under the Draft EIS Proposed Action or Alternative B, rerouting commercial traffic from the current J-74 and other directly routed civilian aircraft would have added one to two minutes of additional flight time for a re-routed aircraft. Similar durations could apply to other commercial traffic in the area. The Draft EIS Proposed Action creation of a Capitan MOA with a floor of 12,500 feet MSL was identified in public hearings on the Draft EIS as an area of concern to civil aviation. The Air Force concurs with FAA reviewers that impacts would be reduced through identifying Alternative A as the preferred alternative in this Final EIS. Alternative A does not propose re-routing J-74 or creating a Capitan MOA and mitigates potential airspace impacts to an insignificant level.

NMTRI would not change management of Melrose AFR. No airspace impacts are expected from supersonic flight or the use of RR-188 chaff and M-206 flares within the MOA/ATCAA airspace.

Acoustic Environment

The acoustic environment under the airspace would change with Alternative A, the Draft EIS Proposed Action, or Alternative B. The United States Environmental Protection Agency (USEPA) has identified a day-night average sound level (DNL) of 55 decibels (dB) as a level "requisite to protect public health and welfare with an adequate margin of safety." This is a threshold below which adverse noise impacts are not usually expected (USEPA 1974).

Noise in military airspace is quantified by a metric called Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}), which accounts for the annoyance associated with the "surprise" effect of noise from high speed military aircraft. The DNL metric combines the levels and durations of noise events and the number of events over an extended period of time. Noise levels are interpreted the same way for both DNL and L_{dnmr}. Models predict that DNL under the existing and proposed airspace would remain below 55 dB. Under the existing airspace, current noise from subsonic aircraft averages about 43 dB. Because the NMTRI proposal expands the volume of airspace, noise levels could decrease slightly in some areas and increase in others. Under Alternative A, the Draft EIS Proposed Action, or Alternative B, noise under the existing Pecos MOA would be in the 42 to 43 dB range. Military aircraft training in Pecos MOA expansion areas could produce a noticeable increase, from an estimated ambient level of 25 to 36 dB, to 42 dB (eastern expansion) or to a not likely noticeable 28 dB (western expansion). The proposed limited use Capitan ATCAA would have no discernible noise effects with the DNL under the Capitan ATCAA from military aircraft training predicted to be 25 dB in an area where the estimated ambient noise level is 25 to 36 dB.

Under Alternative A, the Draft EIS Proposed Action, or Alternative B, supersonic flight would be allowed above 10,000 feet MSL. Supersonic flight currently occurs above 30,000 feet MSL. The Draft EIS projected an increase from 168 to 467 supersonic sorties per month. This would be the projected flight activity into FY 2008. Toward the center of the airspace, the average number of sonic booms could increase from about one every five days to two every three days. This results in an increase in C-weighted day-night average sound level (CDNL) noise from 40 dB to 52 dB toward the center of the airspace. People and animals would notice this increase and it could be deemed intrusive. Because sonic booms are an impulsive sound, the strength of booms can also be measured by pressure or pounds per square foot (psf). Peak overpressure values for sonic booms would not be strong enough to cause damage to human or animal health or structures, such as buildings or water towers. Damage to fragile articles, such as windows in poor condition, could occasionally occur. Any discernible increase in sonic booms may annoy some people.

Safety

NMTRI does not propose any changes to operations and maintenance, ordnance use, or number of training flights. Under Alternative A, risks of a major or Class A accident will remain unchanged with continued F-16 training.

Bird-aircraft strike hazards are not expected to change with the same quantity of flights distributed over the larger Pecos MOA. Under Alternative A, airspace changes to the Capitan ATCAA and the Sumner North ATCAA would not be expected to adversely affect civil aviation. An active Capitan ATCAA for two times during each month would still permit civil aircraft to use the corridor northwest of Roswell up to 18,000 feet MSL.

During scoping for the Draft EIS, commenters expressed concern over an increase in fire risk due to the use of defensive flares in military training. The number of flares used annually would not increase with the NMTRI proposal and the Air Force would not use flares below 2,000 feet AGL. M-206 flares, or their equivalents, are designed and employed so that they would be fully consumed within 400 feet of the aircraft or 1,600 feet AGL. When the National Fire Danger Rating System indicates high fire conditions or above, the minimum altitude for flare release will be raised to 5,000 feet AGL. Except in the extremely rare case of a malfunctioning flare (approximately 0.01 percent duds) reaching the ground, there should be no change in fire risk from NMTRI.

Physical Resources

The Draft EIS public hearings identified residual flare materials from flares other than the authorized M-206 flare. Concern was expressed that physical resources, such as soil and water, could potentially be affected by chaff and flares. Flares are designed to be fully consumed prior to reaching the ground; therefore there is a low probability of a flare-caused fire affecting physical resources under the airspace outside the Melrose AFR. Under all action alternatives, the total amount of chaff and flares used in the Pecos/Sumner airspace complex would not increase from the present. Extensive research has shown little to no negative effects of chaff and flare debris on soil or water quality. Chaff fibers would be expected to be less than 0.005 ounces per acre per year. Plastic or mylar pieces of residual material drift to the earth after the deployment of chaff or flares. Based on information provided during the public hearings on the Draft EIS, an estimated average of one piece of residual materials would annually be deposited on each 9 acres under the airspace. ACC has issued instructions to users of the Pecos complex that only M-206 flares, or their equivalents, are permitted to be used in the airspace. No significant impacts are expected to soil and water from the use of chaff and flares under the preferred alternative.

Biological Resources

Biological resources are plants and wildlife, including threatened and endangered species, and livestock. Animals under the new and expanded airspace would experience changes in noise levels. Animals may temporarily shift their habitat use or activities in response to noise, but they would be expected to quickly habituate and return to normal activity levels. Animals may also initially react negatively to sonic booms, but previous studies have shown they will generally habituate. The increase in sonic booms from one per five days under No-Action to two per three days under Alternative A, the Draft EIS Proposed Action or Alternative B would not be expected to affect wildlife or livestock behavior. A particularly close or loud aircraft overflight or sonic boom could produce a startle reaction and negative response in wildlife or livestock. Public comments on the Draft EIS identified five cases of injury or death to penned livestock attributed to low flying military aircraft during the past 12 years. These incidents occurred in areas of existing overflight. Such incidents or comparable cumulative effects would likely be random and infrequent.

Previous studies have documented that wildlife and livestock would not be harmed by residual chaff or flare materials. Chaff fibers, flare ash, and end caps would not accumulate in amounts that would affect forage or water quality. Most animals would avoid chaff fibers and, even if they were ingested, they are unlikely to be available in amounts that could cause injury. There are no recorded cases of domestic or wild animals ingesting end caps. As discussed above under Safety, fire risk should not change under NMTRI as a result of flare use. Although

species in the area cope with naturally occurring range fires, any additional human-caused fires could affect wildlife and livestock. Overall, biological resources under the airspace would not be expected to be affected by the use of chaff or the use of flares.

Cultural Resources

Cultural resources include prehistoric and historic districts, sites, structures, and artifacts. Five National Register of Historic Places (NRHP) or New Mexico State Register properties underlie the airspace of the Alternative A, Draft EIS Proposed Action, or Alternative B. These include several buildings, a railroad bridge, and the ruins of Fort Sumner. Predicted peak overpressure noise from sonic booms from F-16 aircraft would not be strong enough to cause damage to structures in good condition. Historic structures, fragile items on the edge of shelves, or windows in less than good condition could be affected by increased vibration associated with sonic booms. Because the historic structures are located in communities that are generally avoided by training aircraft, impacts from sonic boom overpressures are unlikely. Minimal chaff and flare residual materials or fire risk associated with flare use would not be expected to impact NRHP properties. Native American Tribes who responded to Air Force consultation have not identified any specific concerns. Therefore, no impacts are expected to cultural resources from the preferred alternative.

Land Use and Recreational Resources

The NMTRI preferred alternative and other alternatives do not involve any changes to activities on the ground. NMTRI would not change land use patterns, access, or land ownership and management. Increased noise in some areas and an increase in sonic booms from one every five days to two per three days may annoy some individuals, including the extremely unlikely sonic boom or low overflight coincident with hunting, but such should not change overall land use or recreation activities in this region of less than one person per square mile. Access to land would remain unaffected and noise levels would remain below identified USEPA levels for consideration of potential consequences. No significant impacts would be expected under the preferred alternative.

Socioeconomics

Socioeconomic concerns include potential effects on employment, personal income, property values, and other economic pursuits. The smaller Capitan ATCAA under the mitigated Alternative A would not be expected to delay or otherwise affect civilian aircraft traffic during range normally LFEs. During public hearings, some commenters expressed concern that existing overflights and existing use of chaff and flares caused annoyance. Under No-Action or any action alternative, overflight would continue from 27 FW (into FY 2008), 150 FW, and transient aircraft. As noted in the noise analysis, some individuals would be annoyed by any level of military training above them.

No direct changes to economic resources are expected because the NMTRI proposal does not involve any on-the-ground activities. Changes in airspace, noise levels, and in sonic booms should not affect local employment, ranching operations, wind energy projects, oil/gas exploration and production, or other business activities. Sonic booms are not expected to occur at pressure levels that could damage structures, although older windows or objects on shelves could be vibrated or damaged. Changes in sonic booms from one per five days to two per three days or any chaff or flare residual materials would not be in amounts that would affect property values or land use. The risk of a defensive flare-induced fire in the affected area, compared to

other potential sources of fire, would be very low. Therefore, no effects on socioeconomic resource are expected from Alternative A, the Draft EIS Proposed Action, or Alternative B.

In the unlikely event of property damage due to an Air Force activity, the Air Force has established procedures for damage claims.

Environmental Justice

Federal agencies are required by law to address potential impacts of their actions on environmental and human health conditions in minority and low-income communities. Furthermore, they must identify and assess environmental health and safety risks which may disproportionately affect children. There would be no disproportionately high or adverse impacts to minority or low-income communities that would result from NMTRI and there would be no effects on children.

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1.0 PURPOSE AND NEED

1.1 INTRODUCTION

New Mexico-based aircraft currently train in military training airspace overlying parts of New Mexico and Texas. This airspace as it exists today does not meet all training needs for existing combat conditions or weapons systems. Existing combat conditions continue to evolve with new generation threats and weapons that are both capable of engaging at greater and greater distances. Survivability requires that pilots train to engage hostile targets at higher altitudes or at greater speeds. Pilots that "train as they will fight" have much greater survivability once they engage in real combat. New Mexico-based units need changes to the local New Mexico airspace to support more realistic training. These units are the 27th Fighter Wing (27 FW), based at Cannon Air Force Base (AFB), New Mexico, into 2008, and the 150th Fighter Wing (150 FW) of the New Mexico Air National Guard (NMANG) (based at Kirtland AFB, New Mexico). For the purposes of this document, New Mexico aircrews are defined as New Mexico-based F-16s. Proposed changes include modifying the configuration of existing airspace, creating new airspace, authorizing supersonic flight above 10,000 feet above mean sea level (MSL) in the airspace, and expanding the use of defensive countermeasures (chaff and flares) in the new and modified airspace. Collectively, these changes constitute the proposed New Mexico Training Range Initiative (NMTRI).

NMTRI IS COMPRISED OF FOUR ELEMENTS TO SUPPORT COMBAT CONDITION TRAINING:

1) MODIFY THE EXISTING AIRSPACE;
2) CREATE A NEW MOA/ATCAA;
3) AUTHORIZE SUPERSONIC FLIGHT ABOVE 10,000 FEET MSL;
4) EXPAND THE USE OF CHAFF AND FLARES.

The purpose of NMTRI is to provide military training airspace that is adequately sized, configured, and capable of supporting effective realistic training for the full range of F-16 mission capabilities. NMTRI is proposed to support the full range of missions and tactics that can be employed by F-16 squadrons, including supersonic simulated weapons delivery and defensive maneuvers enabling pilots to "train as they will fight." NMTRI would create a training environment that would allow realistic training under expected combat conditions. The NMTRI training airspace would permit flight at supersonic speeds, allow pilots to develop effective responses to potential threats, and provide adequate space for combat training maneuvers. NMTRI would increase training opportunities for New Mexico-based F-16s and the transient users of the military airspace. Although Air Combat Command (ACC) has scheduled the last F-16 aircraft to leave Cannon in Fiscal Year (FY) 2008, the United States Air Force (Air Force) training would still benefit from making the proposed airspace changes. In mid 2006, 27 FW has approximately 50 F-16 pilots training for a combat deployment to Iraq; NMTRI airspace would greatly enhance their combat training, combat effectiveness, and survivability in war as described in this Environmental Impact Statement (EIS). Approximately another 25 pilots will continue to train in NMTRI airspace in preparation for combat later in 2007 and F-16 aircrews will continue to train in

Cannon's airspace well into 2008. It is in the nation's best interest to chart NMTRI airspace as expeditiously as possible to enhance our national security.

As the 27 FW aircraft depart Cannon AFB, the 150 FW will continue to use the NMTRI airspace to train their F-16 crews. In June 2006, Air Force Special Operations Command (AFSOC) was designated as the new mission for Cannon AFB and Melrose Air Force Range (AFR). New Mexico-based aircrews are expected to continue to use NMTRI airspace as described in the EIS. Airspace is a national asset and NMTRI airspace is especially important to enhancing aircrew training by expanding the east and west borders of Pecos Military Operations Area (MOA) respectively, allowing supersonic operations at 10,000 feet MSL, and improving airspace linkage into Melrose AFR. NMTRI airspace offers realistic training for pilots to practice combat tactics they currently use in war; a capability that does not exist in the current airspace configuration.

Although the Base Realignment and Closure (BRAC) decision of September 2005 and the new mission designation of June 2006 will result in a change in aircraft at Cannon AFB, the Air Force maintains the requirement for NMTRI airspace. New Mexico F-16 aircrews continue to train for deployment to Iraq and will continue to do so in New Mexico airspace well into 2008. The 150 FW of the NMANG and transient aircraft (those not permanently assigned to 27 FW or 150 FW) units will utilize NMTRI airspace as described in this EIS (refer to NMANG correspondence in Appendix C).

This EIS addresses potential environmental consequences that could result from implementation of the NMTRI proposal.

1.2 BACKGROUND

The Air Force has identified an operational requirement to synchronize the local training airspace with the current capabilities of the F-16 aircraft and its munitions. New Mexico pilots are an integral part of the United States Air Force's Aerospace Expeditionary Force (AEF), expected to deploy and fight in contingencies around the world. New Mexico F-16 aircrews must confront the world's most sophisticated hostile tactics and anti-aircraft systems. Pilots require access to training airspace that provides as realistic a combat environment as feasible to execute their missions and to support national military and security objectives. State-of-the-art aerial combat and surface attack missions of the F-16 require highly tuned offensive and defensive pilot skills that are best practiced at speed and altitude regimes likely to be encountered in actual combat. This requires an airspace configuration that allows aircrews to practice current tactics at supersonic speeds and make full use of the F-16's capabilities.

1.2.1 CANNON AFB

Cannon AFB is located in eastern New Mexico approximately 5 miles west of Clovis. The base comprises approximately 3,500 acres and administers Melrose AFR, which is located about 30 miles west of Cannon AFB (Figure 1-1). Since the Draft EIS was issued, the Defense BRAC Commission received and considered a May 2005 recommendation from the Secretary of Defense to close Cannon AFB. A final report (September 2005) from the Commission to the president recommended Cannon AFB remain open with an enclave until at least December 31, 2009, and that the 27 FW be disestablished. The planned schedule for disestablishment of the 27 FW is December 2007.

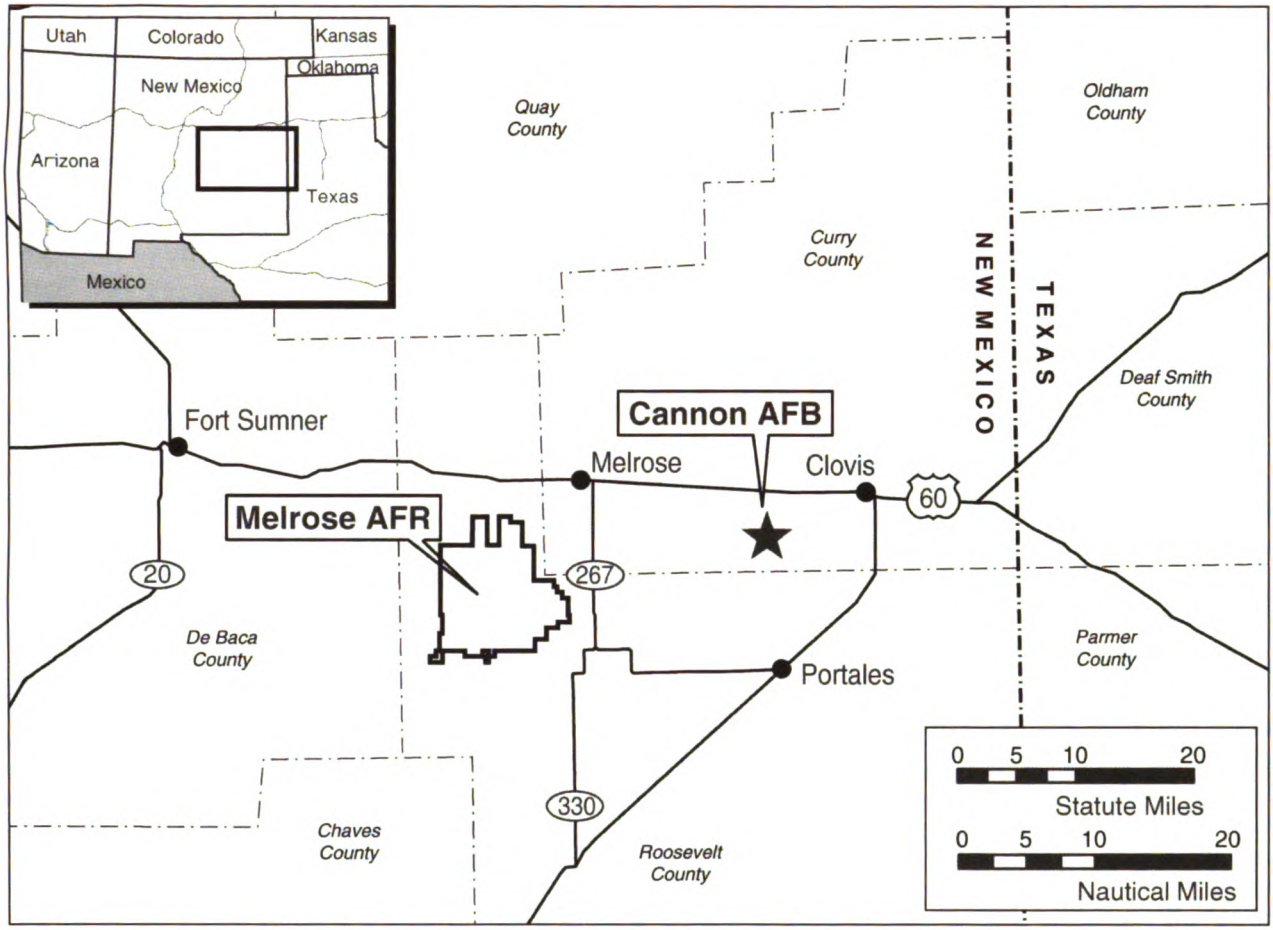


FIGURE 1-1. LOCATION OF CANNON AFB AND MELROSE AFR

In June 2006, AFSOC was designated as the new mission for Cannon AFB and Melrose AFR. Details associated with the transition, including aircraft to be assigned training at Melrose AFR, training within the airspace, facilities at Cannon AFB, and targets at Melrose AFR are still unknown. The AFSOC development and training will be addressed in a separate environmental analysis per the Notice of Intent published in the *Federal Register* on August 24, 2006.

Cannon AFB-managed airspace is discussed in Section 1.2.2. NMTRI focuses on airspace and does not propose any changes to Cannon AFB or to Melrose AFR. NMTRI would change airspace size and configuration necessary to enhance the combat capabilities and survivability of New Mexico aircrews. As noted in the Draft EIS, NMTRI is intended to support the existing training mission of the 60 F-16 aircraft assigned to Cannon AFB, the 18 F-16s assigned to the 150 FW of the NMANG, and transient users. Aircrews need airspace adequately sized and configured to train as they will fight and be prepared for worldwide deployment under their AEF responsibilities described in Section 1.2.2.

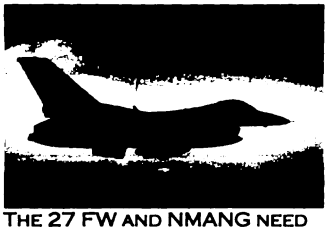
Cannon AFB has trained aircrews with an air-to-ground mission since 1943. Initially, the 16th Bombardment Operational Wing trained crews of the B-17, B-24, and B-29 heavy bombers. Inactivated in 1947, the base was reactivated in 1951 as a Tactical Air Command (TAC) base

with the 140th Fighter-Bomber Wing, flying F-86 Sabre fighters. By 1959 the base's 27th Tactical Fighter Wing had been established and was flying F-100 supersonic aircraft. Ten years later the 27th was re-equipped with the supersonic F-111E, and in 1971 with the supersonic F-111D. From the early 1970s through the mid 1990s, aircraft trained at supersonic speeds in the airspace, including F-111 flights above FL 300. In 1995, all F-111 aircraft were replaced by supersonic F-16s with a combined air-to-air and air-to-ground role. The F-16s normally train at higher altitudes than the F-111s. Cannon AFB has historically hosted cooperative programs designed to standardize flight training among allied nations. For example, until recently, the 428th Fighter Squadron was a combined United States Air Force/Republic of Singapore Air Force F-16 squadron that was established at Cannon AFB as part of this cooperative program.

The current New Mexico F-16 mission is to develop and maintain a fighter wing and active Air National Guard units capable of day, night, and all-weather combat operations for war-fighting missions worldwide.

1.2.2 MILITARY TRAINING AIRSPACE

Military training airspace associated with NMTRI begins approximately 12 miles west of Cannon AFB and extends approximately 90 miles west. The NMANG 150 FW and the 188th Fighter Squadron have a primary flying mission to provide air interdiction support to the Twelfth Air Force, ACC, with worldwide deployment responsibilities.



THE 27 FW AND NMANG NEED ADEQUATE AIRSPACE TO TRAIN AS THEY WILL FIGHT SO THAT THEY CAN MEET THEIR AEF RESPONSIBILITIES AND BE PREPARED FOR WORLDWIDE DEPLOYMENT. CURRENT LIMITS ON TRAINING OPERATIONS WITHIN THE AIRSPACE PRECLUDE CANNON AFB AND NMANG SQUADRONS FROM TRAINING LOCALLY USING THE CAPABILITIES OF THEIR AIRCRAFT. F-16 AIRCRAFT HAVE THE ABILITY TO ACCELERATE TO SUPERSONIC SPEEDS TO ATTACK OR AVOID THREATS. THE FOUR F-16 SQUADRONS AT CANNON AFB AND THE ONE F-16 SQUADRON OF THE NMANG HAVE A NEW CAPABILITY TO LAUNCH MUNITIONS AT SUPERSONIC SPEEDS AT A GREATER DISTANCE FROM TARGETS. THE F-16 SQUADRONS ALSO NEED TO TRAIN TWICE A MONTH AS A TEAM OF APPROXIMATELY 20 AIRCRAFT IN A LARGE-FORCE EXERCISE.

Pilots assigned to Cannon AFB and the NMANG must be trained to support both air-to-air and air-to-ground missions. These missions require proficiency in numerous aspects of aerial combat. Table 1-1 outlines the missions and tactics required for pilot training. Most, if not all, training flights are integrated into a cohesive series of missions and tactics performed during actual combat. At any time during a combat mission, a pilot could be exposed to numerous types of threats, either air-based (opposing aircraft with missiles and guns) or ground-based (various surface-to-air missiles or anti-aircraft artillery). The Air Force has electronic warfare ground-based electronic threat emitters in areas underlying the military training airspace to simulate ground based threats. These emitters provide electronic signatures that simulate ground-based "enemy" radar systems, threaten pilots during training, and require pilots to take defensive actions for self-protection. Pilots are currently authorized to use chaff and flares during training to spoof or avoid these threats as part of this defensive action. The 27 FW manages 10 emitter sites throughout the areas encompassed by the existing training airspace.

TABLE 1-1. MISSION AND TACTICS REQUIRED FOR 27 FW PILOT TRAINING

Mission/Tactic	*Definition*
Basic Surface Attack (BSA)	Air-to-ground delivery of ordnance, such as training ordnance, on a conventional bombing range such as Melrose AFR.
Tactical Weapons Delivery (TWD)	More challenging multiple attack headings and profiles; pilot is exposed to varying visual cues, shadow patterns, and the overall configuration and appearance of the target. Supersonic speeds that can include target acquisition are added to the challenge of bomb release accuracy. TWD includes sweep (ensuring control of battlefield).
Surface Attack Tactics (SAT)	Practiced in a block of airspace such as a MOA or Restricted Area that provides room to maneuver up to supersonic speeds. Precise timing during the ingress to the target is practiced, as is target acquisition. Ordnance is only used on approved ranges. Training includes egress from the target area and reforming into a tactical formation.
Close Air Support (CAS)	Focuses on missions providing direct support to ground forces in close proximity to enemy forces. A Forward Air Controller (FAC) uses direct radio contact to direct CAS. Training includes coordination with the FAC, ensuring precise location of friendly troops, and simulated delivery of ordnance on enemy positions.
Basic Fighter Maneuvering (BFM)	Fundamental training of all air-to-air flight maneuvering conducted with two aircraft practicing individual offensive and defensive maneuvering against each other.
Air Combat Maneuvering (ACM)	Training intra-flight coordination, survival tactics, and two-ship maneuvering against an adversary that includes maneuvering at supersonic speeds. The use of on-board radar is emphasized in this training.
Air Combat Tactics (ACT)	Three or four aircraft designated as friendly or enemy forces that separate as far as possible in the maneuvering airspace to ensure vertical separation before tactics training. Opposing forces approach each other at different designated altitudes and at speeds up to and including supersonic flight. Training using the same type of aircraft is termed similar air combat tactics; if different types of aircraft are involved, it is termed dissimilar air combat tactics. ACT also includes Defensive Counter Air (DCA), Red Air, and Force Protection (FP).
Tactical Intercept (TI)	Target aircraft and intercept aircraft are separated beyond each aircraft's radar detection capability. The target aircraft may achieve supersonic speeds as it attempts to penetrate the area protected by the interceptor. The interceptor must detect the target, maneuver at supersonic speeds to identify the aircraft, and then position itself to successfully intercept.
Advanced Targeting Pod (ATP) Training	During the day, the advanced targeting pods assist in navigation and weapons delivery at various altitudes. During the night, an advanced targeting pod is used at specified altitudes for system navigation and weapons delivery training. The ATP can be integrated in multiple training events.
Suppression of Enemy Air Defenses (SEAD)	Highly specialized mission requiring specific ordnance and avionics and can include supersonic speeds. The objective of this mission is to neutralize or destroy ground-based anti-aircraft systems
Destruction of Enemy Air Defense (DEAD)	A specialized mission that extends SEAD and combines tactics, ordnance, avionics and includes supersonic speeds for the specific objective of the destruction of ground-based weapons that could threaten friendly forces.
Combat Search and Rescue (CSAR)	A specialized mission using aircraft, rescue teams, and specialized equipment to search for and rescue personnel in distress. Training conducted often at low airspeeds at 1,000 feet above ground level (AGL) or lower. Multiple tactics are applied during CSAR training.

New Mexico F-16 squadrons are integrated into the Air Force's Expeditionary Air Force (EAF) Construct. The EAF is comprised of a group of different types of aircraft, with a mixture of capabilities suited to the tasking, deployed to overseas locations for about 120 days. These squadrons from multiple United States (U.S.) bases are integrated with other forces overseas. Pre- and/or post-deployment training, at locations other than a "home" base, also occurs for about another 30 days out of the year. Squadrons or wings at the bases are rotated into the AEF program on a 20-month cycle. On average, each squadron would be deployed for 165 days per AEF cycle (120 days AEF and 45 days pre- or post-AEF training).

During these deployments, Air Force pilots must meet and counter increasingly sophisticated enemy forces employing upgraded equipment and enhanced tactics. To meet their responsibilities, pilots must demonstrate proficiency in the missions and tactics listed in Table 1-1. The NMTRI proposal is designed to support the existing mission and aircraft capabilities of the 27 FW, the NMANG, and other military users.

There are four types of local training airspace used by the 27 FW and NMANG. Figure 1-2 displays these types of airspace. Airspace managed by Cannon AFB associated with this proposal encompasses the Restricted Airspace supporting Melrose AFR, the Pecos MOA and its associated Air Traffic Control Assigned Airspace (ATCAA), Taiban MOA, and Sumner ATCAA. Figure 1-3 presents a top-down view of this existing airspace.

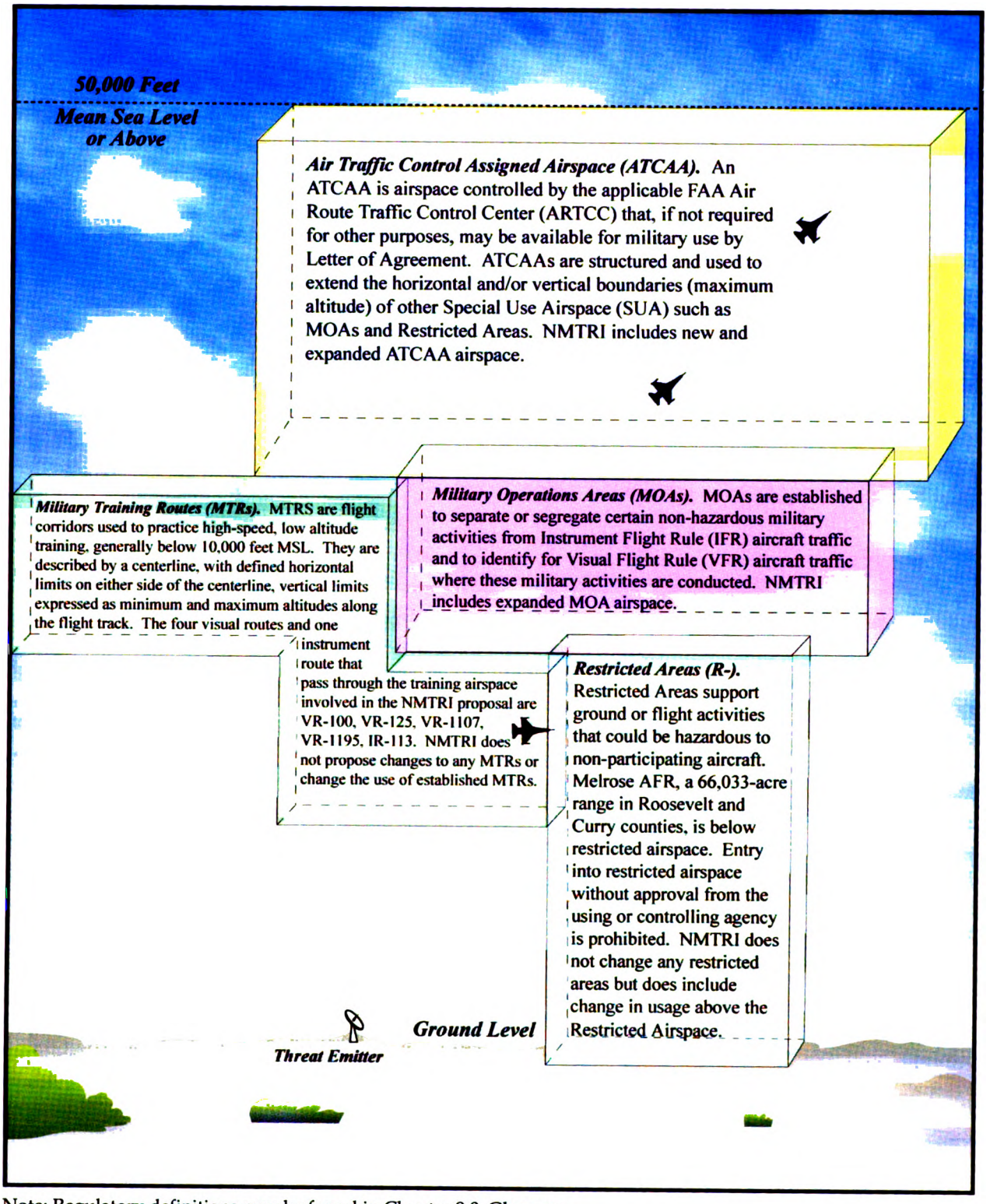
There are several airspace limitations that prevent training engagements at combat speeds, against threats, or at target distances within this existing airspace. The Pecos MOA and Pecos ATCAA underlie only a portion of the Sumner ATCAA. This limitation restricts maneuvering to the west and east under the Sumner ATCAA. The Pecos South Low MOA does not extend to the area covered by the Pecos South High MOA. This Roswell shelf creates a limitation on training to avoid threats. The limitations on realistic training associated with these airspace constraints affect quality pilot training in the following ways:

- Negatively impacts all aspects of air-to-air and air-to-ground training by limiting the available volume of airspace forcing the F-16s to use non-optimal employment tactics for simulated ordnance deliveries.

- Seriously compromises pilot training when pilots become habituated to "administratively disregarded" commercial air traffic operating near the airspace. Even momentary hesitation in combat from this habit can have catastrophic consequences.

- Teaches similar negative habits to pilots who are not trained to aggressively manipulate their radar to search the full airspace volume for enemy aircraft.

- Reduces available airspace in the Pecos complex and restricts usability of the Melrose AFR where critical training missions occur.



Note: Regulatory definitions may be found in Chapter 9.0, Glossary.

FIGURE 1-2. TYPES OF TRAINING AIRSPACE

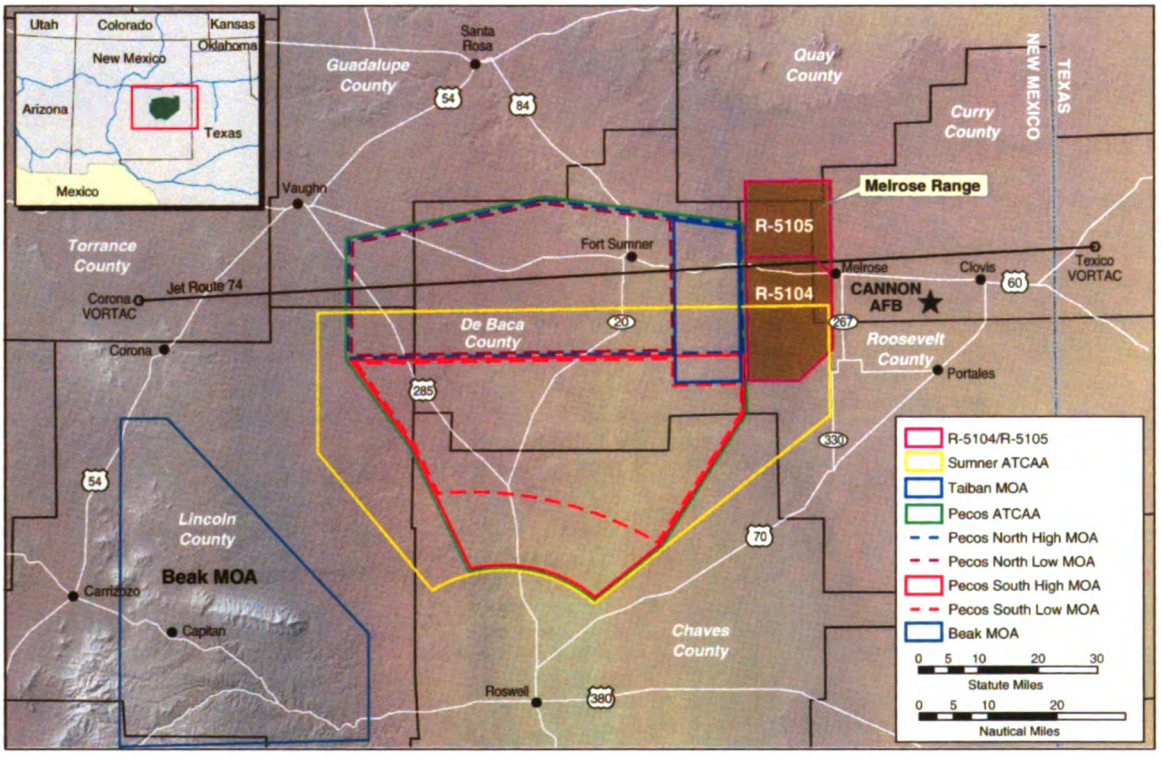


FIGURE 1-3. EXISTING AIRSPACE

As a result of these restrictions, aircrews cannot conduct the full range of training necessary to exploit the F-16's capability and enhance pilot survivability in combat.

The abrupt and segmented changes in altitude associated with the current MOA structure introduce pilot concerns about the boundary of the airspace and artificially constrain realistic threat-avoidance training. In summary, the current airspace configuration requires pilots to train using non-optimal tactics in restricted training regimes. This continually reinforces negative habit patterns which can affect pilot survivability in combat.

The Pecos and Taiban MOAs and overlying ATCAAs support varied military training, including training on Melrose AFR. Jet Route J-74 (J-74) crosses east-west above the Pecos MOA through the upper altitudes of the Pecos ATCAA. This route is controlled by the Federal Aviation Administration (FAA) Albuquerque Air Route Traffic Control Center (ARTCC) to allow aircraft to travel along a specified route from point A to point B. The purpose of military training airspace is to separate commercial, civil, and military operations. Traffic on J-74 and directly routed civil aircraft traffic are normally assigned altitudes at or above Flight Level (FL) 310 (approximately 31,000 feet MSL) during times when military flight training is in progress but limited to FL 300.

The Pecos ATCAA overlies the Pecos North/South High MOAs and extends usable maneuvering airspace from FL180 through FL300 or as assigned by the Albuquerque ARTCC. The Sumner ATCAA overlies a large portion of the Pecos ATCAA and is activated from FL240 to FL510, or as assigned by Air Traffic Control (ATC), when this additional airspace is required above the Pecos MOAs and ATCAA to fulfill high altitude training requirements. A Letter of Agreement (LOA) between Albuquerque ARTCC and Cannon AFB outlines use of these

ATCAAs (as discussed in Section 3.1.2). The availability of the ATCAAs is generally dependent upon the ARTCC's need to route other Instrument Flight Route (IFR) air traffic through this airspace.

The Beak MOA/ATCAA can be used as a staging area for exercises, but the narrow transit corridor between the Beak MOA and Pecos MOA/ATCAAs does not support staging, ingress, or maneuvering to avoid threats or to initiate deployment of long-range stand-off weapons. The multiple shapes and pieces of airspace severely limit threat avoidance and weapons tactics training required for combat.

1.3 PURPOSE OF NMTRI

The purpose of NMTRI is to provide military training airspace that is adequately sized, configured, and capable of supporting effective realistic training for the full range of F-16 training missions. The purpose of NMTRI can be appreciated by comparing Figures 1-4 and 1-5. Figure 1-4 presents the current airspace as viewed from the southeast looking northwest. The existing airspace configuration is comprised of multiple different airspace blocks. If a pilot maneuvers to avoid a simulated threat and flies too close to the edge of a block, that pilot risks a "spill out" from the training airspace boundary. This results in the equivalent of a traffic ticket to a motorist. As with a motorist, too many tickets for a pilot result in the loss of permission to "drive." The multiple airspace blocks unrealistically constrain pilots to avoid "tickets" rather than train pilots to avoid the real life or death threats of combat conditions.

Figure 1-5 presents the NMTRI preferred alternative "filled in" airspace that combines airspace blocks. NMTRI airspace would permit military pilots to train with the full capabilities of their aircraft (as described in Section 1.2.2) and as a team of approximately 20 aircraft in large-force exercises (LFEs). During these exercises, different aircraft fulfill different missions and tactics (from Table 1-1) and face different threats. Figure 1-6 shows the type of combat training that could occur for an approximately 20 aircraft LFE. The lack of the Capitan ATCAA limits the training benefits that could be realized by combining the Beak and the Pecos airspaces to provide a transition, ingress, and maneuver area to be used during LFEs. At present, any LFE transits a narrow corridor between the Beak and Pecos MOAs that requires an individual request and processing and that does not provide for realistic training access to the Pecos MOA complex. The purpose of NMTRI is to size and configure the New Mexico airspace for pilots training in the missions and tactics faced in combat. The proposed NMTRI configured airspace would support these exercises and permit realistic scenarios for engagement.

The NMTRI airspace configuration and use would satisfy operational requirements, include supersonic flight above 10,000 feet MSL (1 mile or more above ground level). The F-16 is capable of flying and launching modern weapons at supersonic speed, which is essential for specific combat situations. At supersonic speeds, the timeframe during which aircrews are exposed to enemy threats is minimal. In addition, modern munitions can be released at greater distances from the target during supersonic flight. For example, when a JDAM is delivered supersonically, the release range from the target is increased by up to three times over conventional munitions. The 27 FW, NMANG, and other units would continue to use RR-188 chaff and M-206 flares as previously approved in the existing airspace as well as in the new and modified airspace. No increase in the amount of chaff or flares is anticipated.

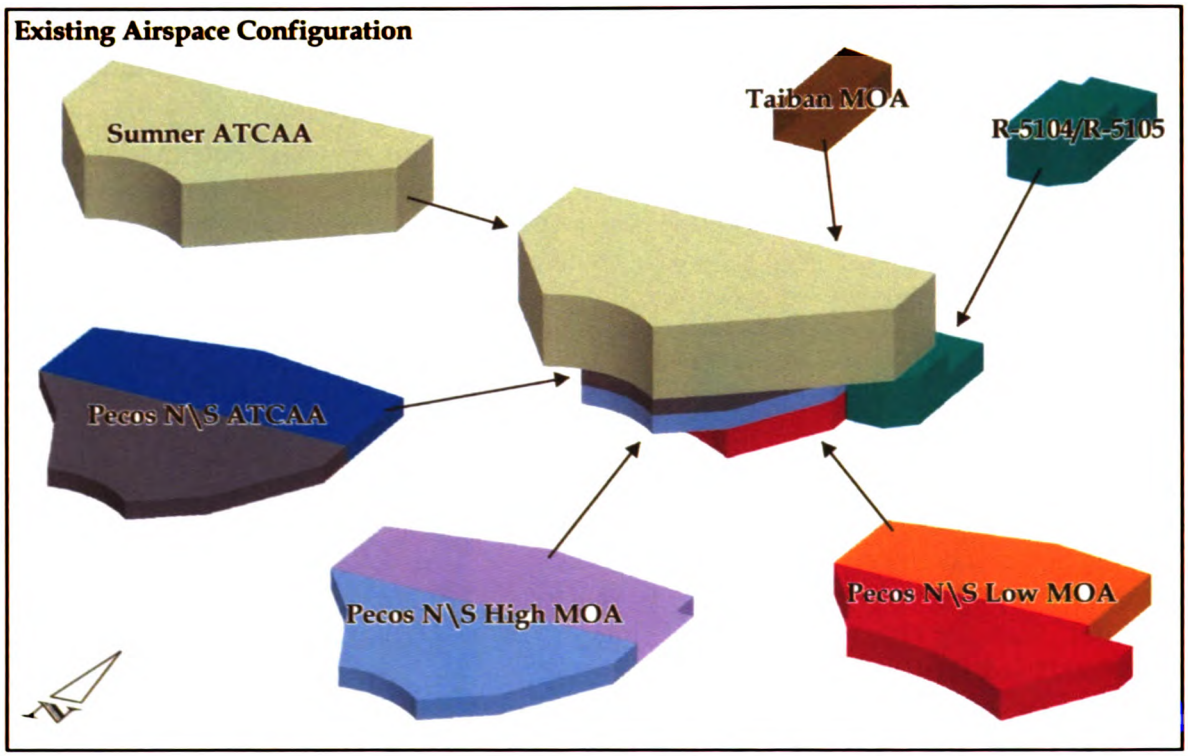


FIGURE 1-4. THREE-DIMENSIONAL VIEW OF EXISTING AIRSPACE BLOCKS AS VIEWED FROM THE SOUTHEAST LOOKING NORTHWEST

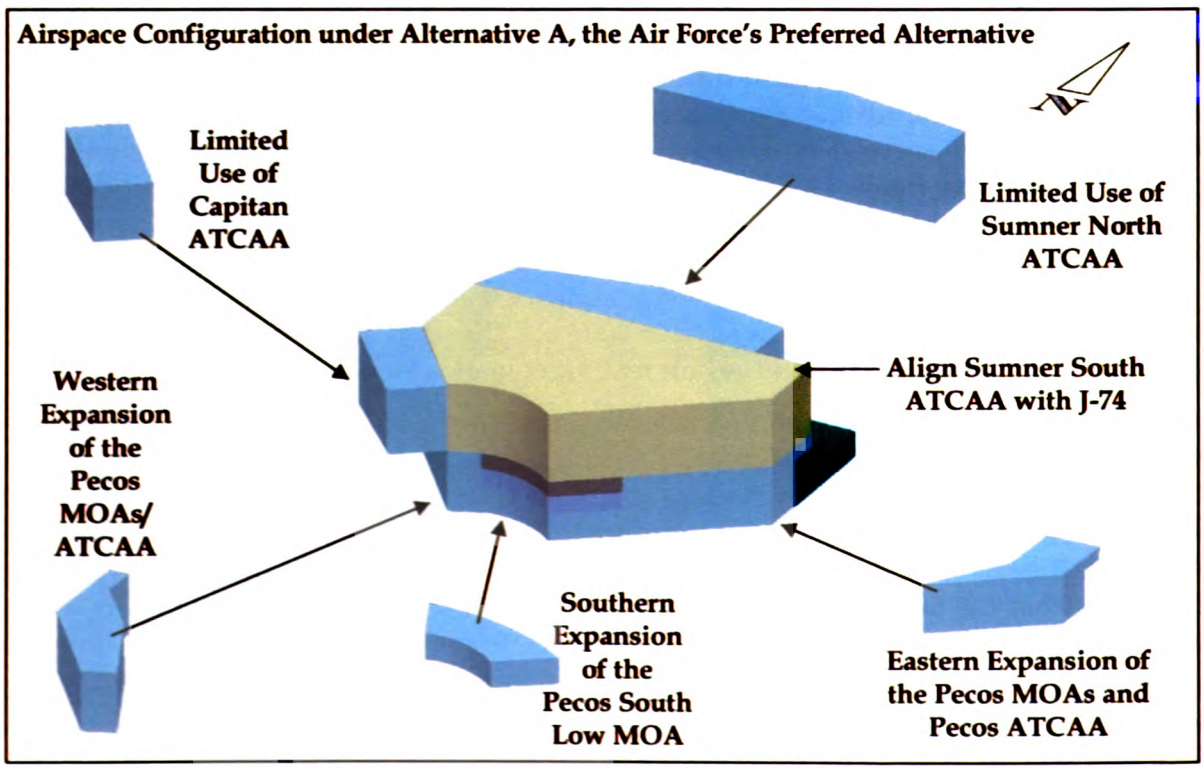


FIGURE 1-5. ALTERNATIVE A, THE PREFERRED ALTERNATIVE, AIRSPACE CONFIGURATION AS VIEWED FROM THE SOUTHEAST LOOKING NORTHWEST

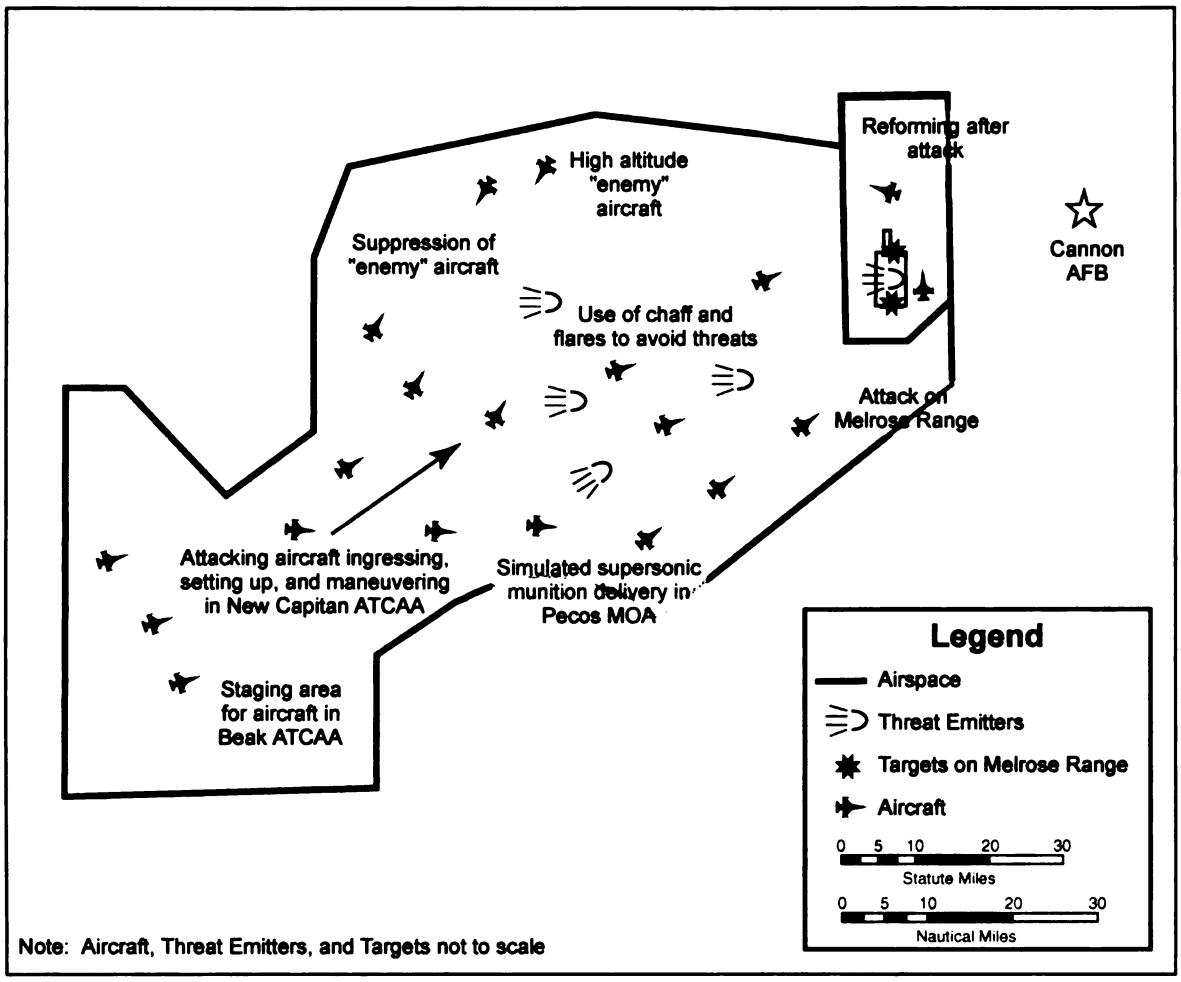


FIGURE 1-6. REPRESENTATIVE LFE WITH APPROXIMATELY 20 AIRCRAFT USING PROPOSED NMTRI AIRSPACE

NMTRI provides an airspace complex that is adequately sized, configured, and capable of supporting representative engagement distances with hostile forces and permits deployment of chaff and flares in the expanded airspace. Existing military training airspace includes some, but not all of these requirements. NMTRI airspace changes would provide for all of these requirements for effective and realistic combat training.

Although ACC has scheduled the last F-16 aircraft to leave Cannon in early 2008, the Air Force maintains the requirement for charting NMTRI airspace. Currently, 27 FW has 50 F-16 pilots training for a combat deployment to Iraq; NMTRI airspace would greatly enhance their combat training, combat effectiveness, and survivability in war as described in the EIS. Additionally, another 25 pilots will continue to train in NMTRI airspace in preparation for combat later in 2007 and Cannon AFB F-16 aircrews will continue to train in Cannon's airspace well into 2008; it is in the nation's best interest to chart NMTRI airspace as expeditiously as possible to enhance our national security.

After the 27 FW aircraft depart Cannon AFB, the 150 FW (NMANG) at Albuquerque, New Mexico will continue to use the NMTRI airspace to train their F-16 crews (refer to NMANG correspondence in Appendix C). Other users may schedule and use NMTRI airspace as described in the EIS. Airspace is a national asset and NMTRI airspace is especially significant to

enhancing aircrew training by allowing low altitude (10,000 feet MSL) supersonic operations, expanded MOAs/ATCAAs, and improved airspace linkage into Melrose AFR. NMTRI airspace offers realistic training for pilots to practice combat tactics they currently use in war; a capability that does not exist in the current airspace configuration.

1.4 NEED FOR NMTRI

New Mexico aircrews need airspace adequately sized and configured to train as they will fight and be prepared for worldwide deployment under their AEF responsibilities. As a result of current airspace restrictions, the pilots' ability to conduct the full range of training necessary to exploit the F-16's capability and enhance pilot survivability in combat is severely impacted. Pilots cannot train for missions presented in Table 1-1 with the full performance capabilities of their aircraft. Deployed aircrews need to be trained to succeed against the world's most sophisticated hostile tactics and anti-aircraft systems.

New Mexico aircrews need access to local training airspace that provides as realistic a combat environment as feasible to execute its mission and support national military and security objectives. State of the art aerial combat and surface attack missions in the F-16 multi-role fighter require highly tuned offensive and defensive pilot skills. These skills are best practiced in all speed and altitude regimes faced in the combat environment. Training airspace is needed that is configured to allow aircrews to practice current tactics, to make full use of F-16 capabilities, and to permit training in LFEs. The proposed NMTRI changes to airspace size and configuration are needed to enhance the combat capabilities and survivability of New Mexico F-16 aircrews.

1.5 LEAD AND COOPERATING AGENCIES

The Air Force is the proponent for the NMTRI proposal and is the lead agency for the preparation of the EIS. The FAA is a cooperating agency. As defined in 40 Code of Federal Regulations (CFR) §1508.5, a cooperating agency...

> means any Federal agency other than a lead agency which has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment.

Congress has charged the FAA with administering all navigable airspace in the public interest as necessary to ensure the safety of aircraft and the efficient use of such airspace. As the agency with jurisdiction by law and special expertise with respect to those portions of the NMTRI proposal regarding changes in the configuration of the airspace and establishment of new airspace, the FAA is participating as a cooperating agency. As a cooperating agency, FAA has participated in public scoping and preparation of the Draft EIS. Their input has been critical in developing the Preferred Alternative, Alternative A. Table 1-2 presents a list of relevant correspondence exchanged throughout the NMTRI process between the Air Force and the FAA (copies of this correspondence may be found in Appendix C). FAA comments on the Draft EIS may be found in Chapter 6.0 with other agency letters.

TABLE 1-2. CORRESPONDENCE WITH THE FAA

From	*To*	*Letter date*	*Subject*
FAA	Air Force	20 January 2004	Cooperating Agency Status
Air Force	FAA	9 December 2004	NMTRI Draft Airspace Proposal
FAA	Air Force	11 February 2005	NMTRI Draft Airspace Proposal
FAA	Air Force	22 April 2005	ZAB response to NMTRI Draft Airspace- Revision April 05
FAA	Air Force	9 June 2005	NMTRI Airspace Documentation
Air Force	FAA	21 June 2005	NMTRI, Mr. Semanek's 9 Jun 05 Email
Air Force	FAA	July 2005	Formal NMTRI Airspace Proposal to AF Rep, for DOR Signature

Correspondence related to the airspace proposal that occurred following the issuance of the NMTRI Draft EIS in January 2005 contributed to the analysis and the Air Force's selection of the Preferred Alternative. Section 2.2 of this EIS describes the Preferred Alternative and other alternatives. As described in Section 2.2.1.2, Alternative A includes mitigations developed from the Draft EIS review process. These mitigations include the designation and use of the Sumner North ATCAA and the Capitan ATCAA. The mitigations include abandoning the proposed Capitan MOA and reducing the Capitan ATCAA in size (see Section 2.2.1.2). Alternative A does include specific use of the Sumner North ATCAA as described in Section 2.2.1.1. The consequences of the mitigated Alternative A are presented in Chapter 4.0 of this EIS. The consequences of the mitigated Alternative A to Airspace and Range Management may be found in Section 4.1.3.2. The consequences of the mitigated Alternative A to Safety may be found in Section 4.3.3.2.

FAA has cooperated with the Air Force on preparation of this Final EIS. The Air Force's decision on the NMTRI proposal will be documented in an Air Force Record of Decision (ROD). After the ROD is approved, if an action alternative is selected, the Air Force will submit a final NMTRI Airspace Proposal to FAA requesting action on the airspace modifications and establishment of new airspace as recorded in the Final EIS and ROD. FAA will review the airspace proposal submitted by the Air Force in accordance with its policies and procedures, including FAA Orders 1050.1 and 7400.2. The Air Force's goal in its cooperative effort with the FAA is for this EIS to fulfill the NEPA requirements of both agencies.

1.6 ORGANIZATION OF THIS EIS

This EIS is organized into the following chapters and appendices: Chapter 1.0 describes the purpose and need of the proposal to provide military training airspace that is adequately sized, properly configured, and capable of supporting the training mission for F-16 aircraft based at Cannon AFB and the NMANG at Kirtland AFB, New Mexico. Detailed descriptions of Alternative A, the Draft EIS Proposed Action, Alternative B, and the No-Action Alternative are provided in Chapter 2.0. Chapter 2.0 also discusses alternatives considered but not carried forward for further analysis. Finally, Chapter 2.0 provides a comparative summary of the effects of the alternatives with respect to the various environmental resources.

Chapter 3.0 describes the existing conditions of environmental resources that could be affected by Alternative A, the Draft EIS Proposed Action, or Alternative B. Chapter 4.0 addresses the environmental consequences to those resources that could result from implementing an alternative, including the No-Action Alternative. Chapter 5.0 is expanded in this Final EIS to address the cumulative effects of recent past, present, and reasonably foreseeable actions that may be implemented in the region of influence (ROI). Chapter 5.0 also presents the relationship between short-term uses and long-term productivity identified for the resources affected, and the irreversible and irretrievable commitment of resources if Alternative A, the Draft EIS Proposed Action, or Alternative B were selected. Chapter 6.0 contains comments received from federal, state, and local agencies, and the public during the Draft EIS public comment period. Comments include written materials received and comments made during public hearings. Responses to comments are also included in Chapter 6.0. Chapter 7.0 contains references cited in the EIS and lists the individuals and organizations contacted during the preparation of the EIS. A list of the document preparers is included in Chapter 8.0. Chapter 9.0 is a glossary of frequently used terms.

NMTRI EIS

In addition to the main text, the following appendices are included on a CD attached to the inside back cover of this document: Appendix A, Characteristics of Chaff; Appendix B, Characteristics of Flares; Appendix C, Public Involvement and Agency Correspondence; Appendix D, Relevant Statutes, Regulations, and Guidelines; Appendix E, Airspace Description and Utilization; Appendix F, Obstruction Marking and Lighting; Appendix G, Aircraft Noise Analysis and Airspace Operations; Appendix H, Special-Status Plant and Animal Species and Scientific Names; and Appendix I, Section 4(f) Analysis required for FAA rulemaking.

27th Fighter Wing at Cannon AFB

The 27 FW's mission is to provide lethal combat power with F-16 fighter aircraft capable of day, night, and all weather combat operations.

Advanced technology and sophistication of enemy threats demand that 27 FW pilots be trained to instantly respond to these threats. F-16s at Cannon AFB are capable of supersonic flight, which enables pilots to deliver weapons at sufficient distances from enemy areas where they are subjected to fewer hostile threats.

New Mexico Air National Guard

NMANG is located at Kirtland AFB in Albuquerque, New Mexico. The NMANG is composed of State Headquarters, the 150th Fighter Wing and the 188th Fighter Squadron.

The 150 FW's primary flying mission is to provide air interdiction support to the Twelfth Air Force, Air Combat Command, with worldwide deployment capability.

The NMANG F-16 aircraft train on Melrose AFR and with Cannon AFB aircrews in Cannon AFB managed airspace.

New Mexico based F-16s are:

- Compact
- A high-performance weapons system for U.S. and allied nations
- Capable of supersonic speeds
- Highly maneuverable
- Proven in combat
- Multi-role fighters with precision strike, beyond visual range, and day and night capabilities

Recent New Mexico F-16 Deployments:

- Operation Iraqi Freedom
- Operation Noble Eagle, providing homeland security
- Operation Southern Watch in support of the U.N.'s no-fly zone in Iraq

NMTRI provides local training to maximize the value of a limited number of training hours.

Existing New Mexico airspace managed by Cannon AFB does not provide adequate space for pilots to train to meet current or realistic enemy threats. Cannon AFB is proposing to:

- Modify airspace
- Create a new MOA/ATCAA
- Obtain authorization for supersonic operations in the airspace above 10,000 feet above MSL
- Use chaff and defensive flares in the new and modified airspace.

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2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 CRITERIA FOR DEVELOPING THE PROPOSED ACTION

Identification and analysis of alternatives is a core element of the environmental process under the National Environmental Policy Act (NEPA), 32 Code of Federal Regulations (CFR) 989 and Federal Aviation Administration (FAA) Order 1050.1, Environmental Impacts: Policies and Procedures. For this proposal, the United States Air Force (Air Force) worked with the FAA, the State of New Mexico, and the public to help identify candidate alternatives. Because the action largely relates to the use and configuration of airspace, the major focus for alternative development is operational requirements.

The Air Force identified operational criteria and other considerations for use in identifying alternatives that met the purpose and need for the New Mexico Training Range Initiative (NMTRI). Operational criteria are listed below and discussed in detail in Section 2.1.1:

- Existing military airspace,
- Airspace volume,
- Ability to maximize training time,
- Adjacency to a military training range, and
- Utilization and availability.

THE AIR FORCE USED FIVE OPERATIONAL CRITERIA AND THREE OTHER CONSIDERATIONS TO EVALUATE CANDIDATE ALTERNATIVES.

The following other considerations (discussed in Section 2.1.2) were also utilized to define candidate alternatives:

- Identification of population centers,
- Quantification of civilian air traffic,
- Identification of special-use land management areas.

2.1.1 OPERATIONAL CRITERIA

Airspace used for aircrew combat training must meet certain operational requirements. These requirements are discussed below.

EXISTING MILITARY AIRSPACE

Airspace is a valuable national resource. Whenever possible, the Air Force seeks to meet the purpose and need for proposed actions through maximum use of existing military airspace and minimum change to non-military airspace. Historic use of military training, including historic use by supersonic aircraft (see Section 1.2.1), was considered in the identification of potential areas for aircraft overflight and supersonic activity.

AIRSPACE VOLUME (SIZE)

The airspace must allow aircrews to practice current tactics and make full use of all F-16 capabilities (described in Section 2.2.1.5). This requires both a horizontal and vertical extent that allows for representative engagement distances with hostile threats. The airspace configuration would be sufficient in size to permit supersonic flight above 10,000 feet above mean sea level (MSL), employment of defensive chaff and flares, and electronic combat simulation.

Maximize Training Time and Minimize Transit

Effective and efficient training requires pilots to be spending as much flying time as possible practicing the missions and tactics described in Table 1-1. This means that airspace near a base permits pilots to maximize training time and minimize "commute" time to the training airspace. Airspace should be accessible for missions and tactics training by New Mexico aircrews. Training at supersonic speeds increases fuel consumption and limits available training time in the airspace. Airspace that is distant from the training aircraft base requires pilots to expend limited fuel and flying time in transit rather than in training.

PILOTS NEED TO SPEND AS MUCH FLYING TIME AS POSSIBLE PRACTICING MISSIONS AND TACTICS.

Adjacency to a Military Training Range

A key required operational element is to allow pilots to refine their tactics and practice profiles for effective munitions delivery. Munitions delivery can only be accomplished at an approved range. These tactics include stand-off simulated launch at supersonic speed, simulated threat suppression, and actual delivery of approved munitions on Melrose Air Force Range (AFR). Sites on Melrose AFR and, primarily, under the Pecos Military Operations Area (MOA) are used for electronic threats that simulate radar guided weapons. This Electronic Combat Range (ECR) trains pilots with threats faced in combat. Adequate airspace is needed to train pilots to rapidly react to these threats. Integrating the Melrose AFR facility and the ECR sites into these practice profiles is essential to achieve a simulated combat environment.

Utilization and Availability

Cannon Air Force Base (AFB)-managed airspace has the benefit of being accessible and available for New Mexico aircrews to train. Airspace proximate to the bases includes the Restricted Airspace supporting Melrose AFR, the Pecos MOA and its associated Air Traffic Control Assigned Airspace (ATCAA), Taiban MOA, and Sumner ATCAA. Airspace managed by other agencies gives priority to the requirements of those agencies, so New Mexico Air National Guard (NMANG) and 27th Fighter Wing (27 FW) pilots do not have priority to train in airspace scheduled by others.

2.1.2 Other Considerations

In addition to operational criteria, the Air Force identified other considerations that could affect alternative airspaces considered for training. The Air Force considered the ability to address training needs while avoiding underlying human and environmental resources to the extent practicable. The following describes those considerations.

Population Centers

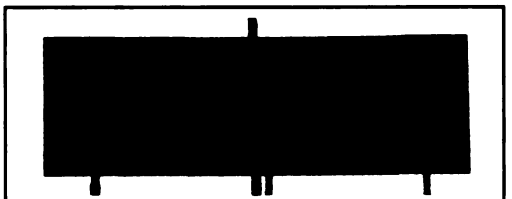
A relatively small number of communities are located under the airspace managed by Cannon AFB. Towns, ranches, and other settlements in eastern New Mexico can be identified and the Air Force intends to avoid areas with concentrations of populations to the extent practicable. Airspace that overlies more densely populated areas makes avoidance of those population centers difficult. When pilots have to focus on multiple avoidance areas they may not be able to focus as well on needed training.

Civilian Air Traffic

Airspace is a nationally valuable resource that is required by commercial and general aviation, as well as by the military for training. The volume of commercial and general aviation in flight tracks potentially affected by adjusting military training airspace was quantified and the potential for deconfliction was considered in the review of potential alternatives.

Special-Use Land Management

Special-use land management areas include Wilderness Study Areas (WSAs), Areas of Critical Environmental Concern (ACECs), and national and state parks that contain environmentally sensitive lands and resources. The Air Force identified such special-use lands and considered their occurrence under airspace identified for the NMTRI proposal.



FORT SUMNER IS THE PRIMARY POPULATION CENTER UNDER THE PECOS MOA COMPLEX.

2.1.3 Application of Criteria and Considerations to Develop the Proposed Action and Alternatives

The operational criteria and other considerations from Sections 2.1.1 and 2.1.2 were applied to candidate airspaces to identify alternatives in this Environmental Impact Statement (EIS). The airspace would need to meet the training requirements of the 27 FW and NMANG, the capabilities of the F-16 aircraft, and the operational criteria. Where possible, other considerations would be included to help define alternatives.

Figure 2-1 summarizes the application of the operational criteria and other considerations to candidate airspaces. Supersonic training in Bronco MOA would provide approximately 69 percent of the comparable training time possible in Pecos MOA. Comparable training in Mt. Dora MOA would be 49 percent of that possible in Pecos MOA, and White Sands Missile Range (WSMR) would only permit 33 percent as much training time as would be possible in the Pecos MOA complex. The Pecos MOA complex and associated airspaces represented the only airspace block that met all operational criteria. In addition, the Pecos MOA and associated airspaces have a lower population density per square mile than any of the other training airspaces under consideration (see Figure 2-1).

An ATCAA "bridge" connecting the Pecos MOA with either the Beak MOA or Bronco MOA would permit additional staging, ingress, and maneuvering for training with all the missions and tactics required for large-force exercises (LFEs) (approximately twice per month). A review of Figure 2-1 demonstrates that such an airspace connecting Pecos to Bronco would have to be more than twice as large as a connection from the Pecos to Beak. Civil aviation activity on the east side, between Bronco and Pecos, is approximately 10 times greater than flight activity on the west side between Beak and Pecos (personal communication, Semanek 2004). An ATCAA to provide staging, ingress, and maneuvering for training between Pecos and Bronco would require so much deconfliction between civil and military aircraft that it was not considered feasible at this time. The Capitan ATCAA connecting Pecos with Beak can be less than one-half the size of an ATCAA connecting Bronco with Pecos. The Capitan ATCAA, defined in Alternative A, would substantially reduce any potential for commercial or general aviation conflicts.

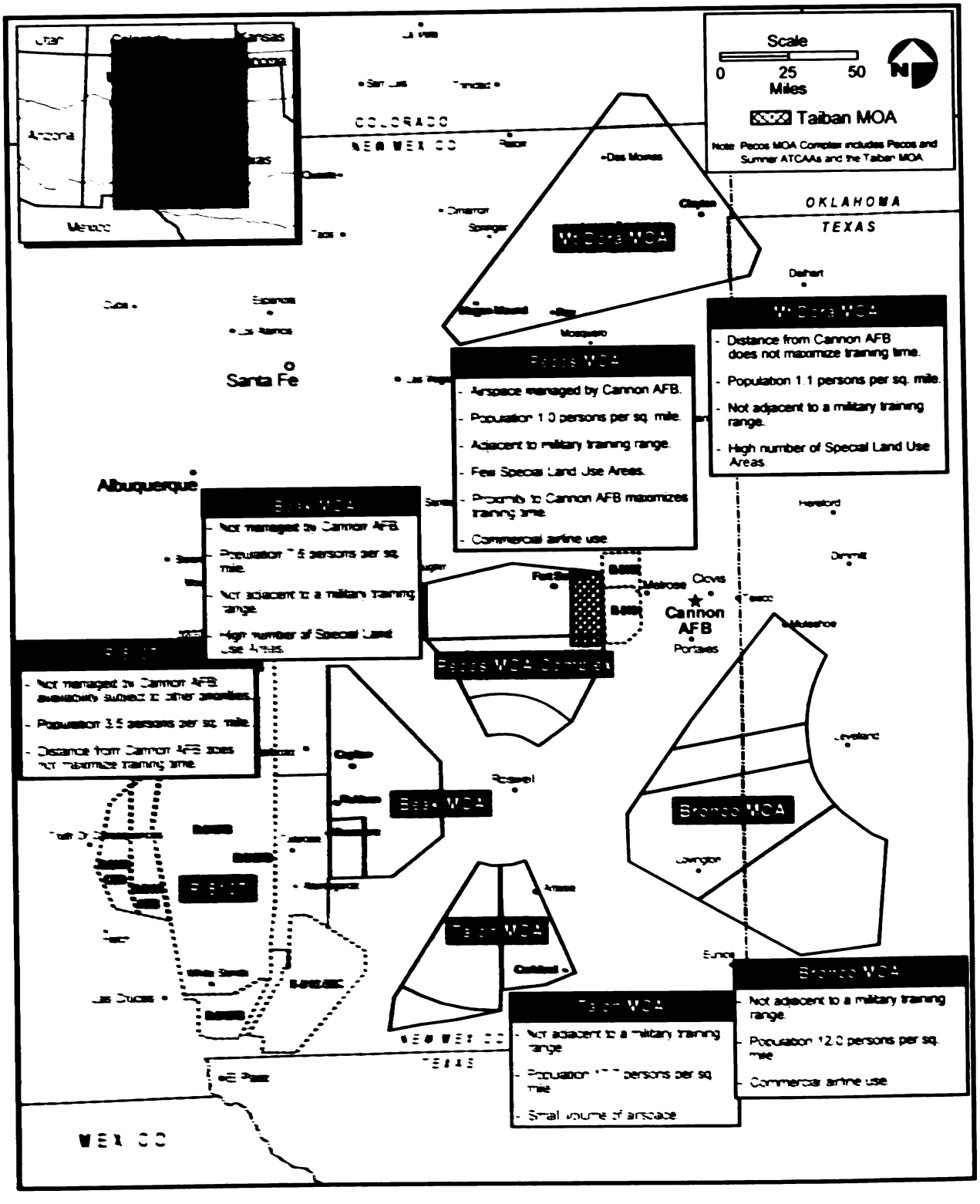


FIGURE 2-1. EXISTING NEW MEXICO AIRSPACE USED FOR APPLICATION OF OPERATIONAL CRITERIA AND OTHER CONSIDERATIONS

Application of the criteria and considerations led to the identification of the Pecos MOA complex as the basis for viable alternatives in this EIS. The secondary goal of having training airspace of adequate volume without disrupting other users of the regional airspace led to the Alternative A limited use Capitan ATCAA. Section 2.3 discusses three candidate alternatives considered but not carried forward for full analysis.

2.2 PREFERRED ALTERNATIVE AND OTHER ALTERNATIVES

Application of the operational criteria and the other consideration to the candidate airspace resulted in the identification of the Pecos MOA complex with the Capitan ATCAA as the airspace combination best meeting the NMTRI purpose and need. Public and agency review and comments on the Draft EIS resulted in the Air Force and FAA reviewing the Draft EIS Proposed Action, Alternative A, and Alternative B. Following this review, mitigations were incorporated into Alternative A and this alternative has been designated the Air Force's preferred alternative. The mitigations to reduce the potential for environmental consequences include the size and altitude for the connecting Capitan ATCAA and the scheduling of the Sumner North ATCAA for military training use. For simplicity in understanding the alternatives, the sequence of presenting the alternatives has been revised in this Final EIS. The titles of the alternatives and the sections where they are described are presented in Table 2-1.

TABLE 2-1. SEQUENCE OF ALTERNATIVES

Final EIS Alternative Designation	*Final EIS Section*	*Draft EIS Alternative Designation*	*Draft EIS Section*
Alternative A Preferred Alternative	2.2.1	Alternative A	2.2.2
Draft EIS Proposed Action	2.2.2	Proposed Action	2.2.1
Alternative B	2.2.3	Alternative B	2.2.3
No-Action	2.2.4	No-Action	2.2.4

2.2.1 ALTERNATIVE A: PREFERRED ALTERNATIVE

Alternative A provides a block of airspace that is adequately sized and configured to permit comprehensive training opportunities for the 27 FW, the NMANG, and other military pilots. NMTRI would produce an increase in the quality, not the quantity of training flights. As explained in this Final EIS cumulative analysis, Chapter 5.0, training activity is expected to change over the next few years as a result of Base Realignment and Closure (BRAC) and designation of the new AFSOC mission. The Air Force NMTRI preferred alternative, Alternative A, would allow aircrews to train using the full array of offensive and defensive tactics required in combat.

There are four basic elements to the preferred alternative:

- Modifications of the existing airspace structure,
- Creation of a new, limited use Capitan ATCAA between Beak and Pecos ATCAAs,
- Authorization for supersonic operations in the training airspace below the current 30,000 feet MSL to 10,000 feet MSL (approximately 5,000 feet above ground level [AGL]), and
- Extending the use of defensive chaff and flares into the new and expanded airspace.

The airspace elements are depicted on Figure 2-2. Each element is described in detail in Sections 2.2.1.1 through 2.2.1.4.

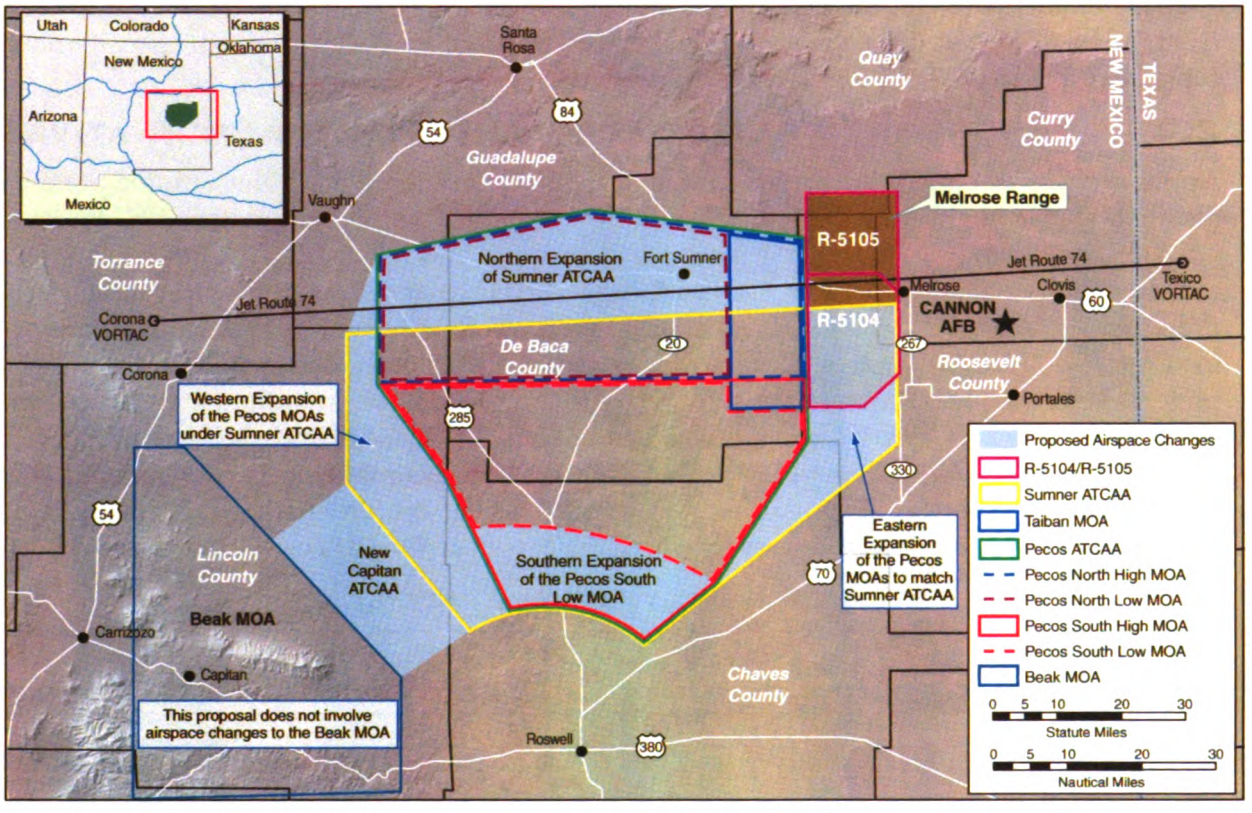


FIGURE 2-2. ALTERNATIVE A, PREFERRED ALTERNATIVE

2.2.1.1 MODIFICATIONS TO EXISTING AIRSPACE

Current airspace and preferred alternative (Alternative A) airspace changes are summarized and compared in Table 2-2.

The current airspace configuration includes an assortment of airspace "blocks." The NMTRI proposal would simplify this airspace by making changes in the lateral and vertical boundaries of these blocks. In some cases, the lateral boundaries of individual blocks would be extended; this would provide more room for aircraft maneuvering, and greatly enhance the range of mission and tactics training that could be undertaken within the airspace. Currently, the lower boundary, or floor, of the airspace blocks varies considerably. This places a substantial constraint on training opportunities (described in Section 1.3). Under Alternative A, the lower boundary of the Pecos South Low MOA and the eastern and western expansion of the Pecos MOA would be extended to create a consistent floor across the airspace. This would "fill in" or consolidate the airspace complex to eliminate unrealistic constraints on training and associated maneuvering inherent in the current airspace configuration.

Alternative A would laterally expand the Pecos MOA/ATCAA to the east and west to coincide with the existing Sumner ATCAA boundaries. The Pecos ATCAA will be deleted and replaced with the Sumner North/South ATCAAs. The floor of the expanded airspace would match the 500 feet AGL of the existing Pecos MOA. The ceiling of the existing Sumner ATCAA would be lowered from Flight Level (FL) 510 to FL500.

TABLE 2-2. AIRSPACE DESCRIPTIONS
(PAGE 1 OF 2)

Training Airspace	*Underlying Counties*	*Current Floor*[1]	*Current Ceiling*	*Proposed Floor*	*Proposed Ceiling*	*Proposed Lateral Expansion?*
Pecos North Low MOA	Guadalupe, Lincoln, De Baca, and Roosevelt	500 AGL (~5,500 MSL)	10,999 MSL	Same as current throughout proposed boundaries	Same as current	Yes, to E and W to horizontal boundaries of Pecos and Sumner ATCAAs
Pecos North High MOA	Same as Pecos North Low	11,000 MSL	17,999 MSL	Same as current	Same as current	Yes, to E and W to horizontal boundaries of Pecos and Sumner ATCAAs
Pecos South Low MOA	Lincoln, Chaves, De Baca	500 AGL (~5,500 MSL) except Roswell Shelf	10,999 MSL	Same as current throughout proposed boundaries	Same as current	Yes, to S to meet the southern border of the Sumner ATCAA
Pecos South High MOA	Same as Pecos South Low	11,000 MSL	17,999 MSL	Same as current	Same as current	Yes, to E and W to horizontal boundaries of Pecos and Sumner ATCAAs
Taiban MOA	De Baca, Roosevelt	500 AGL (~5,500 MSL)	10,999 MSL	Same as current	Same as current	None
Restricted Area R-5105	Quay, Roosevelt, Curry	Ground surface	10,000 MSL	Same as current	Same as current	None
Restricted Area R-5104A	Roosevelt, Curry	Ground surface	17,999 MSL	Same as current	Same as current	None
Restricted Area R-5104B	Roosevelt, Curry	18,000 MSL	23,000 MSL	Same as current	Same as current	None
Melrose ATCAA	Roosevelt, Curry	24,000 MSL	30,000 MSL	Same as current	Same as current	None
Pecos ATCAA	Same as Pecos North and South	18,000 MSL	30,000 MSL	Replaced by Sumner ATCAA	Replaced by Sumner ATCAA	Replaced by Sumner ATCAA
Sumner South ATCAA	Curry, Roosevelt, Chaves, Lincoln De Baca	24,000 MSL	51,000 MSL	18,000 MSL	50,000 MSL	None (aligned with J-74)

TABLE 2-2. AIRSPACE DESCRIPTIONS
(PAGE 2 OF 2)

Training Airspace	*Underlying Counties*	*Current Floor*[1]	*Current Ceiling*	*Proposed Floor*	*Proposed Ceiling*	*Proposed Lateral Expansion?*
Sumner North ATCAA	De Baca, Guadalupe, Curry	N/A	N/A	18,000 MSL	30,000 MSL (50,000 MSL twice/month during low commercial traffic)	Yes, to N to horizontal boundary of Pecos MOA
Capitan ATCAA	Lincoln, Chaves	N/A	N/A	18,000 MSL	32,000 MSL	New ATCAA

Note: 1. Average ground elevation in the region of military training airspace under consideration is approximately 5,000 MSL.
MOA = Military Operations Area
ATCAA = Air Traffic Control Assigned Airspace
AGL = above ground level
MSL = mean sea level

The existing Sumner ATCAA would be extended to the north to conform to the northern border of the Pecos MOA and adjusted to align and be consistently 5 nautical miles (nm) below Jet Route J-74 (J-74). The Sumner ATCAA would replace the existing Pecos ATCAA. A Sumner North ATCAA would be created to overlie the northern portion of the Pecos MOA not covered by Sumner South ATCAA from FL 180 to FL 300 or as assigned (used in conjunction with Pecos/Taiban MOAs). The 27 FW will request Sumner North ATCAA up to FL 500 for LFEs twice per month and twice per week during low demand traffic periods as defined by Albuquerque Center. The airspace would be contiguous and would extend vertically from 500 feet AGL to approximately 50,000 feet MSL when the ATCAA is activated for LFEs.

The existing restricted areas, R-5104 and R-5105, allow low-altitude inert weapons delivery on Melrose AFR. NMTRI does not include any changes in the shape of Melrose AFR or the shape or altitudes of the restricted areas supporting the range. NMTRI does include the ability to fly at supersonic speeds to 10,000 feet MSL in existing airspace that overlies the Melrose AFR and associated restricted airspace. There are no changes to Melrose AFR associated with the NMTRI proposal.

2.2.1.2 CREATION OF NEW AIRSPACE

Alternative A includes mitigations developed from the Draft EIS review process for the creation of a Capitan ATCAA to allow maneuvering between the existing Beak MOA/ATCAA (scheduled by Holloman AFB) and the expanded Pecos/Sumner ATCAA (scheduled by Cannon AFB). The mitigations include abandoning the proposed Capitan MOA and reducing the Capitan ATCAA in size to FL180 (18,000 feet MSL) to FL320 (32,000 feet MSL). The Capitan ATCAA would be established by Letter of Agreement (LOA) between 27 FW and Albuquerque Center. The Capitan ATCAA would be scheduled through Albuquerque Air Route Traffic Control Center (ARTCC) in 2-hour blocks on an as-needed basis that is anticipated to be approximately twice per month. Creation of this link would allow uninterrupted aircrew training between the Beak and Pecos airspaces for LFEs that typically involve approximately 20 aircraft and simulate combat missions (see Figure 1-6).

COUNCIL ON ENVIRONMENTAL QUALITY SECTION 1508.20 DEFINES "MITIGATION" TO INCLUDE:

(A) AVOIDING THE IMPACT ALTOGETHER BY NOT TAKING A CERTAIN ACTION OR PARTS OF AN ACTION.
(B) MINIMIZING IMPACTS BY LIMITING THE DEGREE OR MAGNITUDE OF THE ACTION AND ITS IMPLEMENTATION.
(C) RECTIFYING THE IMPACT BY REPAIRING, REHABILITATING, OR RESTORING THE AFFECTED ENVIRONMENT.
(D) REDUCING OR ELIMINATING THE IMPACT OVER TIME BY PRESERVATION AND MAINTENANCE OPERATIONS DURING THE LIFE OF THE ACTION.
(E) COMPENSATING FOR THE IMPACT BY REPLACING OR PROVIDING SUBSTITUTE RESOURCES OR ENVIRONMENTS.

The Capitan ATCAA would predominately overlie a portion of eastern Lincoln County, and include a small wedge of western Chaves County. The geographic area 1.2 miles under the proposed airspace is approximately 450 square statute miles. Figure 2-3 is a view from near Roswell that shows the proposed airspace changes and includes the new Capitan ATCAA. This mitigated Alternative A responds to comments on the Draft EIS and avoids the potential for significant impacts to civil air traffic using the Roswell-Corona corridor.

The new airspace also includes two adjustments to the Pecos MOA and Sumner ATCAA. One is a small connection of the northwestern corner of the Pecos MOA and modified Sumner ATCAA to avoid a sharp right angle in that corner of the airspace. The other is a sliver of airspace to align the northern edge of the Pecos MOA and overlying Sumner ATCAA at the same angle and consistently 5 nm south of J-74 (see Figure 2-2).

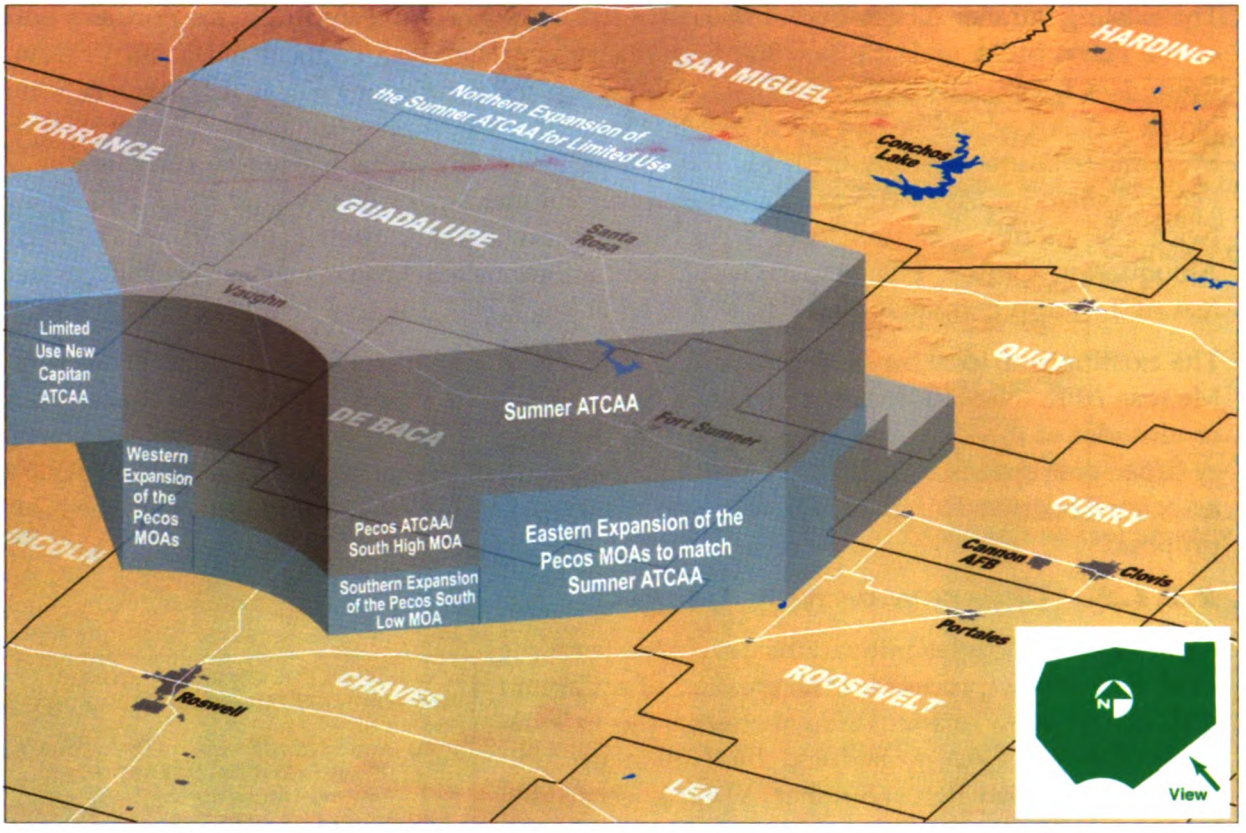


FIGURE 2-3. THREE-DIMENSIONAL VIEW OF ALTERNATIVE A AS VIEWED FROM THE SOUTHEAST LOOKING NORTHWEST

2.2.1.3 AUTHORIZATION FOR SUPERSONIC OPERATIONS

Under Alternative A, supersonic operations would be authorized at altitudes above 10,000 feet MSL (approximately 5,000 to 6,000 feet AGL) in the modified Pecos MOA, the Sumner ATCAA, the Sumner North ATCAA, the Taiban MOA, the newly-created Capitan ATCAA, and in Restricted Airspace over the Melrose AFR.

F-16 pilots are required to fully train for, and master, evolving tactics for today's sophisticated and capable air-to-air and air-to-ground weapons. They need to train as realistically as possible to the way they employ these weapons in combat. In many cases, this involves bursts of supersonic speeds as they practice effective delivery techniques and simulated release of weapons such as the Joint Direct Attack Munition (JDAM), the Advanced Medium-Range Air-to-Air Missile (AMRAAM), and newer guided munitions.

F-16 PILOTS HAVE THE ABILITY TO LAUNCH MUNITIONS, SUCH AS THE JDAM, AT SUPERSONIC SPEEDS.

The F-16 is capable of flying and launching these modern weapons at supersonic speed, which is essential for specific combat situations. When pilots attack a target, they must fly briefly at a steady altitude and speed to launch munitions. During that time they are vulnerable to enemy threats. At supersonic speeds, the timeframe during which aircrews are exposed to enemy threats is reduced. In addition, modern munitions released at supersonic speeds can be

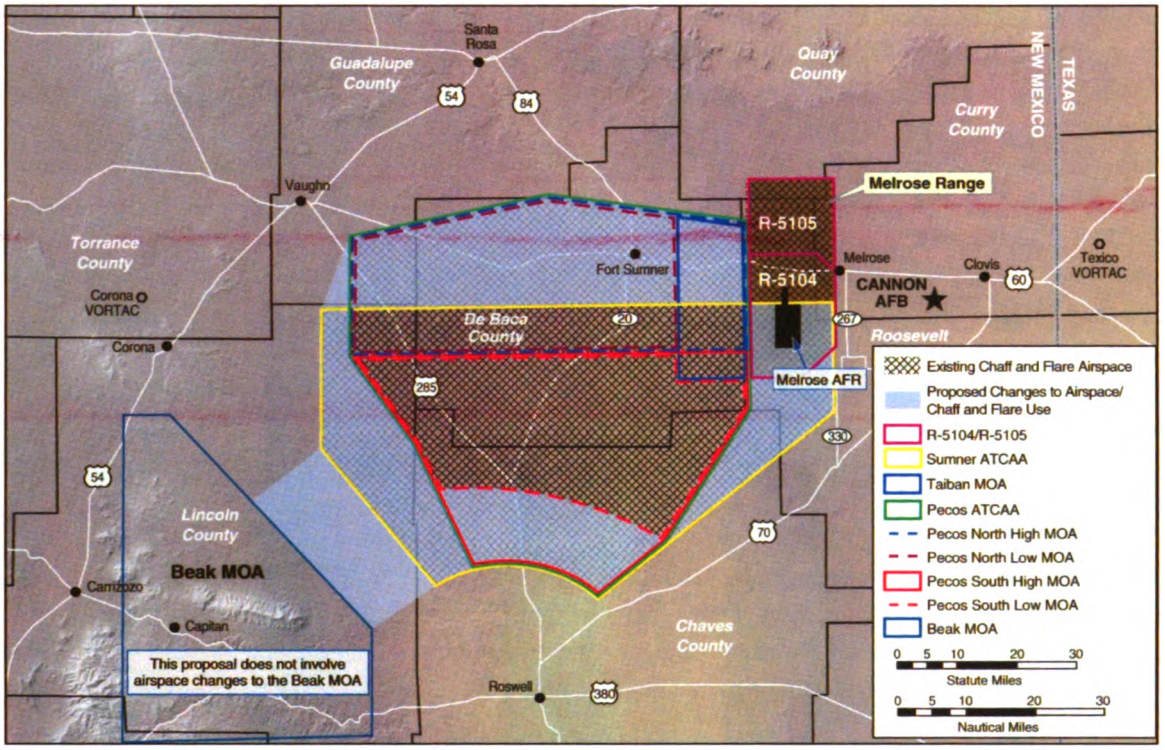
released at greater distances from the target. Supersonic weapons releases increase standoff distance from threats by as much as three times for some missions. This distance increases aircraft and pilot survivability by enabling pilots to either completely avoid threat engagement zones or reduce threat effectiveness if avoidance is not possible. When pilots are threatened by enemy action, such as a hostile radar tracking their aircraft, they must react at high speed to the threat to avoid or neutralize it. If the threat is from another aircraft, supersonic flight effectively increases the release speed of the AMRAAM air-to-air missile. This increase in release speed means that enemy aerial targets can be engaged at greater distances, and the aircrew's exposure to enemy aircraft and air defense systems is reduced.

The ability to fly at supersonic speeds at altitudes from 10,000 feet MSL and above is required for pilots to refine their tactics, learn rapid maneuvers, and practice delivery profiles for more effective use of the full capabilities of such weapons as the JDAM and AMRAAM. Most portions of supersonic flight in the Pecos complex would be at altitudes above 30,000 feet MSL. If altitudes above 30,000 feet MSL were consistently available, nearly all of the air-to-air deliveries and 80 percent of the JDAM deliveries would be above that altitude. Most supersonic operations below 30,000 feet AGL would tend to be on egress from a simulated munitions launch or in defensive maneuvering. Defensive maneuvering could occasionally be down to 10,000 feet MSL. Practicing defensive maneuvering at supersonic speeds is currently limited by existing altitude constraints and limited access to altitudes above 30,000 feet MSL.

2.2.1.4 Expanded Use of Chaff and Flares in New and Modified Airspace

Military aircraft are currently authorized to use RR-188 chaff (or equivalent), a variety of defensive flares in Restricted Areas (R-5104, R-5105), and M-206 (or equivalent) defensive flares in Taiban MOA, Sumner ATCAA, and in the Pecos MOA/ATCAA (see Figure 2-4). Flares are currently authorized for use above 2,000 feet AGL under conditions not designated at, or above, high fire risk. Chaff is also authorized in the northern portion of Visual Routes (VRs) 100/125 (see Figure 3.1-2). Under the Proposed Action, the use of RR-188 chaff and M-206 defensive flares would also be authorized in the new and modified airspace (Figure 2-4). During public hearings on the Draft EIS, a commenter presented materials which were later identified as flare residual materials not consumed during deployment of the flares. Subsequent review of the materials identified them as coming from Multi Jettison Unit (MJU)-7-type flares. The flare type currently assessed for defensive training within the Pecos MOA complex is the M-206 flare which is one-half the size of the MJU-7-type flare (see Appendix B). The Air Combat Command (ACC) and Cannon AFB have issued instructions to all users of the airspace directing that RR-188 chaff and M-206 flares (or their equivalents) are assessed for use in existing airspace and are proposed as part of NMTRI in airspace outside the restricted areas.

New Mexico aircrews, transients, and other users will continue to use chaff and flares in the previously approved, existing airspace as well as in the new and modified airspace; however, no increase in the quantity of chaff and flares is anticipated. Under NMTRI, when the National Fire Danger Rating System indicates high fire conditions or above, the minimum altitude for flare release would be revised to 5,000 feet AGL.



Note: VR-100/125, depicted on Figure 3.1-2, is also approved for chaff use.

FIGURE 2-4. CURRENT AND PROPOSED AREAS FOR CHAFF AND FLARE USE

Pilots use chaff and flares as self-protection measures against radar-directed anti-aircraft artillery and radar-guided and heat-seeking missiles. When pilots detect threats from these systems, they must respond instantly and instinctively using appropriate countermeasures. The inability of pilots to actually use these countermeasures in training results in the loss of critical response habit patterns. The instinctive nature of these habit patterns often determines a pilot's survivability in a hostile environment. The following discussion provides information characterizing military training chaff and flares that would be used under the proposed action. Figure 2-5 depicts the life cycle and processes upon release of chaff and flares.

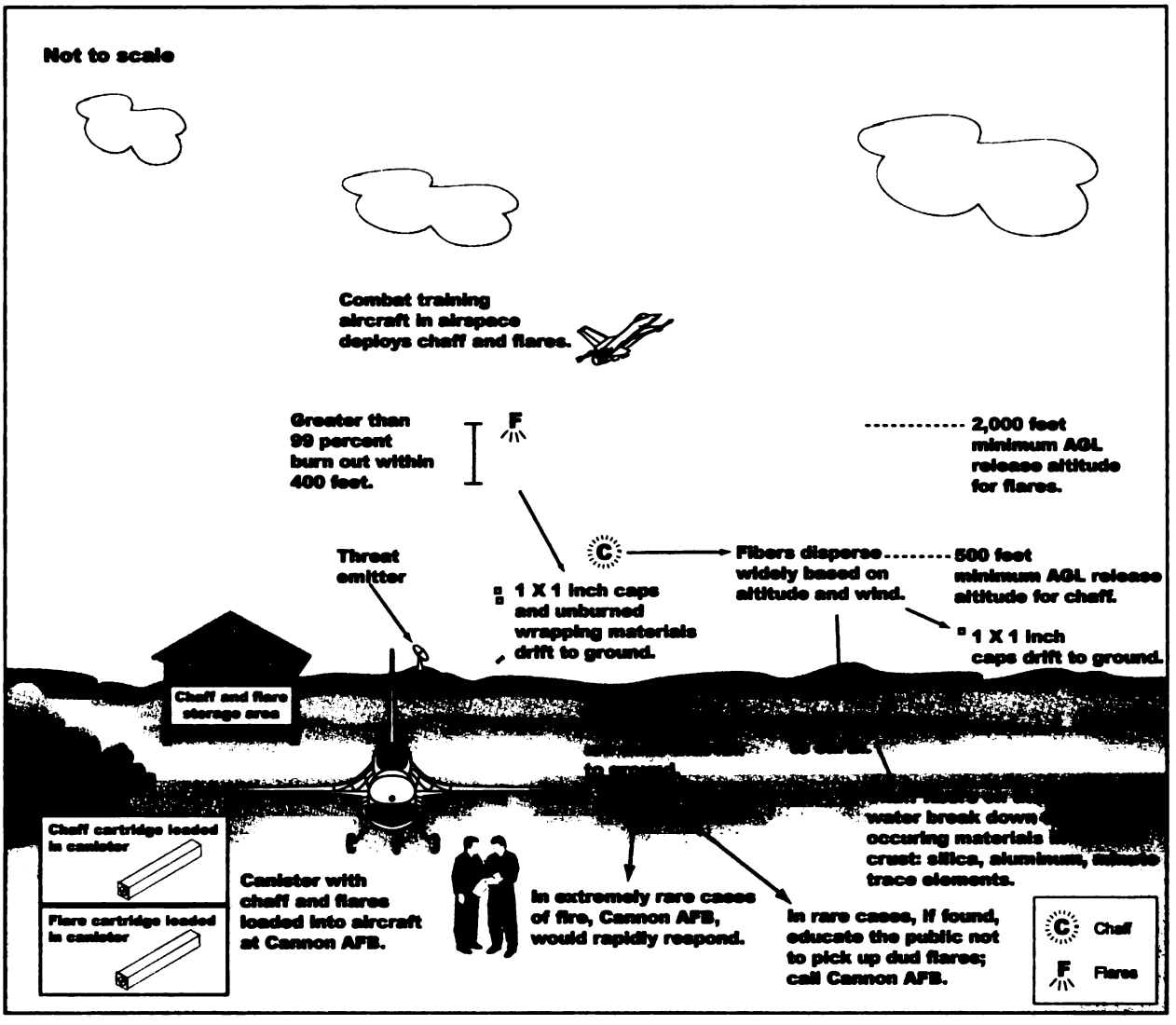


FIGURE 2-5. LIFE CYCLE OF DISPENSING CHAFF AND FLARE

An annual total of 60,770 chaff bundles and 40,286 flares would continue to be authorized throughout the new, modified, and existing airspace. Each chaff bundle has a 1-inch by 1-inch plastic or nylon end cap, a 1-inch by 1-inch plastic or nylon piston, and a 1-inch by 1-inch felt spacer that falls to the ground. Each flare has a piston, end cap, one or two felt spacers, and a piece of aluminum-coated mylar wrapping (like stiff duct tape) that could be from 1-inch by 1-inch to 2-inches by 13-inches depending on the extent to which the burning flare consumed the wrapper. It is estimated that the average annual deposition of both chaff and flares residual pieces would be approximately one piece per 9 acres. Chaff concentrations would be estimated to be approximately 0.14 grams (0.005 ounce) per acre per year.

Winds at the altitude chaff and flares are deployed and at altitudes between deployment and the ground would affect the drifting and ultimate deposition of residual materials. The eventual location of chaff fibers would depend on the release altitude and winds at different altitudes. For the purpose of this study, all materials are assumed to fall to the ground under the airspace. This produces estimates of higher concentrations than may actually occur in the environment.

Chaff. Modern training chaff (known as "angel hair" chaff) is typically designated as RR-188 chaff. Chaff consists of bundles of extremely small strands of aluminum-coated silica fibers that are designed to reflect radio waves from a radar set. Chaff is made as small and light as possible so that it will remain in the air long enough to confuse enemy radar. Individual chaff fibers are approximately the thickness of a very fine human hair and range in length from 0.3 inch to 1.0 inch or more (0.76 centimeter to 2.5 centimeters). The length of the chaff determines the frequency range of the radio wave most effectively reflected by that particular fiber. Chaff fibers are cut to varying lengths in order to make it effective against the wide range of enemy radar systems that may be encountered. Chaff approved for use in the Cannon airspace is RR-188 chaff or other versions of training chaff depending on the user. This specific chaff contains fibers cut to lengths that will not interfere with radars operated by the FAA for Air Traffic Control (ATC) throughout the National Airspace System.

About 5 million chaff strands are dispensed in each bundle of chaff. When released from an aircraft, chaff initially forms an "electronic cloud" that disperses widely in the air. Dispersed chaff effectively reflects radar signals and forms an image on a radar screen. If the pilot quickly maneuvers the aircraft while momentarily obscured or "masked" from precise radar detection by the electronic cloud, the aircraft can avoid the threat. When multiple chaff bundles are ejected, each forms a similar cloud that further confuses radar-guided weapons. Chaff itself is not explosive; however, it is ejected from the aircraft pyrotechnically using a small explosive charge that is part of the ejection system. The chaff dispenser remains in the aircraft. Two 1-inch square by ⅛-inch thick pieces of plastic and a felt spacer are ejected with the chaff. On rare occasions, the chaff may not wholly separate and may fall to earth as a clump. For more detailed information on chaff, refer to Appendix A.

Flares. M-206 (or equivalent) defensive training flares are magnesium pellets that, when ignited, burn for a short period (3.5 to 5 seconds) at approximately 2,000 degrees Fahrenheit (°F). The burn temperature is hotter than the exhaust of an aircraft engine and therefore attracts and decoys heat-seeking weapons and sensors targeted on the aircraft. The flares are wrapped with aluminum filament reinforced mylar and inserted into an aluminum case closed with one or two felt spacer(s) and a plastic end cap. The top of the case has a pyrotechnic impulse cartridge that is activated electrically to produce hot gases that push one 1-inch square by ¼-inch thick plastic or nylon slider, a 1-inch by 1-inch by ¼-inch thick end cap, and the magnesium flare material out of the flare dispenser mounted in the aircraft. The parasitic type M-206 flare ignites as it is ejected from the dispenser and the flare consumes some or nearly all of the wrapping material around the flare. Depending upon the amount of wrapping material consumed by the flare, a piece of aluminum-coated mylar material (similar to stiff duct tape) from 1-inch by 1-inch up to 2-inches by 13-inches could also fall to the ground. On extremely rare occasions (estimated at 0.01 percent), a flare may not ignite and could fall to the earth as a dud flare. For more detailed information on flares, refer to Appendix B.

Use of training flares where approved within Cannon AFB-managed airspace would incorporate the following modified management practices:

- The minimum altitude for flare release in special use airspace will continue to be 2,000 feet AGL (flares burn out after falling approximately 400 feet).
- When the National Fire Danger Rating System indicates high fire conditions or above, the minimum altitude for flare release would be raised to 5,000 feet AGL.

- Cooperation with local agencies for mutual aid response to fires will continue.
- An education program for fire departments beneath the airspace will continue to include information on flares.

These management practices would be applied to any new and modified airspace and the communities and agencies beneath the airspace under NMTRI.

2.2.1.5 TRAINING ACTIVITIES WITHIN THE PROPOSED AIRSPACE

The primary users of the NMTRI proposed airspace are the 27 FW and the NMANG 150th Fighter Wing (150 FW). Table 2-3 describes the missions of these F-16 aircraft. The purpose of the F-16 fighter aircraft is to provide day, night, all weather, and supersonic combat operations.

TABLE 2-3. PRIMARY USERS OF NMTRI AIRSPACE

Squadron	*Mission and Capabilities*
27 FW 522nd Fighter Squadron "Fireballs"	Conducts combat operations with an F-16C squadron. Maintains continuous ability to rapidly deploy & support combatant commanders worldwide. Decisively employs the F-16CJ throughout the entire spectrum of missions including counter air, counter land, counter sea, and strategic attack. Maintains capabilities in High-Speed Anti-Radiation Missile Targeting System, Suppression of Enemy Air Defenses (SEAD), conventional, and non-conventional weapons. Base Realignment and Closure (BRAC) 2005 would reassign the aircraft by the end of Fiscal Year (FY) 08.
27 FW 523rd Fighter Squadron "Crusaders"	Maintains continuous ability to rapidly deploy in support of combatant commanders worldwide with day or night F-16 combat ops. Decisively employs the F-16C through the entire mission spectrum including interdiction, strategic attack, counter air, close air support, forward air control airborne, and combat search and rescue (CSAR). Delivers global combat power through employment of conventional and precision-guided weapons. BRAC 2005 would reassign the aircraft by the end of FY 08.
27 FW 524th Fighter Squadron "Hounds of Heaven"	Maintains capability to rapidly deploy to support combatant commanders worldwide with day or night all-weather combat operations. Employs the F-16C throughout the mission spectrum, including air interdiction, strategic attack, counter air, Close Air support (CAS) and Forward Air Control Airborne (FAC-A). Provides decisive combat power using night vision capabilities to deliver precision, conventional, and non-conventional weapons. BRAC 2005 would reassign the aircraft by the end of FY 08.
27 FW 428th Fighter Squadron "Buccaneers"	Representative of support the Air Force provides to allies, the hybrid United States (U.S.)/Republic of Singapore Air Force F-16C/D fighter squadron was manned by highly experienced U.S. instructor pilots, maintenance and support personnel. Republic of Singapore Air Force personnel were trained in rapid deployment and tactical employment of the F-16C/D throughout a wide spectrum of missions including air-to-air, joint maritime, and precision air-to-ground weapons delivery. Republic of Singapore Air Force stopped funding the program in FY 05.
150 FW 188th Fighter Squadron (NMANG) "Land of Enchantment Defenders"	Has a primary flying mission to provide air interdiction support to the Twelfth Air Force, Air Combat Command (ACC), with worldwide deployment capability. NMANG F-16s have played a key role in the developmental testing of many critical weapons at the White Sands Missile Range (WSMR) and various other locations. The NMANG F-16 aircraft train in the Pecos and Taiban MOAs, Melrose AFR, and other airspace in New Mexico.

The F-16 is a compact, multi-role fighter aircraft that provides a relatively low-cost, high-performance weapon system for the United States (U.S.) and allied nations. The F-16 is highly maneuverable and has proven itself in combat. The F-16C (single seat) and F-16D (dual seat) were introduced in 1984. The F-16 is armed with a 20-millimeter, multi-barrel cannon mounted in the fuselage and can carry up to 500 rounds of ammunition. Infrared-guided air-to-air missiles can be mounted on the wingtips. Under wing stations on the aircraft can be used to mount additional fuel tanks, air-to-air munitions, air-to-ground munitions, or electronic warfare pods.

F-16s are multi-role fighters with precision strike beyond visual range, and have both day and night capabilities. As demonstrated in wars in Afghanistan and Iraq, the F-16 can employ advanced precision-guided bombs that can be released at greater distances from the target if dropped at supersonic speeds. This enhances pilot survivability by allowing the pilot to keep enemy threats at a greater distance. The three different types or "blocks" of F-16 aircraft in the 27 FW and 150 FW are presented in Table 2-4.

TABLE 2-4. CHARACTERISTICS OF F-16 AIRCRAFT USED BY THE AIR FORCE 27 FW AND NMANG 150 FW

F-16 Aircraft Block	*Engine*	*Current Advanced Targeting Pod*	*Missions*
Block 30	F-110-GE100	None	Air-to-air (40%) Air-to-ground (60%)
Block 40	F-110-GE129	LANTIRN[1, 2]	Air-to-air (40%) Air-to-ground (60%)
Block 50	F-110-GE129	LANTIRN[1, 2]	Air-to-air (60%) Air-to-ground (40%)
Block 52	F-100-PW-229	LANTIRN[1, 2]	Air-to-air (45%) Air-to-ground (55%)

Notes: 1. Combat mode used on approved government-controlled lands.
2. Other Advanced Targeting Pods such as Sniper XR or LITENING AT will also be used in conjunction with the F-16 Common Configuration Implementation Program upgrades.
LANTIRN = Low Altitude Navigation and Targeting Infrared for Night

Operational activity levels of aircraft are normally expressed in terms of the number of sorties flown. A sortie is defined as the departure of an aircraft from a base, performance of a mission or missions, and return of the aircraft to a base. During the performance of a training mission, the aircrew may fly through several elements of military training airspace. In order to account for the use of several airspace elements during the performance of a sortie, the term "sortie-operation" is used. Thus, each time a flight occurs in a specific airspace element, this study counts it as one sortie-operation in that airspace for airspace and acoustical analysis. Several sortie-operations may be counted during the accomplishment of a single sortie as an aircraft flies through several airspace elements. Thus, the number of sortie-operations is larger than the number of sorties.

Table 2-5 presents the number of projected sorties in the airspace involved in this proposal for the 27 FW and NMANG. These projections are for training sorties anticipated through Fiscal

Year (FY) 08. As described in Chapter 5.0, Cumulative Effects and Other Environmental Considerations, Cannon AFB would continue to actively field ACC F-16 combat coded aircraft through that time. Table 2-6 presents the 27 FW and NMANG F-16 training altitude profile. The table demonstrates the high altitude training of the F-16, with nearly 90 percent of the training time spent above 5,000 feet AGL. Other military units use the airspace on an infrequent basis. Other aircraft using the airspace include B-1B bombers from Dyess AFB. The B-1Bs schedule the airspace from one to five times per week, flying one to three aircraft during a scheduled period. Other aircraft flown in the airspace infrequently include A-10s, F-15s, F/A-18s, F-22s, German Air Force Tornados, B-52s, C-130s, and various helicopters. LFEs, which typically occur once or twice a month, involve approximately 20 participating aircraft of a variety of types (personal communication, Berg 2004).

TABLE 2-5. SORTIES PROJECTED FOR THE NMTRI AIRSPACE[1]

Airspace	PROPOSED F-16 ANNUAL SORTIES		
	Day	*Night*	*Total*
Pecos MOA	1,064	56	1,120
Pecos ATCAA	1,064	56	1,120
Sumner North ATCAA[2]	532	28	560
Sumner South ATCAA	1,862	98	1,960
Capitan ATCAA[2]	53	3	56
Melrose AFR (R-5104/5105)	692	36	728
Totals	**5,320**	**280**	**5,600**

Note: 1. Projections are through FY 07.
2. New airspace units.
Source: Extrapolated projections from personal communication, Berg 2004.

TABLE 2-6. ALTITUDE PROFILE FOR F-16 TRAINING

Altitude (in feet)	*Percentage of Time at Altitude*
Above 24,000 MSL[1]	47
18,000 MSL - 23,999 MSL	22
10,000 AGL[2] - 17,999 MSL	10
5,000 AGL - 9,999 AGL	10
2,000 AGL - 4,999 AGL	7
1,000 AGL - 1,999 AGL	3
500 AGL - 999 AGL	1

Notes: 1. MSL = mean sea level
2. AGL = above ground level

Sorties identified as occurring during the day are those conducted between the hours of 7:00 a.m. to 10:00 p.m. Night sorties are used in the acoustical analysis to determine the amount of "environmental night" activities between 10:00 p.m. to 7:00 a.m. Sorties during this time period are given a noise penalty in the acoustical analysis. Depending on the amount of sunlight, after dark sorties may or may not occur during environmental night.

One aspect of NMTRI involves proposed authority to conduct supersonic operations at altitudes as low as 10,000 feet MSL. Not all training events require supersonic flight. Those that require it do not require it all of the time. Aircrews do not fly at supersonic speeds for long periods, especially at altitudes near 10,000 feet MSL, due to overall mission profiles and tactics, and the extremely high rate of fuel consumption at supersonic speeds. The difference between the potential for supersonic flight during a mission and the projected actual time a mission would fly supersonically is presented in Table 2-7.

Table 2-7 presents the F-16 annual training mission events, the potential sortie operations, and the hours of flight time associated with these requirements. A mission event is a specific training activity in a specific airspace. As an example, pilots would perform 3,229 Surface Attack Tactics (SAT) in a year. If one aircraft practiced two SATs in each of two airspace units during one sortie, that training flight would represent one sortie with four mission events. The table lists the sortie-operations within each mission category that would have the potential to fly supersonically and the hours of potential supersonic operations. The table also presents the projected number of sortie-operations by mission type and the hours of training projected to be flown at supersonic airspeeds.

Another aspect of NMTRI involves lowering the floor of the Pecos/Sumner airspace complex to a minimum 500 feet AGL. Not all training events require flight in low-altitude regimes and F-16 aircrews do not fly at low altitudes for long periods as noted on Table 2-6. Approximately 40 percent of the low-level training flights below 1,000 feet AGL occur within the Restricted Areas (R-5104/R-5105). The difference between the potential for low-level training and the projected actual time spent in low-level training is presented in Table 2-8.

Table 2-8 presents important aspects of low-altitude flights below 1,000 feet AGL associated with the NMTRI proposal. The table identifies the training mission requirements, the annual hours of flight time for each mission, the potential number and annual hours of low altitude missions, and the projected numbers and hours of training that are expected to actually be flown at low altitudes. The total number of F-16 hours below 1,000 feet AGL is projected to be less than one percent of the annual training hours in the airspace.

The 27 FW/150 FW and other users would apply the full spectrum of their training in missions and tactics approximately twice per month in LFEs. During these exercises, approximately 20 aircraft will fulfill the variety of roles expected during actual combat. Figure 1-6 schematically depicts a representative LFE. The numbers and types of training events presented in Tables 2-7 and 2-8 include the anticipated twice monthly LFEs. During these exercises, "attacking" aircraft would assemble or stage in the Beak ATCAA and attack by transiting through the Capitan ATCAA into the Pecos ATCAA. As they attack, they would maneuver to counter "enemy" aircraft and ground-based threats. These maneuvers could include use of defensive chaff and flares and supersonic speeds. Assigned aircraft would accelerate to supersonic speeds when necessary and simulate munitions launches at targets. Aircraft would then perform missions [illegible] with practice or simulated munitions. Pilots would assemble in formations to complete their missions.

TABLE 2-7. ANNUAL MISSION EVENTS WITH POTENTIAL FOR SUPERSONIC FLIGHT

TRAINING EVENTS	TOTAL F-16 ACTIVITY[1]		POTENTIAL SUPERSONIC OPERATIONS		ESTIMATED SUPERSONIC OPERATIONS	
	Mission Events	*Total Hours*	*Mission Events*	*Hours of Airspace Use*	*Mission Events*	*Hours of Airspace Use*
BSA	1,495	1,971	0	0	0	0
SAT Day	3,229	4,311	3,229	479	968	143
SAT Night	1,397	1,886	1,397	207	418	63
CAS Day	1,684	2,273	0	0	0	0
CAS Night	411	555	0	0	0	0
J-SEAD	40	53	0	0	0	0
Sweep	277	374	277	41	221	33
FP Day	672	908	672	100	538	80
FP Night	356	481	356	53	285	42
DCA Day	1,780	2,341	1,781	263	1,424	210
DCA Night	888	1,167	887	131	444	66
ACM	1,051	1,387	1,052	155	106	15
BFM	1,378	1,829	1,378	204	138	19
Red Air	2,181	2,882	2,182	323	872	129
CC Option	1,842	2,487	1,842	273	185	27
Total	18,681	24,905	15,053	2,229	5,599	827

BSA= Basic Surface Attack
SAT Day= Surface Attack Tactics conducted during day
SAT Night= Surface Attack Tactics conducted during darkness
CAS Day= Close Air Support conducted during day
CAS Night= Close Air Support conducted during darkness
J-SEAD= Joint Suppression of Enemy Air Defense, includes DEAD = Destruction of Enemy Air Defense
Sweep= Ensure Control of Battlefield
FP Day= Force Protection conducted during day
FP Night= Force Protection conducted during darkness
DCA Day= Defensive Counter-Air conducted during day
DCA Night= Defensive Counter-Air conducted during darkness
ACM= Air Combat Maneuvering
BFM= Basic Fighter Maneuvering
Red Air= Aircraft Acting as Enemy
CC Option= Commander's Option; could include any mission

Note: 1. 27 FW and NMANG through first quarter FY 08.
Source: Air Force 2004a

TABLE 2-8. ANNUAL MISSION EVENTS WITH POTENTIAL FOR CONDUCTING LOW-ALTITUDE FLIGHT[1]

Training Events	TOTAL F-16 ACTIVITY		POTENTIAL LOW-ALTITUDE OPERATIONS		PROJECTED LOW-ALTITUDE OPERATIONS	
	Mission Events	*Total Hours*	*Mission Events*	*Hours of Airspace Use*	*Mission Events*	*Hours of Airspace Use*
BSA	1,495	1,971	0	0	0	0
SAT Day	3,229	4,311	3,229	387	807	97
SAT Night	1,397	1,886	1,397	168	71	8
CAS Day	1,684	2,273	1,684	202	337	40
CAS Night	411	555	411	49	4	2
J-SEAD	40	53	0	0	0	0
Sweep	277	374	0	0	0	0
FP Day	672	908	0	0	0	0
FP Night	356	481	0	0	0	0
DCA Day	1,780	2,341	0	0	0	0
DCA Night	888	1,167	0	0	0	0
ACM	1,051	1,387	0	0	0	0
BFM	1,378	1,829	0	0	0	0
Red Air	2,181	2,882	2,182	262	218	27
CC Option	1,842	2,487	1,842	221	185	22
Total	18,681	24,905	10,745	1,289	1,622	196

BSA= Basic Surface Attack
SAT Day= Surface Attack Tactics conducted during day
SAT Night= Surface Attack Tactics conducted during darkness
CAS Day= Close Air Support conducted during day
CAS Night= Close Air Support conducted during darkness
J-SEAD= Joint Suppression of Enemy Air Defense, includes DEAD = Destruction of Enemy Air Defense
Sweep= Ensure Control of Battlefield
FP Day= Force Protection conducted during day
FP Night= Force Protection conducted during darkness
DCA Day= Defensive Counter-Air conducted during day
DCA Night= Defensive Counter-Air conducted during darkness
ACM= Air Combat Maneuvering
BFM= Basic Fighter Maneuvering
Red Air= Aircraft Acting as Enemy
CC Option= Commander's Option; could include any mission

Note: 1. Through first quarter FY 08
Source: Personal communication, Berg 2014

2.2.2 DRAFT EIS PROPOSED ACTION

The Draft EIS Proposed Action involves several airspace changes that are described for the preferred alternative in Section 2.2.1. These include expanding the Pecos MOA laterally; establishing a consistent floor of 500 feet AGL in the Pecos MOA; creating the Sumner North ATCAA, supersonic operations as low as 10,000 feet MSL (approximately 5,000 to 6,000 feet AGL) in the modified Pecos MOA/ATCAA and in the R-5104 portion of Melrose AFR, and training with chaff and flares in the modified and new airspace. The Draft EIS Proposed Action included four changes not included in the preferred alternative, Alternative A. These changes were 1) creation of a Capitan MOA/ATCAA with a floor of 12,500 feet MSL and a ceiling of 50,000 feet MSL, 2) extension of the Sumner ATCAA (renamed the Pecos ATCAA) to the horizontal boundary of the Pecos MOA/ATCAA, 3) moving J-74 from its present route up to 17 nm north of its current location, 5 to 7 miles north of the extended Sumner ATCAA renamed Pecos ATCAA, and 4) deploying M-206 flares above 2,000 feet AGL under any National Fire Danger Rating System fire conditions. Figure 2-6 presents the Draft EIS Proposed Action.

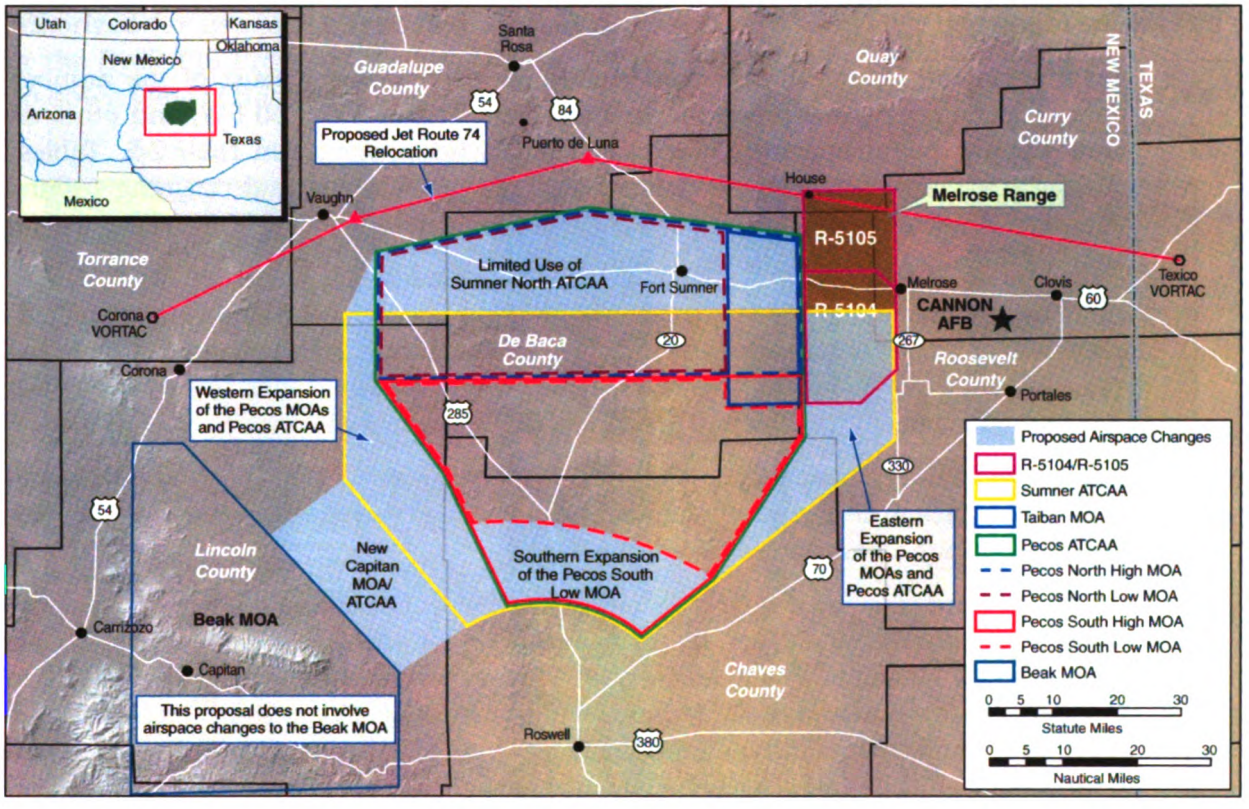


FIGURE 2-6. DRAFT EIS PROPOSED ACTION

In response to public and agency comments on the potential significance of impacts to commercial aviation, the FAA and Air Force identified mitigation measures that could reduce the potential impacts (abandoning the proposed Capitan MOA and reducing the size of the Capitan ATCAA).

When the Draft EIS Proposed Action included a relocation of J-74, an air traffic study was performed to evaluate potential conflicting land uses. The Draft EIS air traffic study area, presented in Figure 2-7, was evaluated for all applicable environmental resources. This area

was considered when the potential existed for J-74 to be relocated into the air traffic study area. Appendix I provides further information on this study area.

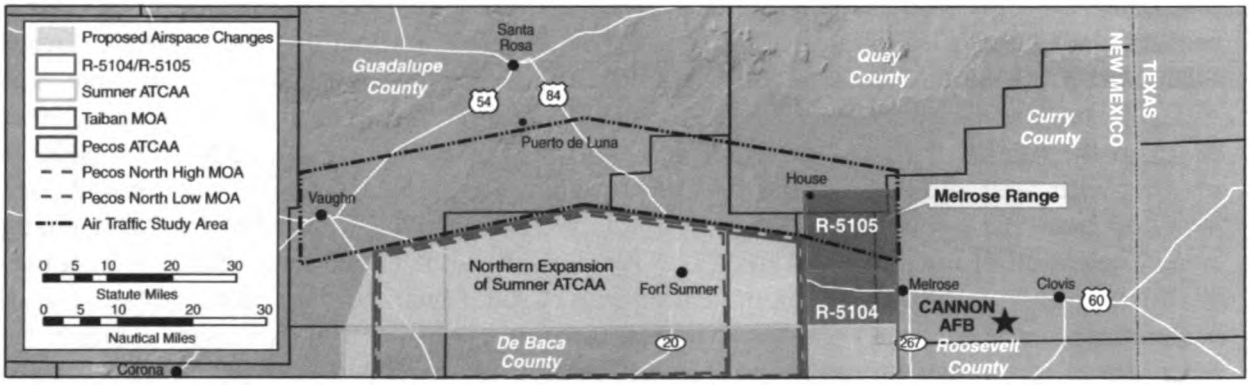


FIGURE 2-7. AIR TRAFFIC STUDY AREA

The training activities within the Draft EIS Proposed Action new and expanded airspace would include the following:

- Training in the Draft EIS Proposed Action airspace would consist of the number of annual sortie operations presented in Table 2-5. The 27 FW, 150 FW, and other users would apply the full spectrum of missions and tactics presented in Table 2-5. Tables 2-6 and 2-7 present the estimated supersonic and projected low-altitude training within the Alternative A airspace. Training in the airspace would be by 27 FW, 150 FW, and other users of the airspace as described in Section 2.2.1.5.
- LFEs of approximately 20 aircraft would be conducted twice monthly as depicted on Figure 1-6. Under the Draft EIS Proposed Action, training aircraft would have had a somewhat larger airspace to transition from the Beak airspace and greater access to ATCAA airspace within which to practice high altitude maneuvers.
- Supersonic training from 10,000 feet MSL (5,000 to 6,000 feet AGL) to permit pilots to refine their tactics, learn maneuvers, and practice delivery profiles of current air-to-air and air-to-ground munitions (see Section 2.2.1.3).
- Chaff and flare use would be expanded to the new and modified airspace. Pilots would train in defensive maneuvers by using chaff and flares as self-protection measures against either infrared or radar-directed air- and ground-based threats. The annual total of 60,770 chaff bundles and 40,286 flares would continue to be authorized and would be used throughout the existing, modified, and new airspace. Flares would be deployed at a minimum altitude of 2,000 feet AGL during any fire conditions and are designed to burn out after falling approximately 400 feet.

2.2.3 ALTERNATIVE B

Alternative B actions included the airspace changes described in Section 2.2.2 and depicted in Figure 2-8. Alternative B differed from the Draft EIS Proposed Action by not including creation of a new Capitan MOA/ATCAA. The Alternative B airspace modifications involved expanding the Pecos MOA/ATCAA laterally and establishing a consistent floor of 500 feet AGL in the Pecos MOA. The northern expansion of the Sumner ATCAA was part of Alternative B, as was the relocation of J-74. Supersonic operations would be authorized as low as 10,000 feet MSL (5,000 to 6,000 feet AGL) in the modified Pecos MOA/ATCAA, the Sumner ATCAA, the Sumner North ATCAA, the Taiban MOA, and in the R-5104 portion of Melrose AFR. Chaff and flares would have been authorized for use in the modified airspace as described for the Draft EIS Proposed Action. Figure 2-9 presents a top down view of this alternative.

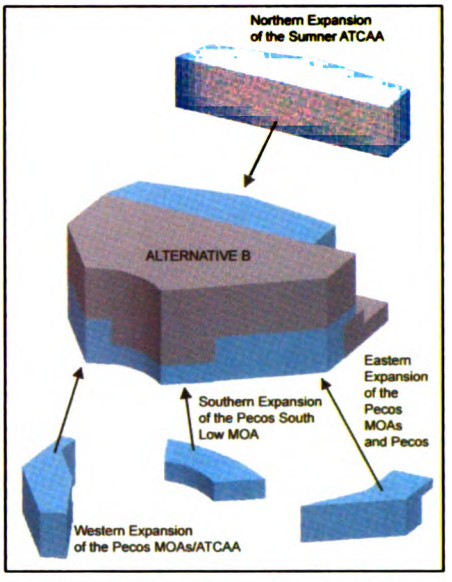


FIGURE 2-8. ALTERNATIVE B AIRSPACE COMPOSITION

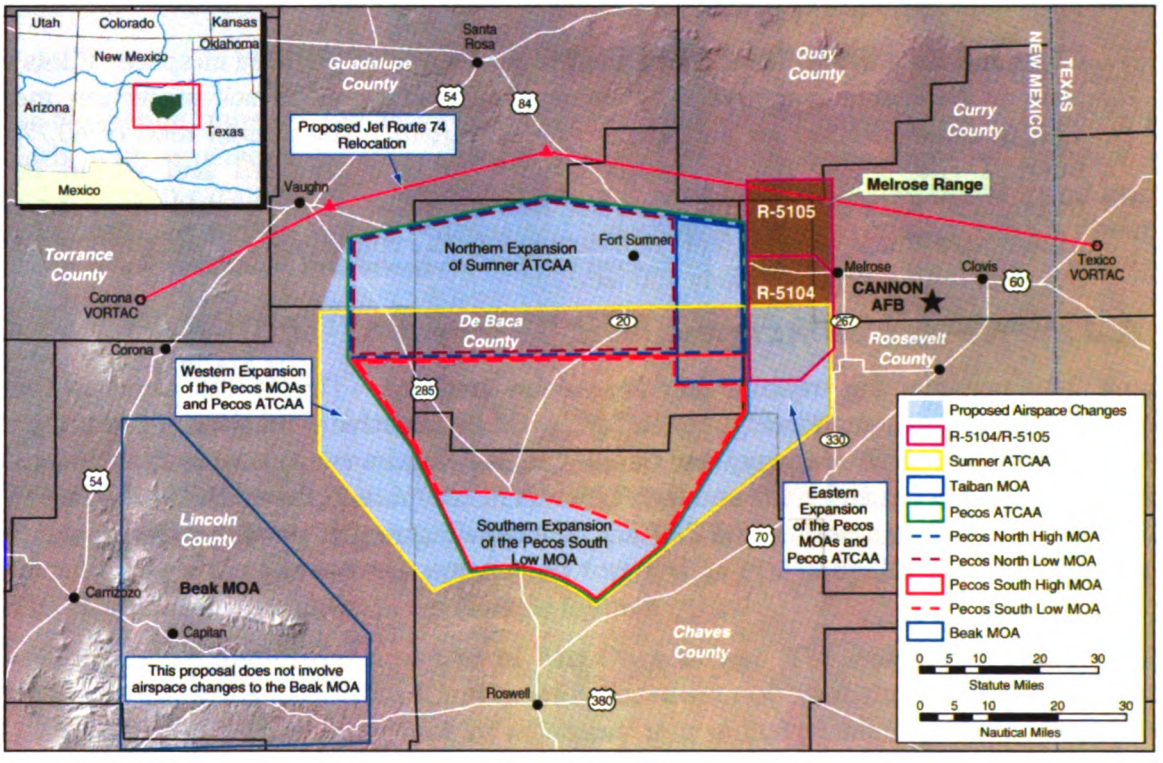


FIGURE 2-9. ALTERNATIVE B

The Capitan MOA/ATCAA would not have been created and would not connect the Beak MOA/ATCAA and the Pecos airspace complex. A transition corridor between the Beak and Pecos MOAs would be temporarily activated to support each individual LFEs. Although this occurs on an as needed basis today, it is not optimum for the long-term training needs of the 27

FW and NMANG. Without the Capitan MOA/ATCAA, staging, ingress, and maneuvering airspace Alternative B would affect LFEs by reducing the amount of useable airspace available for developing realistic combat scenarios. This would reduce the ability to fully train as described in Section 2.2.1.5.

The training activities within the new and expanded airspace under Alternative B would include the following:

- Training in the Alternative B airspace would consist of the number of annual sortie operations presented in Table 2-5. The 27 FW, 150 FW, and other users would apply the full spectrum of F-16 missions and tactics presented in Table 2-5. Tables 2-6 and 2-7 present the estimated supersonic and projected low-altitude training within the Alternative B airspace. Training in the airspace would be by 27 FW, 150 FW, and other users of the airspace as described in Section 2.2.1.5.
- LFEs of approximately 20 aircraft would be conducted twice monthly as depicted in Figure 1-6. Under Alternative B, the ability of attacking aircraft to stage, ingress, maneuver and simulate launch of munitions after exiting the staging area in the Beak MOA would be substantially constrained by not having the Capitan MOA/ATCAA.
- Supersonic training from 10,000 feet MSL (5,000 to 6,000 feet AGL) to permit pilots to refine their tactics, learn maneuvers, and practice delivery profiles for air-to-air and air-to-ground munitions (see Section 2.2.1.3).
- Chaff and flare use would be expanded to the new and modified airspace. Pilots would train in defensive maneuvers by using chaff and flares as self-protection measures against radar-directed air and ground-based threats. The annual total of 60,770 chaff bundles and 4,256 flares would continue to be authorized and would be used throughout the existing, modified, and new airspace. Flares would be deployed at a minimum altitude of 2,000 feet AGL during any fire conditions and are designed to burn out after falling approximately 400 feet.

2.2.4 NO-ACTION ALTERNATIVE

Figure 2-11 presents the existing and No-Action airspace. This is the same as the three dimensional view presented in Figure 1-4. Under this alternative, F-16 aircrews would continue to use existing airspace managed by Cannon AFB. Supersonic operations would continue above 30,000 feet MSL and chaff and flare use would continue in Pecos MOA/ATCAA, Taiban MOA, T-1, T-4, T-5, and Sumner ATCAA for defensive training as previously approved.

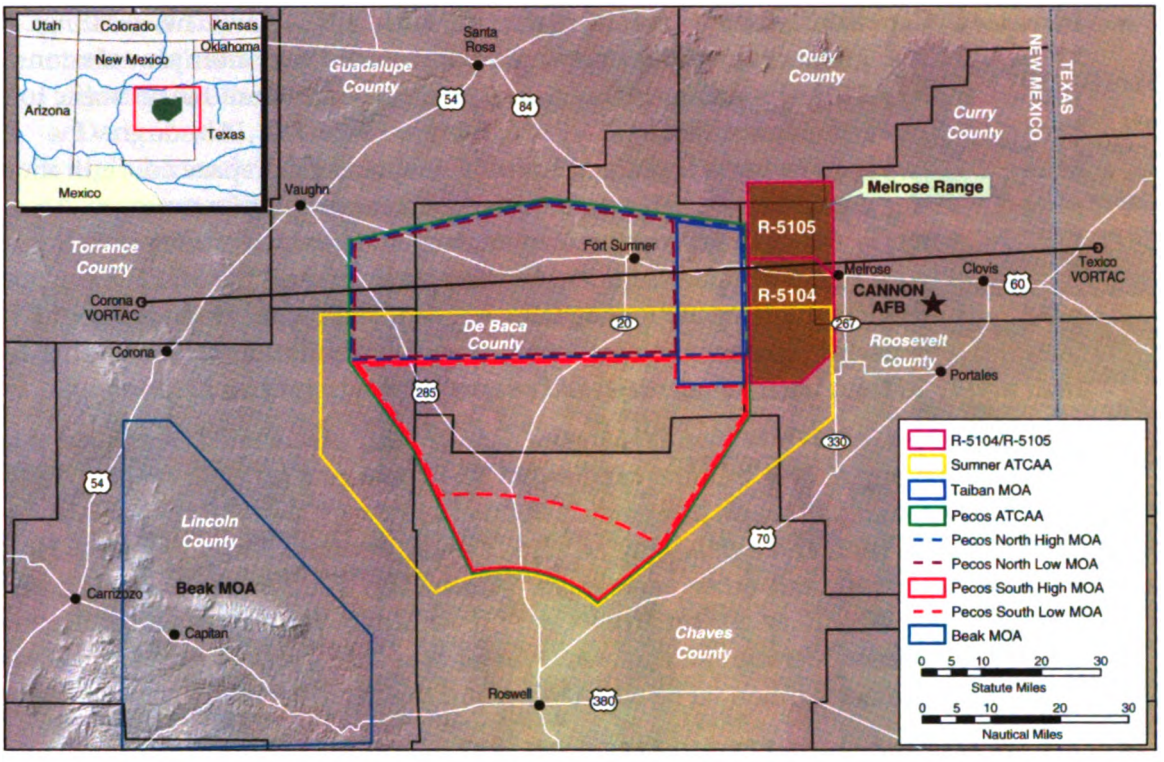


FIGURE 2-10. NO-ACTION ALTERNATIVE

Under No-Action, most 27 FW and NMANG squadrons do not have the opportunity to train regularly with supersonic tactics. This has resulted in pilots being deployed overseas with limited supersonic training. No-Action would limit New Mexico aircrew training and increase training costs. Aircrews would potentially be deployed overseas into combat without the benefit of being proficient in maneuvers needed in combat conditions.

2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

Throughout the alternative identification and screening process, as well as during public scoping, other candidate alternatives were considered to support the NMTRI purpose and need (as described in Sections 1.3 and 1.4). The Air Force considered three additional candidate alternatives with adequate training airspace in the vicinity of Cannon AFB (see Figure 2-1). These candidate alternatives were not carried forward as operationally viable alternatives in this EIS. These candidate alternatives were as follows.

- **Increased Capabilities and Use of Mt. Dora MOA:** The existing Mt. Dora MOA is located at a distance from Cannon AFB and does not meet the operational criteria of maximizing F-16 training time or adjacency to a military training range. The distance would force pilots to significantly reduce training time because they must allow for enough fuel to return to base. The Mt. Dora MOA is not adjacent to a training range and does not permit training in the full spectrum of missions and tactics. For these operational reasons, Mt. Dora MOA was not carried forward for detailed analysis as suitable for the NMTRI initiative.

- **Increased Capabilities and Use of Bronco MOA/ATCAA:** The existing Bronco MOA/ATCAA airspace provides training opportunities for multiple missions. The Bronco MOA/ATCAA is currently fragmented by a corridor to allow air traffic to transit between Roswell, New Mexico, and Lubbock, Texas. Although the Bronco MOA/ATCAA is an important piece of training airspace, its airspace configuration does not provide for continuous aircrew training into a weapons delivery range. Access to a training range is the primary operational reason that precludes consideration of the Bronco MOA/ATCAA airspace as a viable alternative to meet the NMTRI purpose and need. In addition, the population density below the Bronco airspace would further fragment the useful airspace as pilots seek to avoid population centers. This reduces their ability to train with the required full spectrum of missions and tactics.
- **Increased Use of White Sands Missile Range and Associated Airspace:** WSMR currently has supersonic training capabilities and contains a training range. WSMR and associated training airspace, however, is not managed by Cannon AFB. WSMR does not meet the utilization and availability criteria because multiple Army missions, Holloman AFB-based aircraft, and other users have priority over Cannon AFB training missions. Additionally, WSMR is distant from Cannon AFB and would not maximize training time. For these operational reasons, WSMR was not carried forward as a viable alternative to meet Cannon AFB/NMANG requirements for primary mission training.

2.4 Environmental Impact Analysis Process

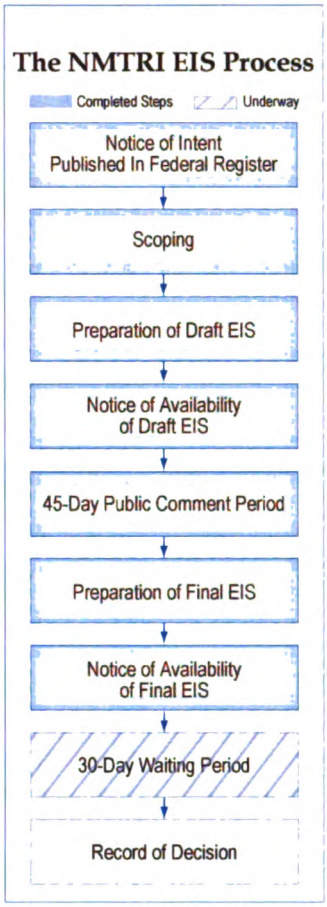
2.4.1 The NEPA Process

This NMTRI Draft EIS has been prepared in accordance with NEPA (42 United States Code [USC] 4321-4347), Council on Environmental Quality (CEQ) (40 CFR § 1500-1508), and 32 CFR 989, *et seq., Environmental Impact Analysis Process* (formerly known as Air Force Instruction [AFI] 32-7061). This process complies with FAA 7400.2, *Procedures for Handling Airspace Matters.* NEPA is the basic national requirement for identifying environmental consequences of federal decisions. NEPA ensures that environmental information is available to the public, agencies, and the decision maker before decisions are made and before actions are taken.

An EIS is prepared as a tool for compiling information about a proposal and providing a full and fair discussion of environmental impacts to the natural and human environment. Reasonable alternatives to the proposed action as well as the No-Action Alternative are also evaluated in an EIS. In this Draft EIS, the No-Action Alternative means that there would be no modifications or additions to the current airspace managed by Cannon AFB. As described in Section 2.2.4, this will maintain training conditions as they are today. The Air Force analyzes alternatives to ensure that fully informed decisions are made after review of the comprehensive, multidisciplinary analysis of potential environmental consequences. Compliance with NEPA guidance for preparation of an EIS involves several critical steps summarized below.

1. *Announce that an EIS will be prepared.* For this NMTRI EIS, a Notice of Intent was published in the *Federal Register* on December 31, 2003.

2. *Conduct scoping.* This is the first major step to identify the relevant issues to be analyzed in depth and to eliminate issues that are not relevant. Scoping for this EIS ran from December 31, 2003 through March 1, 2004. Throughout the 2-month period, the Air Force actively solicited comments through press releases, newspaper ads, public service announcements, flyers, letters, and postcards to the public, local governments, federal and state agencies, Native Americans, and pilot associations. These entities were solicited to ensure that their concerns and comments about the proposal were included in the analyses. In December 2003, the Air Force initiated the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) and submitted letters to local, state, tribal and federal agencies informing them of the Air Force's intent to prepare this EIS (Appendix C). Four scoping meetings were held in Portales, Fort Sumner, Vaughn, and Roswell, New Mexico to present details about the proposal, the NEPA process and opportunities for public and agency involvement (refer to Table 2-9). Approximately 75 members of the public and agency representatives attended the meetings. In addition to receiving verbal and written comments at the scoping meetings, the Air Force also received written comments from the public and agencies through the mail. To the extent possible, scoping comments have been used to shape the analysis and focus the issues in this Draft EIS (see Section 2.4.2). Comments on the Proposed Action and alternatives will continue to be accepted throughout the environmental process.



3. *Prepare a Draft EIS.* The Draft EIS is a comprehensive document for public and agency review. The Draft EIS describes the NMTRI purpose and need, explains the Proposed Action and alternatives, presents the existing conditions in the region potentially affected, and provides analysis of the environmental consequences of the Proposed Action and each alternative, including the No-Action Alternative. This Draft EIS has been distributed to agencies, regional libraries, and members of the public who have requested copies to ensure the widest dissemination possible. The 45-day public comment period began when the Notice of Availability for this Draft EIS was filed in the *Federal Register*.

4. *Public/Agency Review.* The 45-day public comment period provided the public and agencies the opportunity to review the Draft EIS and to provide comments on the analysis. This comment opportunity includes a series of public hearings held during the comment period. The hearings give the public and agencies an opportunity to verbally comment

OPPORTUNITIES FOR PUBLIC INPUT INCLUDE SCOPING MEETINGS AND PUBLIC HEARINGS.

on the Draft EIS after their review and evaluation of the document. The hearings provide direct feedback to the Air Force from the public and agencies. All comments received during the public comment period are incorporated into the Final EIS. Written comments submitted at public hearings and those received through the mail by the Air Force are given equal consideration in the preparation of the Final EIS.

5. *Prepare a Final EIS.* This Final EIS was prepared following the public comment period and includes all written comments and verbal testimony from public and agency reviewers during the public hearings and the comment period. This Final EIS revises the Draft EIS to reflect public and agency comments, the Air Force's responses, and additional information received from reviewers (refer to Chapter 6.0). The Final EIS provides the decision maker with a comprehensive review of the potential environmental consequences of selecting the Proposed Action or an alternative. A Notice of Availability (NOA) is published in the *Federal Register* to announce availability of the Final EIS.
6. *Allow for Additional Public Involvement.* The Air Force will include an additional 30-day opportunity for public involvement and comment through the provisions outlined in 32 CFR Part 989.20 which states: "The Final EIS should be furnished to every person, organization, or agency that made substantive comments on the Draft EIS or requested a copy. Although the Air Force is not required to respond to public comments received during this period, comments received must be considered in determining final decisions such as identifying the preferred alternative, appropriate mitigations, or if a supplemental analysis is required."
7. *Issue a Record of Decision.* The final step in the NEPA process is approval of the Record of Decision (ROD). The NOA begins a 30-day waiting period before the ROD is signed. The ROD identifies which action has been selected by the Air Force decision maker and what management actions or other measures would be carried out to reduce, where possible, adverse impacts to the environment.

The goal is for this EIS to satisfy the NEPA requirements for both the FAA and the Air Force. FAA's federal actions are dependent upon the special use airspace proposal. Figure 2-11 depicts the FAA non-regulatory special use airspace process. Should the jet route be moved, a separate process is required.

2.4.2 Issues Identified During the Public Review of the Draft EIS

Table 2-9 identifies the location of the four NMTRI public hearings conducted as part of the environmental analysis. Comments and testimony during public hearings and other submitted comments resulted in the issues presented in Table 2-10. These issues are discussed in the baseline or existing conditions in Chapter 3.0 and the resource analysis in Chapter 4.0 of this EIS.

TABLE 2-9. NMTRI PUBLIC HEARINGS CONDUCTED DURING JANUARY 2005

Date	*Time*	*Location*	*Address*
January 24, 2005 Monday	6:00 - 8:00 p.m.	Goddard High School Little Theater	701 East Country Club Road Roswell, NM
January 25, 2005 Tuesday	6:00 - 8:00 p.m.	Santa Rosa High School Technology Center	717 Third St. Santa Rosa, NM
January 27, 2005 Thursday	6:00 - 8:00 p.m.	Community Service Building, Courthouse Annex	514 Ave. "C" Fort Sumner, NM
January 28, 2005 Friday	6:00 - 8:00 p.m.	Clovis Community College Town Hall	417 Schepps Blvd. Clovis, NM

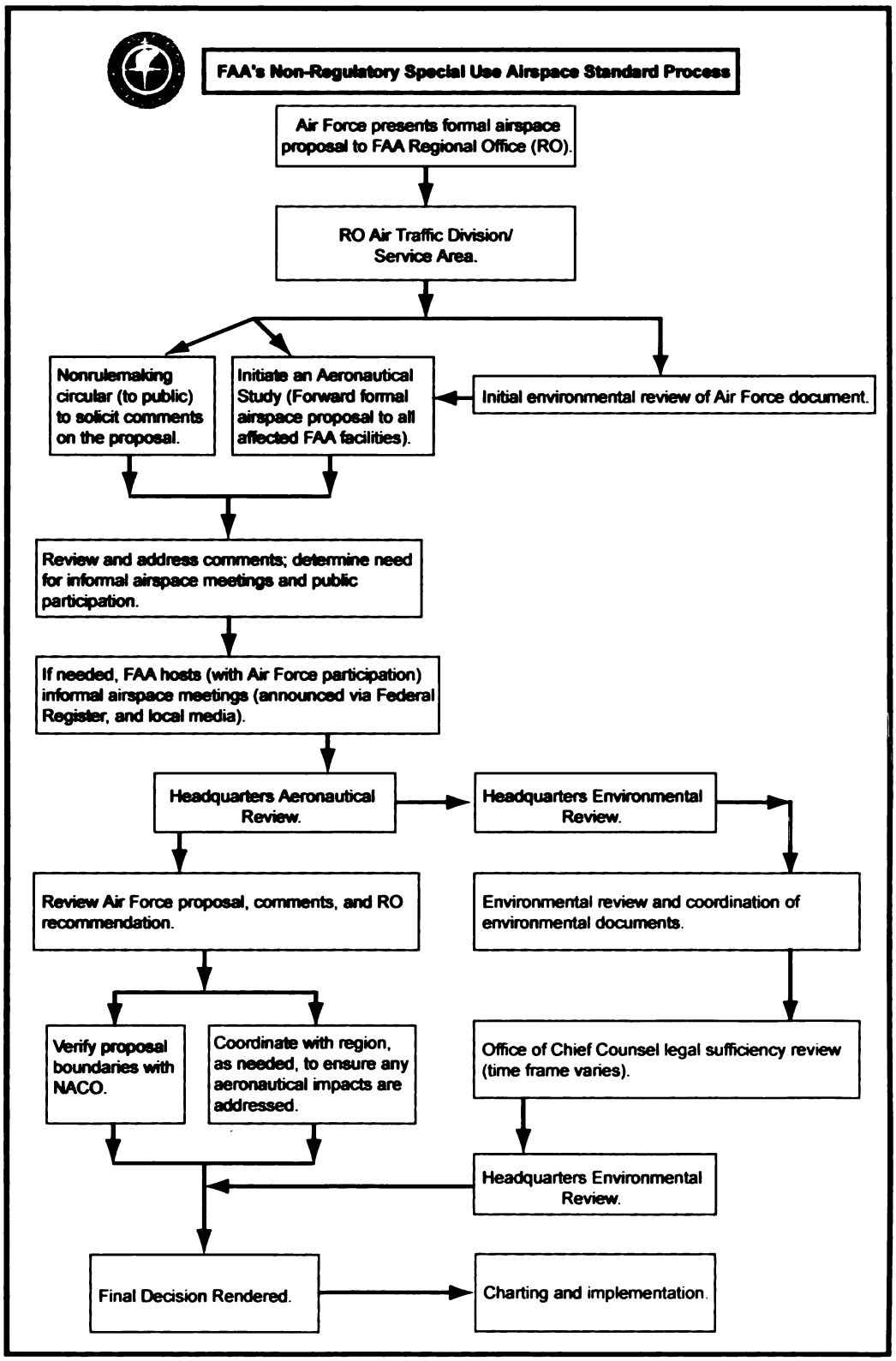
As described in the Draft EIS, some environmental resources were integrated into other resources and not carried forward for separate evaluation because it was determined that implementation of any of the alternatives would be unlikely to affect the resources. These resources were air quality, visual resources, hazardous materials and waste management, and ground transportation. A brief explanation of the reasons why these resources were not expected to be impacted is provided below:

Air Quality: The implementation of the Proposed Action or alternatives would not involve the demolition or construction of any facilities and there would be no proposed change in the number of aircraft sorties flown within the study area. The majority of aircraft sorties occur above the mixing height for emissions and would not affect air quality on the ground. Air quality within the area is currently in attainment for federal and state standards and no elements of the Proposed Action or alternatives are anticipated to have any affect on these standards.

Hazardous Materials and Waste Management: The implementation of the Proposed Action or alternatives would not increase the use of any hazardous materials. There would be no demolition or construction associated with any element of the Proposed Action or alternatives that would generate any solid or hazardous waste. There would be no increased use of flares or chaff. Any residual materials from deployment of chaff and flares is addressed in the environmental discussions of safety, biology, and socioeconomics.

Ground Transportation: The implementation of the Proposed Action or alternatives would not involve an increase in base personnel or an increase in the use of the road or railroad systems in the study area and would not have the potential to interfere with the movement of vehicles. Transportation issues regarding aircraft, both commercial and general aviation, are addressed in the environmental discussions of airspace and socioeconomics.

Visual Resources: The implementation of the Proposed Action or alternatives would not involve the demolition or construction of any facilities that would have the potential to affect the visual environment. The new and modified airspace locations are within close proximity to or under areas already in use by military aircraft for training, and therefore, the appearance of military aircraft would not be expected to change the existing viewshed. Residual materials from chaff and flares are discussed in socioeconomics.



Note: Specific requirements are found in FAA Order 7400.2.

FIGURE 2-11. FAA'S NON-REGULATORY SPECIAL USE AIRSPACE STANDARD PROCESS

TABLE 2-10. PUBLIC REVIEW ISSUES BY EIS SECTION

Issue Raised	*Included in NMTRI EIS Section*
EIS Process	2.4
Purpose and Need	1.1-1.4
Addressing Additional Alternatives	2.3
Airspace and Range Management	1.2.2, 1.3, 2.1, 2.2, 3.1, 4.1
Restrictions on private or general aviation (includes radio communications)	3.1.1, 3.1.2, 4.1.2, 4.1.3, 4.2.3
Violations of agreed-to airspace/claims	2.2.1.5, 3.1.1, 3.1.2, 3.7.2
Use of chaff and flares	2.2.1.4, 2.2.2, 2.2.3, 4.1.3
Cumulative impacts from multiple military operations	4.1.2, 4.1.3, 5.1
Increase in supersonic activities	4.1.3, 4.2.3
Acoustic Environment	3.2, 4.2
Sonic boom frequency and impacts	2.2.1.3, 2.2.2, 2.2.3, 3.2.2.2, 4.2.2, 4.2.3
Aircraft overflight and sonic boom effects on property, electric systems, wireless signals, etc.	4.2.2, 4.2.3
Changes in noise levels	3.2.1, 3.2.2, 4.2.2, 4.2.3
Safety	3.3, 4.3
Chaff and flare use	3.3.2.1, 3.3.2.2, 4.3.3, 4.5.2.2, 4.5.3
Noise and sonic boom safety to workers	4.2.2, 4.2.3
Aircraft accidents	3.3.2.3; 4.3.3
Communication with small aircraft	3.1.2, 4.1.3.1
Physical Resources	3.4, 4.4
Chaff and flares on land or water	4.3.3, 4.4.2, 4.4.3
Oil and gas exploration or production	3.8.2.4, 4.4.2, 4.4.3, 4.8.3
Weather/cloud dissipation, drought considerations and impact to grasslands	4.2.2
Biological Resources	3.5, 4.5
Aircraft overflight and sonic boom effects on humans, workers, wildlife, horses, cattle, or ranching operations	4.2.2, 4.2.3, 4.5.2.1, 4.5.3, 4.8.3
Impacts on grasslands	3.5.2, 4.4.3, 4.5.2.2, 4.5.3
Chaff and flares as debris	4.5.2.2, 4.5.3, 4.7.3
Cultural Resources	3.6, 4.6
Land Use and Recreational Resources	3.7, 4.7
Impediments to property use (wind farms, oil and gas derricks, radio transmission/cell towers)	3.1.2, 4.1.3.1, 4.3.3, 4.4.2, 4.4.3, 4.7.3, 4.8.3
Grazing and cattle	3.5.2.4, 4.5.2, 4.5.3, 4.7.3, 4.8.3
Cannon AFB access to property or Cannon AFB and/or Melrose expansion	2.2.1.1, Table 2-2, 3.7.2, 4.7.2, 4.7.3
Socioeconomic	3.8, 4.8
Land values	4.7.3, 4.8.3
Effects on dairies, ranches, agricultural operations, or hunting income	3.8.2.2, 3.8.2.3, 4.8.3
Wind farms or oil/gas production.	3.8.2.4, 3.8.2.5, 4.8.3
Environmental Justice	3.9, 4.9
Cumulative Actions	5.1

2.4.3 FAA Impact Analysis Categories

When the FAA (participating in the NMTRI EIS as a cooperating agency) is the lead agency or proponent of an action, it considers analysis of an array of environmental resources similar to the Air Forces. Table 2-11 lists those resource analysis categories, as identified in FAA Order 1050.1 (revised 2004), and correlates them with the resources discussed in the NMTRI EIS.

2.4.4 Regulatory Compliance

This EIS has been prepared to satisfy the requirements of the NEPA (Public Law [P.L.] 91-190, 42 USC 4321 *et seq.*) as amended in 1975 by P.L. 94-52 and P.L. 94-83. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions. In addition, this document was prepared in accordance with Section 102 (2) of NEPA, regulations established by the CEQ (40 CFR 1500-1508), AFI 32-7061, (i.e., 32 CFR Part 989).

This analysis of environmental resources considered all applicable federal, state, and local regulations in Chapter 3.0 and 4.0 of this document. Certain areas of federal legislation, such as the Endangered Species Act (ESA) and National Historic Preservation Act (NHPA), have been given special consideration. Other state and federal regulations used for guidance in this analysis are presented in Appendix D.

Implementation of an alternative would involve coordination with several agencies. Compliance with the ESA involves communication with the Department of the Interior (delegated to the U.S. Fish and Wildlife Service [USFWS]) in cases where a federal action could affect listed threatened or endangered species, species proposed for listing, or candidates for listing. The primary focus of this consultation is to request information on whether any of these species occur in the region of influence of an alternative. If any of these species are present, a determination of the potentially adverse effects on the species is made. Should no species protected by the ESA be affected by an alternative, no additional action is required. A letter was sent to the appropriate USFWS office as well as New Mexico Department of Game and Fish, informing them of the alternatives and requesting information on protected species (Appendix C).

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 SHPO and the Mescalero Apache, Jicarilla Apache, and Comanche tribes informing them of the NMTRI proposal (Appendix C).

2.4.5 Permit Requirements

This EIS has been prepared in compliance with NEPA; other federal statutes, such as the Clean Air Act and the Clean Water Act; Executive Orders (EOs); and applicable state statutes and regulations. A list of Cannon AFB permits and certifications was compiled and reviewed during the EIS process. Table 2-12 summarizes these applicable federal, state, and local permits and the potential for change to the permits due to implementing a NMTRI alternative. No new permits are expected to be required.

Table 2-11. Impact Analysis Categories Identified in FAA Order 1050.1E (2004).

FAA Impact Analysis Categories	*How Addressed by NMTRI EIS Analyses [relevant NMTRI EIS sections in brackets]*	*Comment*
Air Quality	Not carried forward for further analysis	No change in number of sorties, aircraft type, or chaff or flare use; no construction or demolition
Coastal Resources	Not Applicable	Project airspace is not over or near coast line
Compatible Land Use	Land Use and Recreational Resources [3.7, 4.7]	Appendix I
Construction Impacts	Not Applicable	No construction activities associated with proposed action or alternatives
Department of Transportation Act: Sec. 4(f)	Land Use and Recreational Resources [3.7, 4.7]	Appendix I
Farmlands	Physical Resources [3.4, 4.4] and Land Use [3.7, 4.7]	No potential to convert farmland to non-agricultural uses
Fish, Wildlife, and Plants	Biological Resources [3.5, 4.5]	
Floodplains	Physical Resources [3.4, 4.4]	No actions will encroach on a base (i.e., 100 year flood) floodplain, or on any floodplain
Hazardous Materials, Pollution Prevention, and Solid Waste	Not carried forward for further analysis as a separate topic; see also Safety [3.3, 4.3] and Socioeconomics [3.8, 4.8]	No increase in use of hazardous materials or generation of solid waste
Historical, Architectural, Archeological, and Cultural Resources	Cultural Resources [3.6, 4.6]	
Light Emissions and Visual Impacts	Not carried forward for further analysis as a separate topic; see also Land Use and Recreational Resources [3.7, 4.7]	Proposed action and alternatives occur in areas already overflown by aircraft; no light emissions
Natural Resources and Energy Supply	Not Applicable	Aircraft will continue to use airspace and fuel under all alternatives
Noise	Acoustic Environment [3.2, 4.2]	
Secondary (Induced) Impacts	Discussed in each section and in cumulative impacts [5.0]	
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks	Socioeconomics [3.8, 4.8] Safety [3.3, 4.3] Environmental Justice [3.9, 4.9]	
Water Quality	Physical Resources [3.4, 4.4]	Proposed action and alternatives will have no impact on water quality
Wetlands	Biological Resources [3.5, 4.5]	No effects to wetlands, as action involves only airspace
Wild and Scenic Rivers	Land Use and Recreational Resources [3.7, 4.7]	No wild and scenic rivers are located beneath project airspace

TABLE 2-12. ENVIRONMENTAL-RELATED PERMITTING

Permit	*Resource*	*Preferred Alternative*
Air Quality Synthetic Minor Permit	Air	No change to air emissions and no changes needed to existing air quality permit.
Cannon AFB National Pollutant Discharge Elimination System (NPDES) Storm Water	Storm Water	No construction on Cannon AFB and therefore no change to storm water discharge.
Cannon AFB Non Discharge (Sludge Disposal)	Waste Water	No construction on Cannon AFB and therefore no change to waste water discharge.
Cannon AFB Hazardous Waste Permit	Hazardous Waste	No change in Hazardous Wastes and therefore no change needed to existing permit.
Cannon AFB Discharge Plan (DP-873)	Groundwater	No construction on Cannon AFB and therefore no impact to groundwater resources.
Aboveground Storage Tank Registration Certification	Hazardous Materials	No change in Hazardous Materials and no change needed to existing certification.

2.5 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-13 summarizes the potential environmental consequences of the preferred alternative (or mitigated Alternative A), the Draft EIS Proposed Action, Alternative B, and No-Action alternatives from the detailed impact analyses presented in Chapter 4.0, and cumulative effects from Chapter 5.0.

TABLE 2-13. SUMMARY OF IMPACTS BY RESOURCE
(PAGE 1 OF 6)

Preferred Alternative Alternative A (mitigated)	*Draft EIS Proposed Action*	*Alternative B*	*No-Action*
AIRSPACE AND RANGE MANAGEMENT			
J-74 would not be changed. Commercial traffic would continue east-west transit through the Sumner North ATCAA except during twice per month LFE exercises scheduled by Albuquerque Center not during high civilian traffic. This would avoid significant airspace impacts. Supersonic flight above 10,000 feet MSL is expected to create little impact regarding airspace management. Sonic booms would increase from one per five days to two per three days. Sonic boom overpressures would not be expected to have any effect on other aircraft flying in the airspace. No airspace impacts are expected from use of RR-188 chaff and M-206 (or equivalent-sized) flares in new or expanded airspace. Proposed MOA and ATCAA expansions would not prohibit use of airway by other operators. General aviation pilots would use "see and avoid" rules in the existing and expanded MOA. Civil aviation flights could operate under the 18,000 feet MSL floor or over the 32,000 feet MSL ceiling of the proposed Capitan ATCAA when activated for LFEs. Alternative A with mitigations would not be expected to result in any significant impacts to airspace.	Rerouting J-74 up to 17 nm north of its current location, or 5 to 7 nm north of the expanded Pecos North MOA/ATCAA, could impact a portion of the current routine commercial traffic transiting the area. A Capitan MOA/ATCAA from 12,500 feet MSL to 50,000 feet MSL could impact civil airspace in the Roswell-Corona corridor. Supersonic, chaff and flare, and other airspace consequences are the same as under Alternative A.	Rerouting J-74 could impact commercial traffic as noted for the Draft EIS Proposed Action. Capitan MOA/ATCAA airspace would not be established so there would be no environmental consequences to the Roswell-Corona corridor. Supersonic, chaff and flare, and other airspace consequences are the same as under Alternative A.	No airspace modifications or expansion of military training airspace would occur. The training inefficiencies resulting from the segmented configuration of the existing airspace would continue. Supersonic flight would continue above 30,000 feet MSL with an estimated one sonic boom every five days. Chaff and flare use would continue as assessed in existing airspace. Scheduling issues associated with joint military and civil use of the current airspace configuration would continue.

TABLE 2-13. SUMMARY OF IMPACTS BY RESOURCE (PAGE 2 OF 6)

Preferred Alternative Alternative A (mitigated)	*Draft EIS Proposed Action*	*Alternative B*	*No-Action*
ACOUSTIC ENVIRONMENT			
Change in the acoustic environment from subsonic operations is minor in most areas under the airspace. Average noise levels under the existing Pecos South MOA would be reduced from 43 dB to 42 dB, due to training operations being spread over a larger volume of airspace. Average noise levels in the eastern low altitude expansion of the Pecos MOA would noticeably increase from an estimated ambient condition of 25 - 36 dB to 42 dB. Annual average noise levels adjusted for day-night and for sudden onset noise are all below the 55 dB noise level identified by USEPA as protective of public health and welfare with an adequate margin of safety. Average military aircraft noise levels under the Capitan ATCAA would be 25 to 28 dB. Average military aircraft noise levels under the southern and western expansion of Pecos would be comparable to either under the Capitan ATCAA or the eastern expansion of Pecos, depending upon training activity. Military aircraft would be noticed, but the calculated military noise level is within the estimated 25 - 36 dB ambient conditions or below the 55 dB noise level. The projected change from 168 to 467 supersonic sorties per month would result in an average increase of sonic booms from one per five days to two per three days. Sonic boom noise levels toward the center of the airspace would be a C-Weighted Day-Night Sound Level (CDNL) 52 dB. Individual sonic booms would be noticeable and could be perceived as intrusive. Peak overpressure values would not be strong enough to result in damage to human health or animals. Damage to structures is generally not expected, although vibration could affect or damage fragile items or items such as windows in poor condition.	Noise levels generally would be comparable to Alternative A. Average noise levels in the Pecos South MOA would be reduced from 43 dB to 42 dB. Noise in the Pecos expansion would increase as described for Alternative A. Military aircraft noise levels under Capitan would increase to 25 - 28 dB in an area with ambient noise levels of 25 to 36 dB. These average noise levels are all below the 55 dB identified by USEPA. Sonic boom levels would be CDNL 52 dB with an average of two booms per three days toward the center of the airspace. The sonic boom environment would be more concentrated toward the center of the airspace than near the edges. Sonic boom effects would be as described Alternative A.	Noise levels generally would be comparable to Alternative A. Average noise levels in the Pecos South MOA would be reduced from 43 dB to 42 dB. Noise in the Pecos expansion would noticeably increase to 42 dB as described for Alternative A. The sonic boom environment and consequences would be the same as for Alternative A. The Capitan MOA/ATCAA would not be established and noise levels would remain at ambient levels in the area between the Beak and Pecos MOAs.	Noise levels under the Pecos MOA would remain at existing 43 dB. Sonic booms would continue at one per five days and the baseline sonic boom environment would result in a CDNL 40 dB toward the center of the airspace. The acoustic environment in the areas under the Sumner ATCAA not coincident with other airspace and between the Pecos and Beak MOAs would remain at the estimated 25 to 36 dB ambient levels.

TABLE 2-13. SUMMARY OF IMPACTS BY RESOURCE
(PAGE 3 OF 6)

Preferred Alternative Alternative A (mitigated)	*Draft EIS Proposed Action*	*Alternative B*	*No-Action*
SAFETY			
No specific proposals associated with Alternative A would create new or unique ground safety issues. Continuing J-74 on its established route would not change airspace safety. Establishing the Capitan ATCAA with a floor of 18,000 feet MSL and using it two days per month would limit civil aviation traversing the area. See-and-avoid safety issues were raised by general aviation pilots who requested enhanced communication within the Pecos MOA complex. Supersonic or startle effects would not be expected to be a safety risk to humans or animals although startle effects of low overflight could impact penned animals. Chaff has not been found to be harmful to domestic animals or wildlife. Flares are designed and employed above 2,000 AGL in a manner that ensures that they are fully consumed before reaching the ground. Proposing flare deployment above 5,000 AGL in fire conditions of high or above should result in minimal fire risk. Flight activity would continue at current levels. Risks of a Class A mishap would remain unchanged. Emergencies, including life-flights, would continue to be supported by stopping military training in the affected airspace. Ground, ordnance, flight safety, and flare use risks are comparable to existing conditions.	No aspects of the Proposed Action would be expected to create new or unique ground safety issues. Moving J-74 was identified as a potential safety risk during the Draft EIS review process. Establishing the Capitan MOA and ATCAA would create a 12,500 MSL floor and a new MOA which were identified during the Draft EIS review process as a potential increased safety risk to civil aviation. Ground, ordnance, flight safety, and flare use risks are comparable to Alternative A.	No specific proposals associated with Alternative B would create new or unique ground safety issues. Moving J-74 would affect commercial traffic as described for the Draft EIS Proposed Action. The Capitan MOA/ATCAA would not be established and there would be no effects on civil aircraft traversing the airspace between the Beak and Pecos MOAs. Ground, ordnance, flight safety, and flare use risk assessments are comparable to Alternative A.	No changes to airspace would occur. Risks associated with airspace use, ground, ordnance, flight safety, and flare use would remain unchanged from current conditions.

TABLE 2-13. SUMMARY OF IMPACTS BY RESOURCE (PAGE 4 OF 6)

Preferred Alternative Alternative A (mitigated)	*Draft EIS Proposed Action*	*Alternative B*	*No-Action*
PHYSICAL RESOURCES			
Effects to physical resources from NMTRI focused on chaff and flare use. Chaff or flare debris would not accumulate in soil or water in quantities that would negatively affect their quality or uses. Flares are designed to be fully consumed prior to reaching the ground; therefore there is a low probability of fire affecting physical resources due to flare use. The total number of chaff and flares used in the Pecos/Sumner airspace complex would not change from the present. Chaff fibers would be expected to be 0.005 ounces per acre per year and 1-inch by 1-inch plastic or felt pieces from chaff or flares or aluminum-coated mylar wrapping from flares would be approximately one per 9 acres per year. No significant impact to physical resources would occur due to deployment of chaff and flares or any other component of Alternative A.	Potential effects would be the same as under Alternative A. Chaff fibers, end caps, or wrapping distribution would be the same as under Alternative A. No significant impact would occur to physical resources.	Potential effects would be essentially the same as under Alternative A. Defensive chaff or flares would not be used by military aircraft between the Beak and Pecos MOAs. No significant impact to physical resources would occur under Alternative B.	Effects to physical resources would be the same as under current conditions. Chaff and flare plastic or felt pieces from chaff and flares and mylar coated wrapping from flares would continue to be deposited at approximately one piece per 9 acres per year. No significant impact to physical resources occurs under No-Action.
BIOLOGICAL RESOURCES			
No biological impacts are expected due to any changes in subsonic noise in existing airspace. Expansion areas would experience new levels of noise, which could cause short-term wildlife reactions such as shifts in habitat use or activities. Habituation would be expected to reestablish behavior patterns. Noise from supersonic flights would expose animals to higher noise levels from sonic booms than currently experienced. Animals could temporarily react negatively to more or louder sonic booms initially, but habituation to an average of two supersonic events every three days would be expected. A particularly close low level overflight or loud sonic event could result in a startle reaction and negative response to wildlife and livestock. Such incidents would be random and infrequent. Wildlife and livestock would not be affected by residual chaff or flare materials. Flare deployment above 5,000 MSL during high or greater fire conditions would be expected to result in no substantive change to fire risk. Any fire can affect agricultural resources, wildlife, and habitat.	Effects to biological and agricultural resources would be essentially the same as those described under Alternative A.	Effects to biological and agricultural resources would be essentially the same as those described under Alternative A. Resources under the proposed Capitan airspace would experience essentially the same effects as under existing conditions.	Biological and agricultural resources would continue to experience the effects of existing military training, including chaff and flare use and an average of one supersonic event per five days.

TABLE 2-13. SUMMARY OF IMPACTS BY RESOURCE
(PAGE 5 OF 6)

Preferred Alternative Alternative A (mitigated)	*Draft EIS Proposed Action*	*Alternative B*	*No-Action*
CULTURAL RESOURCES			
Noise levels, including sonic booms, under Alternative A would not be sufficient to produce conditions that could adversely affect cultural or historic resources. Windows in less than good condition could be affected by an increased number and intensity of sonic booms. The cultural and historic sites within established communities would not likely experience substantial noise impacts. Use of flares is not expected to change fire risk. Distribution of chaff and flare residual materials is unlikely to adversely affect cultural resources.	Effects to cultural and historic resources under Alternative A would be essentially the same as under Alternative A.	Effects to cultural and historic resources under Alternative B would be essentially the same as under Alternative A.	No change to effects on cultural resources. Chaff and flare residual materials and sonic booms under the airspace would continue to occur.
LAND USE AND RECREATION			
There would be no anticipated change in general land use patterns, land ownership, land management plans, or special use areas for lands underlying the proposed airspace. NMTRI does not include modifications to Cannon AFB or Melrose AFR. Access to land would remain unaffected and noise levels would remain below identified USEPA levels for consideration of potential consequences. Current management of recreation-related resources and land used for recreation activities such as hunting would continue as under existing conditions. Increased noise levels due to supersonic flight may result in some increased human annoyance to population under the airspace (population density in the region is less than 1 person per square mile). No significant impacts to land use or recreation would be expected under Alternative A.	Effects to land use and recreation resources similar to those under Alternative A. NMTRI does not include modifications to Cannon AFB or Melrose AFR. No impacts to land uses or recreation, including in the air traffic study area, would be expected.	Effects to land use and recreation resources similar to those under Alternative A. The Capitan MOA/ATCAA would not be established and effects on resources under the corridor would be the same as under existing conditions. No impacts to land uses or recreation under Alternative B would be expected, including in the air traffic study area.	Land use and recreation resources under the existing airspace would experience the same effects as under existing conditions.

TABLE 2-13. SUMMARY OF IMPACTS BY RESOURCE (PAGE 6 OF 6)

Preferred Alternative Alternative A (mitigated)	*Draft EIS Proposed Action*	*Alternative B*	*No-Action*
SOCIOECONOMICS			
Expanded airspace and low-altitude flight would not be expected to result in any significant impacts to humans, livestock, economic pursuits, or land values in the region. Commercial and general aviation traversing on J-74 or Capitan ATCAA would not be significantly affected by the twice monthly ATCAA activation periods. Changes in noise would not have significant effects on land use, property values, recreation activity, ranching operations, wind energy projects, oil/gas exploration or production, or other economic pursuits. Noise startle events, such as an increase in sonic booms from one per five days to two per three days, could result in negative impacts to a particular animal or human receptor, and the incidence of such an event may increase annoyance. Five cases of damage to penned domestic animals were attributed to low level overflights under the Cannon AFB Pecos airspace complex between 1994 and 2005. Damage to property in good condition from noise effects would not be anticipated. Older windows or fragile objects balanced on shelves could be vibrated or damaged as a result of an increase in sonic boom numbers or intensity. The Air Force has established procedures for any damage claim. Chaff debris or residual flare components would not accumulate in sufficient quantities to affect property value or land uses although finding such materials on private or public property could result in annoyance. The risk of flare-induced fire in the affected area would continue to be minimal.	Most socioeconomic effects would be the same as those described for Alternative A. Reconfiguring J-74 and redirecting other civil traffic could increase flight time by 1 to 2 minutes and concentrate more commercial traffic north of existing J-74. Civil aviation flights could be required to fly at lower altitudes, use "see-and-avoid," adjust schedules, or otherwise avoid an active Capitan MOA. As noted in comments during the Draft EIS process, J-74 and Capitan MOA could affect civil aviation scheduling and economics. Potential effects from noise, sonic booms, chaff, flares, and risk of fire would be the same as for Alternative A.	Most socioeconomic effects would be the same as those described for Alternative A. The effects of rerouting J-74 would be the same as under the Draft EIS Proposed Action. The Capitan MOA/ATCAA would not be created under this alternative. Potential effects from noise, sonic booms, chaff, flares, and risk of fire would be generally the same as for Alternative A.	Effects on socioeconomic resources under the Pecos MOA complex would be the same as under existing conditions. This includes sonic booms from flights above 30,000 feet MSL, chaff and flare use in the currently approved airspace, and the current minimal fire risk from existing flare use.
ENVIRONMENTAL JUSTICE			
No impacts related to Environmental Justice issues are anticipated. There would be no effects on children.	No impacts related to Environmental Justice issues or effects on children are anticipated.	No impacts related to Environmental Justice issues or effects on children are anticipated.	No change related to Environmental Justice issues are anticipated.

3.0 AFFECTED ENVIRONMENT

This chapter describes the condition of environmental resources within the areas potentially affected by the alternatives described in Chapter 2.0.

The National Environmental Policy Act (NEPA) requires that the analysis address those areas and the components of the environment with the potential to be affected by the proposed action. Locations and resources with no potential to be affected need not be analyzed.

Public and agency scoping comments were used to focus the analysis on those environmental resources of interest to scoping participants. Some environmental resources were not carried forward for evaluation in this Environmental Impact Statement (EIS) because it was determined that implementation of the Proposed Action or any of the alternatives would be unlikely to affect those resources. These resources are air quality, hazardous materials and waste management, transportation and visual resources. An explanation of the reasons why these resources were not expected to be affected was presented in Section 2.4.2. The public and agencies review of the Draft EIS helped describe the potential consequences to the environmental resources. Those consequences are addressed in Chapter 4.0. Cumulative effects associated with other federal and regional action, including Base Realignment and Closure (BRAC) Act and designation of the new AFSOC mission, are described in Chapter 5.0.

The expected geographic scope of potential impacts is known as the Region of Influence (ROI). The ROI for this project is defined for each environmental resource as the outermost boundary of potential environmental consequences. The ROI generally is focused on the areas under or adjacent to the Pecos Military Operations Area (MOA)/Air Traffic Control Assigned Airspace (ATCAA) complex or affected by an alternative. In addition to this ROI, each resource considered the air traffic study area, as described in Section 2.2.2. No change in airspace use in the Beak MOA is proposed as part of the New Mexico Training Range Initiative (NMTRI).

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 "navigable airspace" that overlies the geopolitical borders of the United States (U.S.) and its territories. "Navigable airspace" is airspace above the minimum altitudes of flight prescribed by regulations under United States Code (USC) Title 49, Subtitle VII, Part A, and includes airspace needed to ensure safety in the takeoff and landing of aircraft (49 USC § 40102). Congress has charged the Federal Aviation Administration (FAA) with responsibility for developing plans and policy for the use of the navigable airspace and assigning by regulation or order the use of the airspace necessary to ensure the safety of aircraft and its efficient use (49 USC § 40103(b); FAA Order 7400.2 2004). Special Use Airspace (SUA) identified for military and other governmental activities is charted and published by the National Aeronautical Charting Office in accordance with FAA Order 7400.2 and other applicable regulations and orders. 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. The FAA considers multiple and sometimes competing demands for aviation airspace in relation to airport operations, Federal Airways, Jet Routes, military flight training activities, and other special needs to determine how the National Airspace System can best be structured to address all user requirements. Specific rules and regulations concerning airspace designation and management are listed in FAA Order 7400.2.

There are two categories of airspace or airspace areas, regulatory and non-regulatory. Within these two categories, there are four types of airspace, Controlled, Special Use, Other, and Uncontrolled airspace. Controlled airspace is airspace of defined dimensions within which air traffic control service is provided to Instrument Flight Rule (IFR) flights and to Visual Flight Rule (VFR) flights in accordance with the airspace classification (Pilot/Controller Glossary [P/CG] 2004). Controlled airspace is categorized into five separate classes: Classes A through E. These classes 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. Uncontrolled airspace is designated Class G airspace.

SUA is airspace of defined dimensions wherein activities must be confined because of their nature, or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. The types of SUA areas are Prohibited Areas, Restricted Areas, MOAs, Warning Areas, Alert Areas, Controlled Firing Areas, and National Security Areas.

ATCAAs are classified as other airspace which includes 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). When not required for other needs, an ATCAA can extend the vertical boundary of training airspace as authorized for military use by the controlling Air Route Traffic Control Center (ARTCC).

The United States Air Force (Air Force) manages airspace in accordance with processes and procedures detailed in Air Force Instruction (AFI) 13-201, Air Force Airspace Management. AFI 13-201 implements Air Force Planning Document 13-2, Air Traffic Control, Airspace, Airfield, and Range Management, and Department of Defense (DoD) Directive 5030.19, DoD Responsibilities on Federal Aviation and National Airspace System Matters. It addresses the development and processing of SUA, and covers aeronautical matters governing the efficient planning, acquisition, use, and management of airspace required to support Air Force flight operations (Air Force 2001a).

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, 2001c, 2001d). 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, 2001c, 2001d).

The airspace directly associated with the Proposed Action and alternatives includes Restricted Areas, MOAs, and ATCAAs. The volume of airspace encompassed by the combination of airspace elements constitutes the ROI for airspace management. The ROI for range management are those geographic areas consisting of government-owned land comprising the Melrose Bombing, Gunnery, and Electronic Combat Range complex, known as Melrose Air Force Range (AFR).

The Beak A, B, and C MOAs and associated ATCAA (Beak) is not included in the ROI for airspace. Beak (on Figure 3.1-1) is proposed as part of NMTRI to be connected to the Pecos MOA complex. Beak is a staging area for large-force exercises (LFEs) of approximately 20 aircraft that are conducted approximately twice monthly. No change in configuration or use of Beak is proposed under the Proposed Action or an alternative. Under existing or No-Action conditions, Beak is used for selective mission training and assembly of aircraft to perform limited scope large-force training in the Pecos complex. Under existing conditions, participating aircraft are not permitted to maneuver or otherwise perform training in missions as they transit between the Beak and Pecos complexes. Since no change is projected to occur in or under the Beak MOA, it is a location not expected to be affected by an alternative.

3.1.2 EXISTING CONDITIONS

MILITARY OPERATIONS AREAS

The alternatives described in Chapter 2.0 include changes to Pecos MOAs. Each MOA is airspace of defined vertical and lateral limits established below the Class A airspace floor of 18,000 feet above mean sea level (MSL). MOAs separate and segregate certain non-hazardous military activities from IFR traffic and to identify for VFR traffic where these activities are conducted (P/CG 2004). MOAs are considered "joint use" airspace. Non-participating aircraft operating under VFR are not prohibited from entering a MOA, even when the MOA is active for military use. Aircraft operating under IFR must remain clear of an active MOA unless approved by the responsible ARTCC. Joint use by both participating and VFR non-participating aircraft is accomplished under the "see-and-avoid" concept described in 14 Code of Federal Regulations (CFR) § 91.113(b), which states that "[w]hen weather conditions permit, pilots operating IFR or VFR, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft" (P/CG 2004). Right-of-way rules are contained in CFR Part 91. ARTCC provides separation of non-participating IFR aircraft within active MOAs in a variety of ways including restricting IFR traffic from the active MOA. Lights out training is not currently conducted by 27 FW F-16s in the Pecos MOA. However, under a Letter of Agreement (LOA) between the Albuquerque ARTCC and the 27 FW, the 27 FW could perform lights training if needed.

During public hearings, some New Mexico general aviation pilots stated that they avoid flying through an active MOA. They expressed specific concern that the Capitan MOA as presented in the Draft EIS Proposed Action would constrain air traffic. They also expressed the opinion that, in practice, Albuquerque ARTCC does not grant clearance to enter an active MOA for non-participating IFR traffic. Clearances through an active MOA may be granted to non-participating IFR traffic provided positive separation is maintained between participant and non-participant.

Figure 3.1-1 presents the existing airspace associated with NMTRI. This airspace includes the Pecos MOAs and the Taiban MOA. The Pecos MOAs are four distinct MOAs that are divided into a north and south segment, with each segment having a high and low component. In general, these MOAs abut each other horizontally and vertically, essentially forming one contiguous block of airspace. The exception to this is the Pecos South High MOA, which extends to the south beyond the southern border of the Pecos South Low MOA. This structuring of the MOA airspace, in effect, created a "shelf" of MOA airspace extending to the south of the southern border of the Pecos South Low MOA that begins at 11,000 feet MSL. Termed the "Roswell Shelf," this afforded non-MOA airspace up to 11,000 feet MSL to support other aircraft transiting to and from Roswell, New Mexico. This Roswell Shelf was needed prior to the 1997 improvements in FAA radar coverage at Roswell. The Taiban MOA is situated along the northeastern edge of the Pecos MOAs. This MOA effectively extends the Pecos North Low MOA and a portion of the Pecos South Low MOA eastward to the Restricted Airspace, which supports operations on Melrose AFR. These MOAs are scheduled and managed by staff at Cannon Air Force Base (AFB); utilization is under the control of the Albuquerque ARTCC.

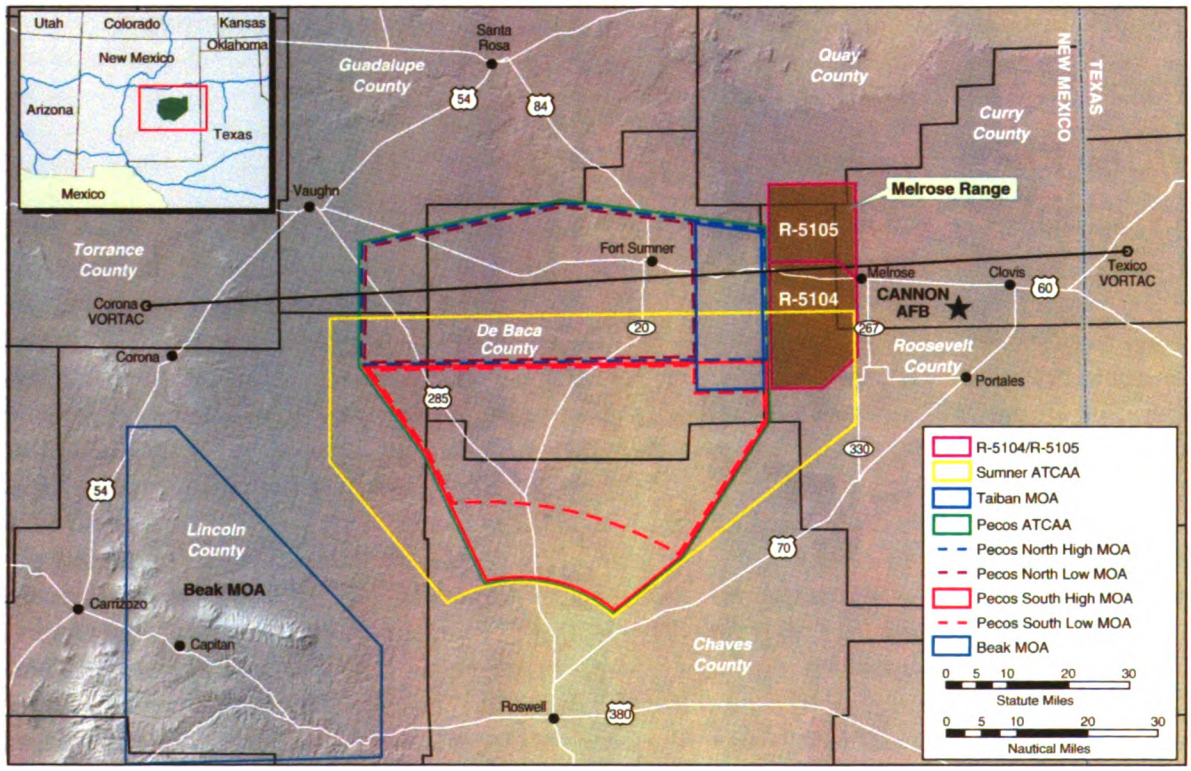


FIGURE 3.1-1. EXISTING AIRSPACE ASSOCIATED WITH NMTRI

AIR TRAFFIC CONTROL ASSIGNED AIRSPACE

NMTRI proposes changes to ATCAAs. ATCAAs are airspace of defined vertical and lateral limits, assigned by air traffic control (ATC), for the purpose of providing air traffic segregation between the specified activities being conducted within the assigned airspace and other IFR air traffic (P/CG 2004). This airspace, if not required for other purposes, may be made available for

military use. ATCAAs are normally structured and used to extend the horizontal and/or vertical boundaries of other SUA such as MOAs and Restricted Areas.

The MOAs, Restricted Areas, and associated ATCAAs involved in the NMTRI airspace are developed, coordinated, used, and managed in accordance with LOAs between the 27th Fighter Wing (27 FW) and the Albuquerque Center. For the NMTRI airspace, the LOA delegate airspace to Cannon AFB Radar approach Control, defines responsibilities, and outlines procedures for aircraft operations, air traffic control operations, and utilization of airspace for which the 27 FW is the scheduling authority. Such LOAs are supplementary to the procedures in FAA Orders 7110.65 (Air Traffic Control) and 7610.4 (Special Military Operations).

There are five ATCAAs associated with NMTRI. The Pecos North and South ATCAAs overlie the Pecos North and South High MOAs. The Sumner ATCAA overlies the Pecos ATCAA over the southern portion of the Pecos North High MOA, and all of the Pecos South High MOA. In addition to extending the vertical boundaries of the Pecos airspace, the Sumner ATCAA also extends east and west of the Pecos airspace as depicted on Figure 3.1-1. The Melrose ATCAA overlies the restricted airspace associated with Melrose AFR and is discussed in more detail below. The MOAs and the Pecos and Sumner ATCAAs are described in Table 3.1-1. And finally, there is a newly proposed Capitan ATCAA.

TABLE 3.1-1. EXISTING MOAS AND ATCAAS ASSOCIATED WITH NMTRI

MOA/ ATCAA	ALTITUDES		HOURS OF USE		*Controlling ARTCC*
	Minimum	*Maximum*	*From*	*To*	
Pecos North Low MOA	500 AGL[1]	UTBNI[2] 11,000 MSL [3]	8:00 a.m.[4]	8:00 p.m.[4]	Albuquerque
Pecos North High MOA	11,000 MSL	UTBNI FL 180[5]	8:00 a.m.	8:00 p.m.	Albuquerque
Pecos South Low MOA	500 AGL	UTBNI 11,000 MSL	Inter By NOTAM[6]	Inter By NOTAM[6]	Albuquerque
Pecos South High MOA	11,000 MSL	UTBNI FL 180	Sunrise[4]	Sunset[4]	Albuquerque
Taiban MOA	500 AGL	UTBNI 11,000 MSL	8:00 a.m.	Midnight	Albuquerque
Pecos ATCAA	FL 180	FL 300	When Requested[7]	When Requested	Albuquerque
Sumner ATCAA	FL 240	FL 510	When Requested	When Requested	Albuquerque

Notes: 1. AGL = Feet Above Ground Level
2. UTBNI = Up To, But Not Including
3. MSL = Feet Above Mean Sea Level. Average ground elevation in ROI is approximately 5,000 MSL.
4. Times are Monday through Friday. Additional scheduling is promulgated through Notices To Airmen (NOTAM).
5. FL = Flight Level. Described in terms of hundreds of feet MSL using a standard altimeter setting. Thus,
FL180 is approximately 18,000 MSL.
6. Inter By NOTAM = Times of use are intermittent, and are published in NOTAMs.
7. ATCAAs are scheduled when requested in conjunction with other military training airspace to support required training, provided the airspace is available.

Source: FAA 2000a; LOA 1996

The 27 FW and NMANG are projected to fly approximately 5,600 annual sorties through the first quarter FY 08 and conduct a range of training activities in this MOA/ATCAA airspace. Other aircraft using the airspace include B-1B bombers from Dyess AFB. The B-1Bs schedule the airspace from one to five times per week, flying one to three aircraft during a scheduled period. Other aircraft flown in the airspace infrequently include A-10s, F-15s, F/A-18s, F-22As, German Air Force Tornados, B-52s, C-130s, and various helicopters. LFEs, which typically occur approximately two times per month, involve approximately 20 aircraft of varied types (personal communication, Berg 2004).

Restricted Areas

NMTRI does not propose any boundary changes to Restricted Areas. Each Restricted Area is designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft. A Restricted Area is airspace designated under 14 CFR Part 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated "joint-use" and IFR/VFR operations in the area may be authorized by the controlling ATC facility when it is not being utilized by the using agency (P/CG 2004). The restricted airspaces, R-5104A, R-5104B, and R-5105 support training activities on Melrose AFR. R-5105 supports operations on the northern portion of the range while R-5104A and R-5104B support operations on the southern portion. The Melrose ATCAA overlies R-5104B, and extends the vertical boundary of this airspace. If R-5104A, R-5104B, and the Melrose ATCAA are all activated, operations on the southern portion of Melrose AFR are supported by a block of airspace that extends from the surface to approximately 30,000 feet MSL. Specific elements of this airspace are described in Table 3.1-2.

THE AIRSPACE OVER MELROSE AFR IS RESTRICTED TO MILITARY USE. NO CHANGE IN MELROSE AFR IS PROPOSED AS PART OF NMTRI.

TABLE 3.1-2. RESTRICTED AIRSPACE DESCRIPTION

Airspace	ALTITUDES		*Controlling ARTCC*
	Minimum	*Maximum*	
R-5104A	Surface	UTBNI[1] 18,000 MSL[2]	Albuquerque
R-5104B	18,000 MSL	23,000 MSL	Albuquerque
R-5105	Surface	10,000 MSL	Albuquerque
Melrose ATCAA	FL 240[3]	FL 300	Albuquerque

Notes: 1. UTBNI = Up to, but not including
2. MSL = Feet above mean sea level
3. FL = Flight Level. FL 240 is approximately 24,000 feet MSL

Source: FAA 2000a

Military Training Routes

NMTRI does not propose any changes to MTRs. MTRs are flight corridors developed and used by the DoD to practice high-speed, low-altitude flight, generally below 10,000 feet MSL. Specifically, MTRs are airspace of defined vertical and lateral dimensions established for the conduct of military flight training at airspeeds in excess of 250 knots indicated airspeed (IAS) (P/CG 2004). MTRs are developed in accordance with criteria specified in FAA Order 7610.4 (AP/1B 2003). They are described by a centerline, with defined horizontal limits on either side of the centerline, and vertical limits expressed as minimum and maximum altitudes along the flight track. MTRs are identified as Visual Routes (VR) or Instrument Routes (IR). VRs are used by DoD and associated Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training under VFR below 10,000 feet MSL at airspeeds in excess of 250 knots IAS (P/CG 2004). IRs are used by DoD and associated Reserve and Air Guard units for the purpose of conducting low-altitude navigation and tactical training in both IFR and VFR weather conditions below 10,000 feet MSL at airspeeds in excess of 250 knots IAS (P/CG 2004). Although not involved with the NMTRI proposal, there are segments of five MTRs that pass through the Pecos MOA complex: IR-113, VR-1107, VR-1195, VR-100, and VR-125. Figure 3.1-2 shows the military training routes in the vicinity of the Pecos MOA complex.

Other Aviation and Airspace Use

One public airport and three private airfields underlie Pecos MOA airspace. The public airport, Fort Sumner, is situated under the Pecos North MOAs. Although there is no controlled airspace associated with this airport's operation, aeronautical charts reflect that the floor of the Pecos North Low MOA is restricted to 1,500 feet above ground level (AGL) in the airport's vicinity. Private airfields Double V and Bojax are located under the Pecos South MOAs. An airfield for El Paso Natural Gas is located on the extreme southern boundary of the Pecos South High MOA.

The Roswell commercial and general aviation airport is located south of the Pecos South High MOA. Upgrades to the Roswell radar system after 1997 improved the ability of air traffic controllers to monitor aircraft in the Roswell shelf airspace proposed for the Pecos Low South MOA expansion.

There are four Federal Airways ("Victor" Routes) in the vicinity of the Pecos MOAs. V-264 traverses southwest to northeast north of the Pecos MOAs, providing routing between the Corona Very High Frequency Omni-directional Radio Range and Tactical Air Navigation Aid (VORTAC) and Tucumcari, New Mexico. V-291, V-68, and V-83 (see Figure 3.1-3) traverse northwest to southeast along the western border of the Pecos MOAs, and provide routing between the Corona VORTAC and Roswell, New Mexico. All of these routes are situated outside of the boundaries of the Pecos MOAs. Victor routes are not affected by the Capitan ATCAA. Air carrier and air taxi traffic in the region is considered moderate; general aviation traffic in the region is considered relatively light (personal communication, Semanek 2004).

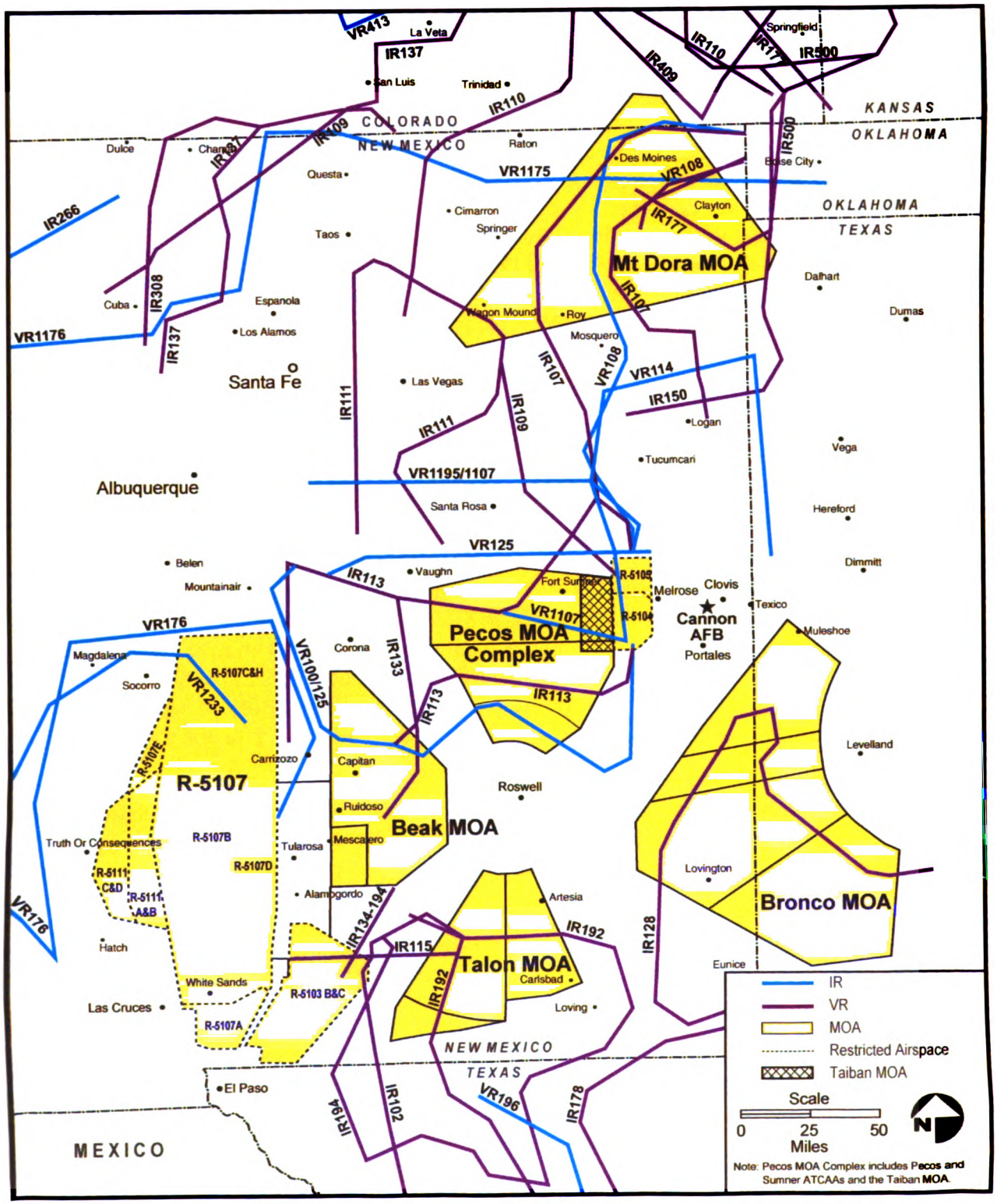


FIGURE 3.1-2. MILITARY TRAINING AIRSPACE IN THE VICINITY OF CANNON AFB

One high-altitude Jet Route, Jet Route J-74 (J-74), provides direct east-to-west routing between the Texico VORTAC and the Corona VORTAC. Jet routes are established under Federal Aviation Regulation (FAR) Part 71 in Class A airspace above Flight Level (FL) 180 to designate frequently used routings. They have no specified width; width varies depending on many aeronautical factors (FAA 2004). J-74 passes over the Pecos North High MOA, through the northern portion of the Pecos ATCAA, and over the restricted airspace associated with Melrose AFR. The Pecos ATCAA is capped at FL300, and does not conflict with civil traffic generally at FL310 or higher. Commercial traffic routed via direct or using J-74 fluctuates from light to heavy, depending on the time of day. Most traffic involves operations to and from Dallas-Fort Worth, Texas. Peaks normally occur during mid-morning and mid to late afternoon (personal communication, Semanek 2004). The 27 FW seldom requests authorization to use this airspace because commercial traffic regularly makes it unavailable for military use. The lack of access has "conditioned" military pilots to constantly work around this capped airspace and to ignore "bogeys" above FL300. This diminishes the area for realistic training.

North of J-74 and the Pecos complex, another Jet Route (J-72) traverses northwest to southeast. Further to the west, this route converges with the east-west routes J-6 and J-78. Figure 3.1-3 provides the locations of V-291, V-68, V-83, J-78, J-72, J-74, and Worth-3 (discussed below).

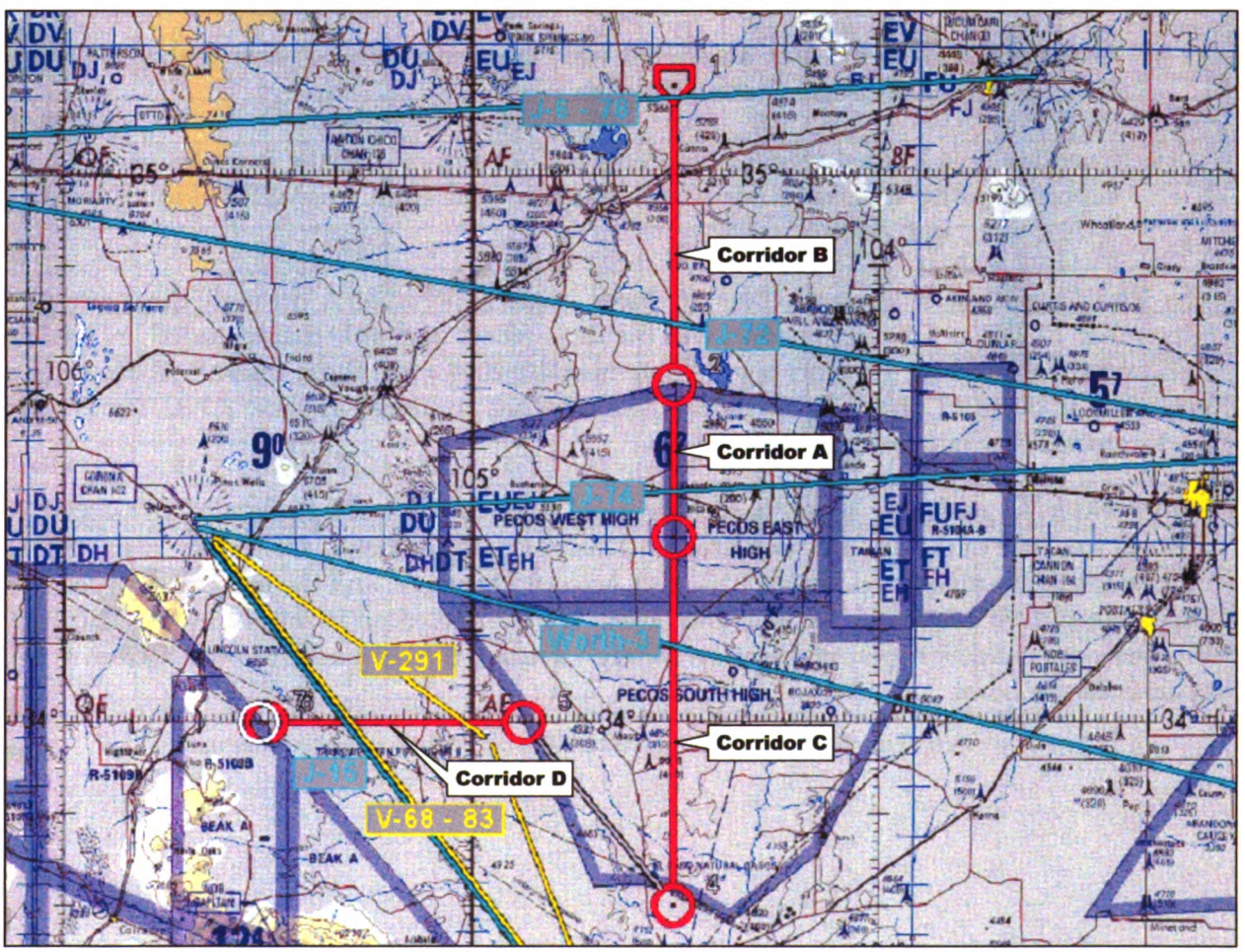


FIGURE 3.1-3. EXISTING AIRCRAFT USAGE AIRSPACE

A standard instrument departure (SID) track (Worth-3) passes through the Pecos MOAs south of J-74. Worth-3 supports departures from Dallas–Fort Worth and passes through the northern region of the Pecos South MOA in a northwesterly direction from Lubbock, Texas, to the Corona VORTAC.

Currently, LFEs involve transit between the Beak and Pecos MOAs. This transit is accomplished using a temporary transit corridor between the two MOA complexes. This corridor is informally defined, and requests for its use must be made in accordance with FAA procedures at least 10 days in advance. Use of this transit corridor is accomplished through coordination between the 27 FW and Albuquerque Center (personal communication, Berg 2004).

The ROI for NMTRI airspace includes four corridors depicted in Figure 3.1-3 and identified below.

- Corridor A is the area on the northern edge of the existing Sumner ATCAA. This is the area where J-74 and other directly routed traffic operate.
- Corridor B is situated north of Corridor A, and represents J-72 and direct traffic.
- Corridor C covers the area associated with the southern expansion of the Pecos South Low MOA, and addresses traffic using the Worth-3 SID.
- Corridor D is located west of the Pecos MOAs and east of the Beak MOA. This area captures traffic transiting north and south to and from Roswell including traffic on V-291, V-68, and V-83.

The FAA provided radar track data in these areas September 6 through the morning of September 10, 2004. This time period was the most recent available that included an Air Force LFE which occurred on the morning of September 10, 2004. The flight tracks and use rates are presented in detail in Appendix E. Hourly use rates are presented in Table 3.1-3. Times shown are Mountain Daylight Savings Time.

For Corridor A, general aviation traffic averaged approximately 14 percent of all traffic. The greatest total use of the airspace occurred on Thursday, September 9. On a daily basis, the least intense use of the airspace is before 10:00 a.m. (except Thursday) and the most intense use of the airspace occurred between 10:00 a.m. and noon. Traffic tapered off in the afternoon. During the 14-hour data collection period Monday through Friday, the airspace supported from 0 to 12 operations per hour.

TABLE 3.1-3. HOURLY AIRCRAFT TRAFFIC IN EACH CORRIDOR ON FIGURE 3.1-3

	TIME OF DAY													
	0800 0859	*0900 0959*	*1000 1059*	*1100 1159*	*1200 1259*	*1300 1359*	*1400 1459*	*1500 1559*	*1600 1659*	*1700 1759*	*1800 1859*	*1900 1959*	*2000 2059*	*2100 2159*
Corridor A[1]														
Monday	1	0	8	3	8	5	12	3	7	7	7	2	6	1
Tuesday	0	0	8	7	7	6	3	6	8	6	11	3	6	7
Wednesday	0	1	7	9	6	7	4	7	4	7	3	4	0	0
Thursday	6	10	10	11	8	9	6	5	6	8	5	4	5	6
Friday	1	0	7	6	3	3	--	--	--	--	--	--	--	--
Total Traffic	8	11	40	36	32	30	25	21	25	28	26	13	17	14
Daily Average	1.6	2.2	8	7.2	6.4	6	5	4.2	5	5.6	5.2	2.6	3.4	2.8
Corridor B[1]														
Monday	0	0	12	12	8	10	7	13	11	11	12	6	8	3
Tuesday	0	1	13	16	12	14	14	13	11	12	11	8	11	3
Wednesday	2	1	14	17	6	6	20	12	10	8	12	1	14	14
Thursday	0	1	12	19	10	10	11	12	8	13	7	8	10	10
Friday	0	1	13	19	9	11	--	--	--	--	--	--	--	
Total Traffic	2	4	64	83	45	51	52	50	40	44	42	23	43	30
Daily Average	0.4	0.8	12.8	16.6	9	10.2	10.4	10	8	8.8	8.4	4.6	8.6	6
Corridor C[1]														
Monday	1	0	3	2	5	7	5	7	5	0	6	1	3	3
Tuesday	1	0	6	3	4	0	6	4	5	1	5	3	1	4
Wednesday	0	0	4	6	5	2	8	4	5	3	4	0	2	0
Thursday	2	0	5	5	2	4	7	3	7	3	1	3	1	1
Friday	0	1	6	4	1	2	--	--	--	--	--	--	--	--
Total Traffic	4	1	24	20	17	15	26	18	22	7	16	7	7	8
Daily Average	0.8	0.2	4.8	4	3.4	3	5.2	3.6	4.4	1.4	3.2	1.4	1.4	1.6
Corridor D[2]														
Friday	0	3	4	4	2	--	--	--	--	--	--	--	--	--
Total Traffic	0	3	4	4	2	--	--	--	--	--	--	--	--	--
Daily Average	0	3	4	4	2	--	--	--	--	--	--	--	--	--

Notes: 1. Traffic was recorded for a five-day work week from 6 September through 9 September 2004.
2. Traffic was recorded for 10 September 2004 during the time an Air Force LFE was in progress.

For Corridor B, on average, general aviation traffic constituted approximately 12 percent of all traffic. The greatest total use of the airspace occurred on Tuesday, September 7. On a daily basis, the least intense use of the airspace is before 10:00 a.m. and the most intense use occurred between 10:00 a.m. and noon. Traffic declined somewhat in the afternoon. Overall, during the 14-hour data collection period each day, the airspace supported from 0 to 20 operations per hour.

On Corridor C, general aviation traffic averaged approximately 21 percent of all traffic. The greatest total use of the airspace occurred on Monday, September 6. The least intense use of the airspace occurred before 10:00 a.m., with traffic picking up and remaining relatively at the same level through mid-afternoon. The airspace supported from 0 to 8 operations per hour during the 14-hour data collection period each day.

Corridor D flight traffic during the Friday morning LFE was 13 aircraft. General aviation traffic constituted approximately 8 percent of all traffic.

Tall structures on the ground have the potential to create hazards to flight. Table 3.1-1 demonstrates that three MOAs allow flight at low altitudes. The FAA provides detailed instructions for the marking of obstructions (i.e., paint schemes and lighting) to warn pilots of their presence. Appendix F of this document provides the main text of the applicable FAA circular. Any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200 feet (61 meters) AGL or exceeds any obstruction standard contained in 14 CFR Part 77, should normally be marked and/or lighted. The FAA may also recommend marking and/or lighting a structure that does not exceed 200 feet AGL or 14 CFR Part 77 standards because of its particular location (FAA 2000b) (see Appendix F). The obstruction standards in 14 CFR Part 77 are primarily focused on structures in the immediate vicinity of airports and approach and departure corridors from airports (14 CFR Part 77 1971).

Range Management

Melrose AFR is a Class A Range. Class A ranges are manned, have a ground-based scoring capability, and a Range Control Officer (RCO) who controls aircraft using the range (Air Force 2001e). Overall responsibility for the operation of Melrose AFR rests with the Commander of the 27 FW, Cannon AFB, New Mexico. The Operations Group Commander of the 27 FW exercises operational control of the range (Cannon AFB 2000).

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

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 2001e). Additional information pertaining to the SAFE-RANGE program is contained in Section 3.3, Safety, of this EIS. The lands associated with Melrose AFR meet these requirements.

Cannon AFB's Supplement to AFI 13-212 also assigns responsibilities and provides detailed processes and procedures to the RCO regarding range scheduling, maintenance, explosive ordnance disposal, range decontamination and debris disposal, entry into, operations within, and exit from the airspace directly supporting range operations (Cannon AFB 2000).

3.2 ACOUSTIC ENVIRONMENT

3.2.1 DEFINITION OF THE RESOURCE

The acoustic environment is generally described by the sound level or the amplitude of a sound that occurs at any given time. From the ground, the sound level of an aircraft changes continuously, starting at the ambient (background) level, increasing to a maximum as the aircraft passes closest to the receiver, and then decreasing to ambient as the aircraft flies into the distance. Sound levels are on a logarithmic decibel scale; a sound level that is 10 decibels (dB) higher than another will be perceived as twice as loud. Specific noise metrics include Maximum Sound Level (L_{max}), the Sound Exposure Level (SEL), Day-Night Average Sound Level (DNL), and Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}). A-weighted levels are used for subsonic aircraft noise, and C-weighted levels are used for sonic booms and other impulsive noises. A "C" is included in the symbol to denote when C-weighting is used. Each of these metrics is summarized below and discussed in detail in Appendix G.

- L_{max} is used to define maximum sound levels. L_{max} is the highest sound level measured during a single aircraft overflight. For an observer, the sound level starts at the ambient sound level, rises up to the maximum level as the aircraft flies closest to the observer, and returns to the ambient level as the aircraft recedes into the distance.
- SEL accounts for both the maximum sound level and the length of time a sound lasts. SEL does not directly represent the sound level heard at any given time. Rather, it provides a measure of the total sound exposure for an entire event. This provides a better measure of intrusion that L_{max} alone.

FEDERAL AVIATION ADMINISTRATION (FAA) ORDER 1050.1E PROVIDES DEFINITIONS FOR THESE METRICS:

SEL (SOUND EXPOSURE LEVEL) – A SINGLE EVENT METRIC THAT TAKES INTO ACCOUNT BOTH THE NOISE LEVEL AND DURATION OF THE EVENT AND REFERENCED TO A STANDARD DURATION OF ONE SECOND.

L_{MAX} (MAXIMUM SOUND LEVEL) – A SINGLE NOISE EVENT METRIC THAT IS THE HIGHEST A-WEIGHTED SOUND LEVEL MEASURED DURING AN EVENT.

L_{EQ} (EQUIVALENT SOUND LEVEL) – A CUMULATIVE LEVEL OF A STEADY TONE THAT PROVIDES AN EQUIVALENT AMOUNT OF SOUND ENERGY FOR ANY SPECIFIC PERIOD.

- DNL is a noise metric combining the levels and durations of noise events and the number of events over an extended time period. It is a cumulative average computed over a set of 24-hour periods to represent total noise exposure. DNL also accounts for more intrusive night time noise, adding a 10 dB penalty for sounds after 10:00 p.m. and before 7:00 a.m. DNL is the appropriate measure to account for total noise exposure around airfields and airports. Depending on the regularity of operations, DNL is

computed either as an annual average or for operations representing an average busy day.

- L_{dnmr} is the measure used for subsonic aircraft noise in military airspace (MOAs or Warning Areas). When military aircraft fly low and fast, the sound can rise from ambient to its maximum very quickly. This rapid onset-rate carries a "surprise" effect that can make noise seem louder than its measured SEL would suggest. L_{dnmr} contains a penalty of up to 11 dB to account for this effect. It is computed for the busiest month of the year, so as to account for the seasonal use of some airspaces. L_{dnmr} is interpreted by the same criteria as used for DNL.
- C-Weighted Day-Night Sound Level (CDNL) is a day-night average sound level computed for areas subject to sonic booms. These areas are also subjected to subsonic noise assessed according to L_{dnmr}.
- Peak overpressure, pounds per square foot (psf) is used to characterize the strength of impulsive noise such as sonic booms. A decibel version of this, L_{pk}, is sometimes used when relating boom amplitude to human or animal response, but the direct physical pressure is most commonly used when assessing effects on structures.

Specific guidelines concerning noise are discussed in Appendix D. The ROI for noise consists of all current and proposed airspace units and the underlying lands and vicinity potentially affected by aircraft flights in the airspace.

UNDER LABORATORY CONDITIONS, THE HUMAN EAR CAN DETECT A 1 dB CHANGE. IN THE ENVIRONMENT, THE SMALLEST CHANGE IN AVERAGE NOISE LEVEL THAT CAN BE DETECTED IS APPROXIMATELY 3 dB. A CHANGE IN SOUND LEVEL OF ABOUT 10 dB IS USUALLY PERCEIVED BY THE AVERAGE PERSON AS A DOUBLING OF THE SOUND'S LOUDNESS.

In this EIS, sound levels are presented for noise generated by military aircraft associated with the airspace alternatives. Those are not the only noise sources; there is an existing ambient sound environment as well. Aircraft noise must be compared with existing noise as well as evaluated on an absolute basis. The sound levels in the affected area have not been measured, but they would be comparable to sound levels in other lightly populated areas in the Western U.S. Table 3.2-1 lists sound levels that have been measured in those kinds of areas. The table notes the sources of the data and the metric reported. When predicted aircraft noise levels fall in the lower ranges of the levels in Table 3.2-1, they are not significant even if they represent an increase from existing aircraft noise levels. Based on the sound levels and types of areas summarized in Table 3.2-1, ambient sound levels in the study area (outside of population centers) would be expected to be in the range of 25 to 36 dB.

TABLE 3.2-1. SOUND LEVELS IN LIGHTLY POPULATED AREAS

Location	*Sound Level Range, dB*	*Reference*
North Rim, Grand Canyon	16-31[1]	U.S. Environmental Protection Agency (USEPA) 1971
Farm in Valley	35-44[1]	USEPA 1971
Small Town Residential Cul-de-Sac	40-50[1]	USEPA 1971
Grand Canyon	22-35[2]	Miller *et al.* 2003
Idaho, sagebrush country	25-36[3]	Fidell *et al.* 2003
Central and Eastern Colorado	28-44[4]	Air National Guard 1996

Notes: 1. L_{90} to L_{10} (L_{90} and L_{10} are the sound level exceeded 90 percent and 10 percent of the time)
2. L_{50}, range over eighteen sites (L_{50} is the sound level exceeded 50 percent of the time)
3. L_{eq}, range over eight sites (L_{eq} is the equivalent sound level)
4. L_{90}, range over 17 sites

3.2.2 EXISTING CONDITIONS

3.2.2.1 SUBSONIC NOISE

Subsonic noise in military airspace has been studied by measurement and analysis of operations and noise in airspaces (Frampton *et al.* 1993; Lucas *et al.* 1995), and by computer modeling of those analyses (Lucas and Calamia 1996). It has been found that, for noise modeling purposes, there are three kinds of activity. These are specific tracks (such as defined paths to fixed targets), corridors (such as MTRs), and random operations (general MOA activity, with no fixed defined tracks). Where operations with no predetermined tracks apply, flight tracks are widely dispersed, and over an extended time period, no one location is expected to experience different flight activity than another. For modeling purposes, these flight tracks are random. Such non-predetermined or random flight tracks are an important part of training. Military aircrews must learn to be flexible, and cannot become accustomed to particular landmarks. The random nature of operations and noise has been recently affirmed by analysis of specially-collected radar data in Idaho airspace (Bradley *et al.* 2003) and noise monitoring in that same airspace (Fidell *et al.* 2003).

The Air Force has developed the MR_NMAP (MOA-Range NOISEMAP) computer program (Lucas and Calamia 1996) to calculate subsonic aircraft noise in these areas. MR_NMAP calculates noise according to the three categories noted above, specific tracks, corridors, and random operations. As noted above, it is supported by actual measurements in several military airspace units.

Flight operations in the airspace ROI are random with aircraft flying at various altitudes, depending on their missions. Flight tracks are randomly distributed, so that crews experience the variety that they would encounter in actual combat. As affirmed as recently as 2003 (Fidell *et al.* 2003; Bradley *et al.* 2003), a person on the ground under training airspace would experience a variety of sounds. Noise events are sporadic; on some days no aircraft would be heard, and on other days one or more aircraft at different altitudes and distances would be heard.

The airspace ROI is divided into several altitude ranges. There is a different character to the noise from aircraft at high altitudes versus low altitudes. An aircraft at low altitude generates high noise levels directly under the track (see Tables 3.2-2 and 3.2-3) but has a relatively short duration (sometimes just 10 or 20 seconds) and a narrow footprint. An aircraft at 500 feet AGL may not even be noticed a mile to the side. At high altitudes, the maximum noise level is lower, but the footprint is bigger: the noise may last for over a minute and may be heard several miles to either side of the flight track.

TABLE 3.2-2. BASELINE AIRCRAFT NOISE LEVELS UNDER EXISTING AIRSPACE

Airspace[1]	L_{dnmr}[2]	*Number of events/day above SEL 65 dB*
Pecos North Low[3]	43	1.2
Pecos South Low[3]	43	1.0
Pecos South High (southern part)	30	0.9
Taiban MOA[3]	43	1.2
R-5105[3]	49	0.4
R-5104A/B[3]	51	1.5
Areas Under Sumner ATCAA[4]	16	0.1

Notes: 1. Ambient conditions estimated to be 25 to 36 dB.
2. Military aircraft noise calculated from MR_NMAP.
3. Other airspaces overlay; airspace named is the dominant layer.
4. Areas that are not coincident with other airspaces.

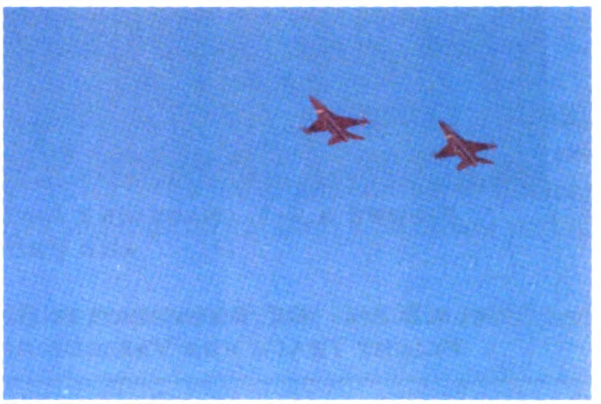
TABLE 3.2-3. REPRESENTATIVE MAXIMUM A-WEIGHTED SOUND LEVELS (L_{MAX}) UNDER THE FLIGHT TRACK FOR VARIOUS JET AIRCRAFT TYPES AND FLIGHT ALTITUDES

Aircraft Type	*Airspeed*	*Power Setting*	ALTITUDE (FEET AGL)					
			500	*1,000*	*2,000*	*5,000*	*10,000*	*20,000*
F-15C	520 knots	81% NC	114	108	99	86	74	57
F/A-18	500 knots	92% NC	116	108	99	85	71	54
F-14A	530 knots	100% NC	111	103	94	80	67	51
B-1B	550 knots	101% RPM	112	106	98	86	75	61
F-16C	540 knots	99% NC	107	100	92	79	67	50
Tornado	420 knots	70% NC	102	95	88	75	65	52
F-22A	520 knots	70% ETR	116	108	99	85	71	54

NC = Core Engine Fan Speed
RPM = Revolutions Per Minute
ETR = Engine Throttle Ratio

An important characteristic of noise from an aircraft at low altitude is that it has a high onset rate, i.e., it arrives very quickly and there is a relatively short time (often only a few seconds) from ambient to L_{max}. This causes noise from such overflights to be more annoying than would be expected from their measured SEL. An adjustment of up to 11 dB has been developed for this effect, and incorporated into the L_{dnmr} metric. (Plotkin *et al.* 1987; Plotkin *et al.* 1991; Stusnick *et al.* 1992; Stusnick *et al.* 1993) L_{dnmr} is the monthly average onset-rate adjusted DNL. Noise levels are interpreted the same way for both DNL and L_{dnmr}.

The primary noise metric calculated by MR_NMAP is DNL in accordance with Federal Interagency Committee on Noise guidelines. The committee was formed to provide forums for debate over future research needs to better understand, predict, and control the effects of aviation noise, and to encourage new technical development efforts in these areas. Because military airspaces involve high speed flight operations, L_{dnmr} (which accounts for the high speed, sudden onset surprise factor), is also computed by MR_NMAP and is the appropriate metric for this airspace.



THIS FINAL EIS USES SEVERAL NOISE METRICS TO EXPLAIN EXISTING AND PROJECTED NOISE.

L_{dnmr} has been computed for the areas under each current airspace listed in Table 2-1 and is presented in Table 3.2-2 and Figure 3.2-1 for current conditions. The analysis addressed operations of the Cannon-based F-16C aircraft presented in Table 2-4, plus transient aircraft from Section 3.1.2. As discussed earlier, and elaborated in Appendix G, this cumulative metric represents the most widely accepted method of quantifying sound levels. However, people often desire to know what the loudness of an individual aircraft will be. MR_NMAP and its supporting programs can provide the L_{max} (Table 3.2-3), and SEL (Table 3.2-4) for individual aircraft at various distances and altitudes. L_{max} is the maximum noise that would be heard by an individual as an aircraft flies overhead. SEL quantifies the combined effect of magnitude and duration of a flyover. Table 3.2-2 shows, in addition to L_{dnmr}, the number of events per day with SEL above 65 dB that a person in each area is likely to hear. This quantity is computed by MR_NMAP (Lucas and Calamia 1996). Note that the number of events heard by a person at a given location is fewer than the number of sorties; that is because noise from any one sortie is heard only in a small portion of the airspace.

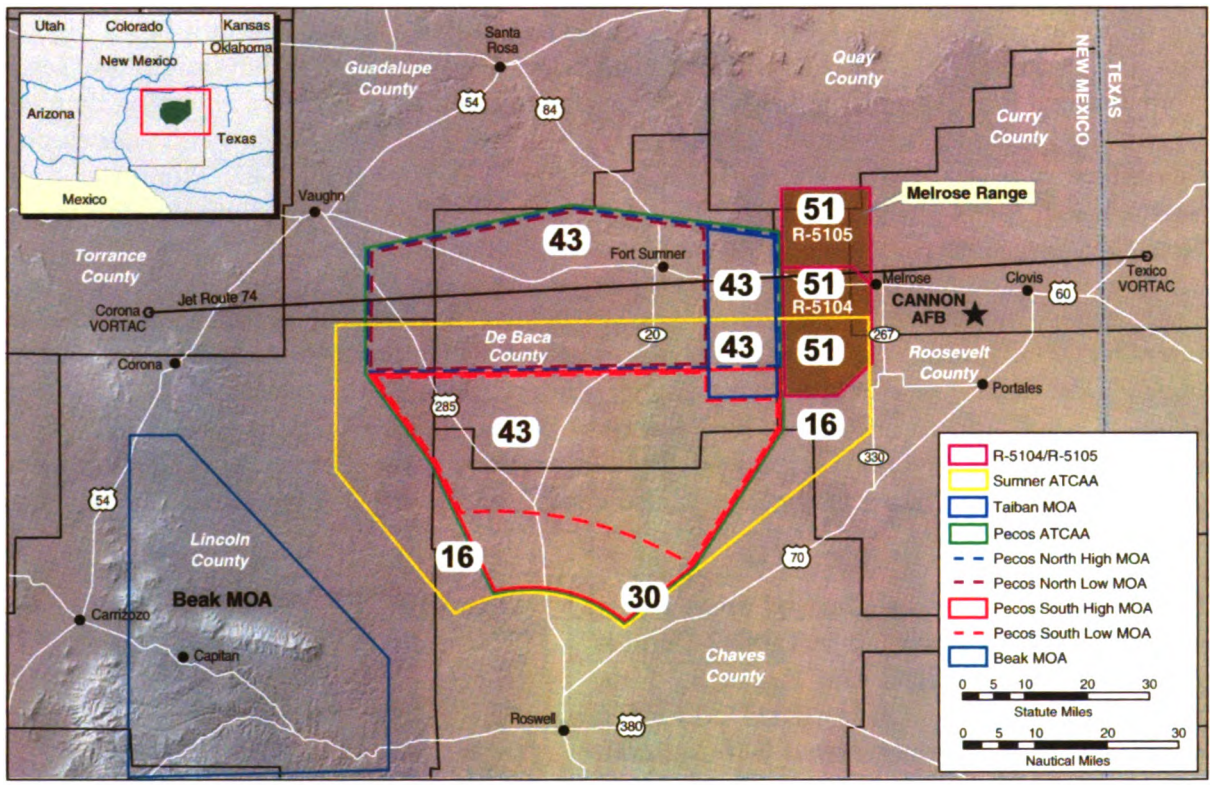


FIGURE 3.2-1. BASELINE AIRCRAFT NOISE LEVELS UNDER EXISTING AND PROPOSED AIRSPACE

TABLE 3.2-4. REPRESENTATIVE SOUND EXPOSURE LEVELS (SEL) UNDER THE FLIGHT TRACK FOR VARIOUS AIRCRAFT TYPES AND FLIGHT ALTITUDES

Aircraft Type	*Airspeed*	*Power Setting*	ALTITUDE (FEET AGL)					
			500	*1,000*	*2,000*	*5,000*	*10,000*	*20,000*
F-15C	520 knots	81% NC	112	107	101	91	80	65
F/A-18	500 knots	92% NC	114	108	101	89	77	62
F-14A	530 knots	100% NC	109	103	96	84	73	58
B-1B	550 knots	101% RPM	112	108	101	92	82	70
F-16C	540 knots	99% NC	106	100	94	84	74	60
Tornado	420 knots	70% NC	101	95	90	80	71	60
F-22A	520 knots	70% ETR	114	108	101	89	77	62

NC = Core Engine Fan Speed
RPM = Revolutions Per Minute
ETR = Engine Throttle Ratio

Where airspaces are layered, the aircraft noise at ground level is the combination of all layers above it. Table 3.2-2 and Figure 3.2-1 show the total aircraft noise on the ground, accounting for all airspace layers. These values were computed by entering operations data from Chapter 2.0 into MR_NMAP. MR_NMAP identifies the noise contribution from each layer, as well as the combination (decibel combination, as described in Appendix G) of all layers. The dominant layer (usually the lowest one) is specifically indicated in Table 3.2-2.

THE DECIBEL SCALE IS LOGARITHMIC. A SIMPLE RULE OF THUMB IS THAT WHEN A SOUND'S INTENSITY IS DOUBLED, THE SOUND LEVEL INCREASES BY 3 DB, REGARDLESS OF THE INITIAL SOUND LEVEL. THIS MEANS THAT IF A SOUND WITH A LEVEL OF 40 DB WERE ADDED TO AN INITIAL SOUND LEVEL OF 40 DB, THE NEW LEVEL WOULD BE 43 DB.

It is important to note, from Table 3.2-1, that the ambient noise level under the airspace in the study area outside of population centers is expected to be in the range of 25 to 36 dB. The numbers from MR_NMAP are military aircraft levels calculated from the model. Where the calculated numbers are below the estimated ambient levels, such as on Table 3.2-2 for areas under the Sumner ATCAA not coincident with other airspaces, the military aircraft contribution to ambient noise conditions would essentially not be detected.

The noise environments shown in Table 3.2-2 and Figure 3.2-1 fall into three categories:

- High altitude airspace (the three ATCAAs, Pecos North and South High, and R-5104B), where operations are at high altitudes (above 10,000 feet) and L_{dnmr} noise levels are calculated to be in the 30 dB range or lower. These levels are around or below ambient (non-aircraft) noise levels expected in this area and thus do not form a dominant part of the acoustic environment.
- Low altitude MOAs (Pecos North and South Low) where the floor is as low as 500 feet AGL. L_{dnmr} is around 43 dB.
- Melrose AFR (R-5104A and R-5105), which has a combination of low-altitude and high activity, and levels are around 50 dB.

3.2.2.2 Sonic Boom

Supersonic aircraft flight is primarily associated with air combat training. Modern combat tactics and advanced weaponry also require supersonic speeds to launch a variety of munitions at optimum levels and within desired employment envelopes. These activities can occur in specially designated supersonic airspace, above 5,000 feet AGL, or in airspace above 30,000 feet MSL. There is currently no designated supersonic airspace in the immediate area, so existing supersonic operations are only authorized above 30,000 feet MSL.

Aircraft exceeding Mach 1 (the speed of sound) always create a sonic boom; however, not all supersonic flight activities will cause a boom that can be heard at ground level. As altitude increases, air temperature decreases, and the resulting layers of temperature change cause booms to be turned upward as they travel toward ground level. Depending on the altitude of the aircraft and the Mach number, many sonic booms are turned upward sufficiently that they never reach the ground. This same phenomenon, referred to as "cutoff," also acts to limit the width (area covered) of the sonic booms that reach the ground (Plotkin *et al.* 1989).

The amplitude of an individual sonic boom is measured by its peak overpressure, in pounds per square foot (psf). The amplitude of a boom depends on the aircraft's size, weight, geometry, Mach number, and flight altitude. Table 3.2-5 shows sonic boom peak overpressures for several aircraft in level flight at various altitudes. The biggest single condition affecting these amplitudes is altitude. Maneuvers can also affect boom amplitude, increasing or decreasing overpressures from those shown in Table 3.2-5.

TABLE 3.2-5. SONIC BOOM PEAK OVERPRESSURES (PSF) FOR VARIOUS AIRCRAFT TYPES AT MACH 1.2, LEVEL FLIGHT

	ALTITUDE (FEET AGL)				
Aircraft	*5,000*	*10,000*	*20,000*	*30,000*	*40,000*
F-15C	9.4	5.4	2.9	1.9	1.5
F/A-18	8.8	5.0	2.7	1.7	1.3
F-14A	9.6	5.5	2.9	1.9	1.5
B-1B	17.8	10.4	5.7	3.9	3.1
F-16C	7.6	4.4	2.3	1.5	1.2
Tornado	8.9	5.1	2.7	1.7	1.3
F-22A	9.9	5.7	3.0	2.0	1.5

Sonic booms are created by the displacement of air and are very similar to the heated expansion and contraction of air caused by lightning. As the lightning's electrical charge displaces air, effectively, a "sonic boom" of thunder is created. The amplitude of the lightning boom is determined by the proximity of the receiver to the lightning. A close lightning strike is accompanied by a loud crack and a distant strike may be a rolling thunder sound.

When a sonic boom from an aircraft reaches the ground, it impacts an area that is referred to as a "footprint" or (for sustained supersonic flight) a "carpet." The size of the footprint depends on the supersonic flight path and on atmospheric conditions. As depicted in Figure 3.2-2, sonic booms are loudest near the center of the footprint, with a sharp "bang-bang" sound. Near the edges, they are weak and have a

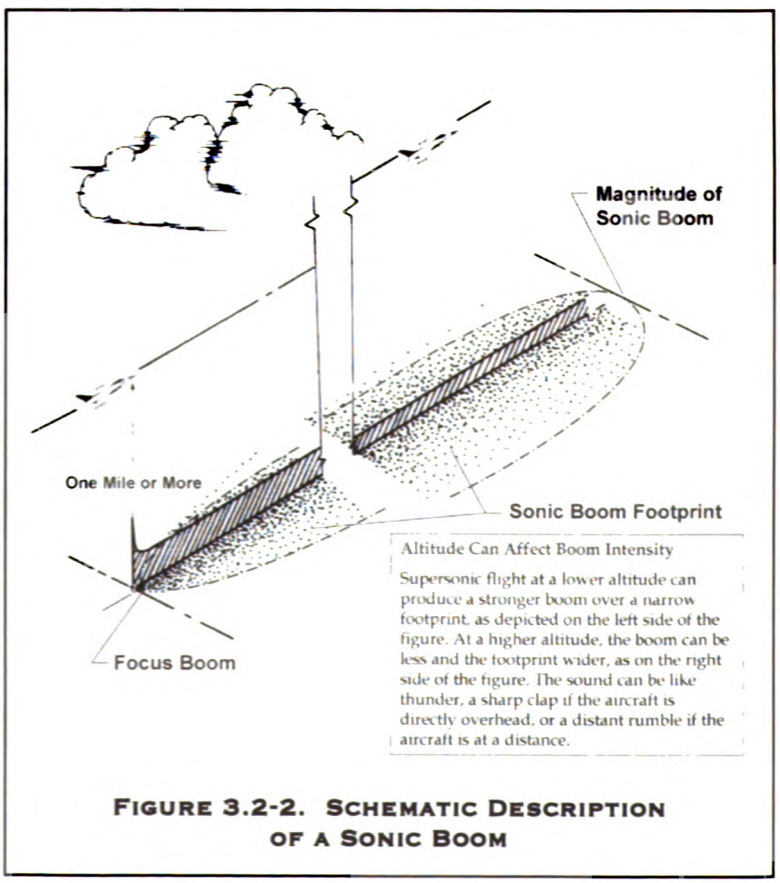


FIGURE 3.2-2. SCHEMATIC DESCRIPTION OF A SONIC BOOM

rumbling sound like distant thunder. Sonic booms from air combat training activity typically have an elliptical pattern. Aircraft will set up at positions up to 100 nm apart before proceeding toward each other for an engagement. The airspace used tends to have an elliptical shape, with its long axis aligned with the setup points. Aircraft will fly supersonic at various times during an air combat training (ACT) event. Supersonic flight can occur during the "engagement" phase as they fly toward each other, especially air-to-air missile training. They can go supersonic at random times during a "dogfight" or "furball" phase. Finally, it is common for one or more aircraft to dive away at supersonic speeds during "disengagement" at the end of the event. The long-term average (CDNL) sonic boom patterns also tend to be elliptical.

A second type of supersonic activity is training for supersonic Joint Direct Attack Munition (JDAM) delivery. Some missions of this type occur above 30,000 feet, and are included in the supersonic sortie rates presented in Table 3.2-5. The supersonic footprint from a JDAM run is similar to the footprint from the engagement phase of a high-altitude ACT intercept. Sonic booms from these operations may therefore be modeled together with ACT sonic booms.

Long-term sonic boom measurement projects have been conducted in four airspace units: White Sands, New Mexico (Plotkin *et al.* 1989); the eastern portion of the Goldwater Range, Arizona (Plotkin *et al.* 1992); the Elgin MOA at Nellis AFB, Nevada (Frampton *et al.* 1993); and the western portion of the Goldwater Range (Page *et al.* 1994). These studies included analysis of schedule and air combat maneuvering instrumentation data and supported development of the 1992 BOOMAP model (Plotkin *et al.* 1992). The current version of BOOMAP (Frampton *et al.* 1993; Plotkin 1996) incorporates results from all four studies. Because BOOMAP is directly based on long-term measurements, it implicitly accounts for such variables as maneuvers, statistical variations in operations, atmosphere effects, and other factors.

BOOMAP is based on data collected in supersonic authorized airspace, where supersonic operations can occur at 5,000 feet AGL and above. Because current Cannon AFB airspace is not designated supersonic, supersonic operations are permitted only above 30,000 feet MSL.

Operations in the 27 FW airspace above 30,000 feet MSL occur in the Sumner ATCAA, which extends from 24,000 feet through 51,000 feet MSL. Analysis of current sortie rates above 30,000 feet MSL, together with typical Mach number and altitude distributions for supersonic operating areas, indicates that there are currently 158 supersonic sorties per month. Applying this sortie rate to BOOMAP, and scaling according to the altitude difference (average altitude of 40,000 feet MSL, versus average altitude of 15,000 to 20,000 feet MSL in the designated supersonic arenas) yields a boom exposure of CDNL = 41 dB toward the center of the airspace. The current supersonic area in the vicinity of Cannon AFB is limited to those portions above 30,000 feet MSL, which includes Pecos South High MOA, the southern portion of Pecos North High MOA, and Sumner ATCAA. This area corresponds to the boundaries of the Sumner ATCAA.

Figure 3.2-3 shows the full BOOMAP output, in the form of CDNL contours over the airspace. The CDNL 40 contour (the highest multiple-of-five value in the airspace) is depicted. This contour is centered in the supersonic (high altitude) part of the current airspace that corresponds to the boundary of the Sumner ATCAA, as shown in Figure 3.2-3. The estimated number of booms is 0.2 per day in the center of the airspace or one every five days. The number of booms per day near the edge of the airspace would be lower than those at the center.

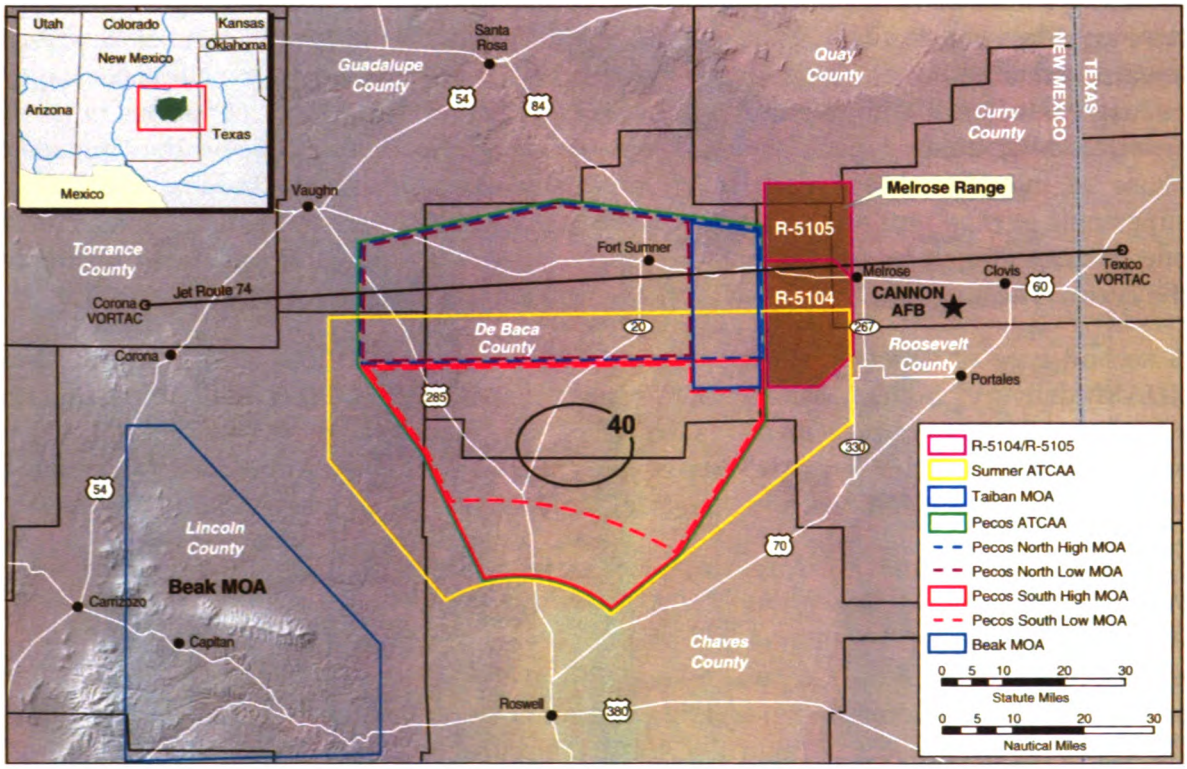


FIGURE 3.2-3. BASELINE SONIC BOOM ENVIRONMENT, CDNL

3.3 SAFETY

3.3.1 DEFINITION OF THE RESOURCE

This section addresses ground, explosive, and flight safety associated with operations conducted by the 27 FW, Cannon AFB, New Mexico. These operations include activities at the airfield itself as well as training conducted in military training airspace. Ground safety considers operations and maintenance activities that support the base activities on Melrose AFR, including fire and crash response. Explosive safety discusses the management and use of ordnance or munitions associated with airbase operations and training activities conducted in various elements of training airspace. Flight safety considers aircraft flight risks.

The ROI for safety includes Cannon AFB and its immediate vicinity, Melrose AFR, and those areas encompassed by regional military training airspace that would be used by 27 FW and New Mexico Air National Guard (NMANG) aircrews during training. These areas include the Pecos MOAs and the overlying ATCAAs, the Taiban MOA, and the Restricted Areas and overlying ATCAA that support operations on Melrose AFR.

3.3.2 EXISTING CONDITIONS

3.3.2.1 GROUND SAFETY

Day-to-day operations and maintenance activities conducted by the 27 FW are performed in accordance with applicable Air Force safety regulations, published Air Force Technical Orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements.

THE 27 FW FIRE DEPARTMENT PROVIDES AN ON-SITE FIRE RESPONSE CAPABILITY AT MELROSE AFR.

Cannon AFB fire and emergency services meet all established Air Force staffing and equipment standards. Should extraordinary requirements occur, the Cannon AFB Fire Department has established mutual aid support agreements with the nearby communities of Clovis, Portales, Texico, House, and Melrose (Air Force 2001e).

The 27 FW Fire Department on-site fire response and suppression capability on Melrose AFR has proven to be adequate for the range. Additional large earth-moving equipment, which is on site to support range operations, is also available for fire suppression if needed. The RCO on Melrose AFR coordinates with the Fire Department on a daily basis to determine the local fire danger. If risk is excessive, certain restrictions on range operations may be imposed. These restrictions could range from limiting the type of ordnance used, to the complete curtailment of all ordnance use. All aircrews must review and adhere to fire restrictions regarding the use of ordnance on the range.

A "Weapon's Safety Footprint," and its extent and configuration, is a ground safety consideration. When an air-to-ground weapon containing high explosives (live ordnance) detonates, the radius of blast damage and fragmentation of the weapon's case must be considered. When a training (inert) air-to-ground weapon impacts on or near the target, different concerns exist. The inert weapon may have a spotting charge that sets off a shotgun-sized charge with smoke to mark where the bomb struck. Because the ordnance does not detonate, it may skid, bounce, or burrow under the ground for some distance from the point of impact, coming to rest at some distance from that point. The military services have analyzed extensive historic data and incorporated those data into a computer program. This program (called SAFE-RANGE) considers the type of ordnance, the aircraft, the delivery profile, the target type, as well as other data such as the demonstrated accuracy of the aircraft's bombing and navigation system. The program then calculates an area around the target within which either effects from live ordnance will spread, or the specific training or inert ordnance under consideration will come to rest. This area has dimensions in front of, beyond, and on either side of the target. The results reflect (at a 95 percent confidence level) the geographic area which will contain 99.99 percent of the specific weapon's deliveries and their effects (Air Force 2001f).

Willie Pete (white phosphorus) rockets typically used in Combat Search and Rescue (CSAR) (Table 2-2) mission training are the only live ordnance approved for use on Melrose AFR. No live, high explosive ordnance is used on Melrose AFR. The SAFE-RANGE program has been run for all ordnance currently delivered on Melrose AFR. Specific operational limitations and constraints for use of the range have been documented in detailed range operating procedures. These operational parameters are unique to targets, aircraft, ordnance used, and delivery profiles employed. All aircrew using the range must be knowledgeable of and comply with all requirements specified in these operating procedures (Cannon AFB 2000).

3.3.2.2 EXPLOSIVES SAFETY

The 27 FW controls, maintains, and stores all ordnance and munitions required for mission performance. Ordnance is handled and stored in accordance with Air Force explosive safety directives (AFI 91-201), and all munitions maintenance is carried out by trained, qualified personnel using Air Force-approved technical data. Ample storage facilities exist and all facilities are approved for the ordnance they store.

During training, aircraft are not loaded with any ordnance configured with high explosive warheads. Inert training bombs and several different types of rockets are delivered on Melrose AFR, as well as training projectiles fired from the aircrafts' 20 millimeter cannon. Aircraft may also be configured with training air-to-air and air-to-ground missiles

Ordnance expenditure during training is limited to ranges within Restricted Airspace. Air Force safety standards require safeguards on weapons systems and ordnance to ensure against inadvertent releases. All munitions mounted on an aircraft, as well as the guns, are equipped with mechanisms that preclude release or firing without activation of an electronic arming circuit.

System malfunctions or material failures could result in either an accidental release of ordnance or the release of a dud component that fails to operate properly. Studies have shown that the probability of such an accidental release occurring, the probability of it occurring where person or property could be affected, and the possibility of injury to a person or damage to property on the ground is so infinitesimally small that the risk associated with the occurrence can be essentially discounted (Air Force 1999).

RR-188 chaff and M-206 or equivalent flares have been assessed for use in the Pecos MOAs, Taiban MOA and Pecos and Sumner ATCAAs. Within the restricted airspace associated with Melrose AFR, other types of flares and ordnance can be deployed. Chaff may also be used along the northern portions of VR-100/VR-125 (Air Force 2001e). Use is governed by detailed operating procedures to ensure safety. Chaff is small fibers of aluminum-coated mica packed into approximately 4-ounce bundles. Chaff is ejected from an aircraft to reflect radar signals. When ejected, chaff forms a brief "cloud" that temporarily masks the aircraft from radar detection. Although the chaff may be ejected from the aircraft using a small pyrotechnic charge, the chaff itself is not explosive (Air Force 1997a). RR-188 chaff is specifically designed to not interfere with FAA radars. Refer to Appendix A for more details on the characteristics of chaff.

Defensive flares consist of small pellets of highly flammable material that burn rapidly at extremely high temperatures. Their purpose is to provide a heat source other than the aircraft's

engine exhaust to mislead heat-sensitive or heat-seeking targeting systems and decoy them away from the aircraft. The M-206 flare is essentially a pellet of magnesium which ignites upon ejection from the aircraft and burns completely within approximately 3.5 to 5 seconds. The M-206 flare burns up within approximately 400 feet from release point (Air Force 1997a; Appendix B). Flare use in the NMTRI airspace is governed by a minimum release altitude restriction of 2,000 feet AGL and limited by fire risk conditions to minimize fire risk. There have been no reported flare caused fires under the MOAs or ATCAAS as a result of Cannon AFB aircraft training.

3.3.2.3 FLIGHT SAFETY

The primary public concern with regard to flight safety is the potential for aircraft accidents. Such mishaps may occur as a result of weather-related accidents, mechanical failure, pilot error, mid-air collisions, collisions with manmade structures or terrain, or bird-aircraft collisions. Flight risks apply to all aircraft; they are not limited to the military.

The Air Force defines four categories of aircraft mishaps: Classes A, B, C, and High Accident Potential (HAP). Class A mishaps result in a loss of life, permanent total disability, a total cost in excess of $1 million, destruction of an aircraft, or damage to an aircraft beyond economical repair. Class B mishaps result in total costs of more than $200,000, but less than $1 million, result in permanent partial disability or inpatient hospitalization of three or more personnel, but do not result in fatalities. Class C mishaps involve reportable damage of more than $20,000, but less than $200,000, or a lost workday involving 8 hours or more away from work beyond the day or shift on which it occurred; or occupational illness that causes loss of work at any time. HAP represents minor incidents not meeting any of the criteria for Class A, B, or C. Class C mishaps and HAP, the most common types of accidents, represent relatively unimportant incidents because they generally involve minor damage and injuries, and rarely affect property or the public (Air Force 2001f). Class A mishaps are of primary concern because of their potentially catastrophic results.

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. As noted in the Draft EIS and in public comments on the Draft EIS, Class A mishaps have occurred on land under the existing Pecos airspace complex. 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 can not be totally discounted. Several factors are relevant to the Pecos airspace complex: the ROI 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, finally, the limited amount of time the aircraft is over any specific geographic area limits the probability that impact of a disabled aircraft in a populated area would occur.

Secondary effects of an aircraft crash include the potential for fire or environmental contamination. Again, because the extent of these secondary effects is situationally dependent, they are difficult to quantify. A crash of any aircraft can cause damage and loss of life. One commenter during public hearings on the Draft EIS explained the trauma associated with responding to an F-16 crash on his property (see Chapter 6.0). The terrain overflown in the ROI is diverse. For example, should a mishap occur in highly vegetated areas during a hot, dry

summer, such a mishap would have a higher risk of extensive fires than would a mishap in more barren and rocky areas during the winter. When an aircraft crashes, it may release hydrocarbons. Those petroleums, oils, and lubricants 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 groundwater in the area will also affect the extent of contamination to those resources.

Based on historical data on 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. These mishap rates do not consider combat losses due to enemy action. F-16C aircraft have flown more than 3,336,700 hours since the aircraft entered the Air Force inventory during Fiscal Year 1985. Over that period, 120 Class A mishaps have occurred and 113 aircraft have been destroyed. This results in a Class A mishap rate of 3.60 per 100,000 flight-hours, and an aircraft destroyed rate of 3.39 (Air Force Safety Center [AFSC] 2004).

Table 3.3-1 presents Class A mishap rates for aircraft flown in the Pecos airspace. Since the single-engine F-16 has the highest mishap rate, and trains most in the airspace, the safety discussion focuses on the highest potential environmental risk.

TABLE 3.3-1. PROJECTED CLASS A MISHAP RATES FOR AIRCRAFT

Aircraft	*Mishap Rates per 100,000 Flying Hours*
A-10	2.35
F-15	2.07
F-16	3.60
F/A-18[1]	3.34
F-22A[2]	N/A
C-130	0.91
B-1B	4.51

Notes: 1. F-18 mishap rate.
2. F-22A has not yet flown 100,000 hours.
Source: AFSC 2004; AFSC 2006

F-16 aircraft carry a small quantity of hydrazine in a sealed canister that is designed to withstand crash impact damage. Hydrazine is a highly volatile propellant that contains toxic elements. It is carried on the F-16 as part of the emergency power unit. When used for this purpose, hydrazine is completely consumed, and poses no safety hazard. In any crash that is severe enough to rupture the canister, it is most likely that fire will also be involved. In this case, the hydrazine will also burn and be completely decomposed. In the unlikely event that the hydrazine should be released but not consumed by fire, impacts on soils and groundwater are likely to be of minor consequence. Hydrazine absorbs water at room temperature. It is incombustible in solution with water at concentrations of 40 percent or less and it evaporates at any given combination of constant meteorological conditions (i.e., temperature, humidity, wind speed, etc.) at a rate slightly slower (approximately 11 percent) than water. For example, at 60° Fahrenheit, 50 percent humidity, and a wind speed of 5 miles per hour, a 4 square-foot pool of

hydrazine would evaporate at a rate of approximately 0.0072 pounds per minute (0.12 ounces) as compared to water, which would evaporate at a rate of approximately 0.0081 pounds per minute (0.13 ounces) (USEPA 1999; The Chemical Engineers Resource Page 2004). Movement of hydrazine through natural soils has been shown to be slow and limited. Due to its absorption and natural decomposition processes, the probability of released hydrazine significantly contaminating groundwater is considered extremely low. However, if a Class A accident occurred and the hydrazine canister were ruptured, and no fire consumed the hydrazine, and quantities of hydrazine were to reach a surface water body, aquatic life in those areas experiencing high concentrations could be significantly impacted.

A Class A mishap can also result in metal debris on the ground. The extent of the debris field depends upon the aircraft accident. Both for reconstructing the cause of the accident and for restoring the accident site as much as possible, the Air Force makes every effort to locate, document, and then clean up debris resulting from the accident. As was noted in public comments on the Draft EIS, small pieces may be missed in any clean up process (see Chapter 6.0).

The 27 FW and NMANG aircrews typically fly 5,600 F-16 sorties and 3,733 hours annually in the NMTRI airspace. Based on a Class A mishap rate of 3.60 per 100,000 flying hours, a Class A mishap would be statistically predicted to occur once every 7.4 years. To place this into context, based on the number of sorties flown, the statistically predictive probability of a Class A Mishap is 0.000024 or one chance in almost 42,000. The causes of mishaps are due to many factors, not simply the amount of flying time of the aircraft.

For purposes of comparison, aircrews at Cannon flew their first F-16 training sortie in September 1995. Since then, Cannon-based F-16s have been involved in six Class A mishaps. All occurred on local training missions, but not necessarily in the NMTRI airspace (personal communication, Zahnley 2004). The most recent Class A mishap involving Cannon-based aircraft occurred in September 2002 (personal communication, Berg 2004). Citizens incurring damage from Cannon AFB mishaps contact Cannon AFB directly to inquire about the damage claims process. The Air Force has an established claims process for citizens who have damages as a result of aircraft training activities. This process is initiated through contact with a Base's Public Affairs Office.

Bird-aircraft strikes constitute a safety concern because they can result in damage to aircraft or injury to aircrews or local populations if an aircraft crashes. Aircraft may encounter birds at altitudes up to 30,000 feet MSL or higher. However, most birds fly close to the ground. Over 97 percent of reported bird strikes occur below 3,000 feet AGL. Approximately 30 percent of bird strikes happen in the airport environment, and almost 55 percent occur during low-altitude flight training (AFSC 2002).

Migratory waterfowl (e.g., ducks, geese, and swans) are the most hazardous birds to low-flying aircraft because of their size and their propensity for migrating in large flocks at a variety of elevations and times of day. Waterfowl vary considerably in size, from 1 to 2 pounds for ducks, 5 to 8 pounds for geese, and up to 20 pounds for most swans. There are two normal migratory seasons, fall and spring. Waterfowl are usually only a hazard during migratory seasons. These birds typically migrate at night and generally fly between 1,500 to 3,000 feet AGL during the fall migration and from 1,000 to 3,000 feet AGL during the spring migration.

Along with waterfowl, raptors, shorebirds, gulls, herons, songbirds, and other birds also pose a hazard. In considering severity, the results of bird-aircraft strikes in restricted areas show that strikes involving raptors result in the majority of Class A and Class B mishaps related to bird-aircraft strikes. Raptors of greatest concern in the Melrose airspace are vultures and red-tailed hawks. Peak migration periods for raptors, especially eagles, are from October to mid-December and from mid-January to the beginning of March. In general, flights above 1,500 feet AGL would be above most migrating and wintering raptors.

Songbirds are small birds, usually less than one pound. During nocturnal migration periods, they navigate along major rivers, typically between 500 to 3,000 feet AGL. The potential for bird-aircraft strikes is greatest in areas used as migration corridors (flyways) or where birds congregate for foraging or resting (e.g., open water bodies, rivers, and wetlands).

While any bird-aircraft strike has the potential to be serious, many result in little or no damage to the aircraft, and only a minute portion result in a Class A mishap. During the years 1985 to 2001, the Air Force Bird-Aircraft Strike Hazard (BASH) Team documented 48,522 bird strikes worldwide. Of these, 20 resulted in Class A mishaps where the aircraft was destroyed. These occurrences constituted approximately 0.04 percent of all reported bird-aircraft strikes (AFSC 2002). Bird-aircraft strike data from 1996 to 2003 indicate that Cannon-based aircraft experience an average of approximately 25 bird-strikes per year. The majority, approximately 41 percent, occur during July, August, and September. The months of January, February, and March exhibit the lowest incidence (approximately 12 percent). The dominant species involved are doves (27 percent), horned larks (16 percent), swallows (12 percent), and kingbirds (11 percent). The remaining 33 percent of strikes involved a wide variety of raptors, owls, shore birds, and small songbirds (personal communication, Zahnley 2004).

The 27 FW maintains detailed emergency and mishap response plans to react to an aircraft accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off base. Response would normally occur in two phases.

The initial response focuses on rescue, evacuation, fire suppression, safety, elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. Subsequently, the second, or investigation phase is accomplished.

The initial response element consists of those personnel and agencies primarily responsible to initiate the initial phase. This element will include the Fire Chief, who will normally be the first On-scene Commander, fire-fighting and crash rescue personnel, medical personnel, security police, and crash recovery personnel. A subsequent response team will be comprised of an array of organizations whose participation will be governed by the circumstances associated with the mishap and actions required to be performed.

The Air Force has no specific rights or jurisdiction just because a military aircraft is involved. Regardless of the agency initially responding to the accident, efforts are directed at stabilizing the situation and minimizing further damage. If the accident has occurred on non-federal property, a National Defense Area will normally be established around the accident scene and the site will be secured for the investigation phase.

After all required actions on the site are complete, the aircraft will be removed and the site cleaned up. Depending on the extent of damage resulting from a Class A mishap, only the largest damaged parts may be located and removed from a crash site.

Wake vortices occur within the airspace. As a plane travels through the air, the trail of disturbed air that follows the aircraft as it passes through the atmosphere is called the wake vortex. Larger aircraft and lower altitudes produce a greater potential for a wake vortex effect on the ground. The F-16 operates primarily in the mid-to-high-altitude range and has no effect on ground structures. There have not been any documented reports of a wake vortex problem from the infrequent training by large aircraft in the airspace. Extensive review of wake vortices has resulted in the conclusion that, under unique circumstances of aircraft size, altitude, configuration, and meteorological conditions, there is a possibility that wake vortex damage could occur. The wake vortex from an F-16 would not contribute to any safety risk.

Transient users of NMTRI airspace can include larger aircraft. Under normal flight conditions, and all but rare atmospheric conditions, wake vortices from B-52 and B-1B low altitude flights fail to generate sufficient velocities to damage structures and vehicles, or pose a hazard to people or animals on the surface. Under infrequent circumstances, such as unusual aircraft maneuvers, damage could occur (Jurkovich and Skujins 2006). The Air Force has established procedures for damage claims that begin by contacting Cannon AFB Public Affairs.

3.4 Physical Resources

3.4.1 Definition of the Resource

Physical resources are grouped according to Major Land Resource Areas (MLRA) and Subresource Areas to facilitate the discussion of baseline or existing conditions. These groupings are based on a national system developed by the U.S. Department of Agriculture (USDA)-Natural Resources Conservation Service (NRCS) that delineates regions sharing recognizable associations of soils, vegetation, hydrology, and other land features. A Subresource Area is defined within an MLRA as geographically associated land resource units with similar land uses, elevation, topography, climate, vegetation, and soils. Following are general descriptions of each MLRA and Subresource Area under the NMTRI airspace.

The ROI for physical resources consists of all lands under the current airspace, the proposed expansion areas, and the proposed Capitan MOA/ATCAA. Specific regulations concerning physical resources are discussed in Appendix D.

3.4.2 Existing Conditions

Regional drainage consists of poorly developed ephemeral streams due to the low annual precipitation and high evaporation rates (Air Force 2003). The most prominent surface water features in the ROI are the Pecos River, and Alamosa, Taiban, and Yeso creeks, all within the Upper Pecos watershed. The Pecos River is designated as a warmwater or coldwater fishery (depending on the reach) by the New Mexico Environment Department and is also used to supply water for irrigation, municipal, and industrial uses. The river flows are governed by the Pecos River Compact, developed in 1948, which requires New Mexico to deliver water to Texas. Most of the surface water bodies in the ROI are intermittent streams and arroyos.

The Permian Basin is a geologic syncline with thick layers of sedimentary rock, mainly Permian limestone, from which oil and gas has been produced since the 1920s. The Permian Basin and oil and gas development occurs at the edges of the ROI in Roosevelt and Chaves Counties (Scholle 2000). Based on well data from 2003, almost 200 oil wells and 1,800 gas wells within the ROI occur in Chaves County, with approximately 25 percent located under the Pecos Low MOA (New Mexico Oil Conservation Division 2003). These wells do not contain structures that are high off the ground. There are no active wells under the existing airspace in the rest of the ROI.

There are three MLRAs and five Subresource Areas within the ROI. Unless otherwise listed, the information used to describe each of these areas is drawn from *Major Land Resource Areas and Subresource Areas, New Mexico* (USDA Soil Conservation Service [SCS] 1980) and *Land Resource Regions and Major Land Resource Areas of the United States* (USDA SCS 1981). Figure 3.4-1 shows the MLRAs, major streams and watersheds within the ROI and Table 3.4-1 lists the counties in each MLRA and Subresource Area.

3.4.2.1 Southern Desertic Basins, Plains, and Mountains MLRA

The Southern Desertic Basins, Plains, and Mountains MLRA covers much of the southernmost area of New Mexico from the Arizona border south of the Gila Mountains to the southeast corner of the state (USDA SCS 1980). In general, the topography can be described as having broad desert basins and valleys bordered by gently to strongly sloping fans and terraces. Low precipitation and scarce surface water bodies limit land uses. The soils are predominantly well-drained and medium-textured. Approximately 2 percent of the ROI falls within the Southern Desertic MLRA.

Southern Desertic-3 Subresource Area

This Subresource Area extends from 2,800 to 5,000 feet in elevation. Its topography encompasses gently sloping plains with low hills underlain by limestone and divided by the Pecos River in Chaves County. The average annual precipitation is 8 to 13 inches, and the average annual temperature is 61 degrees Fahrenheit (°F), with extremes from -25°F to 112°F. The length of the average frost-free season ranges from 207 to 220 days.

The northwest part of Chaves County to the Pecos River, under part of the Pecos South MOA, is located within the drainage area for the Roswell underground water basin, a major aquifer recharged primarily by infiltration into the shallow alluvial aquifer. The Fort Sumner Basin occurs in northern Chaves County. It consists of interbedded shales, sandstones, limestone, salt, and gypsum, and generally yields poor quality water at a low rate. The soil temperature regime is thermic (warm) and the soil moisture regime ranges from aridic (dry) to ustic aridic (less dry). Many of the soils are high in calcium carbonate content.

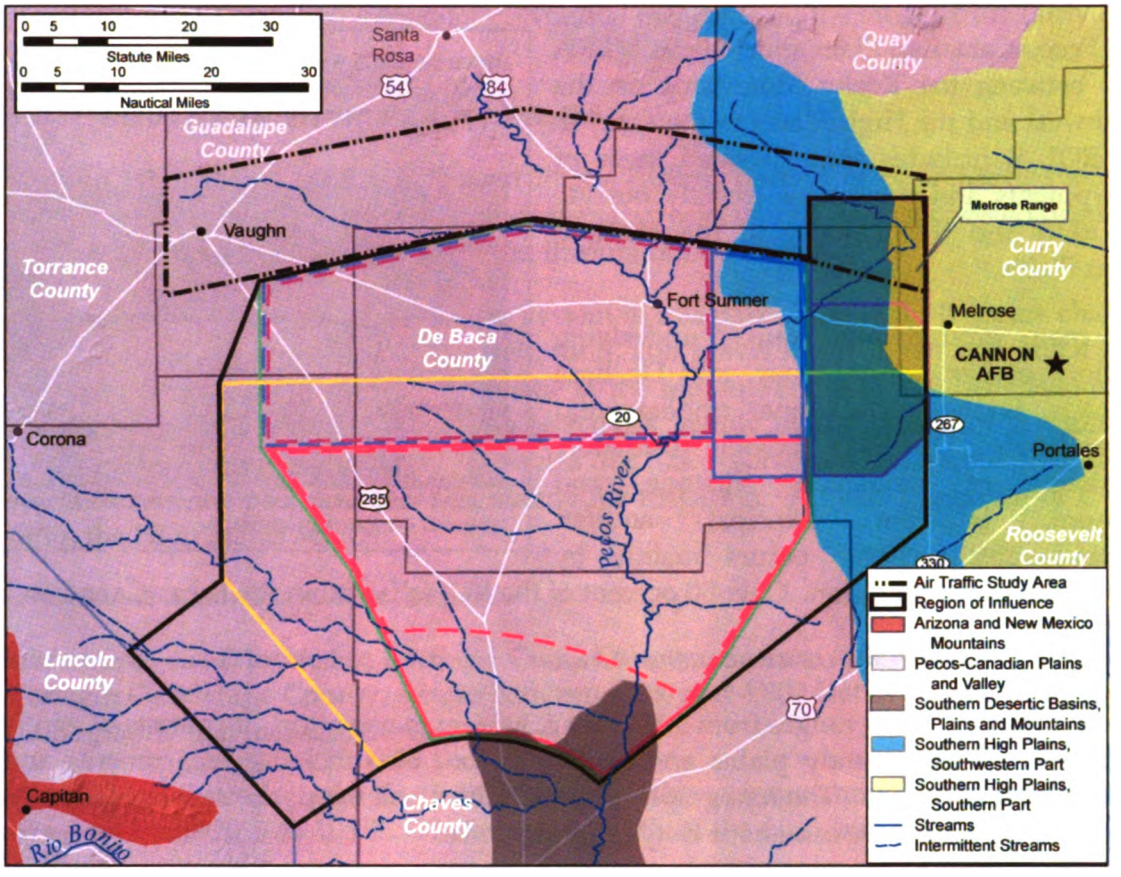


FIGURE 3.4-1. MAJOR LAND RESOURCE AREAS WITHIN THE REGION OF INFLUENCE

TABLE 3.4-1. MAJOR LAND RESOURCE AREAS AND SUBRESOURCE AREAS IN THE ROI

Major Land Resource Area (MLRA)	*Subresource Area/ Associated County*	*Area of MLRA within ROI (Acres)*
MLRA 42: Southern Desertic (SD) Basins, Plains, and Mountains	SD-3/Chaves	70,642
MLRA 70: Pecos-Canadian (PC) Plains and Valleys	PC-2/De Baca, Guadalupe, Quay, Chaves	2,692,093
	PC-3/De Baca, Guadalupe, Lincoln, Chaves	
MLRA 77: Southern High Plains (HP)	HP-2/Curry, Guadalupe, Quay	361,629
	HP-3/Curry, Roosevelt, De Baca, Quay	

Source: USDA SCS 1980; USDA SCS 1981.

3.4.2.2 Pecos-Canadian Plains and Valleys MLRA

The Pecos-Canadian Plain and Valleys MLRA falls between the Rocky Mountains on the northwest and the High Plains to the east. In the ROI, it includes some isolated areas of escarpments and mountains (mostly outside the ROI) and the majority of the Western Great Plains.

SOILS UNDER MOST OF THE AIRSPACE ARE SUSCEPTIBLE TO WIND AND WATER EROSION.

The main groundwater source, underlying portions of Guadalupe, Quay, and De Baca counties, is the Fort Sumner underground water basin. The Yeso geologic formation, consisting of sandstone, siltstone, and gypsum, is the principal aquifer. Ground-water recharge occurs mainly by infiltration of precipitation. Over 80 percent of the ROI falls within the Pecos-Canadian MLRA.

Pecos-Canadian-2 Subresource Area

This Subresource Area ranges from 3,700 and 5,300 feet in elevation. It consists of gently rolling landscapes of deep sandy plains and sand hills, but also includes escarpments and gently sloping valley bottoms. The topography also includes small mesas, buttes, and hills. The Pecos River flows through the sandstone canyons and plains.

The average annual precipitation of 11 to 15 inches occurs mostly during the summer. The average annual temperature is 58°F, with extremes between -25°F and 108°F. There are between 180 and 200 frost-free days.

Many of the soils present have little soil development, high pH, and are representative of those typically found in areas of low rainfall. The soil moisture regime is moderately dry to moderately moist. Most of these soils are susceptible to wind and water erosion, due to their position on the landscape, lack of vegetative cover, or texture.

Pecos-Canadian-3 Subresource Area

The elevation ranges from 5,000 to 7,200 feet with topography of gently rolling limestone hills with some steep escarpments and gently sloping valley bottoms. It extends from the Western Great Plains into the eastern part of the Rio Grande Rift Valley. The underlying geology is mainly sandstone and other sedimentary rocks. The topography includes some small mesas, buttes, hills, and mountain foothills. There are some scattered salt lakes and few perennial streams.

Average annual precipitation, occurring mostly during the summer, is 12 to 17 inches. The average annual temperature is 50°F with extremes of between -30°F and 103°F. There are between 130 and 180 frost-free days on average.

The predominant soils are well drained and moderately fine-textured to moderately coarse-textured and have mixed mineralogy. The soil moisture regime ranges from fairly dry to intermediate moisture levels.

3.4.2.3 SOUTHERN HIGH PLAINS MLRA

The Southern High Plains MLRA is located in the eastern portion of New Mexico and into Texas. It is underlain by nearly horizontal sedimentary rocks that have been covered by alluvial and aeolian deposits. Playa lakes are scattered throughout the region.

The Ogallala Aquifer is the principal aquifer system in this part of the ROI. It occurs chiefly in the Ogallala Formation, a mixture of clay, silt, sand, and gravel layers, often with thick gravel layers near the bottom and a caprock of caliche at the top, underlain by red beds (sandstones and sandy shales). The Ogallala Aquifer is recharged mainly by infiltration of precipitation. This is an important aquifer used by several states that has experienced large-scale groundwater withdrawal during the past few decades, mainly for irrigation. Almost 15 percent of the ROI falls within the High Plains MLRA.

HIGH PLAINS-2 SUBRESOURCE AREA

This Subresource Area, located in northern Curry County, southern Quay County, and a small part of eastern Guadalupe County, ranges between 4,000 and 4,800 feet in elevation with gently rolling topography that includes dunes.

The average annual precipitation is 15 to 17 inches. The average annual temperature is 57°F with extremes from -20°F to 105°F. The average length of the frost-free season is between 170 and 180 days.

Dominant soil types include some with little soil horizon development and others that have a great deal of soil development, indicating that they have developed in place over a long period. Even though there are many soils with sandy surface textures, the overall soil moisture regime is intermediate.

The sandy soils are dominated by bluestems, Indiangrass, grama grasses, and sand sagebrush. The finer-textured soils are dominated by sideoats and blue grama, galleta, little bluestem, and western wheatgrass.

HIGH PLAINS-3 SUBRESOURCE AREA

This area is comprised mainly of smooth high plains with occasional dunes, located mainly in southern Curry County and all of Roosevelt County, and ranges between 3,500 and 4,300 feet in elevation. The average annual precipitation is 14 to 18 inches, and the average annual temperature is 61°F, with extremes from -15°F to 110°F. The average frost-free season is from 180 to 200 days long.

Dominant soil types include some with little soil horizon development and others that have a great deal of soil development, indicating that they have developed in place over a long period of time. The soil moisture regime ranges from intermediate dry to dry intermediate.

Melrose AFR occurs in the long shallow valleys of the Cañada del Tule and Sheep Canyon draws. The Cañada del Tule carries stormwater runoff from the southeastern half of the range and flows in a northeasterly direction. Sheep Canyon carries intermittent flows northeast from the high point on Melrose AFR. High evaporation and infiltration rates prevent these drainages from contributing to surface water flows to the Pecos River. Other surface water features on Melrose AFR include four periodically flooded wetlands, 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. The other small impoundments are less than 0.01 acre and average about 8 feet in depth (Air Force 2003).

The thin topsoil is underlain at relatively shallow depths by a leached tightly cemented clay-carbonate hardpan, also called caliche. The soils are generally characterized as slightly alkaline to alkaline (pH of 7.1 to 8.2), deep to moderately deep, and moderately well to well drained. The soils are typically coarse-textured and have very poor water-holding capacities. Melrose AFR is underlain by the Ogallala Aquifer and its surface area contributes to the recharging of the aquifer (Air Force 2003).

3.5 BIOLOGICAL RESOURCES

3.5.1 DEFINITION OF THE RESOURCE

Biological resources are defined in this EIS as both wild and agricultural resources. Wild resources include native and exotic organisms, and their habitats, including wetlands, within which they occur. Domesticated plants and animals encompass agricultural resources.

The ROI for biological resources consists of all lands directly under the current Pecos MOA/ATCAA, Taiban MOA, Sumner ATCAA, and Melrose AFR and under the expansion areas, including the proposed Capitan ATCAA. Biological resources for the Draft EIS Proposed Action and Alternative B also included those under the air traffic study area.

3.5.1.1 WILD RESOURCES

Assemblages of wild plant and animal species within a defined area that are linked by ecological processes are referred to a community. The existence and conservation of these non-domesticated resources are intrinsically valuable; they also provide aesthetic, recreational, and socioeconomic values to society. Section 3.4 identified the soils in the ROI. This biological resources section focuses on animal species and 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, wild biological resources are organized into three major categories: (1) communities, including animals and plants, (2) wetlands, and (3) special-status species. A habitat-level perspective will govern both descriptions of existing conditions and analyses because of the large area under consideration.

Ecological Communities include both terrestrial plants and animals. The composition of plant species within a given area often defines ecological communities and determines the types of wild assemblages that may be present. Typical animals include snakes, lizards, songbirds, waterfowl, raptorial birds, hoofed animals, carnivores, bats, rodents, other small mammals, fish, and invertebrate species such as mollusks (e.g., snails) and insects. Migratory birds are

included in this discussion because federal agencies are mandated to evaluate the effects of their actions on migratory birds by Executive Order (EO) 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds.* The attributes and quality of available habitats determine the composition, diversity, and abundance patterns of wild species assemblages, or communities. Each species has its own set of habitat requirements and interspecific 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. For this reason, an assessment of habitat types and area affected by the Proposed Action can serve as an overriding determinant in the assessment of consequences for wild populations.

Wetlands are a special category of Waters of the U.S. and are subject to regulatory authority under Section 404 of the Clean Water Act and EO 11990, *Protection of Wetlands.* They include jurisdictional and non-jurisdictional wetlands. Jurisdictional wetlands are those defined by the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) as meeting 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 are those that fail to meet this requirement but meet the broader definition of the EO. For proposed actions not involving direct ground disturbance, wetlands are typically not considered. However, because of the unique set of possible impacts associated with the Proposed Action, general consideration of wetlands is given.

Special-status species are defined as those plant and animal species listed as threatened, endangered, candidate, or species of concern by the U.S. Fish and Wildlife Service (USFWS), as well as those species with special-status designations by the state of New Mexico. The Endangered Species Act (ESA) protects federally listed threatened and endangered plant and animal species. Candidate species are species that USFWS is considering for listing as federal threatened or endangered but for which a proposed rule has not yet been developed. Candidates do not benefit from legal protection under the ESA. In some instances, candidate species may be emergency listed if USFWS determines that the species population is at risk due to a potential or imminent impact. The USFWS encourages federal agencies to consider candidate species in their planning process because they may be listed in the future and, more importantly, because current action may prevent future listing. Species of concern are species for which data were inconclusive to support ESA protection at the time of the proposed listing. It is an informal designation, although USFWS recommends tracking of population trends and threats. The New Mexico Department of Game and Fish (NMDGF) maintains a list of endangered and threatened fish and animals, while the New Mexico Energy, Minerals, and Natural Resources Department (EMNRD) protects endangered plants. Typically state and federal lists have considerable overlap, but occasionally a state may provide more protection than is required at the federal level. New Mexico also ranks animals and plants as "sensitive." These species may be declining, rare, or endemic. State sensitive designations do not provide legal protection but do provide a context for consideration and evaluation of project effects.

3.5.1.2 AGRICULTURAL RESOURCES

Agricultural resources are those plants and animals raised for the benefit of humans. Domestic animals include cattle, sheep, hogs, poultry, and horses. 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. Livestock grazing and rangeland account for 85

percent of land in farming in the seven counties that constitute the social and economic ROI. Ranches in De Baca County, the most representative under the affected airspace, average 7,497 acres.

3.5.2 EXISTING CONDITIONS

3.5.2.1 ECOLOGICAL COMMUNITIES

The ROI lies largely within the *Southwest Plateau and Plains Dry Steppe and Shrub Province*, as described by Bailey (1995). The *Chihuahuan Semi-Desert Province* is in the south, while western areas include *the Arizona-New Mexico Mountains Semi-Desert – Open Woodland – Coniferous Forest – Alpine Meadow Province*. Within these ecoregions, Dick-Peddie (1993) and Brown (1994) described vegetation community types. Terminology below follows Dick-Peddie (1993). The dominant vegetation community in the ROI is Plains-Mesa Grassland (Figure 3.5-1). Approximately 86.3 percent (2,783,077 acres) of the ROI is classified as Plains-Mesa Grassland (New Mexico Resource Geographic Information System Program 1991). At lower elevations in the south, Desert Grassland (322,314 acres; 10.0 percent) and Plains-Mesa Sand Scrub (12,813 acres; 0.4 percent) replace the Plains-Mesa Grassland. To the west in Lincoln County, Plains-Mesa Grassland grades into Juniper Savanna (701 acres; 0.02 percent) at the upper elevations. Urban areas and farmland occupy 3.3 percent (106,439 acres) of the ROI. There is not a one-to-one correlation between vegetation types in Figure 3.5-1 and land resource areas in Figure 3.4-1.

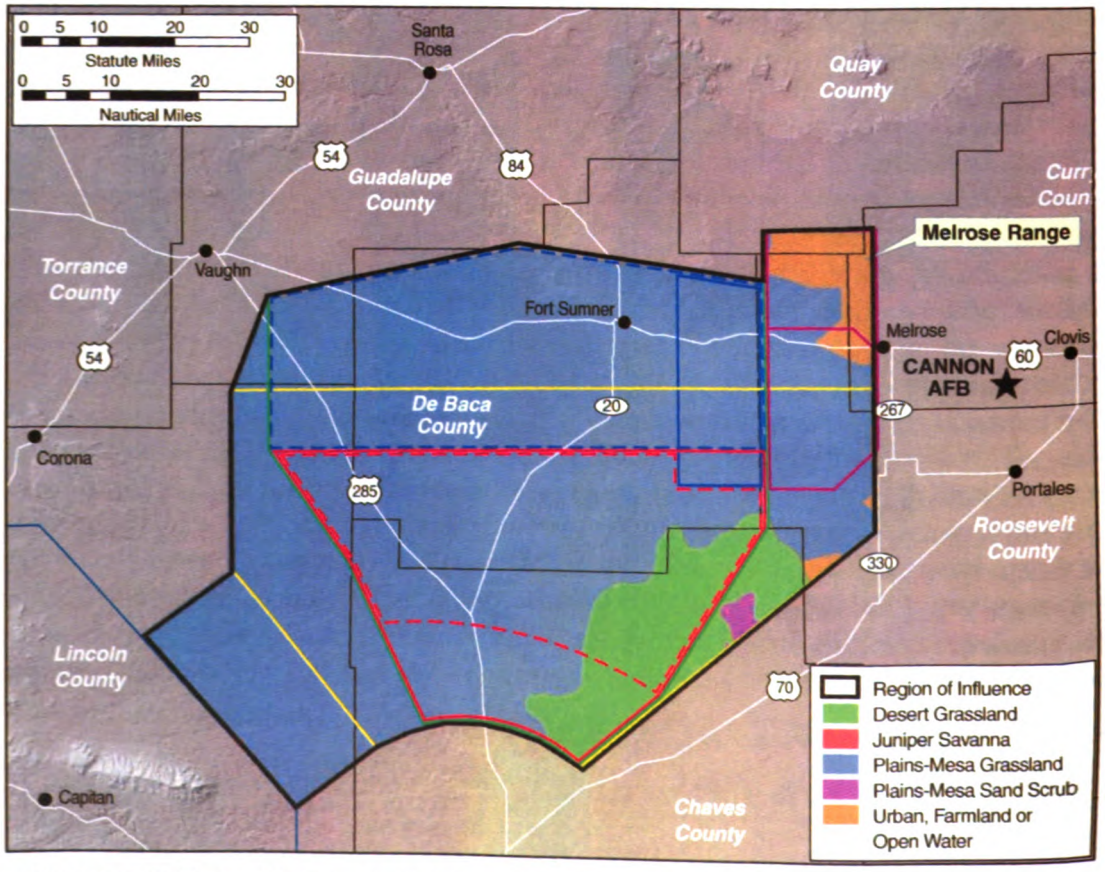


FIGURE 3.5-1. VEGETATION TYPES WITHIN THE REGION OF INFLUENCE

Plains-Mesa Grassland. Plains-Mesa Grasslands are found between 4,000 and 7,500 feet on plains, mesas, and low hills. Three grassland types may be present: tall grass, mixed, and/or short grass prairies. Tall grass prairie is relatively rare and is largely limited to sandhills near Portales in Roosevelt County. Blue gramma (*Bouteloua gracilis*) and other gramma grasses (*Bouteloua* spp.) dominate mixed and short grass prairie. Other important grasses include buffalograss (*Buchloe dactyloides*), Indian ricegrass (*Achnatherum hymenoides*), dropseed (*Sporobolus* spp.), galleta grass (*Hilaria jamesii*), and lovegrass (*Eragrostis* spp.). Although shrubs have always been part of the Plains-Mesa Grassland, the shrub component has increased in recent decades due to livestock grazing and fire suppression (Bailey 1995). Four-wing saltbush (*Atriplex canescens*), winterfat (*Ceratoides lanata*), rabbitbrush (*Chrysothamnus* spp.), and snakeweed (*Gutierrezia* spp.) are common shrubs. Forbs, such as coneflowers (*Ratibida* spp.) and globemallows (*Sphaeralcea* spp.), and pricklypear cacti (*Opuntia* spp.) are also important in Plains-Mesa Grasslands.

Typical mammals associated with Plains-Mesa Grassland are the pronghorn antelope (*Antilocapra americana*), black-tailed prairie dog (*Cynomys ludovicianus*), swift fox (*Vulpes velox*), Plains pocket gopher (*Geomys bursarius*) (Brown 1994). Domestic cattle, sheep, and horses are common grazers. Representative birds include the lesser prairie-chicken (*Tympanuchus pallidicinctus*), long-billed curlew (*Numenius americanus*), western burrowing owl (*Athene cunicularia hypugea*), lark bunting (*Calamospiza melanocorys*), and western meadowlark (*Sturnella neglecta*). Grassland specialists found on Melrose AFR in mixed grasslands included the six-lined racerunner (*Cnemidophorus sexlineatus*), many-lined skink (*Eumeces multivirgatus*), Great Plains skink (*Eumeces obsoletus*), Plains blackhead snake (*Tattilla nigriceps*), western burrowing owl, thirteen-lined ground squirrel (*Spermophilis tridecemlineatus*), black-tailed prairie dog, and hispid pocket mouse (*Chaetodipus hispidus*) (Parmenter *et al.* 1994).

PRONGHORN ANTELOPE ARE TYPICAL MAMMALS ASSOCIATED WITH THE PLAINS-MESA GRASSLAND.

Desert Grassland. The lower elevational limit of Desert Grassland is around 3,600 feet. This community type has been impacted by grazing and drought. In some areas, the native perennial bunchgrasses have been replaced by exotic annual grasses and low-growing sod grasses, such as Lehmann lovegrass (*Eragrostis lehmanniana*) and curly mesquite grass (*Hilaria belangeri*) respectively. Ecologically important grasses are black gramma (*Bouteloua eriopoda*) and tobosa (*Hilaria mutica*). Black gramma is found on gravelly upland sites, while tobosa is the dominant grass on heavier soils in lowlands and swales. Other grasses include various gramma grasses, red three-awn (*Aristida longiseta*), hairy tridens (*Tridens pilosus*), and buffalograss. Lupines (*Lupinus* spp.), filarees (*Erodium* spp.), and buckwheats (*Eriogonum* spp.) are common forbs. Cacti and succulent plants, such as agaves (*Agave* spp.), sotol (*Dasylirion* spp.), and yucca (*Yucca* spp.) are characteristic of Desert Grasslands. Important scrub-shrubs include mesquite (*Prosopis* spp.), althorn (*Koeberlinia spinosa*), and catclaw acacia (*Acacia greggii*). Tarbush (*Flourensia cernua*) and creosotebush (*Larrea tridentate*) have increased with disturbance and drought.

Mammals common to the Desert Grassland are the black-tailed jackrabbit (*Lepus californicus*), spotted ground squirrel (*Spermophilis spilosoma*), various species of kangaroo rats (*Dipodomys* spp.) and woodrats (*Neotoma* spp.), badger (*Taxidea taxus*), and coyote (*Canis latrans*). Birds include Swainson's hawk (*Buteo swainsoni*), mourning dove (*Zenaida macroura*), roadrunner (*Geococcyx californicus*), ash-throated flycatcher (*Myiarchus cinerascens*), curve-billed thrasher (*Toxostoma curvirostre*), and Cassin's sparrow (*Aimophila cassinii*). Ornate box turtle (*Terrapene ornate*), western hognose snake (*Heterodon nasicus*), western hooknose snake (*Gyalopion canum*), and desert grassland whiptail (*Cnemidophorus uniparens*) are representative reptiles.

Plains-Mesa Sand Scrub. Although historically this community type was restricted to the extreme southern parts of New Mexico and along the Rio Grande River, it has expanded and encroached into Desert Grassland. Its typical elevation range is 2,300 to 5,200 feet. Creosotebush, tarbush, and whitethorn (*Acacia neovernicosa*) are the dominant features of the Chihuahuan Desert. Numerous species of yuccas, agaves, sotols, and nolimas (*Nolina* spp.) are found in succulent-scrub upland areas, as are woody shrubs and low-growing cacti. Succulent-scrub uplands grade into Desert Grassland where grassland species, such as gramma grasses, can be found. Lower elevation playas may also support Desert Grassland species.

The Plains-Mesa Sand Scrub is perhaps best known for its diversity and abundance of reptiles. Lizards include the Texas banded gecko (*Coleonyx brevis*), greater earless lizard (*Cophosaurus texanus*), and several species of spiny lizards (*Sceloporus* spp.) and whiptails (*Cnemidophorus* spp.). Snakes include the western hooknose snake, whipsnakes (*Masticophis* spp.), and rattlesnakes (*Crotalus* spp.). Typical mammals found in Plains-Mesa Sand Scrub are the desert pocket gopher (*Geomys arenarius*), southern grasshopper mouse (*Onychomys torridus*), Texas antelope squirrel (*Ammospermophilis interpres*), and desert pocket mouse (*Perognathus penicillatus*). Scaled quail (*Callipepla squamata*), white-necked raven (*Corvus cryptoleucus*), cactus wren (*Campylorhynchus brunneicapillus*), and black-throated sparrow (*Amphispiza bilineata*) are representative birds.

Juniper Savanna. This community type is characterized by pinyon pine (*Pinus edulis*) and one-seed juniper (*Juniperus monosperma*), together commonly called pinyon-juniper woodland. This woodland is found between 4,900 and 7,500 feet, particularly on rocky mesas, plateaus, slopes, and ridges. Understory vegetation includes gramma grasses, galleta grass, Indian ricegrass, buckwheats, and lupines. Woody shrubs include threadleaf groundsel (*Senecio longilobus*) snakeweed, fourwing saltbush, and cliffrose (*Cowania mexicana*). Several species of hedgehog cacti (*Echinocereus* spp.), pricklypears, and chollas (*Opuntia* spp.) are also present.

Pinyon-juniper specialists are the pinyon mouse (*Peromyscus truei*), pinyon jay (*Gymnorhinus cyanocephalus*), gray flycatcher (*Empidonax wrightii*), and gray vireo (*Vireo vicinator*). Pinyon-juniper woodlands are also important for wintering elk (*Cervus elaphus*) and mule deer (*Odocoileus hemionus*) (Brown 1994).

3.5.2.2 WETLANDS

Jurisdictional wetlands comprise less than 1 percent of the ROI (Table 3.5-1) and most are within the Pecos River Valley. Wetlands and riparian areas, however, are critically important for many species of animals, particularly migratory birds. Wetlands, as discussed in Section 3.6.1.1, are important habitat type and subject to federal regulation. Typical wetland plants include cattail (*Typha latifolia*), bulrush (*Scirpus acutus*), rushes (*Juncus* spp.) and sedges (*Carex*

spp.), often interspersed with willows (*Salix* spp.). Native riparian areas are also imperiled due to increased water demands and invasion by the exotic shrubs saltcedar (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*). Plains cottonwood (*Populus deltoids*), peachleaf willow (*Salix amygdaloides*), and narrowleaf cottonwood (*Populus angustifolia*) comprise the climax community along the larger river systems, such as the Pecos River. Riparian scrublands, composed of several willow species, seepwillow (*Baccharis salicifolia*) and saltcedar, are found along floodplains and streams throughout. At the higher elevations, streams and canyons can be composed of narrowleaf cottonwood, maple (*Acer* spp.), box elder (*Acer negundo*), alders (*Alnus* spp.), willows, blueberry elder (*Sambucus glauca*), and red-osier dogwood (*Cornus sericea*).

TABLE 3.5-1. WETLANDS WITHIN THE REGION OF INFLUENCE

Wetland Type	*Acres*
Palustrine Scrub-Shrub	1,990
Palustrine & Riverine Unconsolidated Shore & Bottom	995
Total Wetland Acreage	3,585
Total Land Area	3,225,344
Wetland Percent of Total Land Area	*0.11*

Source: USFWS 1983.

Bitter Lake National Wildlife Refuge (NWR), just south of the ROI along the Pecos River, is an example of the plant and animal diversity that is found in wetland and riparian areas. At least 357 species of birds have been observed on the refuge (Bitter Lake NWR 2004). Approximately 59 mammal species, 50 species of reptiles and amphibians, and 24 fish species have been recorded.

3.5.2.3 SPECIAL-STATUS SPECIES

The Air Force has initiated consultation with USFWS under Section 7 of the ESA and requested a list of threatened, endangered, or proposed species that may occur within the project area. The USFWS provided a list of special-status species for the seven counties within the ROI (Appendix H). In addition, the NMDGF, New Mexico Natural Heritage Program (NMNHP), and New Mexico Rare Plant Technical Council (NMRPTC) web sites were searched for information about state listings (NMRPTC 1999, NMDGF 2003, NMNHP 2003). This information is summarized in Appendix H. Not all species on this list may be within the ROI.

Federally listed endangered species that may occur in the ROI are Kuenzler hedgehog cactus (*Echinocereus fendleri var. kuenzleri*), Pecos gambusia (*Gambusia nobilis*), brown pelican (*Pelecanus occidentalis carolinensis*), interior least tern (*Sterna antillarum athalassos*), northern aplomado falcon (*Falco femoralis septentrionalis*), and southwestern willow flycatcher (*Empidonax traillii extimus*). Several snails and one crustacean are currently listed as proposed endangered. These are Pecos assiminea snail (*Assiminiea pecos*), Koster's springsnail (*Juturnia kosteri*), Roswell pyrg (*Pyrgulopsis roswellensis*), Koster's tryonia (*Tryonia kosteri*), and Noel's amphipod (*Gammarus desperatus*). Threatened species potentially occurring in the ROI are Pecos sunflower (*Helianthus paradoxus*), Arkansas River shiner (*Notropis girardi*), Pecos bluntnose shiner (*Notropis simus*

pecosensis), piping plover (*Charadrium melodus circumcinctus*), bald eagle (*Haliaeetus leucocephalus*), and Mexican spotted owl (*Strix occidentalis lucida*). Candidates for federal listing are sand dune lizard (*Sceloporus arenicolus*) and lesser prairie-chicken. Thirty species of concern also may occur in the ROI and are listed in Appendix H.

Several federally protected species are considered extinct in New Mexico or specifically in the seven counties in the ROI (NMDGF 2003); therefore, these species will not be considered further in this document. Such species include the Texas hornshell (*Popenaias popei*) (a mussel), Rio Grande silvery minnow (*Hybognathus amarus*), grizzly bear (*Ursus horribilis*), and black-footed ferret (*Mustela nigripes*). The Mexican gray wolf (*Canis lupus baileyi*) is extinct from New Mexico; however, Mexican gray wolves have been released as a "nonessential experimental population" in southeast Arizona. The Mexican gray wolf recovery plan also identified the White Sands Missile Range in south-central New Mexico as a potential future release site (USFWS 1998a).

The USFWS also identified several insect-species of concern (not endangered or threatened) that may be present in the ROI (Appendix H). These included Mescalero Sands tiger beetle (*Cicindela formosa rutilovirescens*), bonita diving beetle (*Deronectes neomexicana*), Mescalero Sands June beetle (*Polyphylla mescalerensis*), Sacramento Mountains blue butterfly (*Icaricia icariodes*), desert viceroy butterfly (*Limenitis archippus obsolete*), and Sacramento Mountains silverspot butterfly (*Speyeria atlantis capitanensis*). Little information exists on these insect species. Because no surface impacts are expected and there is no evidence insects are affected by aircraft noise, these species are not discussed further in this document.

3.5.2.4 AGRICULTURAL RESOURCES

Urban areas and farmland occupy 3 to 4 percent of the ROI, the majority of which is in the eastern portion (Figure 3.5-1). Ranches and associated livestock grazing alone constitute approximately 85 percent of the land use in the ROI. Under the airspace, 14 percent is lands managed by the Bureau of Land Management (BLM), 16 percent is state land, and 69 percent is private. Both the BLM and State of New Mexico maintain grazing allotments or leases on their lands. Grazing or other agriculture occurs on approximately 99 percent of the private, state, and federal land under the airspace. Commenters on the Draft EIS described existing ranching operations for a ranch under the existing Pecos MOA (see Chapter 6.0, Comments and Responses).

The New Mexico Department of Agriculture (NMDA) (2003) and USDA (1997) provided livestock statistics by county. In 2002, an estimated 626,000 cows and 124,000 sheep occurred within the seven counties that intersect the ROI (NMDA 2003). The number of farms also provides an estimate of the agricultural resources within the seven counties. In 2002, in the seven counties, 1,970 farms produced cattle, 92 produced hogs, 179 produced sheep, and 1,355 raised horses and ponies (National Agricultural Statistics Service 2004).

3.6 CULTURAL RESOURCES

3.6.1 DEFINITION OF THE RESOURCE

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 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 resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. 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. Resources generally must be more than 50 years old to be considered for inclusion in the National Register of Historic Places (NRHP).

A number of federal regulations and guidelines have been established for the management of cultural resources (Appendix D). The standards set forth in Section 106 of the National Historic Preservation Act (NHPA), as amended, are used to determine effects to most cultural resources in the affected environment. Section 106 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, including NEPA, impacts to cultural resources may be considered adverse if they meet the criteria set out in 36 CFR 800.5(1), and 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.

The Native American Graves Protection and Repatriation Act (NAGPRA) would apply to situations where human remains , funerary, or sacred objects or objects of cultural patrimony were involved. No Native American sacred sites or NAGPRA-related materials have been identified in the ROI. The 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.

The ROI for cultural resources consists of all lands under the current airspace, including Melrose AFR, the proposed airspace expansion areas, and the proposed Capitan MOA/ATCAA.

3.6.2 Existing Conditions

3.6.2.1 Historical Setting

The earliest remains of human activity in the region date to approximately 12,000 years before present (BP) and are associated with the hunting of large game animals, such as mammoth and mastodon, commonly grouped and referred to as Pleistocene megafauna. During this time, the climate was cooler and wetter, supporting vast grasslands, shallow lakes and wetlands. Known only through the material remains they left behind, these earliest inhabitants are known as the

Clovis Culture, and existed for perhaps only 700 years. Evidence of the culture was first recognized at Black Water Draw, New Mexico, south of Clovis, in 1929. In the years since, the site has been extensively excavated, revealing intermittent occupations of successive cultures that span thousands of years.

Through the next several thousand years, the climate became warmer and drier. The grasslands turned to a desert shrub environment, and the lakes and wetlands disappeared along with the megafauna. The environmental changes forced a change in the subsistence of local populations, shifting to a reliance on other game animals and a greater utilization of plant resources. Roughly 3,000 BP, ceramics came into use; the practice of agriculture developed; and more permanent, substantial residential structures (e.g., pueblos) were built (Geo-Marine 1996).

There are seven Apachean-speaking tribes thought to have inhabited the southwestern portion of the United States and the Northern portion of Mexico; of these seven, it is believed that the Mescalero Apache and the Jicarilla Apache were the primary inhabitants of the area underlying the affected airspace (Opler 1983; Tiller 1983). The Mescalero Apache native lands were generally located in the southern portion of the affected airspace extending well into northern Mexico. At the time of European contact, the lands of the Mescalero were extensive, being defined by a series of mountain ranges with peaks greater than 12,000 feet, separated by flats and valleys. The differences in elevation are marked by noticeable changes in flora, fauna, and climate. In the mountain regions, winters are severe with very short growing seasons, which made cultivation difficult. The flats were generally hot and dry, making cultivation almost impossible until the introduction of irrigation. The striking differences in topography and climate had a great and lasting influence on the political and economic development and structure of the Mescalero, who until the later part of the historic period, remained in small hunter-gatherer groups scattered throughout their territory (Opler 1983).

The Jicarilla aboriginal lands were generally located in the northern portion of the affected airspace extending as far north as south-central Colorado. It is believed that the Jicarilla migrated into the southwest between A.D. 1300 and 1500, although their route of migration is much in dispute. The Jicarilla Apache native lands consist of the Southern Rockies, which extend from north-central New Mexico north into southern Colorado, and east into the high plains country, which is defined by mesas, plateaus and intermontane basins. Similar to the Mescalero native lands, the elevational changes are drastic, ranging from 14,000 feet in the Rockies to 3,800 feet in some of the valleys (Tiller 1983).

Although the Apachean speaking groups that migrated south into the region settled into separate locations, they preserved much of their Athapaskan culture. Eventually, many of these groups such as the Mescalero and the Jicarilla were influenced by contact with other native groups such as the Pueblos, and later by the introduction of the horse. These influences led to a change in culture towards a more sedentary life style (Tiller 1983).

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 (Geo-Marine 1996).

Spanish explorers first entered the region beginning in the mid-16th century, following exploration routes along the Pecos and Canadian Rivers. They discovered a barren plain that occupies 37,000 square miles of west Texas and eastern New Mexico. To the north and west, the plain is bounded by an escarpment that rises 300 feet above the plain. Through the millennia, wind and water eroded the bedrock of the escarpment so that from a distance it resembles ramparts or fortifications. As a result, the region, which is actually a southern reach of the Great Plains, was named the Llano Estacado (palisaded plain). Once a forbidding place only suited to seasonal grazing, through irrigation the Llano now supports widespread agriculture and the communities of Lubbock and Amarillo, Texas, and Clovis, New Mexico.

Commerce between the United States and a Mexico newly independent from Spain was instrumental in bringing American settlers to the region in the early to mid-19th century. Traveling the Santa Fe Trail, business interests came into increasing conflict with the Apache and other tribes along the route, resulting in the construction of forts. During the Mexican-American war of 1846-1848, American troops traveled west along the Santa Fe Trail as did troops during the American Civil War. Once New Mexico became American territory, trade continued to flourish, and traffic included travelers on their way to the gold fields of California (National Park Service 2004). The Santa Fe Trail also provided a link to the Old Spanish Trail, which connected New Mexico to the markets in California and Mexico.

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 (Rothman 1998). In the following decades, Mescalero encounters with the American military led to short-term treaty and reservation arrangements. In 1863, under General James H. Carleton, Colonel Christopher "Kit" Carson forced some 400 Mescalero Apache to walk approximately 200 miles from Fort Stanton to Fort Sumner. Later that year, over 8,000 Navajo from the Canyon de Chelly in eastern Arizona were forced to march over 300 miles to the Bosque Redondo Reservation at Fort Sumner (Banks 1998). From 1863 to 1868, as many as 9,000 Navajo people (Dineh) and more than 400 Mescalero Apache were incarcerated at the Bosque Redondo Reservation (Geo-Marine 1996). The forced movement of the Dineh to Fort Sumner is memorialized in Navajo history as "The Long Walk."

These forced marches to Bosque Redondo followed a number of alternate routes or segments (Ackerly 1998): Fort Wingate to Los Pinos/Albuquerque segment; the Intermediate Segments East and North of Albuquerque; and the Fort Union to Fort Sumner Segment. Historical accounts of the Fort Wingate to Los Pinos/Albuquerque Segment indicate that it followed a well-traveled wagon road from Old Fort Wingate eastward to the Rio Grande. Near Sheep Springs, the road branched southward towards Los Pinos and northward to Albuquerque (Ackerly 1998).

The Intermediate Segments East and North of Albuquerque are further subdivided into four sub-segments. The Albuquerque to Santa Fe segment of the Santa Fe route follows an existing wagon route along the Camino Real that connected Albuquerque with Santa Fe (Ackerly 1998). Combined historic reports indicate that, for the most part, the Santa Fe route from Santa Fe eastward to Fort Union paralleled the Santa Fe Trail. The route passed through Kozlowski's Ranch, Pigeon's Ranch, Tecolote, Las Vegas through Kroenig's Ranch, then turned north in the direction of Fort Union. From Fort Union south to Fort Sumner, the route followed an existing wagon road paralleling the Rio Pecos (Ackerly 1998). Following another well-established

wagon trail, the Mountain Route started in Albuquerque heading east through the Tijeras Canyon, north along the Sandias Mountains to Galisteo, then turned east toward Fort Union. The Mountain Route passed through San Antonio, San Pedro, San Lorenzo, Real De San Francisco, Placer de Tureto, Eaton's Ranch, and Galisteo, where it connected with the Santa Fe Route near Kozlowski's Ranch. At this point, the Mountain Route passed through the towns of Rowe, Ilfeld, San Jose, Bernal Springs, Tecolote, and Romeroville. At Romeroville, the route forked to the east and west converging at the Pecos River (Ackerly 1998). The Canon Blanco Route was a more direct route between Albuquerque and Fort Sumner (Ackerly 1998). This route followed the Mountain Route through the Tijeras Canyon to the town of Tijeras, where it then headed northeast towards the now abandoned town of Gutierrez. At this point, the Canon Blanco Route headed due east passing through Lagunas and directly into the Canon Blanco where it joined the Fort Union to Fort Sumner road (Ackerly 1998). The final sub-segment of the Intermediate Segments North and East of Albuquerque is known as the Piedra Pintada. This route is believed to have been used by the Navajo as an escape route from Fort Sumner in 1863 and again in 1865. Although the most direct from Albuquerque to Fort Sumner, it is thought that this route was not as extensively used as others, because it was not easily traveled by wagon (Ackerly 1998).

The Fort Union to Fort Sumner segment (Figure 3.6-1) is believed to have been the final segment, used at least partially, by the Santa Fe, Mountain, Canon Blanco, and Piedra Pintada routes. The road extends from Anton Chico south through Fort Butler, Becke's Ranch, Alamo Gordo, San Juan de Dios, and Las Carretas to the site of the Bosque Redondo Reservation at Fort Sumner (Ackerly 1998). In 1868, the Navajo Treaty was signed at Fort Sumner, conceding the right of the Dineh to live on their homelands to the west (Museum of New Mexico 2001a). After a period of instability following the Civil War, a new reservation was established in 1873 for the Mescalero and Chiricahua Apache at its present location near the Sacramento Mountains (Rothman 1998) southwest of the area of potential effect, as well as the establishment of a new reservation for the Jicarilla Apache north of the area of potential effect (New Mexico Blue Book 2004).

Currently, the Mescalero and Chiricahua Apache Indian reservation occupies approximately 460,000 acres and is home to 3,000 tribal members (New Mexico Blue Book 2004). The Jicarilla Apache Indian Reservation is also home to approximately 3,000 members and consists of approximately 750,000 acres (New Mexico Blue Book 2004).

American forts in the region, such as Fort Sumner within the study area, were established by the early 1860s to defend routes of travel through the area (Geo-Marine 1996). After 1865, American cattle ranchers entered the region, establishing extensive ranches during the 1880s, including in the Melrose AFR area. The Goodnight-Loving trail followed the Pecos River valley, through Fort Sumner 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 (Geo-Marine 1996). Small towns grew up along the rail lines, including Taiban and others in the Melrose AFR area. North of the ROI lie the remnants of Route 66, now largely replaced by other highways. This historic route once connected Chicago to Santa Monica, California.

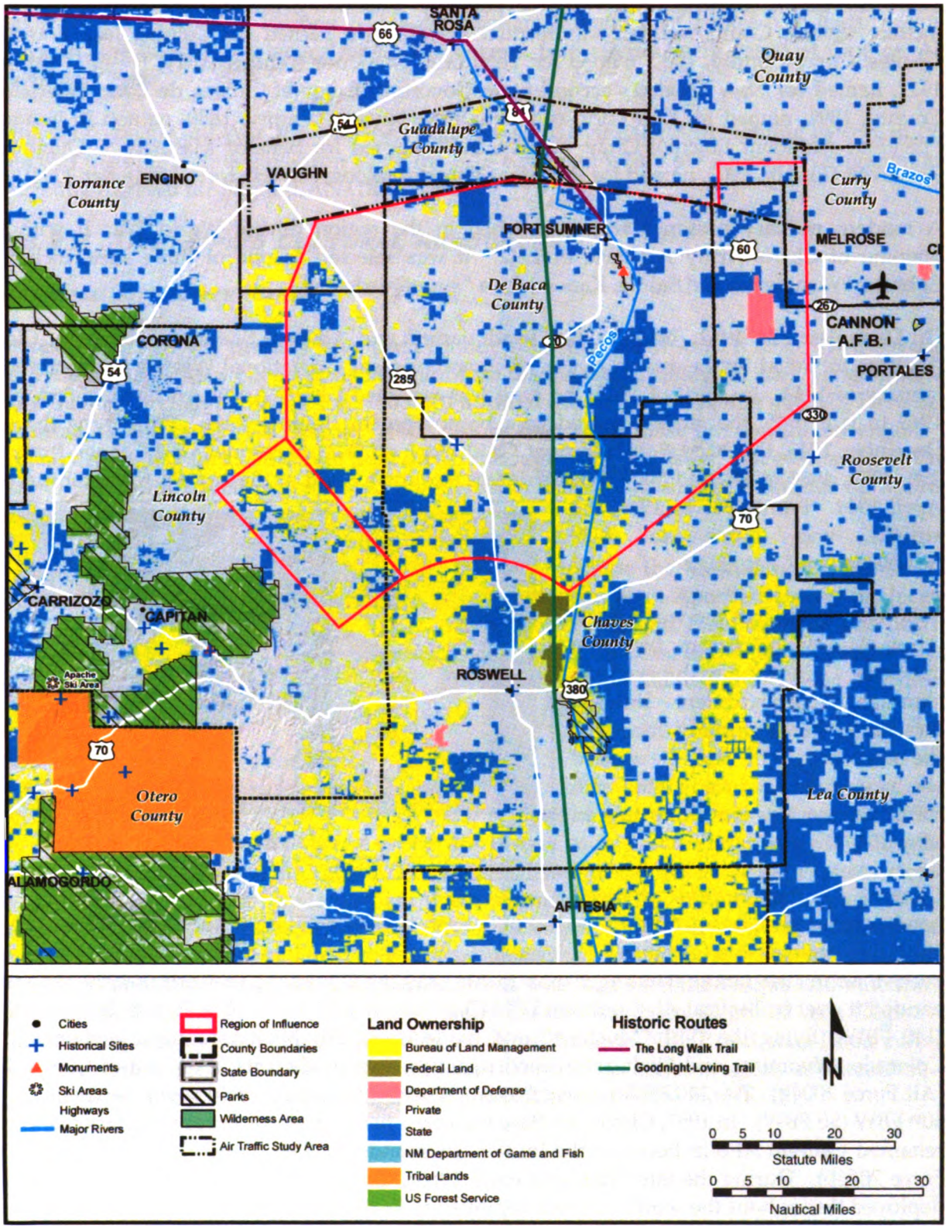


FIGURE 3.6-1. HISTORIC ROUTES IN THE VICINITY OF REGION OF INFLUENCE

There are seven counties underlying or partially underlying the training airspace. These include Chaves County, which was formed in 1889 and named for Colonel Jose Francisco Chaves; Curry County, 1909, named for Territorial Governor George Curry; De Baca County, 1917, named for New Mexico's second State Governor, Ezequiel Cabeza de Baca; Guadalupe County, 1891, named for Our Lady of Guadalupe; Lincoln County, 1869, named in honor of President Abraham Lincoln; Quay County, 1903, named for Senator Matthew S. Quay; and Roosevelt County, 1903, named for President Theodore Roosevelt (Historical Side Bar 2004).

A modern military presence was established in the region during World War II with the opening of Clovis Army Air Base in 1942. It was selected as one of three sites, including Ephrata, Washington and Salina, Kansas, for a "super-airdrome."

On December 24th, 1942, the 409th Base headquarters and Air Base Squadron arrived at Clovis Air Base followed by the arrival of the 16th Bombardment Operational Wing, which arrived in January of 1943. In April of 1943, the base was renamed Clovis Army Air Field. From early 1943 to late 1945, the airfield served as a bombardment training base. From June through December 1943, the 302nd Bombardment Group trained B-24 personnel. B-17 crews from the 25th, 497th, 498th, 499th, and 500th Bombardment Groups trained at the airfield from February to April 1944. From 1945 to 1946, the airfield was home to B-29 Bombardment Groups.

OLDER F-111 AIRCRAFT, SUCH AS THIS ONE AT THE WEST ENTRANCE TO CLOVIS, TRAINED AT HIGH SPEED AND AT LOW LEVELS THROUGHOUT THE PECOS COMPLEX AIRSPACE.

Following the end of the war, Clovis Army Airfield operations began to decrease. Coinciding with personnel shortages, bombardment training was no longer a primary focus for the base. In July of 1946, the airfield was placed on a reduced status with complete inactivation occurring in May of 1947.

Control of the airfield changed hands numerous times during its period of inactivation, which lasted until 1951. In August of 1947, the Strategic Air Command took control, changing the name of the airfield to Clovis Air Force Base in 1948 before handing it over to Air Training Command in April of 1950, who then handed it over to Tactical Air Command (TAC) in July of 1951. The 140th Fighter Bomber Wing (140 FBW), flying the P-51 "Mustang" and made up of Air National Guard elements from Colorado, Wyoming, and Utah, was called to active duty as the first TAC unit at Clovis AFB (Air Force 2004b). The 140 FBW returned to Air National Guard control in 1952, replaced by the 50th FBW (50 FBW). In 1957, Clovis Air Base became a permanent Air Force installation and was renamed Cannon AFB in honor of the former commander of TAC, John Kenneth Cannon (Air Force 2004b). During the late 1950s and early 1960s, Cannon AFB personnel and planes were deployed throughout the world. Crews deployed to Berlin during the Berlin Wall Crisis, and a decade later, to Vietnam and Thailand during the conflict there. In 1965, the mission for Cannon AFB began to change, focusing more on training F-100 pilots and mechanics. In 1968, Cannon AFB added additional training for Forward Air Controllers and Air Liaison Officers.

With this, Cannon AFB became the largest replacement training wing in TAC. During the late 1960s, with the arrival of various F-111s, the primary mission for Cannon AFB began to once again change back into a tactical one. The current F-16 aircraft were based at Cannon AFB starting in 1995.

After the Persian Gulf War, the NMANG transitioned to flying the F-16 Fighting Falcon; in 1991 this was the only fighter squadron to fly the F-16 equipped with Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) pods.

3.6.2.2 Identified Cultural Resources

Melrose Air Force Range

Archaeological survey projects have been conducted within Melrose AFR since 1981, covering more than 45,000 acres (Geo-Marine 2000). More than 200 archaeological sites, ranging in age from the Paleoindian period (before 7500 BP) through the Historic era (after 400 BP), have been recorded on the range (Geo-Marine 2000). More than 50 of these are considered eligible or potentially eligible for inclusion in the NRHP, although none are listed. An evaluation of Cold War architectural structures indicated no eligible or potentially eligible buildings on Melrose AFR (Geo-Marine 1996).

Native American groups with historic ties to the area include the Mescalero Apache, Jicarilla Apache, and Comanche. The nearest reservation is the Mescalero Apache Reservation, located approximately 100 miles southwest of Melrose AFR near Ruidoso, New Mexico. The Jicarilla Apache Reservation is 195 miles northwest of the range. The Comanche Tribe is located near Lawton, Oklahoma, approximately 300 miles northeast of Melrose AFR. No traditional resources have been identified to date within Melrose AFR.

Military Operations Areas

Record searches of both the New Mexico State Register of Cultural Properties and the NRHP indicate that there are NRHP-listed properties in one county underlying project MOAs and proposed expansion areas. As Table 3.6-1 indicates, listed properties in De Baca county include the De Baca County Courthouse, which was constructed in 1917; the Fort Sumner Railroad Bridge, which was constructed in 1906; the Rodrick Drug Store; the Fort Sumner Women's Club; and the Fort Sumner Ruins. Fort Sumner was constructed in 1863 as a resettlement center for the Navajo and Apache Indians. Fort Sumner, near what had been the Bosque Redondo Indian Reservation, is also a New Mexico State Monument and has been identified as a Registered Cultural Property by the State of New Mexico. In addition to NRHP and state-listed cultural resources under project MOAs, there are also likely to be archaeological, architectural, or traditional resources that are either eligible or potentially eligible for the NRHP.

TABLE 3.6-1. STATE AND NATIONAL REGISTER-LISTED PROPERTIES UNDER AIRSPACE

Airspace	*County*	*Property*	*Location*	*State Register*	*National Register*
Pecos MOA/ Sumner ATCAA	De Baca	De Baca County Courthouse	Fort Sumner	X	X
		Fort Sumner Railroad Bridge	Fort Sumner	X	X
		Fort Sumner Ruins, State Monument	Fort Sumner	X	X
		Rodrick Drug Store	Fort Sumner	X	
		Fort Sumner Women's Club	Fort Sumner	X	X

Note: No NRHP properties are underlying the airspace in Chaves, Curry, Guadalupe, Lincoln, Quay, and Roosevelt Counties.

No Indian reservations underlie the project MOAs (Bureau of Indian Affairs 1998). Native American groups with historic ties to the area include the Mescalero Apache, Jicarilla Apache, Comanche, and Navajo. The nearest reservation is the Mescalero Apache Reservation, approximately 30 miles south of the MOAs near Ruidoso, New Mexico. The Jicarilla Apache Reservation is about 150 miles northwest of the MOAs; and the Comanche Reservation is in Lawton, Oklahoma.

In the 1960s, the Fort Sumner State Monument was placed near the Old Fort Sumner Museum to commemorate the signing of the peace treaty with the Navajo people 100 years earlier (Banks 1998). Fort Sumner State Monument is an NRHP-listed site of significant cultural activity. Throughout the year, the Monument is host to Navajo visitors who conduct ceremonies and prayer services to commemorate The Long Walk and their confinement at Bosque Redondo. Fort Sumner State Monument is currently protected by a Noise Sensitive Area (NSA) that has been effective in reducing noise impacts from overflights (personal communication, Smith 2005). As part of the ongoing process to turn the routes associated with The Long Walk into a National Historic Trail, ground-breaking for a more extensive Bosque Redondo Memorial began in November of 2003. Another point of interest, although not listed on the State or National Registers, is Billy the Kid's gravesite near the Old Fort Sumner Museum.

SEVERAL STATE AND NATIONAL REGISTER-LISTED HISTORIC SITES ARE LOCATED IN THE COMMUNITY OF FORT SUMNER.

There are a number of state or federally recognized trails underlying or within the vicinity of the affected airspace. The primary trail that partially underlies the affected airspace is known as

The Long Walk, which is discussed in detail in Section 3.6.2.1. Other trails that do not directly underlie the affected airspace include the Santa Fe trail to the west, which links Santa Fe and Mexico; the Turquoise Trail, which links Albuquerque and Santa Fe, located to the north of the project area; the Old Spanish Trail to the northwest of the project area, which links Los Angeles and Santa Fe; and historic Route 66, which linked Chicago and Santa Monica, California. The Goodnight-loving and Stinson Trails, discussed in Section 3.6.2.1, are not officially recognized by either the state or federal government.

Air Traffic Study Area

A search of the New Mexico State Register of Cultural Properties and the NRHP identified no NRHP-listed properties underlying the air traffic study area that includes the potential J-74 re-route.

3.6.2.3 Native American Consultation and Coordination

In compliance with NEPA and Section 106 of NHPA, the Air Force initiated contact with the Comanche Tribe of Lawton, Oklahoma; Jicarilla Apache Tribe of Dulce, New Mexico; Kiowa Tribe of Carnegie, Oklahoma; Apache Tribe of Andarko, Oklahoma; and the Mescalero Tribe of Mescalero, New Mexico to identify potential concerns associated with the proposed action.

3.7 Land Use and Recreational Resources

3.7.1 Definition of the Resource

The attributes of land use addressed in this analysis include general land use patterns, land ownership, land management plans, and special use areas. General land use patterns characterize the types of uses within a particular area, including agricultural, residential, military, and recreational. Land ownership is a categorization of land according to type of owner; the major land ownership categories include private, federal, Native American, and state. Federal lands are described by the managing agency, which may include the USFWS, U.S. Forest Service (USFS), BLM, or DoD. Land management plans include those documents prepared by agencies to establish appropriate goals for future use and development. As part of this process, sensitive land use areas (e.g., Wilderness, Wild and Scenic Rivers) are often identified by agencies as being worthy of more rigorous management.

THE PECOS COMPLEX OF MILITARY TRAINING AIRSPACE COVERS A LARGE AREA CHARACTERIZED BY HIGH PLAINS AND GRASSLANDS WITH SPARSE VEGETATION AND FEW PERMANENT BODIES OF WATER.

Recreation resources consider outdoor recreational activities that take place away from the residences of participants. This includes natural resource areas (such as BLM managed land) and man-made facilities (such as county parks and facilities) that are designated or available for public recreational use.

The ROI for land use consists of all the lands under the current airspace, the proposed expansion areas, proposed Capitan ATCAA, and the air traffic study area applicable to the Draft EIS Proposed Action and Alternative B (Figure 3.7-1).

3.7.2 EXISTING CONDITIONS

The area underlying the airspace includes portions of Guadalupe, Roosevelt, Lincoln, De Baca, Chaves, Quay, and Curry counties. Major transportation routes in the study area include State Highways 54, 285, and 60. Towns within the study area range in population from less than 200 to about 1,900 (University of New Mexico [UNM] 2000).

The majority (78 percent) of the land under the airspace is privately held. The majority of the public land that would be affected by the Proposed Action is administered by the BLM. Public lands managed by the BLM typically provide a variety of recreational experiences such as hiking, caving, camping, hunting, and nature viewing.

Melrose AFR, which is administered by Cannon AFB, is located in the southern portion of the restricted airspace approximately 30 miles west of Cannon AFB. Melrose AFR comprises 66,000 acres with an additional 20,896 acres of buffer area (personal communication, McCord 2001). The Air Force leases approximately 52,000 acres to ranchers for cattle grazing (personal communication, Chandler 2003). 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.

Table 3.7-1 shows the acreages and percentages of land uses found under Restricted Areas R-5104/5105. Rangeland followed by agriculture are the dominant land uses.

TABLE 3.7-1. EXISTING LAND USE UNDER R-5104/5105

Land Use Category	*Acreage*	*Percentage of Restricted Area*
Rangeland	245,325	83
Agriculture	48,249	16
Water/Wetland	767	<1
Urban	577	<1
Total	294,918	100

Source: Air Force 2001e.

Approximately 71 percent of all land under the restricted airspace is held in private ownership, 21 percent are state lands, and 8 percent is administered by the Air Force (Air Force 2001e).

As shown in Table 3.7-2, approximately 99 percent of the land under the MOAs and ATCAAs is used for rangeland and agriculture. The remaining land (less than 1 percent) is designated as forest, water, wetland, developed, or urbanized land. Residences exist within the community of Fort Sumner, as well as on large acreages. An average density within the total project area is about one person per square mile (U.S. Census 2000b). Section 3.8 provides further discussion of population data under the airspace.

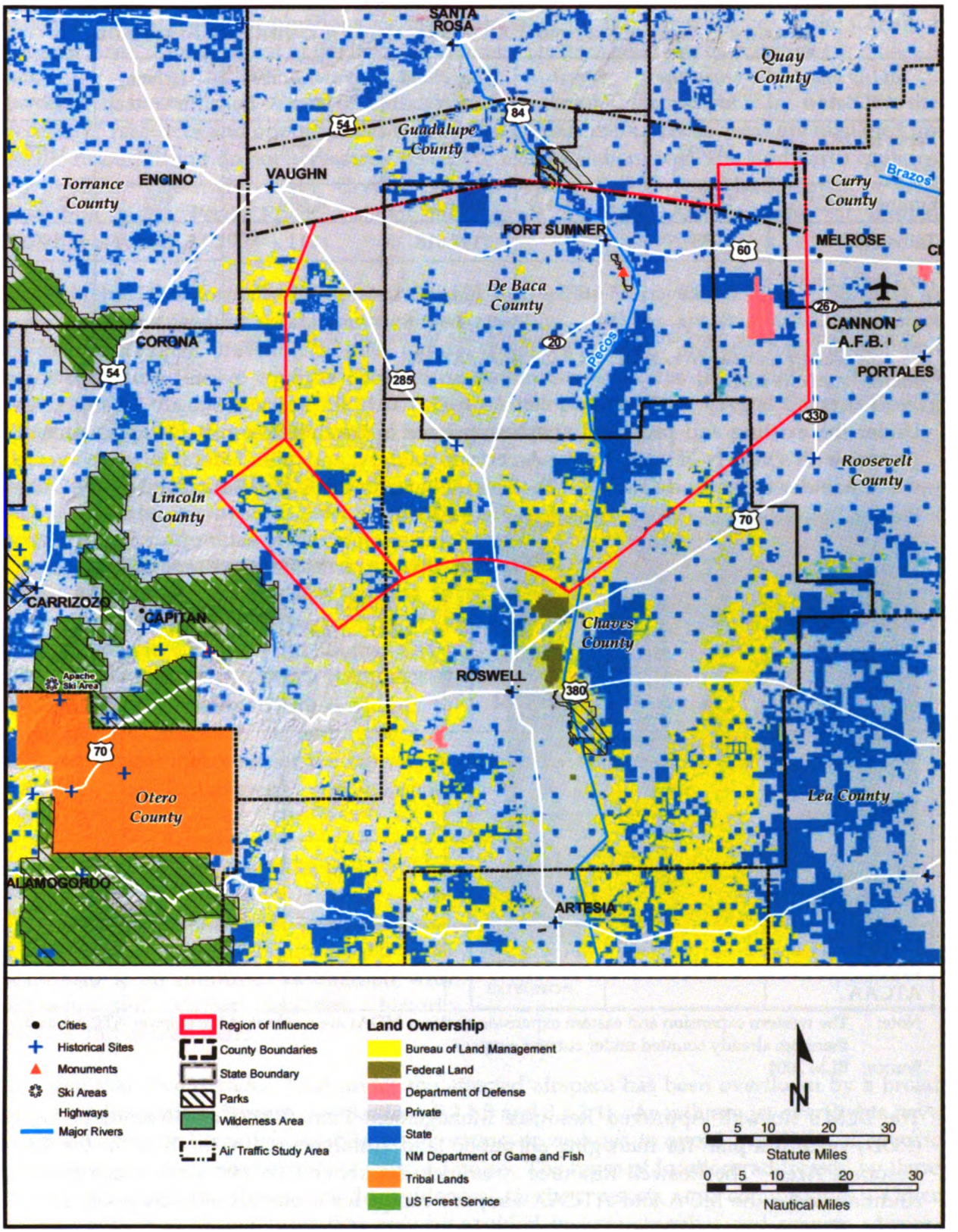


FIGURE 3.7-1. LAND STATUS WITHIN THE REGION OF INFLUENCE

TABLE 3.7-2. EXISTING LAND USE UNDER CURRENT AIRSPACE

MOAs and ATCAAs	*Agriculture (acres)*	*Forest (acres)*	*Rangeland (acres)*	*Water Bodies (acres)*	*Urban (acres)*	*Total Acreage*
Pecos MOA/ ATCAA	15,700	429	1,952,167	4,724	2,078	1,975,098
Sumner ATCAA	15,437	0	2,046,756	4,689	392	2,067,274
Taiban MOA	785	0	197,618	911	39	199,353
Air Traffic Study Area	171,803	6,375	534,662	827	4,652	718,319

Note: Total acreage numbers are not cumulative due to overlap of airspaces. Sumner ATCAA includes the western and eastern expansion of Pecos MOA/ATCAA.
Source: Air Force 2001e.

Under the existing and proposed airspace, private ownership accounts for approximately 78 percent with a variety of state, Native American, military, and other federal interests overseeing the remainder of the land (Table 3.7-3). Federal lands in the ROI are managed by the BLM and the Air Force. Land status is depicted on Figure 3.7-1.

TABLE 3.7-3. LAND OWNERSHIP UNDER THE AFFECTED AIRSPACE

	Private (acres)	*State (acres)*	*Indian Reservation (acres)*	*Military (acres)*	*Other Federal (acres)*
Current Airspace	2,085,624	485,354	0	22,098	367,189
Western Expansion of Pecos MOA	113,411	50,766	0	0	145,701
Eastern Expansion of Pecos MOA	204,574	33,312	0	20,619	4,878
Proposed Capitan ATCAA	130,491	31,562	0	0	105,248

Note: The western expansion and eastern expansion of Pecos MOAs are a subset of the Sumner ATCAA and therefore already counted under current airspace.
Source: BLM 2004

The BLM's Roswell Approved Resource Management Plan (RMP) and Record of Decision (ROD) present a plan for managing all public land administered by the BLM in the Roswell Resource Area. The Roswell Resource Area includes about 1,490,000 acres encompassing all counties under the MOA and ATCAA airspace except for a portion of Chaves County (BLM 1997a). This portion of Chaves County is included in the Carlsbad Approved RMP Amendment and ROD (BLM 1997b). The RMP covers a wide variety of natural and cultural resource management areas. The Carlsbad RMP Amendment and ROD relate to general land

management and use determinations for management of oil and gas resources in the Carlsbad Resource Area. Management of the land is guided by De Baca and Chaves counties.

The BLM has established Areas of Critical Environmental Concern (ACECs) based on the presence of resources and opportunities for efficient management. These areas are managed for specific resources and do not necessarily restrict or exclude other uses. The study area contains four ACECs: Coachwhip Cave, Crystal Caverns-Devil's Well Caves, Martin-Antelope Gyp Cave, and North Pecos River. Management goals for these ACECs allow for limited recreational use (BLM 1997a).

The BLM has also formally designated Special Recreation Management Areas (SRMAs) to recreation areas needing special management attention. SRMAs are established to protect sensitive recreation investments and natural resource values, prevent natural resource degradation, and resolve conflicts between recreational user groups (BLM 1997a). The land beneath the MOAs contains four SRMAs (Martin-Antelope Gyp Cave, Crystal Caverns-Devil's Well, Coachwhip Cave, and Billy the Kid Recreation Area).

Off-Highway Vehicle (OHV) designations are established to provide safe, quality recreational opportunities while minimizing adverse impacts on sensitive resource values (BLM 1997a). This use can be classified as open, closed, or limited. The four SRMAs discussed previously allow for limited OHV use, with small portions of each being closed to any OHV use. Limited use is subject to various restrictions such as limiting use to designated roads and trails, or the number or types of vehicles allowed and seasonal restrictions.

THE BLM HAYSTACK MOUNTAIN OFF-ROAD AREA IS UNDER THE SOUTHEAST PORTION OF THE PROPOSED PECOS MOA EXTENSION.

State lands underlying the MOA and ATCAA airspace include the Fort Sumner State Monument, approximately 10 miles southeast of Fort Sumner (refer to Figure 3.7-1). This monument is an improved destination with restroom and visitor facilities, historic exhibits, and guided tours.

For more than five decades, land under the affected airspace has been overflown by a broad array of military aircraft types (see Sections 2.2.1.5 and 3.6.2.1). As military jet overflights have continued, the Air Force has established operating procedures to avoid overflight of specific locations considered to be sensitive to aircraft noise. The types of locations addressed by these special operating procedures include residences, ranches, resorts, and communities. Other sensitive receptors or land uses that may be avoided include churches and schools. Noise-sensitive areas are defined in the Flight Information Publication reviewed by military pilots for their training missions. Sensitive noise receptors have been identified under the airspace. Citizens seeking information about military overflights contact Cannon AFB Public Affairs

directly. The Pecos North Low MOA is restricted to 1,500 feet AGL over Fort Sumner and its associated airport. This "bubble" in the airspace is designed to avoid sensitive receptors in the area.

Hunting is an important recreational and economic resource in the ROI. Lands under the current and proposed airspace fall within the NMDGF Big Game Units 32, 38, 39, and 40 (NMDGF 2004a). Big game hunted in the region are mule deer, white-tailed deer, pronghorn antelope, turkey, bear, and cougar. Hunting seasons vary by sporting arm (i.e., rifle, bow, or muzzleloader) and species. In general, open seasons (i.e., any sporting arm) for deer are two separate periods of three to four days in November, while bow-only seasons are in September and January. In 2002–2003, an estimated 5,627 hunters harvested 1,431 deer in Units 32, 38, 39, and 40 (NMDGF 2004b). Open antelope season is two days in September, and a bow-only season is five days in late August. Antelope Management Units 23–25, 32 and 37 intersect the ROI. In 2002–2003, an estimated 440 hunters harvested 394 antelope in these units (NMDGF 2004c).

Hunting can occur on public or private lands. Some public lands, such as state parks, are often closed to hunting, while others, such as wildlife management areas, may have specific restrictions. In New Mexico, private landowners may apply for private land authorization certificates to allow antelope hunting on their lands. NMDGF issues the landowner a set number of authorizations for the land and associated leased land (i.e., grazing leases with BLM or state land trust). The landowner may keep the authorizations or sell them to hunters or state-registered outfitters and guides. Within Antelope Management Units 23–25, 32 and 37, 192 landowners are registered in the program. Of the antelope harvest in these units in 2002-2003, 89 percent were taken from private lands.

Proposed Capitan ATCAA Airspace. Approximately 99 percent of the land under this proposed airspace is used for rangeland and agriculture. Approximately 1 percent of the remaining land is forest, water, or wetland and urban areas (Table 3.7-4).

TABLE 3.7-4. EXISTING LAND USE UNDER NEW AND MODIFIED AIRSPACE

	Agriculture (acres)	*Forest (acres)*	*Rangeland (acres)*	*Water Bodies (acres)*	*Urban/ Industrial (acres)*	*Total Acreage*
Capitan ATCAA	455	1,408	265,398	0	38	267,299
Western Expansion of Pecos MOA/ATCAA	0	0	309,815	0	0	309,815
Eastern Expansion of Pecos MOA/ATCAA	12,454	0	250,443	0	342	263,369
Air Traffic Study Area	189,675	7,644	545,670	152	1,641	744,782

Note: The western and eastern expansion areas are a subset of the Sumner ATCAA area described in Table 3.7-2.

Private ownership accounts for approximately 49 percent of the land underlying the proposed Capitan ATCAA with a variety of state and federal interests overseeing the remainder of the land below the airspace (refer to Table 3.7-3).

Recreational uses in this area vary from hunting and fishing to hiking and biking, as well as OHV use. There is one SRMA under the proposed Capitan ATCAA, Torgac Cave, which is part of the Roswell Cave Complex ACEC. This area allows for limited OHV use with only 40 of the 640 acres closed (BLM 1997a).

DEPARTMENT OF TRANSPORTATION ACT SECTION 4(F) LANDS

The Draft EIS Proposed Action and Alternative B included land over which J-74 could have been re-routed. The Air Force preferred alternative (Alternative A) does not include any re-routing of J-74. A discussion on Department of Transportation 4(f) lands within the Air Traffic Study Area is contained in Appendix I of the Final EIS for continuity.

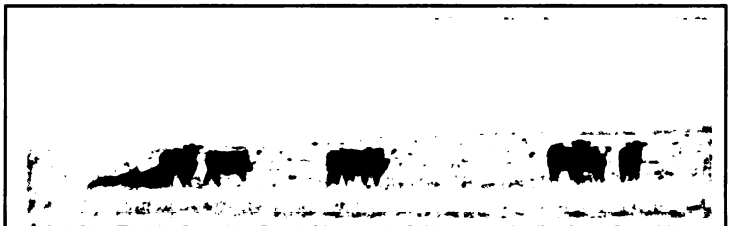
SECTION 6(F) (3)-LAND AND WATER CONSERVATION FUNDS ACT

Section 6(f)(3) of the 1964 Land and Water Conservation Funds (L&WCF) Act requires that all property acquired or developed with L&WCF assistance be maintained perpetually in public recreation use. The State is responsible for compliance and enforcement of these provisions and to ensure consistency with the contractual agreement with the National Park Service. Coordination to determine 6(f) resources and any potential impacts under the airspace will be conducted during the public distribution of the Draft EIS. The New Mexico Parks and Recreation Division of the Department of Energy, Minerals, and Natural Resources stated that if they had any concerns they would be raised during the comment period for the Draft EIS (personal communication, Anderson 2004).

3.8 SOCIOECONOMICS

3.8.1 DEFINITION OF RESOURCE

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income, and regional industries. Changes to these fundamental socio-economic components can influence other resources such as housing availability, utility capabilities and community services.



AGRICULTURE IS THE DOMINANT INDUSTRY UNDER THE AIRSPACE WITH 99 PERCENT OF THE LAND IN AGRICULTURE, PREDOMINANTLY GRAZING.

Agriculture is the dominant industry in the area under the proposed airspace changes. Much of the socioeconomic activity, including employment and related services provided by communities adjacent to the airspace, is related to ranching and more intensive agriculture such as dairies and irrigated cropland.

3.8.2 EXISTING CONDITIONS

The ROI for socioeconomics consists of seven counties that contain land area under the airspace associated with the NMTRI proposal. This affected airspace overlies rural areas in east-central New Mexico, including virtually all of De Baca County and portions of Curry, Chaves, Guadalupe, Lincoln, Quay, and Roosevelt counties (see Figure 1-1). Throughout this section, ROI refers to these seven counties in their entirety. Affected area is the specific land area under the affected airspace boundaries. De Baca County comprises the greatest share of the affected area and is most representative of the socioeconomic characteristics of the area under the affected airspace (Table 3.8-1). With the exception of Fort Sumner in De Baca County, population centers in the ROI counties are situated outside of the affected area. Consequently, county-level data tends to be dominated by the socioeconomic characteristics of communities outside the affected area. For this reason, the focus of the analysis, when based on county-level data, will be on De Baca County. More detailed data, at the census block group level, is available regarding certain demographic characteristics. Therefore, in discussions of these parameters, data specific to the affected area (i.e., those portions of the seven counties actually underlying the affected airspace) are also presented and analyzed.

TABLE 3.8-1. LAND AREA UNDER THE AFFECTED AIRSPACE BY COUNTY

County	*Affected Acres in County*	*Percent of Total Affected Area*	*Percent of County under Airspace*
Chaves	775,732	26.2	19.9
Curry	48,449	1.7	5.3
De Baca	1,320,734	44.6	89.0
Guadalupe	111,145	3.8	5.7
Lincoln	350,456	11.8	11.3
Quay	27,448	0.9	1.5
Roosevelt	326,319	11.0	20.6

Source: UNM 2003

Several communities in proximity to the affected area are profiled in this section to provide a regional context for the socioeconomic analysis. Fort Sumner, located in De Baca County, is located under the affected airspace, while cities outside the affected airspace but within the ROI counties include Clovis (Curry County), Portales (Roosevelt County), Vaughn (Guadalupe), and Roswell (Chaves County).

3.8.2.1 POPULATION AND HOUSING

Much of the airspace associated with the proposed action has been in existence for many years. The changes being proposed would alter the current airspace configuration by expanding the total affected airspace to include additional underlying areas in Chaves, Curry, De Baca, Guadalupe, Lincoln, and Roosevelt counties. The affected area in Quay County would be the same as under existing conditions. Because military airspace is typically configured to avoid densely populated and metropolitan or urban areas, such airspace by design tends to be located over rural and less developed areas. While populated areas do occur within the boundaries of

the NMTRI affected airspace, these areas are typically scattered, relatively low in density compared to urbanized areas, and are avoided to the maximum extent possible. Less than 20 percent of the land area in each of the ROI counties underlies the airspace, with the exception of De Baca County, which is almost entirely under the affected airspace (89 percent of county land area). De Baca County is considered most representative of the affected area.

Population Characteristics

Current and projected population data for the ROI are presented in Table 3.8-2. The total 2001 estimated population for the seven counties in the ROI was 159,622 persons, representing 8.7 percent of the New Mexico population of 1.8 million. Population change during the past decade, from 1990 to 2000, varied greatly across the seven counties, ranging from a decrease of 6.0 percent in Quay County to an increase of 59.0 percent in Lincoln County. De Baca County population was essentially stable over the decade at one person per square mile. Overall, the seven counties experienced approximately one-half the change in population as New Mexico State over the same decade.

Table 3.8-2. Population Data and Projections by County

	Population			*Percent Change 1990-2000*	*Population Density (per mile²)*	Population Projections		
	2001	*2000*	*1990*			*2010*	*2020*	*2030*
New Mexico	1,829,146	1,819,046	1,514,609	20.1	15.0	2,112,957	2,382,999	2,626,333
Chaves County	60,177	61,382	57,849	6.0	10.1	64,864	67,591	69,251
Curry County	45,022	45,044	42,207	7.0	32.0	46,973	48,190	48,168
De Baca County	2,132	2,240	2,252	-1.0	1.0	2,289	2,296	2,296
Guadalupe County	4,545	4,680	4,156	13.0	1.5	5,304	5,748	5,989
Lincoln County	19,814	19,411	12,219	59.0	4.0	23,792	27,100	29,715
Quay County	9,811	10,155	10,823	-6.0	3.5	10,030	9,659	8,986
Roosevelt County	18,121	18,018	16,702	8.0	7.4	20,197	22,159	23,773
Total ROI	159,622	160,930	146,208	10.1	7.0	173,449	182,743	188,178

Source: New Mexico Economic Development Department (EDD) 2004, U.S. Census 2000a, UNM 2003.

Average population density in the ROI counties is approximately 7.0 persons per square mile, about half the state density of 15.0 persons per square mile, reflecting the rural, sparsely populated nature of the region. Population densities in individual counties range from 1.0 persons per square mile in De Baca County to 32.0 persons per square mile in Curry County. Population density in the U.S. overall is an average 79.6 persons per square mile.

Although the entire population in the seven ROI counties is 159,622 persons, the actual population of the land area under the affected airspace is estimated to be 4,336 persons (see Table 3.8-3). This estimate was derived using Census Tract and Block Group data from the 2000 Census. De Baca County, which accounts for only 1.3 percent of the seven-county population, represents 50.5 percent of the estimated population under the affected airspace. In De Baca

County, 97.3 percent of the population resides under the proposed airspace. In the remaining six ROI counties, less than 4 percent of each county's population resides under the affected airspace (see Table 3.8-3). The sparsely populated nature of the affected area becomes apparent by reviewing this detailed Census data. Population density under the affected airspace averages 1.9 persons per square mile, although this average overstates the population density throughout the area because over 26 percent of the persons under the airspace reside in Fort Sumner. Fort Sumner, with a population of 1,160, is home to over half the population of De Baca County. Under 99 percent of the affected airspace, the population density is estimated to be less than one-half person per square mile.

TABLE 3.8-3. DETAILED POPULATION DATA UNDER THE AFFECTED AIRSPACE (2000)

	Population Under Affected Airspace	*Percent of Affected Population*	*Percent of Total County Population*	*Population Density Under Affected Airspace (per mile²)*
Chaves County	921	19.9	1.3	0.68
Curry County	56	2.1	0.2	1.14
De Baca County	2,191	51.5	97.8	1.06
Guadalupe County	121	2.8	2.6	0.69
Lincoln County	631	14.6	3.3	1.15
Quay County	22	0.5	0.2	0.51
Roosevelt County	466	10.7	2.6	0.91
Total Affected Area	4,336	100.0	2.7	0.94

Source: U.S. Census 2000b.

Population data for communities located within the seven affected counties in the ROI are presented in Table 3.8-4. With the exception of Fort Sumner in De Baca County, the communities profiled are located outside the area under the affected airspace.

TABLE 3.8-4. POPULATION DATA BY CITY

Communities in the ROI	POPULATION			*Percent Change 1990–2000*	*Population Density (per mile²)*	*Percent of County Population*
	2001	*2000*	*1990*			
Clovis	32,511	32,667	31,366	5.5	1452.5	72.5
Fort Sumner	1,160	1,249	1,265	-1.6	375.1	55.8
Portales	11,098	11,131	10,758	4.1	1625.0	61.8
Roswell	44,058	45,293	44,450	1.4	1565.1	73.8
Vaughn	510	559	633	-14.8	96.3	11.5

Source: New Mexico EDD 2004, U.S. Census 2000a.

The population densities under regional military training airspace (from Figure 2-1) were calculated for comparative purposes. Airspace coordinates were overlaid on 2000 census tract data using a geographic information system. The population density per square mile under the

Beak MOA was calculated at 7.59, under the Bronco MOA was 12.02, under the Mt. Dora MOA was 1.11, under the Talon MOA was 17.65, and under the R-5107 complex was estimated to be 3.50. As noted in Table 3.8-3, population per square mile under the Pecos MOA was 0.94.

Housing Characteristics

Housing supply in the seven-county ROI, presented in Table 3.8-5, totaled 77,034 units in 2000. Occupied housing units amounted to 60,946 units, resulting in a housing occupancy rate of about 80 percent. Owner-occupied units account for 68 percent of occupied units, with the remaining 32 percent occupied by renters. The median value of owner-occupied units in the ROI ranged from a low of $51,200 in Guadalupe County to a high of $108,400 in Lincoln County. Vacancy rates are comparable throughout the ROI but are highest in Quay County (4.4 percent homeowner vacancy rate, 18.9 percent rental vacancy rate) and lowest in Roosevelt County (3.8 percent homeowner vacancy rate, 11.7 percent rental vacancy rates). Using De Baca County data as a guide, the estimated housing under the proposed airspace would total 2,740 units with a median value of $60,000.

Table 3.8-5. Housing Characteristics by County (2000)

	Household Size	*Total Housing Units*	*Occupied Housing Units*	*Owner-Occupied Units*	*Renter-Occupied Units*	*Median Value of Owned Units*
Chaves	2.72	25,647	22,561	16,000	6,567	$61,000
Curry	2.69	19,212	16,766	9,958	6,808	$64,700
De Baca	2.46	1,307	922	719	203	$45,800
Guadalupe	2.83	2,160	1,655	1,222	433	$51,200
Lincoln	2.37	15,298	8,202	6,336	1,866	$108,400
Quay	2.42	5,664	4,201	2,968	1,233	$54,000
Roosevelt	2.73	7,746	6,639	4,163	2,476	$54,900
Total	2.64	77,034	60,946	41,366	19,583	-

Source: U.S. Census 2000a.

3.8.2.2 Economic Activity

A number of factors have influenced economic activity and employment in New Mexico in recent years, contributing overall to moderate growth despite some industry-specific declines. Since the early 1990s, New Mexico's numerous U.S. military sites and related enterprises have experienced reduced federal defense spending, resulting in a loss of more than 8,500 jobs in the past decade (UNM 2001). The mining and manufacturing sectors, particularly copper and potash mining and textile manufacturing, declined during the 1990s, losing hundreds of relatively high-wage jobs. High-tech manufacturing, on the other hand, has shown significant growth since 1990. Employment in this sector, which contributed an estimated 30,000 total jobs in 2000, has helped offset federal job losses during the same period.

The 1990s were a period of expansion for the ranching industry in New Mexico, particularly dairy operations. Agriculture, food processing and food-related industries together employ over 100,000 people in New Mexico and contribute $2 billion in annual crop and livestock sales (NMDA 2004). Milk production in New Mexico has increased 400 percent since 1990, ranking the state 7th in the nation in milk production, 5th in the nation in production per cow, and first in the nation in herd size (New Mexico State University 2004). The dairy industry has noticeably grown in the past decade in Chaves, Curry, and Roosevelt Counties (see Section 3.8.2.3).

NEW MEXICO MILK PRODUCTION IS 7TH IN THE NATION. THIS DAIRY IS IMMEDIATELY SOUTH OF CANNON AFB AND EAST OF THE TRAINING AIRSPACE.

Additional industry trends in recent years include the influx of call centers to the state, due to favorable legislation, and the growth of the gaming industry, particularly Native American-owned casinos. By 2000, these two industries contributed 12,000 and 6,000 jobs, respectively (UNM 2001). There also were substantial job gains in the retail sector due to the proliferation of Wal-Marts across the state. While job growth was moderate overall, the losses in relatively high-paying federal, mining and manufacturing jobs compared to the gains in high-tech manufacturing and relatively low-paying call center, gaming, and retail jobs resulted in slow growth in the state's average wage level.

EMPLOYMENT AND JOB COMPOSITION

Whereas employment in the State of New Mexico increased close to 15 percent during the decade of the 1990s, employment in the seven counties comprising the ROI increased less than 5 percent during the same period (see Table 3.8-6). From 1990 to 2000, employment in the ROI increased by 2,880 jobs (4.8 percent). The civilian labor force grew by only 2.0 percent during this time, meaning that—for the most part—the increase in employment utilized idle labor already available in the area. Consequently, the unemployment rate in the region dropped from 8.0 percent to 4.9 percent during this period. Unemployment in the state also decreased from 1990 to 2000, from 6.5 percent to 5.0 percent, but increased again to 6.4 percent in 2003. There were 1,001 persons in the civilian labor force in De Baca County in 2000, with employment of 957 jobs and an unemployment rate of 4.4 percent.

TABLE 3.8-6. EMPLOYMENT CHARACTERISTICS

	2000			1990		
	Civilian Labor Force	*Employment*	*Unemployment Rate*	*Civilian Labor Force*	*Employment*	*Unemployment Rate*
Chaves	24621	23114	6.1	25482	22802	10.5
Curry	19448	18307	4.2	18462	17409	5.7
De Baca	1001	957	4.4	925	855	7.6
Guadalupe	1776	1629	8.3	1793	1598	10.9
Lincoln	7641	7334	4.1	6170	5733	7.1
Quay	4499	4311	4.2	4924	4601	6.6
Roosevelt	7373	7126	3.4	7321	6900	5.8
Total	66359	62778	4.9	65077	59898	8.0

Source: New Mexico Department of Labor 2004.

The distribution of jobs by industry sector for the seven ROI counties is displayed in Table 3.8-7. In the ROI overall, the services industry comprised the largest employment sector accounting for 23 percent of all jobs, followed closely by the retail trade industry accounting for 20 percent of all jobs. State and local government comprised 15 percent of total ROI employment. Farm employment and agricultural services together comprised 9 percent of employment in the seven counties.

TABLE 3.8-7. DISTRIBUTION OF EMPLOYMENT BY INDUSTRY

	Chaves	*Curry*	*De Baca*	*Guadalupe*	*Lincoln*	*Quay*	*Roosevelt*	*ROI*
Farm	5.7%	4.8%	30.3%	13.9%	4.8%	17.0%	16.2%	7.7%
Agricultural Services, Forestry, Fishing	2.3%	*	*	*	1.6%	*	2.4%	1.3%
Mining	3.9%	*	*	*	*	*	0.6%	1.5%
Construction	4.8%	4.1%	6.3%	11.6%	8.1%	4.3%	5.4%	5.3%
Manufacturing	8.3%	1.9%	3.1%	*	3.2%	1.2%	3.4%	4.5%
Transportation, Public Utilities	3.3%	6.3%	*	6.6%	3.2%	5.7%	6.0%	4.6%
Wholesale Trade	3.5%	3.0%	*	*	*	*	2.7%	2.4%
Retail Trade	20.0%	19.7%	14.8%	24.1%	22.8%	20.3%	17.6%	20.1%
Finance, Insurance, Real Estate	5.8%	5.0%	2.7%	*	11.2%	3.8%	4.5%	5.8%
Services	24.9%	22.6%	12.9%	20.9%	30.2%	20.0%	15.0%	23.3%
Federal Civilian	1.4%	4.3%	1.6%	1.6%	1.3%	1.6%	0.9%	2.2%
Military	0.7%	14.6%	*	0.7%	0.6%	0.7%	0.8%	4.7%
State & Local Government	15.3%	11.6%	20.5%	17.1%	10.9%	20.5%	24.6%	15.0%

Note: An * denotes figures not published to avoid disclosure of confidential information.
Source: U.S. Bureau of Economic Analysis 2004.

Employment by industry in De Baca County is most representative of employment under the affected airspace. Farm employment in De Baca County accounts for 30.3 percent of all jobs in the county, compared to 7.7 percent in the ROI. State and local government employment in De Baca County accounts for 20.5 percent of total employment, followed by retail trade and services with 14.8 percent and 12.9 percent of employment, respectively.

Income and Earnings

Employment increased in each of the seven counties in the ROI over the decade from 1990 to 2000 (Table 3.8-8). Wage growth was mixed with the average annual wage per job increasing in all counties, but real wages decreasing in four of the seven counties when inflation is taken into account. Quay County experienced the sharpest decline, with real annual wages per job falling over 20 percent. Chaves, Curry, and Roosevelt counties experienced declines in real wages from 1990 to 2000. Real annual wages per job rose 9.3 percent in Guadalupe County, and rose 8.8 percent in Lincoln County. De Baca County had an annual wage per job increase of 3.5 percent over the past decade.

Table 3.8-8. Income and Business Activity

	2000				1990			
	Per Capita Income	*Earnings per Job*	*Business Establishments (units)*	*Gross Retail Receipts*	*Per Capita Income*	*Earnings per Job*	*Business Establishments (units)*	*Gross Retail Receipts*
Chavez	$18,797	$22,761	1,508	$441 M	$14,184	$19,846	1,387	$284 M
Curry	$20,698	$24,356	1,059	$346 M	$14,538	$21,990	1,021	$230 M
De Baca	$17,189	$19,109	61	$12 M	$12,630	$14,010	66	$8 M
Guadalupe	$13,244	$21,319	106	$41 M	$10,124	$14,798	102	$20 M
Lincoln	$17,428	$19,899	707	$207 M	$15,784	$13,878	489	$99 M
Quay	$17,953	$18,700	289	$69 M	$13,355	$18,161	275	$58 M
Roosevelt	$18,378	$20,411	347	$109 M	$13,117	$19,522	347	$71 M

Source: U.S. Census 2000b, New Mexico EDD 2004.

There were a total 4,077 business establishments in the ROI during 2000, an 11 percent increase from 1990. The number of business establishments decreased in De Baca County from 66 units in 1990 to 61 units in 2000. Gross retail receipts in the ROI amounted to a total $1.2 billion in 2000, an increase of almost 60 percent over the 1990 gross retail receipts of $768 million. Despite the decline in the overall number of business establishments, De Baca County experienced similar growth in gross retail receipts, expanding 50 percent from $8 million in 1990 to $12 million in 2000.

3.8.2.3 AGRICULTURE

ECONOMIC ACTIVITIES INCLUDE SECONDARY INDUSTRIES SUCH AS FARM EQUIPMENT SALES PICTURED HERE IN FORT SUMNER.

Agriculture represents a significant component of New Mexico's economy and to the economy under the affected airspace. Annual crop and livestock sales in the state amount to $2 billion (NMDA 2004). Farming employment and related food processing and food service jobs comprise 10 percent of state employment. A variety of agricultural commodities are produced on New Mexico's farms and ranches, including beef, chile, corn, milk, apples, lamb, sorghum, wheat, peanuts, and wool. In addition to its direct contributions to state output and employment, agricultural activity in New Mexico supports a number of secondary industries, including those associated with farm equipment, feed, and fertilizer.

Milk and other dairy products are the largest income generators for New Mexico farmers and ranchers. New Mexico ranks 7th in the nation in terms of overall milk production, up from 30th in 1990. Three of the seven ROI counties (Chaves, Curry, and Roosevelt) rank among the top four milk-producing counties in the state and in the top 20 dairy counties in the nation (NMDA 2004). The dairy industry provides additional contributions to local and regional economies from the hiring of labor and the purchase of feed and other farm supplies. New Mexico dairies provide 4,000 annual jobs, with an estimated payroll of $81 million, and are among the largest consumers of New Mexico-grown feed crops. Dairy operations in New Mexico include 194 dairy farms, nine fluid milk plants, four cheese plants, one condensed powdered milk plant, and one ice cream plant.

The U.S. Census of Agriculture, taken at 5-year intervals, provides a detailed description of agricultural operations and provides the most recent comprehensive published data on farm and ranch activity in the ROI. This EIS includes data from the 2002 Census of Agriculture as presented in Table 3.8-9. Data on some agricultural elements are available from the NMDA. Comments on the Draft EIS included specifics on one ranching operation under the Pecos MOA. These comments are reproduced in the public and agency comments section of this Final EIS (refer to Chapter 6.0).

TABLE 3.8-9. GENERAL AGRICULTURAL DATA FOR ROI (2002)[1]

	Farms	*Land in Farms (Acres)*	*Average Size of Farm*	*Cropland (Acres)*	*Irrigated Land (Acres)*	*Market Value of Products*
Chaves	604	2,515,660	4,165	100,625	69,789	$283,949
Curry	677	916,320	1,354	497,232	95,103	$232,601
De Baca	188	1,409,434	7,497	21,739	8,061	$15,241
Guadalupe	208	1,461,766	7,028	14,993	4,208	$10,485
Lincoln	343	1,605,566	4,681	18,637	5,074	$11,116
Quay	594	1,651,616	2,780	246,558	29,684	$23,137
Roosevelt	804	1,500,821	1,867	396,207	90,628	$190,083
Total	3,418	11,061,183	3,236	1,295,991	302,547	$766,612

Note: 1. Beef cows typically refer to feedlots and milk cows to dairies as compared with range (other) cattle.
Source: National Agricultural Statistics Service 2004.

The 2002 Census of Agriculture identified a total of 3,418 farms and ranches in the ROI containing about 11 million acres of land (see Table 3.8-9). The average farm in the ROI is 3,236 acres in size, ranging from an average of 1,354 acres per farm in Curry County to 7,497 acres per farm in De Baca County, most representative of the agriculture under the affected airspace. Cropland accounts for 12 percent of the land in farms, and less than 3 percent of the land in farms is irrigated. Livestock grazing and other uses account for 85 percent of land in farms and ranches in the seven county ROI.

The 2002 Census of Agriculture provides numbers of livestock on farms by county. Table 3.8-10 summarizes this information within the ROI. Cattle represent the greatest proportion of livestock in the ROI, accounting for 89 percent of all farm animals. Sheep and lambs account for 10 percent, with the remaining 1 percent of ROI livestock mainly comprised of hogs, pigs, horses, and poultry.

TABLE 3.8-10. NUMBER OF LIVESTOCK ON FARMS (2002)

	Beef Cows	*Milk Cows*	*Other Cattle*	*Hogs/Pigs*	*Sheep/Lambs*	*Horses/Ponies*
Chaves	28,557	85,228	65,709	189	36,930	1,947
Curry	14,837	57,179	126,388	338	476	1,191
De Baca	17,716	8	13,325	12	2,412	650
Guadalupe	17,083	10	12,434	24	4,810	522
Lincoln	19,844	65	10,449	171	25,795	1,326
Quay	29,153	12	30,226	67	657	1,245
Roosevelt	20,002	57,980	71,020	94	2,236	1,286
Total	147,192	200,482	329,591	895	73,316	8,167

Source: National Agricultural Statistics Service 2004.

The total value of all farm commodities sold in the ROI during 2002 totaled $846 million, which accounts for over 40 percent of New Mexico's total crop and livestock sales of $2 billion during that year (NMDA 2003). Chaves, Curry, and Roosevelt counties accrue most of their farm earnings from dairy operations (see Table 3.8-11). Chaves County is the top milk-producing county in the state and the 11th-ranked milk-producing county in the nation. Farming operations in De Baca and Guadalupe counties are comprised of beef cattle operations and other crop production. Farming in Lincoln and Quay counties is almost exclusively beef cattle ranching. None of these four counties has extensive dairy operations.

TABLE 3.8-11. 2002 FARM SECTOR CASH RECEIPTS ($000)

	Cattle and Calves	*Milk*	*All Livestock Commodities*	*All Crops*	*All Farm Commodities*
Chaves	$56,509	$213,409	$272,886	$48,384	$321,270
Curry	$99,742	$125,431	$225,805	$45,227	$271,062
De Baca	$8,646	-	$8,985	$5,172	$14,157
Guadalupe	$6,485	-	$7,340	$635	$7,975
Lincoln	$10,190	-	$12,151	$246	$12,397
Quay	$17,292	-	$17,693	$6,240	$23,933
Roosevelt	$35,511	$128,611	$164,411	$30,866	$195,277
Total	$234,375	$467,451	$709,271	$136,770	$846,071

Source: NMDA 2003.

The preceding discussion of agriculture has presented county-level for the seven counties in the ROI. As presented in Table 3.8-1, only a portion of each county actually underlies the affected airspace. Approximately 99 percent of the land under the proposed airspace is used for agricultural production and grazing. In addition to the traditional agricultural activity, ranches on lands under the airspace derive income from sale of hunting authorizations (see Section 3.7.2). Estimates of the agricultural activity occurring under the affected airspace are presented in Table 3.8-12. A total of 549 farms are situated in the affected area, 31 percent of them in De Baca County, 30 percent in Roosevelt County, and 22 percent in Chaves County. De Baca County accounts for 52 percent of the land in farms in the affected area, and about 11 percent of the market value of agricultural products sold.

TABLE 3.8-12. AGRICULTURE HIGHLIGHTS FOR THE AREA UNDER THE AFFECTED AIRSPACE (2002)

	Farms	*Acres in Farms*	*Milk Cows*	*Other Cattle & Calves*	*Market Value of Products Sold ($000)*
Chaves	120	500,616	16,960	18,759	56,506
Curry	36	48,565	3,030	7,485	12,328
De Baca	167	1,254,396	7	27,626	13,564
Guadalupe	12	83,321	1	1,682	598
Lincoln	39	181,429	7	3,423	1,256
Quay	9	24,774	0	891	347
Roosevelt	166	309,169	11,944	18,751	39,157
Total	549	2,402,271	31,950	78,618	123,756

Source: National Agricultural Statistics Service 2004.

3.8.2.4 OIL AND GAS DEVELOPMENT

New Mexico is among the nation's leading developers of extractive energy resources. The state ranks 2nd in natural gas production and 5th in crude oil production, with proven natural gas and oil reserves ranked 3rd and 4th in the country, respectively. There are about 21,800 active oil-producing wells in New Mexico, and 23,300 active gas-producing wells. Total crude oil production in the state in 2002 was 67.4 million barrels and total natural gas production was 1,625 billion cubic feet (New Mexico EMNRD 2003).

Oil and gas development is limited in the ROI, occurring only in Chaves and Roosevelt counties. Furthermore, over 90 percent of the oil and gas production in these two counties occurs to the south, outside the area under the affected airspace. There are 200 oil-producing wells and 1,800 gas-producing wells located in the affected area, representing 4 percent of active wells in the state. These wells produced 86,000 barrels of crude oil and 1,967 million cubic feet of natural gas in 2003, accounting for 0.13 percent of the state's total oil and gas output (New Mexico Oil Conservation Division 2003).

Gross oil and gas revenues, in the form of taxes and royalties, contributed approximately 20 percent to the state's General Fund in recent years; $500 million in 2002 (New Mexico EMNRD 2003). Wells on lands in the affected area account for less than 1 percent of this total contribution. Oil and gas extraction activities employ about 3,500 persons in the state and an estimated 100 persons in Chaves and Roosevelt counties. Of the total two-county employment, it is likely that fewer than ten are directly associated with oil- and gas-producing wells under the affected airspace.

3.8.2.5 WIND POWER

Wind power generation is a renewable source of electricity that produces power without depleting water resources, producing emissions or generating solid waste. Commercial wind

power generation in the U.S. currently is concentrated in the western and central states. Development of wind energy facilities in these states primarily reflects state policies designed to encourage their development rather than the state's wind energy potential. California has the most installed wind power capacity but its potential is less than one-seventh New Mexico's potential (New Mexico EMNRD 2000). According to Pacific Northwest Laboratories, New Mexico ranks 12th in the nation in annual wind energy potential, estimated at 435 billion kilowatt hours.

There is currently one utility-scale wind power plant in New Mexico. The New Mexico Wind Energy Center is the world's third largest wind generation facility consisting of 136 turbines with a production capacity of 204 megawatts (MW) of energy, or enough electricity to power 100,000 typical homes (Public Service Company of New Mexico [PNM] 2003). Each of the 136 turbines is powered by blades 110 feet in length and sits atop a 210-foot tower. The Center is located about 20 miles northeast of Fort Sumner on 9,600 acres of private and state-owned land in De Baca and Quay counties. The Center is outside the northern boundary of the affected airspace. Florida-based FPL Energy owns and manages the facility. PNM purchases the output, currently estimated at 600,000 MW hours each year. The Wind Center is expected to generate $40 million in regional economic benefits over the next 25 years through lease payments to private landowners, payments in lieu of taxes, and worker salaries (New Mexico EMNRD 2000).

Caprock Wind Ranch is an 80 MW facility planned to be installed by Austin-based Cielo Wind Energy LLC on privately owned land in Quay County, northeast of the affected airspace (New Mexico Business Weekly 2003). The 80 MW facility would generate about 245,000 megawatt hours of energy each year to be purchased by Minneapolis-based Xcel Energy and delivered to customers through its operating company, Southwestern Public Service.

3.8.2.6 PUBLIC SERVICES

The discussion of public services and public finance focuses on Fort Sumner in De Baca County, because it is the only major community in any of the seven ROI counties actually situated under the proposed airspace and De Baca County is most representative of the affected area. Public services in Fort Sumner include fire suppression, law enforcement, public education, medical services, and utilities. Two full-time police officers and 17 volunteer firefighters serve the Fort Sumner community.

The three public schools in Fort Sumner serve an enrollment of 369 students (New Mexico EDD 2004). The school district in Fort Sumner serves the population in an area of 2,332 square miles with a student-teacher ratio of 11.4 to 1. The closest post-secondary institution is Clovis Community College, located about 60 miles from Fort Sumner in Curry County.

Major medical services are provided by Guadalupe County Hospital, 45 miles northwest of Fort Sumner, and Plains Regional Medical Center, 60 miles east in Clovis. Public utilities serving the region include Farmers Electric Coop., Inc., Eastern New Mexico Natural Gas, Fort Sumner Water Department, ENMR Plateau Telecommunications, and Village of Fort Sumner Sewer Department. The closest commercial airport is Albuquerque International, 159 miles from Fort Sumner.

Municipal services provided by Fort Sumner include water, sewer, and ambulance. The annual operating budget is $1.7 million and annual revenues are $460,000.

3.9 Environmental Justice

3.9.1 Definition of the Resource

Environmental justice is defined by the *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, enacted in 1994, which directs federal agencies to address disproportionate environmental and human health effects in minority and low-income communities. Also included with environmental justice issues are concerns pursuant to EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, enacted in 1997. EO 13045 directs federal agencies to identify and assess environmental health and safety risks that may disproportionately affect children.

EO 12898 applies to federal agencies that conduct activities that could substantially affect human health or the environment. The concept of environmental justice ensures that studies such as EISs address whether actions of federal agencies disproportionately impact human health and environmental conditions in minority communities or low-income communities. The evaluation of environmental justice is designed as follows:

- To focus attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities with the goal of achieving environmental justice.

- To foster non-discrimination in federal programs that substantially affect human health or the environment.

- To give minority communities and low-income communities greater opportunities for public participation in, and access to, public information on matters relating to human health and the environment.

The approach applied in this section is in accordance with the *Interim Guide for Environmental Justice with the Environmental Impact Analysis Process* (Air Force 1997b). For purposes of this analysis, minority, low-income and youth populations are defined as follows:

- *Minority Population*: Blacks, American Indians, Eskimos, Aleuts, Asians, Pacific Islanders, and persons of Hispanic or Latino origin of any race.

- *Low-Income Population*: Persons living below the poverty level, based on a 2000 equivalent annual income of $17,603 for a family of four persons.

- *Youth Population*: Children under the age of 18 years.

3.9.2 EXISTING CONDITIONS

The ROI for environmental justice consists of seven counties that contain land area under the airspace associated with the NMTRI proposal. This affected airspace overlies rural areas in east-central New Mexico, including virtually all of De Baca County and portions of Curry, Chaves, Guadalupe, Lincoln, Quay, and Roosevelt counties (see Figure 1-1). Throughout this section, ROI refers to these seven counties in their entirety. Affected area is the specific land area under the affected airspace boundaries. De Baca County comprises the greatest share of the affected area and is most representative of the socioeconomic characteristics of the area under the affected airspace (refer to Table 3.8-1). With the exception of Fort Sumner in De Baca County, population centers in the ROI counties are situated outside of the affected area. Consequently, county-level data tends to be dominated by the characteristics of communities outside the affected area. More detailed data, at the census block group level, are available regarding population and environmental justice concerns. Therefore, in the following discussion, data specific to the affected area (i.e., those portions of the seven counties actually underlying the affected airspace) are also presented and analyzed.

Minority persons account for 43.1 percent of the seven-county ROI population, compared to 55.3 percent of the state population (see Table 3.9-1). Of the seven counties listed, only Guadalupe County has a minority population proportionately greater than the state. Lincoln County has the smallest percentage of minority residents in a single county (29.1 percent). Persons of Hispanic or Latino origin are the largest minority group in the ROI, representing 37.3 percent of the total ROI population and 86.5 percent of the minority population. In the State of New Mexico, persons of Hispanic or Latino origin represent 42.1 percent of the overall population and 76.1 percent of the minority population.

TABLE 3.9-1. ENVIRONMENTAL JUSTICE DATA

	2000 POPULATION	MINORITY POPULATION		LOW-INCOME POPULATION		YOUTH POPULATION	
		Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
State of New Mexico	1,819,046	1,005,932	55.3%	334,704	18.4%	509,333	28.0%
Chaves County	61,382	29,402	47.9%	13,074	21.3%	17,862	29.1%
Curry County	45,044	18,603	41.3%	8,558	19.0%	13,558	30.1%
De Baca County	2,240	833	37.2%	396	17.7%	540	24.1%
Guadalupe County	4,680	3,955	84.5%	1,011	21.6%	1,142	24.4%
Lincoln County	19,411	5,649	29.1%	2,892	14.9%	4,406	22.7%
Quay County	10,155	4,204	41.4%	2,122	20.9%	2,539	25.0%
Roosevelt County	18,018	6,721	37.3%	4,090	22.7%	5,063	28.1%
Total Counties	160,930	69,367	43.1%	32,143	20.0%	45,110	28.0%

Source: U.S. Census 2000a

The population of the ROI is 20.0 percent low income, meaning one out of every five persons in the ROI lives below the poverty level. The population of New Mexico has comparable poverty status, with 18.4 percent of the population identified as low-income. The low-income population in the individual counties ranges from a low of 14.9 percent in Lincoln County to a high of 22.7 percent in Roosevelt County.

Children under the age of 18 years constitute 28.0 percent of the ROI population, which is the same as for New Mexico overall. There is relatively little variation in the youth population among the ROI counties, ranging from a low of 22.7 percent in Lincoln County to a high of 30.1 percent in Curry County.

The actual minority population on the land area under the affected airspace is estimated to be 1,318 persons, representing 30.4 percent of the total affected population of 4,336 persons (see Table 3.9-2). This estimate was derived using Census Tract and Block Group data from the 2000 Census. The minority population is concentrated in Guadalupe County, representing 85.8 percent of the affected population in that county. Virtually the entire minority population in Guadalupe County is comprised of persons of Hispanic or Latino origin. Similarly, persons of Hispanic or Latino origin represent 30 percent of the total affected population and 95 percent of the minority population in the area under the affected airspace.

TABLE 3.9-2. DETAILED ENVIRONMENTAL JUSTICE DATA UNDER THE AFFECTED AIRSPACE

Counties with Land Area Under the Affected Airspace	*2000 Affected Population*	MINORITY POPULATION		LOW-INCOME POPULATION		YOUTH POPULATION	
		Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Chaves County	820	131	16.0%	208	25.4%	215	26.2%
Curry County	86	9	10.5%	13	15.1%	24	27.9%
De Baca County	2,191	822	37.5%	388	17.7%	528	24.1%
Guadalupe County	120	103	85.8%	26	21.7%	29	24.2%
Lincoln County	631	149	23.6%	90	14.3%	154	24.4%
Quay County	22	3	13.6%	3	13.6%	4	18.2%
Roosevelt County	466	101	21.7%	86	18.5%	127	27.3%
Total Affected Area	4,336	1,318	29.6%	814	18.2%	1,081	24.7%

Source: U.S. Census 2000c.

The population in the affected area is 18.8 percent low income overall, with poverty rates by area generally similar to, or slightly lower than, the respective county levels. Children under the age of 18 years comprise 24.9 percent of the population under the affected airspace. In general, low-income and youth populations in the affected area tend to be of similar proportion to those at the regional and state level.

Air Traffic Study Area

The air traffic study area overlies four rural counties in central New Mexico, including portions of De Baca, Guadalupe, Quay, and Roosevelt counties (see Figure 2-3). Population estimates in this section were derived using Census Tract and Block Group data from the 2000 Census. The study area population is concentrated in Guadalupe County, specifically in the town of Vaughn. The minority population on land area under the air traffic study area is estimated to be 858 persons, representing 66.3 percent of the total study area population of 1,293 persons. Persons of Hispanic origin account for over 95 percent of the minority population in the study area. The minority population in the study area is somewhat higher, proportionally, than for the state, but similar to regional levels. The incidence of poverty in the study area is 20.7 percent. Children under the age of 18 years comprise 25.6 percent of the study area population. Low-income and youth population rates in the study area are comparable to county and state levels.

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4.0 ENVIRONMENTAL CONSEQUENCES

This chapter presents an assessment of the potential environmental consequences of implementing the preferred alternative (Alternative A), the Draft Environmental Impact Statement (EIS) Proposed Action, or Alternative B described in Chapter 2.0. The Draft EIS analysis proceeded in the sequence of:

- The Draft EIS Proposed Action
- Alternative A (with mitigations, now the preferred alternative)
- Alternative B
- No-Action

For ease of review of this EIS, this sequence has been retained in Chapter 4.0. The Final EIS designations of the alternatives, as bulleted above, has been incorporated into Chapter 4.0.

The analysis presented in this chapter is based on overlaying an alternative from Chapter 2.0 on the baseline or existing conditions presented in Chapter 3.0. Each of the environmental resources described in Chapter 3.0 is affected to a different degree and has a different method of analysis. Each resource section presented below includes the methodology for conducting the impact analysis, the issues and concerns that focused the analysis, and the potential direct and indirect consequences of implementing an alternative.

Cumulative effects of an alternative with other past, present, and reasonably foreseeable future actions within the region of influence (ROI) are presented in Chapter 5.0. Irreversible, irretrievable, short-term, and long-term effects are also discussed in Chapter 5.0.

4.1 AIRSPACE AND RANGE MANAGEMENT

4.1.1 METHODOLOGY

The potential effects of a New Mexico Training Range Initiative (NMTRI) alternative on the new and modified airspace environment were assessed by considering the changes in airspace, aircraft operations, and airspace uses that could occur. The assessments considered compliance with Air Force Instruction (AFI) 13-201 (*Air Force Airspace Management)* and supplements thereto, as well as measures that could minimize potential impacts on other regional air traffic and the Air Traffic Control (ATC) system.

United States Air Force (Air Force) ranges are managed in accordance with requirements and procedures prescribed by AFI 13-212. These requirements address a wide range of subjects that include land ownership and control, weapons use, employee safety, range scheduling, range maintenance, explosive ordnance disposal (EOD), range decontamination, debris disposal, and environmental stewardship of the range.

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4.1.2 Issues and Concerns

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 ATC systems were encumbered by changed flight activities associated with a NMTRI alternative. When any significant change is planned, such as new or revised defense-related activities within an airspace area or a change in the complexity or density of aircraft movements, the Federal Aviation Administration (FAA) reassesses the airspace configuration. The FAA seeks to determine if such changes could adversely affect (1) ATC systems and/or facilities; (2) movement of other air traffic in the area; or (3) airspace already designated and used for other purposes supporting military, commercial, or general aviation.

Potential impacts to management of Melrose Air Force Range (AFR) could occur if a NMTRI alternative prevented or significantly limited the ability of the range manager to comply with stipulated requirements.

4.1.3 Environmental Consequences

4.1.3.1 Draft EIS Proposed Action

Under the Draft EIS Proposed Action, existing Military Operations Areas (MOAs) would be expanded, new MOA airspace would be created, extended Air Traffic Control Assigned Airspace (ATCAA) would be developed, and supersonic flight would be authorized to 10,000 feet mean sea level (MSL), or approximately 5,000 to 6,000 feet above ground level (AGL) throughout the airspace. The Draft EIS Proposed Action also included moving the existing Jet Route (J-74) to the north of its current track and creating a Capitan MOA. Neither of these elements is included in the mitigated Alternative A, the Air Force's preferred alternative.

Within the existing airspace, RR-188 chaff and M-206, or its equivalent flare use, is currently assessed (Air Force 2001e). NMTRI proposes to expand the use of RR-188 chaff and M-206 flares in the new and modified airspace. The levels of use of chaff or flares are not proposed to be increased within the existing or new and expanded airspace. New Mexico aircrews and transient users would continue to fly approximately the same number of annual sorties as under current conditions into Fiscal Year (FY) 08. The use of Military Training Routes (MTRs) in the Cannon airspace would remain unchanged from current conditions under NMTRI.

Modifications to existing MOA airspace would require non-rulemaking action by the FAA (FAA 2004). Responsibilities, procedures for aircraft operations, air traffic control operations, and utilization of ATCAAs are documented in Letters of Agreement (LOAs) between the scheduling military agency (27th Fighter Wing [27 FW]) and the applicable Air Route Traffic Control Center (ARTCC) (Albuquerque Center). These LOAs are supplemental to the procedures in FAA Orders 7110.65 (Air Traffic Control) and 7610.4 (Special Military Operations). Specific Air Force authorization would be required for supersonic flight at lower altitudes (AFI 13-201).

On January 12, 2004, the Deputy Assistant Secretary of the Air Force (Environment, Safety, and Occupational Health) requested the participation of the FAA as a cooperating agency in the development of this EIS (Appendix C). FAA participation was requested due to their special expertise and jurisdiction with regard to the proposed airspace-related elements of the NMTRI. This participation ensures that requirements and analyses of both agencies are integrated into the project planning process as early as possible.

The Draft EIS Proposed Action and Alternative B included the re-routing of a Jet Route which would require a rule-making action by the FAA. Currently, J-74 provides routing between the Texico Very High Frequency Omni-directional Radio Range and Tactical Air Navigation Aid (VORTAC) (east of the NMTRI airspace) and the Corona VORTAC (west of the NMTRI airspace). This route passes through the northern portion of the Pecos ATCAA. The FAA reviewed the Draft EIS Proposed Action and Alternative B which included moving J-74 and explained that such a move could have consequences to airspace use and management. This explanation is based, in part, on the environmental consequences presented in the Draft EIS. Correspondence received from the FAA during the National Environmental Policy Act (NEPA) process is found in Appendix C.

For the Draft EIS, FAA commercial and other civil aircraft traffic data were collected for each of the four airspace corridors discussed in Section 3.1. Data were collected for the week of 6 through 10 September 2004. Data for Corridors A, B, and C were collected over a 14-hour period from 6 through 9 September, and for a five-hour period on 10 September. Corridor D data were collected for the same five-hour period on 10 September. An Air Force large-force training exercise was conducted during the morning of 10 September 2004. Data collected afforded a four-day assessment (Monday through Thursday) of normal aviation activity in the area. The Friday data provided a point of comparison to review changes to aviation activity that may occur a morning when a large-force exercise (LFE) was in process.

Use of J-74 varies depending on the time of day. Route J-74 and direct commercial traffic use this corridor to and from the Dallas-Fort Worth area. FAA evaluated the Air Force's airspace proposal to determine potential regional airspace consequences. An assessment of flight tracks and flight track data presented in Table 4.1-1 (derived from Appendix E) for the week of 6 September through 10 September 2004 yields several insights.

- The highest J-74 and direct use (Corridor A) was 39 flights (rounded to 40 throughout this EIS) which occurred from 9:00 a.m. to 1:00 p.m. on Thursday for two two-hour training time blocks.
- Relocating J-74 to the north would have added 7 to 10 nautical miles (nm) to the jet route and add approximately 1 to 2 minutes to a commercial aircraft flight time due to the additional distance.
- The lowest J-74 and direct civilian use for two two-hour training time blocks was 10 flights between 8:00 a.m. to 10:00 a.m. and 2:00 p.m. to 4:00 p.m. on Tuesday.
- During the Friday, 10 September LFE between 8:00 a.m. and 12:00 p.m., Corridor A (including J-74 and direct traffic) had 14 flights. This was 14 fewer flights than the average of 28 flights during the same period on Monday through Thursday.
- New Mexico aircrews scheduling of two-hour time blocks in current J-74 airspace could impact 10 to 40 commercial flights per day.
- The actual number of flights re-routed to a relocated J-74 would depend upon airline schedules and training schedules.

TABLE 4.1-1. HOURLY AIRCRAFT TRAFFIC IN EACH CORRIDOR[1]

	TIME OF DAY													
	0800 0859	*0900 0959*	*1000 1059*	*1100 1159*	*1200 1259*	*1300 1359*	*1400 1459*	*1500 1559*	*1600 1659*	*1700 1759*	*1800 1859*	*1900 1959*	*2000 2059*	*2100 2159*
Corridor A[2]														
Monday	1	0	8	3	8	5	12	3	7	7	7	2	6	1
Tuesday	0	0	8	7	7	6	3	6	8	6	11	3	6	7
Wednesday	0	1	7	9	6	7	4	7	4	7	3	4	0	0
Thursday	6	10	10	11	8	9	6	5	6	8	5	4	5	6
Friday	1	0	7	6	3	3	--	--	--	--	--	--	--	--
Total Traffic	8	11	40	36	32	30	25	21	25	28	26	13	17	14
Daily Average	1.6	2.2	8	7.2	6.4	6	5	4.2	5	5.6	5.2	2.6	3.4	2.8
Corridor B[2]														
Monday	0	0	12	12	8	10	7	13	11	11	12	6	8	3
Tuesday	0	1	13	16	12	14	14	13	11	12	11	8	11	3
Wednesday	2	1	14	17	6	6	20	12	10	8	12	1	14	14
Thursday	0	1	12	19	10	10	11	12	8	13	7	8	10	10
Friday	0	1	13	19	9	11	--	--	--	--	--	--	--	
Total Traffic	2	4	64	83	45	51	52	50	40	44	42	23	43	30
Daily Average	0.4	0.8	12.8	16.6	9	10.2	10.4	10	8	8.8	8.4	4.6	8.6	6
Corridor C[2]														
Monday	1	0	3	2	5	7	5	7	5	0	6	1	3	3
Tuesday	1	0	6	3	4	0	6	4	5	1	5	3	1	4
Wednesday	0	0	4	6	5	2	8	4	5	3	4	0	2	0
Thursday	2	0	5	5	2	4	7	3	7	3	1	3	1	1
Friday	0	1	6	4	1	2	--	--	--	--	--	--	--	--
Total Traffic	4	1	24	20	17	15	26	18	22	7	16	7	7	8
Daily Average	0.8	0.2	4.8	4	3.4	3	5.2	3.6	4.4	1.4	3.2	1.4	1.4	1.6
Corridor D[3]														
Friday	0	3	4	4	2	--	--	--	--	--	--	--	--	--
Total Traffic	0	3	4	4	2	--	--	--	--	--	--	--	--	--
Daily Average	0	3	4	4	2	--	--	--	--	--	--	--	--	--

Notes:
1. Corridors are mapped on Figure 3.1-3.
2. Traffic was recorded for a five-day work week from 6 September through 9 September 2004.
3. Traffic was recorded for 10 September 2004 during the time an Air Force LFE was in progress.

Rerouting J-74 and direct traffic to the north would have encroached on the utilization of another jet route further to the north. This is the area of J-72 previously identified as Corridor B in Section 3.1.2. Table 4.1-2 presents representative normal training period two-hour blocks of airspace utilization by the 27 FW. For the corridors that include J-74 and J-72, the table presents the average civil aircraft operations which occurred during each two-hour block for the four-day work week of 6 September through 9 September 2004. The average time, in minutes, between flights is presented for each Jet Route for typical two-hour blocks. The final two columns present the average daily time in minutes between flights that would result from rerouting traffic from the J-74 corridor to the J-72 corridor. ATC service demands and overall workload includes factors such as an aircraft turning, slowing, descending, climbing, rerouting, and providing services such as weather and airport information.

TABLE 4.1-2. AVERAGE CIVIL AVIATION OPERATIONS ASSOCIATED WITH J-74 RELOCATION (SEPTEMBER 6-9, 2004)

	CORRIDOR A (INCLUDING J-74)		CORRIDOR B (INCLUDING J-72)		COMBINING CORRIDOR A ON CORRIDOR B	
2-Hour Time Blocks (Local Time)	*Average Operations*	*Average Time (In Min) Between ATC Service Demands*	*Average Operations*	*Average Time (In Min) Between ATC Service Demands*	*Average Operations*	*Average Time (In Min) Between ATC Service Demands*
0800-1000	4.5	26.7	1.25	96.0	5.75	20.9
1000-1200	15.75	7.6	28.75	4.2	44.5	2.7
1200-1400	14	8.6	19.0	6.3	33.0	3.6
1400-1600	11.5	10.4	25.5	4.7	37.0	3.2
1600-1800	13.25	9.1	21.0	5.7	34.3	3.5
1800-2000	9.75	12.3	16.25	7.4	26.0	4.6
2000-2200	7.75	15.5	18.25	6.6	26.0	4.6

The average time between aircraft ranges from 2.7 minutes to 20.9 minutes. The peak hour demand, which occurs on Thursday from 11:00 a.m. to noon, would increase peak traffic from 19 flights per hour to 30 flights per hour (see Table 4.1-1). The FAA is concerned that scheduling and coordination for this number of flights in the airspace could impact airspace management.

During the LFE on 10 September, the number of civil aircraft operating in Corridor A between 8:00 a.m. and 1:00 p.m. was 14, as compared to a daily average of 27.5. Traffic on Corridor B increased slightly, climbing from an average daily use of 39 operations to 42 operations during the same period.

NMTRI proposes expanding the existing Pecos MOA complex laterally and vertically. The MOAs would be expanded laterally to conform with the lateral boundaries of the overlying Sumner ATCAA.

The proposed westward expansion of the Pecos complex would result in the MOA overlying portions of one Federal Airway, V-291. This airway provides routing between the Corona VORTAC and Roswell. The proposed MOA expansion would not totally prohibit use of this airway. IFR traffic would require ATC clearance to transit the active MOA. However, Visual Flight Rule (VFR) traffic could transit the active MOA using the "see-and-avoid" concept.

Other airways (V-68 and V-83) run essentially parallel to V-291, with a ground track approximately 7 nm to the west, providing alternate routing between the same points.

Public hearing comments on the Draft EIS expressed concern that when military aircraft were using the Pecos MOA, charter aircraft and other general aviation pilots considered the airspace unsafe even under "see-and-avoid" conditions. Pilots also expressed concern that a Capitan MOA would affect traffic on V-68 and V-83. V-68 and V-83 are not affected by the Capitan ATCAA. Pilots who commented requested enhanced communications, such as through a repeater tower within the MOA, to provide general aviation increased awareness of when the MOA was actively being used for military training.

If approved by the FAA, the expanded Pecos MOA complex would be well-publicized and documented on aeronautical charts. All pilots should be aware of the changed configuration of this airspace complex. Coordination and communications between the Air Force and the FAA about the scheduling and use of the Pecos MOA complex for military training are expected to result in no adverse impact to airspace management in this area.

The proposed southerly expansion of the Pecos South Low MOA, into the area of the previously defined "Roswell Shelf," would result in lowering MOA airspace in that region from 11,000 feet MSL to 500 feet AGL. As a result, the El Paso Natural Gas private airfield would join the other two private airfields in the region (Double V and Bojax) already underlying low altitude MOA airspace. Existing military training avoidance practices would be applicable. FAA ATC installed radar equipment at Roswell in 1997 that assists ATC in providing service to general aviation in the area of the Roswell Shelf. The FAA ATC radar has the ability to track aircraft in the Roswell Shelf area. This current radar coverage afforded by FAA should minimize the potential for impacts to general aviation in the area of the Roswell Shelf.

Expansion of the Pecos MOA complex would interact with traffic on the "Worth-3" SID. Table 4.1-3 reflects 2-hour blocks of airspace utilization by the 27 FW (a normal training period), the average and peak operations which occurred during the week of 6 September through 9 September 2004 in the indicated time frames, and the average time, in minutes, between flights that would result from these utilization rates.

TABLE 4.1-3. CIVIL AVIATION OPERATIONS ASSOCIATED WITH SOUTHERN EXPANSION OF PECOS MOA COMPLEX

	WORTH-3 (CORRIDOR C ON FIGURE 3.1-3)		
2-Hour Time Blocks (Local Time)	*Average 2-Hour Block Operations*	*Peak Hour Operation*	*Average Time (In Min) Between ATC Service Demands*
0800-1000	1.0	2	120.0
1000-1200	8.5	6	14.1
1200-1400	7.25	7	16.6
1400-1600	11	8	10.9
1600-1800	7.25	7	16.6
1800-2000	5.75	6	20.9
2000-2200	3.75	4	32.0

As shown in Table 4.1-3, the average time between aircraft ranges from 10.9 minutes to 120 minutes. Depending on training airspace scheduling, an average of one to ten Worth 3 civil aircraft flights would need to be re-routed around the Pecos MOA/ATCAA complex. During the five-hour monitoring period when an LFE was in progress on 10 September, 12 aircraft operated in the airspace between 8:00 a.m. and 1:00 p.m., as compared to a daily average of 13.5 on Monday through Thursday.

An assessment of Worth-3 flight tracks and flight track data (presented in Appendix E) for 6 September through 9 September 2004 yields several insights.

- Worth-3 aircraft traffic across the Pecos MOA/ATCAA complex varies from 0 to 8 flights per hour.
- Flight track data from Appendix E show the traffic to be primarily (approximately 80 percent) along a east-south-east to west-north-west corridor.
- Less than 5 percent of the traffic traverses the area proposed for the expansion of the Pecos South Low MOA.

Expanding the Pecos MOA complex laterally to conform with the boundaries of the Sumner ATCAA overlying the existing airspace and to the south in the Roswell shelf would not be expected to substantially affect regional air traffic.

The Draft EIS Proposed Action included creation of a Capitan MOA from 12,500 feet MSL to 18,000 feet MSL to form a "bridge" between the Beak MOAs and the reconfigured Pecos MOAs. An estimated 40 civil aircraft traverse the airspace daily. During morning Air Force LFEs, 13 commercial aircraft traversed the corridor above 12,500 feet MSL.

The ground level under the Draft EIS proposed Capitan MOA is approximately 5,000 feet. Pilots commenting at the Draft EIS public hearings stated that the altitude difference between ground level and the MOA floor leaves insufficient airspace for aircraft to traverse the corridor.

The Air Force, in conjunction with FAA review, has modified the proposal by deleting the Capitan MOA and reducing the size of the Capitan ATCAA from the preferred alternative, the mitigated Alternative A (see Section 4.1.3.2). Private pilots would continue to use V-68, V-83, or route direct to fly below 18,000 feet MSL on the Roswell-Corona VORTAC airway.

As is always the case, and throughout the Pecos complex, if an emergency, such as a life-flight were required, the Air Force would immediately shift or end training in airspace requiring life-flight transport to accommodate the emergency.

As discussed in Section 3.1.2, there are five MTRs that pass through the Pecos MOA complex. The potential for conflicting use of the airspace is resolved either through scheduling ATC or MARSA (Military Assumes Responsibility for Separation of Aircraft) procedures.

The expansion of the Pecos MOA airspace to the east and west would also create MOA airspace in those regions down to 500 feet

COMMUNICATION TOWERS IN EXCESS OF 200 FEET TALL, SUCH AS THESE BETWEEN PORTALES AND ROSWELL, MUST MEET FAA TOWER VISIBILITY AND LIGHTING REQUIREMENTS.

AGL. Should any towers or commercial wind-based energy systems be constructed within the airspace in excess of 200 feet in height they would be subject to FAA tower visibility and lighting requirements (Appendix F). These requirements would be necessary regardless of the MOA floor.

The proposal to allow supersonic flight at altitudes below 30,000 feet MSL throughout the reconfigured airspace would require specific approval by the Air Force (AFI 13-201). Supersonic flight would be expected to create little impact regarding airspace management issues. The duration of supersonic flight would be brief (see Section 4.2). Also, based on the anticipated speeds and size of the F-16 aircraft, overpressures associated with the creation of sonic booms are relatively low. These minimal overpressures would not be expected to have any effect on other aircraft flying in the region.

NMTRI would also expand the use of chaff and flares into the new and modified airspace. RR-188 chaff and M-206 flare use in the existing NMTRI complex, including the Pecos MOA/ATCAA and the Sumner ATCAA, was assessed in 2001 (Air Force 2001e). Specific operating procedures and constraints on their use have proven effective and have not impacted ATC systems. During public hearings on the Draft EIS, materials were presented by a commenter that were subsequently identified as coming from an Multi Jettison Unit (MJU)-7-type flare. Such flares are not authorized for use in the Pecos MOA/ATCAA or any NMTRI proposed airspace. The Air Force has implemented standing instructions to brief pilots training in the existing or NMTRI proposed airspace that only RR-188 chaff or M-206 or equivalent flares are permitted for training use within the MOAs and ATCAAs. Flares do not present any issues involving the management or use of airspace, and the training chaff used by 27 FW pilots does not adversely affect FAA radars. No airspace impacts would be expected to result from this proposed expanded use of RR-188 chaff and M-206, or equivalent, flares.

There are no aspects of any alternative involving any changes or modification to Melrose AFR. Range management would continue as under current conditions. If any special operating procedures would be required as a result of implementing any aspects of the Proposed Action, detailed guidance would be developed and documented in applicable unit supplements to AFI 13-212.

4.1.3.2 Alternative A, the Air Force Preferred Alternative

Alternative A does not redirect J-74. This would avoid the potential for airspace impacts in the J-74 corridor. The northern expansion of the Sumner ATCAA would be requested from Flight Level (FL) 180 through FL500 twice per month and twice per week during low traffic demand periods as defined by Albuquerque Center. The twice per week periods would be requested in two hour blocks prior to or after high demand commercial traffic periods. Alternative A airspace modifications and scheduled use would reduce the potential for airspace impacts. During times other than the LFE, the Alternative A Sumner North and South ATCAAs would be active from FL240 to FL300 or otherwise as assigned. This would facilitate commercial traffic while providing the Air Force with the Pecos MOA/ATCAA and Sumner ATCAA contiguous block of training airspace.

The mitigated Alternative A Capitan MOA would not be proposed and the Capitan ATCAA would have a floor of 18,000 feet MSL and a ceiling of FL320. This would permit private and commercial traffic to traverse the corridor and avoid potential impacts identified by commenters during the Draft EIS public hearings. Airspace consequences of Alternative A modifications and expansion of existing military training airspace, authorization for supersonic

flight down to 10,000 feet MSL, and use of chaff and flares are generally the same as those described in Section 4.1.3.1.

Alternative A does not involve any changes or modification to Melrose AFR. Range management would continue as under current conditions with any required detailed guidance developed and documented in supplements to AFI 13-212.

4.1.3.3 ALTERNATIVE B

Under Alternative B, J-74 would be moved as described for the Draft EIS Proposed Action. The potential significant airspace consequences associated with moving J-74 would be the same as those defined in Section 4.1.3.1. Under Alternative B, the Pecos MOA would be expanded to the east, south, and west, supersonic flight would be authorized down to 10,000 feet MSL, and RR-188 chaff and M-206 flare use would be authorized in the new NMTRI airspace. Under Alternative B, neither the Capitan MOA nor the Capitan ATCAA airspace would be developed.

The lack of the availability of a Capitan ATCAA would limit the training benefits that could be realized by combining the Beak and Pecos airspace complexes to provide a transition, ingress, and maneuver corridor to be used during LFEs. Each exercise would be on a narrow transit corridor between the Beak and Pecos airspaces that does not support transition, ingress, or maneuvering and that requires an individual request and processing, thereby reducing efficiency and increasing manpower and time. Although this occurs on an as needed basis today, it is not the optimum situation for the large-force training with current weapons needed by the 27 FW and New Mexico Air National Guard (NMANG).

Alternative B would have the potential for airspace impacts in the area of the expansion of the Sumner North ATCAA identified in Section 4.1.3.1. However, there would be no significant consequences in the Capitan corridor. There are no aspects of Alternative B that involve any changes or modification to Melrose AFR. Range management would continue as under current conditions as in the Proposed Action.

4.1.3.4 NO-ACTION

Under the No-Action Alternative, 27 FW and 150th Fighter Wing (150 FW) aircrews would continue to train as under current conditions. No airspace modifications or expansion of military training airspace would occur. The training inefficiencies resulting from the segmented configuration of the existing airspace would continue. Supersonic flight would continue to be conducted above 30,000 feet MSL when the airspace is available and supersonic munitions launch profiles and maneuvers would not occur below 30,000 feet MSL. The same quantities of RR-188 chaff and M-206 flare use, presently authorized in the existing airspace, would continue.

Airspace use and management would remain unchanged from current conditions and scheduling issues associated with the joint military-civil use of the airspace in its current configuration would continue. Management of Melrose AFR would also continue as under current conditions.

4.2 ACOUSTIC ENVIRONMENT

4.2.1 METHODOLOGY

Subsonic and supersonic noise levels were calculated for the NMTRI alternatives. These noise levels were compared to the existing noise levels presented in Section 3.2.2 to examine potential effects from changes in airspace configuration and use.

L_{DNMR} IS THE MONTHLY AVERAGE ONSET-RATE ADJUSTED DAY-NIGHT AVERAGE SOUND LEVEL (DNL). IT IS COMPUTED THE SAME WAY AS DNL, BUT INCLUDES A PENALTY OF UP TO 11 DB TO ACCOUNT FOR THE HIGH ONSET RATE OF HIGH SPEED MILITARY AIRCRAFT. EFFECTS ARE INTERPRETED ACCORDING TO THE SAME CRITERIA AS DNL.

4.2.2. ISSUES AND CONCERNS

The noise metrics used in this section are described in Section 3.2 and Appendix G. Annoyance, which is based on perception, represents the primary effect associated with aircraft noise. Attitudinal surveys conducted over the past 30 years show a consistent relationship between Day-Night Average Sound Level (DNL) and the percentages of groups of people who express various degrees of annoyance. Studies of community annoyance to numerous types of environmental noise show that DNL correlates well with effects, and Schultz (1978) showed a consistent relationship between noise levels and annoyance. That Schultz study has been periodically re-examined and reaffirmed. The updated relationship by Finegold *et al.* (1994), which does not differ substantially from the original, is the current preferred form, and is shown in Table 4.2-1. Also shown in Table 4.2-1 is the equivalent relation between annoyance and C-Weighted Day-Night Sound Level (CDNL) from sonic booms (CHABA 1981).

TABLE 4.2-1. RELATION BETWEEN NOISE LEVEL METRICS DNL (FINEGOLD ET AL. 1994) AND CDNL (CHABA 1981) AND ANNOYANCE

DNL (or L_{dnmr})	*CDNL*	*Average Percent Population Highly Annoyed*
55	52	3.3
60	57	6.5
65	61	12.3
70	65	22.1
75	69	36.5

Specific issues and concerns about aircraft noise and sonic booms that were identified during scoping included the following:

- Increased annoyance
- Effects of aircraft noise and sonic booms on human health
- Effects of aircraft noise and sonic booms on animals
- Effects of sonic booms on structures
- Effects of aircraft and sonic booms on weather

The range of DNL shown in Table 4.2-1 is meaningful. The United States Environmental Protection Agency has identified DNL of 55 decibels (dB) as a level that protects public health and welfare with an adequate margin of safety (United States Environmental Protection Agency [USEPA] 1974). This means that 55 dB is a threshold below which adverse noise effects are

usually not expected to occur. The middle level, 65 dB, is widely used as a noise criterion for airports. It represents a compromise between acceptable noise and economic practicality. Residential use above 65 dB is generally considered to be acceptable only if the dwellings are sound insulated. The highest level, 75 dB, is a level above which areas are generally considered to be not suitable for residential use, unless there is substantial sound insulation and outdoor activities are not considered to be important.

Suitability of an area for residential use is keyed to the sound insulation qualities of a dwelling. The USEPA Levels Document (USEPA 1974) identified DNL of 45 dB as a suitable indoor noise environment. Frame homes with some open windows have an outdoor-to-indoor noise reduction of about 20 dB, so an exterior level of 65 dB means that 45 dB will be achieved indoors. Well-built homes with good windows have noise reduction in the range of 25 to 28 dB. To obtain this protection, windows must be kept closed, so forced air ventilation (possibly air conditioning) is needed in areas exposed to levels above 65 dB. At exterior levels approaching 75 dB, it is generally necessary to include storm windows and pay attention to construction details. Adequate soundproofing for areas exposed to sound levels above 75 dB requires special acoustic windows, plus above-average wall construction. The exterior environment in such areas is not suitable for typical enjoyment of the outdoors.

Note that DNL is an annual average measurement, and not a limit on individual events. Because annoyance is a long-term quality of life issue, it is best quantified by averages such as DNL and CDNL. While this is scientifically appropriate, those metrics are not intuitively meaningful to non-experts. During scoping and public hearings, requests were made to explain individual event noise effects. This EIS addresses the noise of individual events as well as cumulative averages. The amplitude of individual events is directly relevant for non-annoyance impacts, especially the effects of sonic booms on structures. Sonic booms are quantified, as appropriate, by their peak pressure as well as by their sound level.

Appendix G provides details on the effects of noise on human health and the studies used to identify them. Factors often noted as noise impacts are noise-induced hearing loss, speech interference, and sleep disturbance. These are components that contribute to annoyance or potential health effects, and are also discussed in Appendix G. The most sensitive health aspect of noise is hearing loss. For reference, workplace standards for protection against hearing loss are equivalent to a constant level of 80 dB over a 24-hour period. The USEPA Levels Document (USEPA 1974) assessed the data upon which those standards are based, and concluded that continuous levels of 70 dB or less would be protective of hearing with an adequate margin of safety. The noise levels associated with the Proposed Action and Alternatives are well below USEPA's identified level for protection of hearing. Since hearing loss is the most sensitive adverse health effect of noise, the relatively low noise from the action poses no health threat.

The effect of noise on domestic animals and wildlife was also a concern expressed by public commenters. For domestic animals, concern generally focuses on adverse effects on the use of or economic value of the animals. Since agriculture and grazing represent 99 percent of the area under the affected airspace, ranchers expressed concern regarding damage that could occur if livestock were panicked by noise or sonic booms. Five cases of livestock injury attributed to low flying aircraft were reported between 1994 and 2005 by commenters on the Draft EIS. These effects are discussed in Section 4.5.2.1. For wildlife, concern generally focuses on impacts to specific populations. The effects of noise and sonic booms on wildlife are discussed in Section 4.5.2.1.

A combined ranching and wildlife concern was raised during the scoping meetings when ranchers pointed out that they received income from recreational hunters who paid to hunt on the ranchers' lands (see Section 3.7). In the highly unlikely event of a sonic boom or low altitude overflight occurring at a critical time in a hunt, the hunter could be annoyed. The effects of noise and sonic booms on game species is addressed in Section 4.8, Socioeconomics and Section 4.5, Biological Resources.

The potential for sonic booms to damage structures is extremely small, but is a concern nonetheless. At 1 pound per square foot (psf), the probability of a window breaking ranges from one in a billion (Sutherland 1990) to one in a million (Hershey and Higgins 1976). At 10 psf, the probability of breakage is between one in a hundred and one in a thousand (Haber and Nakaki 1989). Damage to plaster is in a comparable range but depends on the condition of the plaster. Adobe faces small risks similar to plaster, but assessment is complicated by adobe structures being exposed to weather, where they can deteriorate in the absence of any specific loads (Sutherland *et al.* 1990). Ranchers expressed concern about risk to water tanks. The pressure exerted by a foot of water is slightly over 60 psf. Even with liberal assumptions about dynamic amplification, sonic booms are not expected to damage a water tank that is capable of holding water. Similarly, other outdoor structures such as buildings, windmills, radio towers, etc., are resilient and routinely subject to wind loads far in excess of sonic boom pressures. Foundations and retaining walls, which are intended to support substantive earth loads, are not at risk from sonic booms. Appendix G contains tables of sonic boom risk to a variety of structures. The Air Force follows established procedures for claims against the government in cases where damage is claimed to result from sonic booms.

During scoping, members of the public expressed concern that sonic booms might interfere with weather. The particular concern was that aircraft operations might disrupt developing or existing cloud formation, thus reducing rainfall. This possibility arose when citizens described seeing clouds form and dissipate over mountains during aircraft activity.

AN EXAMPLE OF A VAPOR CLOUD AROUND AN F/A-18 HORNET AT MACH 1 IN HIGH HUMIDITY CONDITIONS. (PHOTOGRAPH BY ENSIGN JOHN GAY, USS *CONSTELLATION*).

Cloud formation depends on the amount of moisture in the air, together with local temperature and pressure at the cloud layer. Aerodynamic loads (lift and drag; pressure on the wings) on an aircraft in flight have a localized effect on temperature and pressure. These loads are sometimes made visible by local condensation. The resulting vapor cloud is actually a condensation cloud in low-pressure expansion regions. One example of this kind of cloud was documented to occur at Mach 0.9, so it is not strictly a sonic boom phenomenon (Maglieri and Plotkin 1991). Captured on video, these vapor clouds can be seen repeatedly forming and dissipating as the aircraft goes through local moisture variations. The effect is clearly transient, reacting to the local pressure and returning to normal after the aircraft passes. It is likely that cloud dissipation reported by the citizens was a transient phenomenon associated with the aircraft, or, more likely, associated

with local wind currents over and around the terrain. The pressure field of an aircraft (either subsonic or supersonic) does not remove moisture or change atmospheric conditions.

4.2.3 Environmental Consequences

4.2.3.1 Draft EIS Proposed Action

The total number of anticipated aircraft operations within the airspace will be the same as for the baseline or No-Action conditions. The differences have to do with the airspace configuration and use. In some areas, the floor of the airspace would be changed and low altitude areas expanded. Supersonic operations would be permitted down to 10,000 feet MSL (5,000 to 6,000 feet AGL in this area), so that a portion of current subsonic operations would be supersonic.

Subsonic Noise

Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) from military aircraft has been computed for each proposed airspace listed in Table 2-1, and is presented in Table 4.2-2 for the Draft EIS Proposed Action. The analysis addressed operations of the Cannon-based F-16C aircraft presented in Table 2-4, plus transient aircraft from Section 3.1.2. The sound levels shown are those associated with each area under the airspace. The baseline noise levels, shown previously in Table 3.2-1 are included in Table 4.2-2. Noise levels for the Draft EIS Proposed Action are shown graphically in Figure 4.2-1, similar to the depiction of baseline noise levels in Figure 3.2-1. The noise levels fall into three categories:

- High-altitude airspace, where operations are at high altitude (above 10,000 feet) and noise levels are very low.
- Low-altitude MOAs where the floor is as low as 500 feet AGL. Noise levels are around 42 to 43 dB.
- Melrose AFR (R-5104 and R-5105) has a combination of low altitude and high altitude activity, and noise levels are around 50 dB.

Table 4.2-2. Existing and Draft EIS Proposed Action Military Aircraft Noise Levels Under Cannon Air Force Base (AFB) Airspace

	Baseline		Draft EIS Proposed Action	
Airspace	L_{dnmr}	*Number of events/day above Sound Exposure Level 65 dB*	L_{dnmr}	*Number of events/day above Sound Exposure Level 65 dB*
Pecos North Low[1]	43	1.2	43	1.2
Pecos South Low[1]	43	1.0	42	0.9
Taiban MOA[1]	43	1.2	43	1.2
R-5105[1]	49	0.4	49	0.4
R-5104A[1]	51	1.5	51	1.4
R-5104B[1]	51	1.5	51	2.1
Capitan MOA and ATCAA	-	-	25[4]	0.3
Pecos East Expansion[2]	16[4]	0.1	42	0.9
Pecos West Expansion[2]	16[4]	0.1	25[4]	0.3
Pecos South Expansion[3]	30[4]	0.9	28[4]	0.6

Notes:
1. Other airspaces overlay; airspace named is the dominant layer.
2. Baseline is Sumner ATCAA alone.
3. Dominated by Pecos South High.
4. Calculated military aircraft noise is below typical ambient sound levels of 25 to 36 dB.

Figure 4.2-1 shows the aircraft noise at the ground for the Draft EIS Proposed Action. Comparing it to Figure 3.2-1 for baseline, the changes in the sound environment in each area are:

- Pecos North Low: No change.
- Pecos South Low: There will be a 1 dB reduction in military aircraft L_{dnmr}, from 43 dB to 42 dB. This change occurs because the area of the airspace will increase, with the same number of sorties, so the average level will decrease. This change is not perceptible.
- Taiban MOA: No change.
- R-5105: No change.
- R-5104A: No change.
- R-5104B: No change.
- Capitan MOA and ATCAA: New airspace proposed in the Draft EIS Proposed Action has military aircraft L_{dnmr} projected to be 25 dB. This sound level is within the range of typical ambient noise levels. Aircraft will be noticed on occasion, but would not be expected to be more intrusive than existing sounds.
- Pecos East Expansion: Military aircraft L_{dnmr} would increase from 16 dB to 42 dB. In the baseline configuration, aircraft noise in this area is from the Sumner ATCAA, and is below typical 25 to 36 dB ambient sound levels. Extending the Pecos MOA to the east will extend low altitude airspace into these areas. Flight operations and the acoustic environment would be similar to that under the main part of Pecos South Low. There would be an increase in average noise to 42 dB from ambient levels of 25 to 36 dB. The noise level change would be noticed but remain well below the USEPA identified level of 55 dB.
- Pecos West Expansion: Military aircraft L_{dnmr} will increase from 16 dB to 25 dB. In the baseline configuration, aircraft noise in this area is from the Sumner ATCAA, and is below typical ambient sound levels. In the Draft EIS Proposed Action, Pecos South High and Pecos South Low will extend into this area. Assuming that operations in this expansion will not experience a general increase, but will be primarily aircraft moving between the main Pecos airspace and the Capitan MOA/ATCAA, the acoustic environment is projected to be 25 dB, similar to that in Capitan MOA/ATCAA. This sound level is within the range of typical 25 to 36 dB ambient noise levels. Aircraft will be noticed on occasion, but would not be expected to be more intrusive than existing sounds. Assuming the expansion airspace is used comparably to the Pecos East Expansion, the L_{dnmr} could be similar to the 42 dB projected for the Pecos East Expansion. As noted for the Pecos East Expansion, this noise level change would be noticed, but would remain well below the USEPA identified level of 55 dB.
- Pecos South Expansion: There will be a 2 dB reduction in military aircraft L_{dnmr}, from 30 dB to 28 dB. This change occurs because aircraft noise for both the baseline and Draft EIS Proposed Action will be dominated by operations in Pecos South High, and the area of Pecos South High will increase with the same number of sorties. Although the average level will decrease, this change would not be perceptible. If the area is used for similar operations to those of the Pecos East expansion, L_{dnmr} values could be similar to the 42 dB noted in the evaluation of the Pecos East expansion. This change would be noticed, but remain below the USEPA identified level of 55 dB.

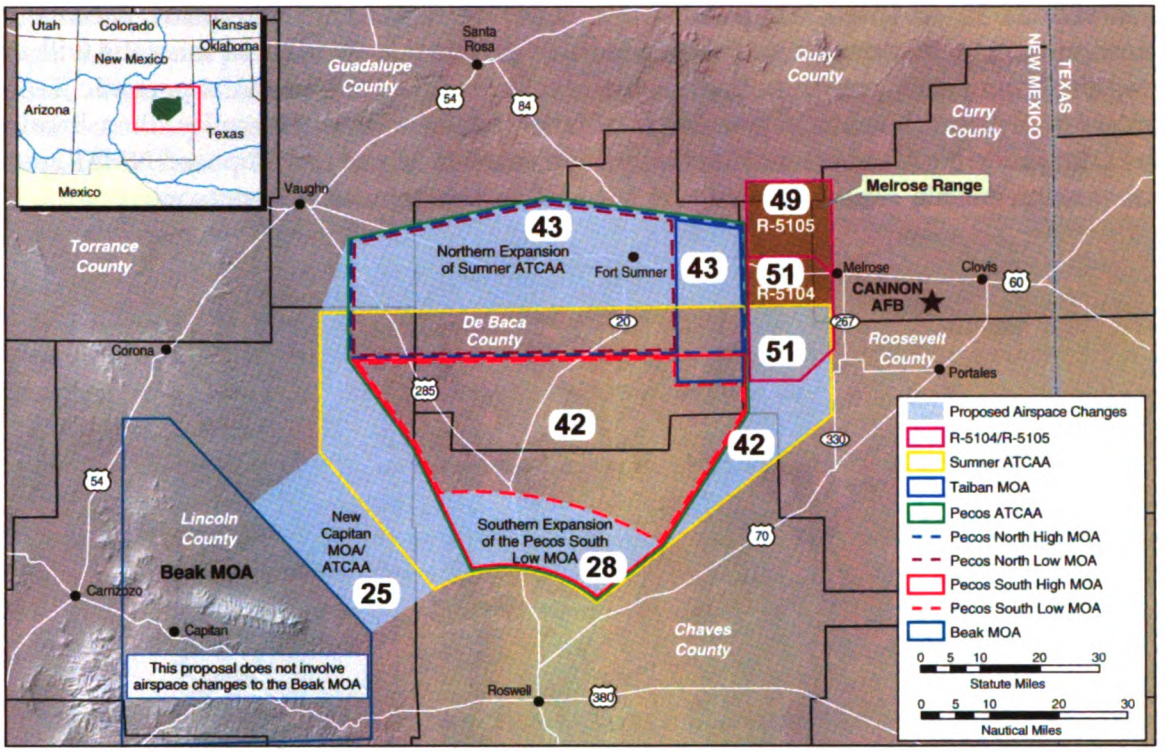

FIGURE 4.2-1. DRAFT EIS PROPOSED ACTION NOISE LEVELS FROM SUBSONIC OPERATIONS, L_{DNMR}

These changes are a consequence of expanding the Pecos South airspace so that its boundaries coincide with those of the Sumner ATCAA. Activity in Pecos South High MOA and Pecos South ATCAA is expected to utilize the expanded area, with no increase in sorties. This spreading of activity will lower the average noise level in the existing area, and increase in the newly expanded areas. The redistribution of training aircraft throughout the increased volume of airspace associated with the Draft EIS Proposed Action will result in a slight decrease in average noise under the existing Pecos South Low MOA. Under the Pecos Low MOA expansion, the noise levels will noticeably increase but will be well below the USEPA identified level of 55 dB. No adverse effects are expected.

Aircraft noise levels would increase under the Draft EIS Proposed Action Capitan MOA/ATCAA and also in the western and southern expansions of Pecos. Average noise levels of 25 to 28 dB will be noticeable compared to the calculated baseline noise levels but are within the ambient noise levels. Potential noise levels of 42 dB would be below the USEPA-identified level of 55 dB.

SONIC BOOMS

Supersonic operations would be permitted at altitudes above 10,000 feet MSL or 5,000 to 6,000 feet AGL. Under baseline or existing conditions, supersonic operations are permitted only above 30,000 feet MSL or 24,000 to 25,000 feet AGL. Baseline or existing conditions are described in Chapter 3.0. Because of the availability of the lower altitude airspace, it is projected that supersonic sorties will increase from 168 per month to 467 per month. These will fall into two categories: Air Combat Training (ACT) and supersonic Joint Direct Attack Munition (JDAM) missions.

As described in Chapter 2.0, training for supersonic JDAM deployment permits longer release-to-target distances, hence less exposure to hostile threats. JDAM missions will involve flying the appropriate profile, without actually releasing the weapon. A supersonic JDAM run consists of flying a level, constant Mach number track for about 10 miles, then breaking to subsonic speed. No JDAMs would actually be released in any of the proposed NMTRI airspace. That mission profile results in about 45 seconds to one minute of supersonic flight. That is comparable to the supersonic time in an ACT sortie. As with ACT, booms that reach the ground depend on the Mach number, altitude, and atmospheric conditions. When a boom reaches the ground, the width of the carpet varies with conditions.

An analysis was performed based on a range of JDAM altitudes from 20,000 to 40,000 feet MSL, expected Mach numbers, and atmospheric properties for one calendar year. Atmospheric properties were based on twice-daily upper air soundings at Albuquerque and Amarillo (National Oceanic and Atmospheric Administration National Climatic Data Center 2004). The result of this analysis was that about one quarter of supersonic JDAM operations will result in a sonic boom at the ground, and an average JDAM mission sonic boom footprint will be about 25 to 50 square miles. This is similar to the footprint size that occurs during ACT supersonic events (Plotkin *et al.* 1992). A second similarity between JDAM operations and ACT is that JDAM mission tracks will not be consistent: variety is an important part of training. Because of this similarity, and supersonic JDAM mission activity being about 25 percent of total supersonic operations, it is appropriate to consider an operation that simulated a JDAM launch to be part of ACT, and apply BOOMAP modeling to the total.

A third similarity between supersonic ACT and JDAM operations is that neither is a low altitude activity. As noted above, about 25 percent of total supersonic operations will be JDAM missions. All supersonic JDAM missions are above 20,000 feet MSL, with 80 percent above 30,000 feet MSL. This is a higher altitude distribution than that used by BOOMAP. The use of BOOMAP for JDAM missions is thus conservative and the sonic boom environment may be slightly overpredicted. While ACT can occur down to 5,000 feet AGL, higher speed phases occur at higher altitudes.

Table 4.2-3 shows typical altitudes for supersonic phases of ACT. Note that supersonic ACT activity is predominantly in the range of 15,000 to 30,000 feet MSL or above. Only a very small percentage of supersonic ACT activity is below 10,000 feet AGL (15,000 feet MSL in this airspace). BOOMAP is based on the altitudes in Table 4.2-3.

TABLE 4.2-3. ALTITUDE DISTRIBUTION FOR SUPERSONIC ACT ACTIVITY

Altitude in feet (MSL)	*Percent of Supersonic ACT time*
10,000-15,000	1
15,000-20,000	12
20,000-25,000	28
25,000-30,000	25
30,000-35,000	19
35,000-40,000	9
>40,000	6

Source: Plotkin *et al.* 1989

The net sonic boom environment in the center of the airspace would be CDNL 52 dB. On average, 0.6 booms per day (about two every three days) would be heard in the center of the airspace. Figure 4.2-2 shows the CDNL contours in the airspace. Note that CDNL at the airspace boundary is in the range of 40 to 45 dB, an increase of about 10 dB from baseline or existing conditions. There would be correspondingly fewer booms at the boundary than toward the center of the airspace under the Draft EIS Proposed Action.

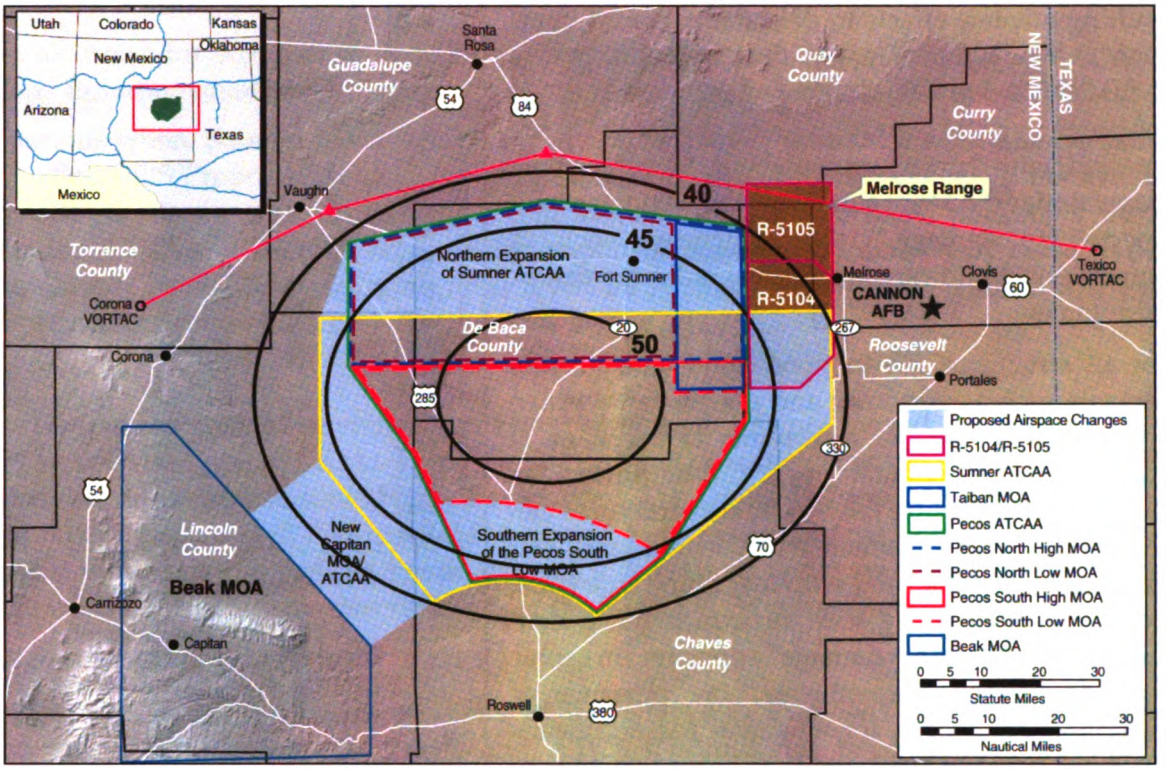

FIGURE 4.2-2. DRAFT EIS PROPOSED ACTION SONIC BOOM ENVIRONMENT, CDNL

The area potentially exposed to sonic booms does not depend on the number of supersonic sorties. The area is described by the presence of supersonic flights and the boundaries of the airspace. The population exposed to sonic booms would generally be the same as the baseline or existing conditions, but the number of booms would increase as described above.

Comparing Figure 4.2-2 and Table 4.2-1 shows that a sonic boom CDNL of 52 dB has an annoyance comparable to a subsonic noise DNL of 55 dB. This does not exceed the level identified by USEPA as protective of public health. From Table 4.2-1, 3.3 percent of sampled populations were highly annoyed at that level, so some individuals, especially toward the center of the airspace may be annoyed.

The increase in sonic booms from supersonic activity would be noticeable and can be intrusive. They would occur on average two times in three days, as opposed to one every five days as it is now. Public concerns expressed during scoping include annoyance of people who are startled by booms, possible damage to structures (particularly brittle objects like older windows) and potential adverse effects on domestic animals and wildlife. Direct effects are best quantified by the peak overpressures of individual booms.

Figure 4.2-3 shows the distribution of sonic boom overpressures under this type of supersonic airspace (Plotkin *et al.* 1989). The average peak overpressure is under 1 psf. About 1 percent of booms will exceed 4 psf. There is a very small probability of booms exceeding 6 or 7 psf. Sonic boom overpressure can result in vibration with resulting adverse effects to delicate, balanced items (such as displayed china) within a structure. As discussed above in Section 4.2.2, damage to structures in good condition (even windows) is not expected with booms under about 10 psf. Sonic booms under the Draft EIS Proposed Action are not expected to damage viable structures, such as foundations, buildings, windmills, radio towers, or water tanks.

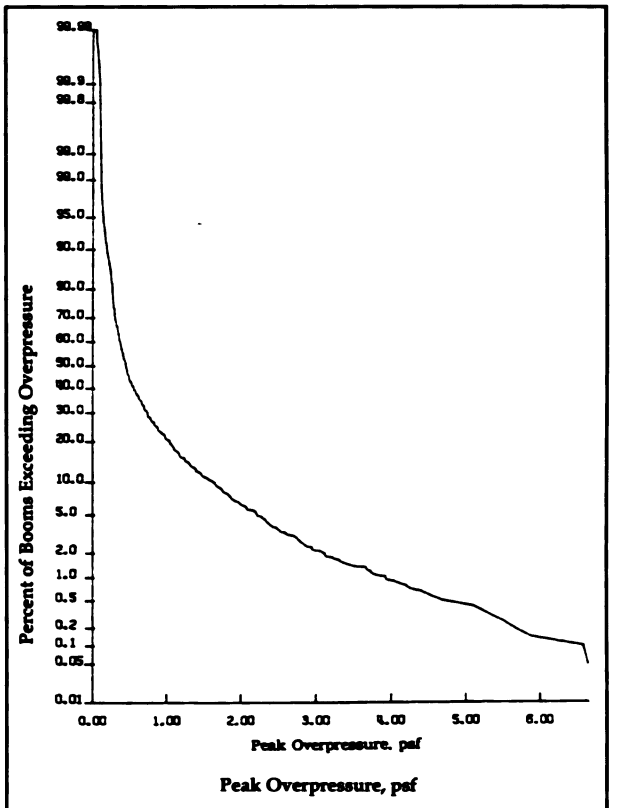

FIGURE 4.2-3. CUMULATIVE PROBABILITY DISTRIBUTION OF PEAK SONIC BOOM OVERPRESSURES

Not all structures are in good condition. Brittle elements such as windows and plaster can weaken with age, and become susceptible to breakage at low boom levels. Sometimes it can be difficult to assess why a structure fails: outdoor structures can deteriorate from weather, rust, wood rot, etc. Much damage associated with low amplitude sonic booms is sustained by such structures. The term "triggering incipient damage" appears in sonic boom literature. Nonetheless, the presence of susceptible structures, for whatever reason, means that some damage attributable to sonic booms is to be expected. The Air Force has established procedures for damage claims. Appendix G, Section 2.7, presents data on the susceptibility of various conventional and unconventional structures to sonic booms.

In general, the sonic boom environment for the Draft EIS Proposed Action is not expected to have significant adverse effect on humans or animals. A unique feature of sonic booms is startle. This manifests itself in two ways. The first is that it is annoying. That is well documented, and is one of the reasons why sonic booms are quantified by C-weighted levels rather than the A-weighted levels used for subsonic noise. The second is that startle might interfere with task activities, including tasks such as driving a car or piloting a light aircraft. Studies have been performed on the effect of sonic booms on various tasks, including driving (Lips 1972; Nowakiwsky 1974). The result of these studies is generally that there is little or no adverse effect. Apparently the concentration associated with such tasks overwhelms startle reaction. See Section 4.5.3 for details on the potential effects of sonic booms in the Proposed Action on wildlife and livestock.

4.2.3.2 ALTERNATIVE A, THE AIR FORCE PREFERRED ALTERNATIVE

Alternative A, as mitigated, would not relocate J-74 and would not create the Capitan MOA. This means that Sumner North ATCAA would be available for use by military pilots through coordination with Albuquerque Center. Referring to Table 2-4, a portion of operations

proposed for Sumner North ATCAA would be shifted into Sumner South ATCAA. This traffic would occur at high altitudes and would not change the lower altitude and more dominant noise of lower aircraft. For the same reason, the area under the Capitan ATCAA under Alternative A would have slightly reduced noise levels when compared with the Draft EIS Proposed Action.

SUBSONIC NOISE

Subsonic noise for Alternative A will be essentially the same as for the Draft EIS Proposed Action. Environmental consequences will be comparable to those described in Section 4.2.3.1.

For periods where Sumner North ATCAA is available, activity and noise would be the same as for the Draft EIS Proposed Action. For periods where Sumner North ATCAA is not available, there will be no combat aircraft noise contribution from the northern portion of Sumner Expanded ATCAA. The total noise in that region is, however, dominated by noise from the lower altitude Pecos MOA. Subsonic noise levels for Alternative A would therefore be the same as explained in Section 4.2.3.1.

SONIC BOOM

Supersonic activity could be shifted somewhat south with J-74 not moved and slightly in from the west with no Capitan MOA. These changes are not of sufficient size or movement to result in modeled differences in sonic boom distribution. The Draft EIS Proposed Action sonic boom environment presented in Figure 4.2-2 is expected to be essentially the same for Alternative A. Potential consequences include boom frequency, vibration, annoyance, and effects on some fragile items or structures as described under the Draft EIS Proposed Action.

4.2.3.3 ALTERNATIVE B

Alternative B is similar in most details to the Draft EIS Proposed Action. The primary difference is that the Capitan MOA and ATCAA would not be created. Subsonic and supersonic noise levels in the airspace would be similar to those for the Draft EIS Proposed Action. Environmental consequences for Alternative B would therefore be the same as described in Section 4.2.3.1.

SUBSONIC NOISE

There is currently military aircraft traffic between the Beak MOA and the Pecos MOA under case specific ATC direction and approval. The military aircraft fly between the Beak MOA and the Pecos MOA in a temporary narrow corridor an estimated twice per month. These training flights are comparable to the number of flights and aircraft which would occur if Capitan MOA/ATCAA were in place. These flights would be more dispersed and could stage, ingress, and maneuver in an approved Capitan MOA/ATCAA. The number of flights and the altitude of those flights would produce noise comparable to that described in Section 4.2.3.1. Activity in the remaining airspace will be as explained under the Proposed Action.

Subsonic noise levels associated with Alternative B would be similar to those for the Draft EIS Proposed Action. The aircraft noise levels in the area between Pecos and Beak are negligible for either alternative.

Sonic Booms

Operations in the proposed Capitan MOA/ATCAA area are not a significant contributor to the sonic boom environment. CDNL under Alternative B would be the same as presented on Figure 4.2-2 for the Draft EIS Proposed Action. Potential consequences would be the same in terms of boom frequency, vibration, annoyance, and effects on some structures.

4.2.3.4 No-Action

Under the No-Action Alternative, the noise levels would remain the same as the baseline or existing conditions with supersonic operations occurring above 30,000 feet MSL. Areas under the airspace would continue to experience an estimated one sonic boom every five days, as in the case today. Section 3.2 describes the baseline noise environment.

4.3 Safety

4.3.1 Methodology

Numerous federal, civil, and military laws and regulations govern operational safety at Cannon Air Force Base (AFB). Individually and collectively these laws and regulations prescribe measures, processes, and procedures required to ensure safe operations and to protect the public, military, and property.

NMTRI elements with a potential to affect safety are evaluated to determine the degree to which such elements increase or decrease safety risks. Ground, fire, and crash safety are assessed for the potential to increase risk. The 27 FW capability to manage risk by responding to emergencies is described. Any changes in the uses and handling requirements for explosive materials are identified and addressed. Analysis of flight risks correlates Class A mishap rates and bird-aircraft strike hazards (BASH) with projected airspace utilization. The magnitude of any safety consequences are presented.

4.3.2 Issues and Concerns

Safety concerns were expressed at scoping meetings about increasing the amount of airspace available for low altitude military training flight. Concerns were also noted about the use of chaff and flares in the proposed NMTRI expanded airspace. Also of concern were any new or altered risks arising from a NMTRI alternative. The adequacy of disaster response, especially fire response, was noted by public commenters.

4.3.3 Environmental Consequences

4.3.3.1 Draft EIS Proposed Action

Ground Safety

There are no aspects of the Draft EIS Proposed Action that would be expected to create new or unique ground safety issues. Operations and maintenance procedures conducted by 27 FW personnel would not change from current conditions. All activities would continue to be conducted in accordance with applicable regulation, technical orders, and Air Force Occupational Safety and Health (AFOSH) standards.

Capability for fire response is located on Cannon AFB and Melrose AFR. The Cannon AFB Fire Department is party to mutual aid support agreements with the nearby communities of Clovis, Portales, Texico, House, and Melrose (Air Force 2001e). All of these capabilities will continue in

effect. Any ground safety emergency that involves a life-flight would continue to be supported by stopping military training in the affected airspace.

Currently, expenditure of RR-188 chaff and M-206 flares is permitted in the existing Pecos/Sumner MOA and ATCAA airspace. Under the Proposed Action, this chaff and flare use in the expanded MOA/ATCAA airspace would also be permitted. Such use creates very little added safety risk.

Chaff, although ejected from the aircraft by a pyrotechnic charge, is not explosive. The composition of chaff is similar to those components found in the earth's crust, and presents no human health or safety risk. Through numerous studies, chaff has never been found to be specifically harmful to domestic animals or wildlife (Air Force 1997a).

Use of flares in the MOA/ATCAA airspace would continue to be conducted in accordance with ACC and Cannon AFB regulations. Under these requirements, the minimum release altitude of flares is 2,000 feet AGL. Considering the burn-time of a flare of approximately 3.5 to 5 seconds, the flare would burn out within 400 feet. This provides an approximate 1,600-foot margin of safety to ensure that no burning material contacts the ground. New Mexico pilots have not caused a fire from flare use in the MOA or ATCAA airspace. One historic flare-caused fire was the result of a transient user flying below the approved altitude for flare use. One fire in 2005 was the result of a spotting charge on an inert munition igniting vegetation. Under NMTRI, when the National Fire Danger Rating System indicates high fire conditions or above, the minimum altitude for flare release would be raised to 5,000 feet AGL. The potential for a flare initiated fire is very small, and raising the minimum altitude during high or extreme fire risk is not expected to change fire risk from existing conditions.

A specific ground safety risk associated with use of flares is the potential for a flare falling to the ground without burning (a dud flare). Historic data on range clean-ups at Melrose AFR and the Utah Test and Training Range, where flare use is intensive in a relative constrained geographic area, indicate that of all flares expended, an estimated 0.01 percent were actually found on the ground as duds. Instructions are provided by Cannon AFB to fire departments and other organizations on the identification of a dud flare and contact at Cannon AFB if a suspected dud flare is found. The risk from dud flares is minimal (Air Force 2001e). It is extremely unlikely that a dud flare could fall from an aircraft and strike an individual on the ground. Should such an extremely remote accident occur, it could result in injury or death. With a dud rate on the ground of approximately .01 percent, and a population of less than one person per square mile, the possibility of such an accident is so remote that it is very near zero.

Explosive Safety

No change in ordnance use will occur with NMTRI. Implementation of an alternative would create no specific explosive safety risks.

Flight Safety

All 27 FW flying training will continue at current levels. Supersonic flight, in and of itself, creates no specific flight safety concerns. As described in Section 3.3.2, the overall probability of an F-16 Class A mishap is 0.000024, or one chance in 42,000. This would produce a statistical average of one Class A mishap per 7.4 years for Cannon AFB aircraft. Cannon-based F-16s were involved in six Class A mishaps between 1995 and 2004. Risks of a Class A mishap remain unchanged from current conditions.

As discussed in Section 3.3, the vast majority of bird-aircraft strikes involving Cannon-based aircraft involve small songbirds. The number of migratory birds involved in incidents is small, and would constitute "unintentional or incidental taking" under the classification of "military readiness activity."

The Draft EIS Proposed Action would add additional low-altitude airspace to the Pecos MOA. During public hearings on the Draft EIS, local general aviation pilots expressed the opinion that the existing MOA airspace is unsafe under "see-and-avoid" conditions. Some pilots commented that they could not adequately communicate with the FAA during a flight to learn whether the MOA was actively being used for military training.

Increased radar coverage established in 1997 with Roswell Air Traffic Control Tower (ATCT) has alleviated radar coverage issues in the area of the Roswell Shelf. With this FAA radar coverage, the low altitude MOA expansion into the Roswell Shelf area should not increase safety risks to general aviation.

The Draft EIS Proposed Action reconfiguration of MOAs and ATCAAs in the high altitude regime would have increased the concentration of air traffic somewhat in the region due to the requirement to reroute or deconflict civil air traffic from military activities. Rerouting of civil aviation associated with J-74 has the potential to reduce safety in the re-routed area. Based on Appendix E, scheduling and coordination could require an increase in FAA management in the airspace to which deconflicted aircraft would be rerouted.

The Capitan MOA/ATCAA, between the Beak MOAs and the reconfigured Pecos MOAs, would have a floor of approximately 7,500 AGL. General aviation pilots expressed concern that this would be too narrow a corridor and would impact on civil aviation activity in the corridor. When the Capitan MOA/ATCAA would have been active, civilian aircraft using V-68 or V-83 would need to fly below 7,500 feet AGL, fly using "see and avoid" rules above that altitude, delay departure, arrival, or re-route around the airspace. During scoping, some civilian pilots expressed concern about safely using see-and-avoid in an active MOA.

Another potential flight concern would be the presence of towers, wind machines, or other ground obstructions in these newly-designated areas. As described in Section 3.1.2 (Airspace and Range Management), the FAA provides detailed instructions for marking any possible obstructions. Major obstructions are plotted on aeronautical charts, and the heights of these obstructions are shown in feet AGL and MSL. Because obstructions presently exist under the current low-altitude MOA airspace, their presence under the new low altitude airspace would not be expected to create a safety concern.

The proposal to expend chaff in the new NMTRI airspace would not create any flight safety issues. Training chaff is specifically designed to not interfere with FAA ATC radars. Should any issues arise, Albuquerque ARTCC would coordinate with controllers at Cannon AFB, and aircraft dispensing chaff would cease.

As a plane travels through the air, the trail of disturbed air that follows the aircraft is called a wake vortex. Larger aircraft and lower altitudes produce a greater potential for a wake vortex effect. There have not been any reports of wake vortex problems from infrequent training by large aircraft in the airspace. The F-16 operates primarily in the mid- to high-altitude range and the F-16 wake vortex would have no discernible effect on ground structures.

4.3.3.2 ALTERNATIVE A, THE AIR FORCE PREFERRED ALTERNATIVE

Alternative A, the preferred alternative, does not propose reconfiguring of J-74 and does not include a Capitan MOA. Existing MOA/ATCAA airspace would be expanded, additional MOA/ATCAA airspace would be created, supersonic flight to 10,000 feet AGL would be authorized, and RR-188 chaff and M-206 flare use in the new and modified NMTRI airspace would be authorized as described in Section 4.3.3.1.

Use of J-74 or direct routing by commercial or other civil aviation above the modified Pecos MOA complex would continue as at present. Alternative A avoids any safety risk concerns in the area of the Sumner North ATCAA and in the area under the Capitan ATCAA. The Air Force will work with Albuquerque Center to coordinate scheduling of the Sumner North ATCAA for LFEs.

Ground, explosive, and flight safety risk assessments are as discussed in Section 4.3.3.1. Chaff would not be expected to have any impact on safety. Flare use restrictions to 5,000 feet AGL under high or greater fire conditions would not be expected to change fire safety risk. There are no specific proposals associated with Implementation of Alternative A which would create new or unique safety issues.

4.3.3.3 ALTERNATIVE B

Alternative B includes relocating J-74 as described for the Draft EIS Proposed Action. The Capitan MOA/ATCAA would not be created. There are no specific proposals associated with the implementation of Alternative B that would create new or unique safety issues. Ground, explosive, and flight safety risk assessments generally remain as discussed in Section 4.3.3.1. No safety issues would be associated with the Roswell-Corona corridor. Class A mishaps would be as discussed in Section 4.3.3.1. Chaff would not be expected to have any impact. Altitude restrictions on flare use under high or above fire conditions would result in no expected change in fire safety risk.

4.3.3.4 NO-ACTION

No changes to 27 FW training airspace would occur under the No-Action Alternative. RR-188 chaff would continue to be used in the existing airspace. M-206 flares would continue to be deployed above 2,000 feet in up to very high fire conditions and not used in conditions in excess of those conditions. Flight safety risks will continue, and a Class A mishap would be as discussed in Section 4.3.3.1 because no change is proposed in the number of training flights. Any existing safety risks would continue along with the requirement to continue to address these existing risks.

4.4 Physical Resources

4.4.1 Methodology

NMTRI has no construction or similar ground disturbing features. The potential impacts to physical resources, primarily soil and water, are from chaff or flare materials falling to the ground. In August 1997, Headquarters ACC of the Air Force conducted a study of the environmental effects of using self-protection chaff and flares in military aircraft training (Air Force 1997a). This physical resources section considers the effects of chaff and flare deposition on resources identified in Section 3.4, including soil chemistry, the potential for chaff and flare debris to accumulate in water bodies and sediments, potential flare caused fires, and residual materials to leach toxic chemicals or change the chemical composition of surface water bodies. The impact would not be considered significant if toxic chemicals would not be released or if accumulated residual materials would not alter soil or water.

4.4.2 Issues and Concerns

Physical resource issues and concerns identified by the public during scoping focused mainly on whether the materials left on the ground after deployment of chaff and flares are environmentally safe. Concerns included whether toxic chemicals would remain or be taken up by plants, animals, or humans. Other concerns involved the potential for build up on the ground to the point where it would limit uses of the soil and water, or would require pick-up and disposal by landowners. While no large fields of active oil and gas exist within the ROI, some members of the public raised the possibility that the Proposed Actions may affect wildcat wells or potential future oil and gas development.

AGRICULTURAL SOILS ADJACENT TO MELROSE AFR HAVE BEEN UNDER AIRSPACE AUTHORIZED FOR CHAFF AND FLARE USE FOR DECADES.

4.4.3 Environmental Consequences

4.4.3.1 Draft EIS Proposed Action

Chaff

Chaff consists of aluminum-coated silica fibers one inch or less in length, and approximately the thickness of very fine human hair (Section 2.2.1.4). Chaff disperses widely when deployed. Ultimate disposition depends upon the altitude of release and the prevailing winds at different altitudes at the time of release. A conservative estimate is that all chaff, nylon or plastic parts, and felt spacers would be deposited on the ground under the airspace. The combined release of chaff and flare end caps and other plastic or aluminum wrapping residual materials would average one piece per approximately 9 acres per year. Chaff filaments are estimated to be 0.005 ounces per acre per year. Training flight patterns as well as winds result in variable deposition under the airspace. Higher percentages of chaff releases could occur toward the center of the airspace and a correspondingly lower percentage of chaff releases could occur toward the edges

of the airspace. Chaff fiber concentrations under the Capitan MOA/ATCAA would be much lower due to the infrequent use of the Capitan MOA/ATCAA airspace. In rare instances, chaff does not deploy correctly and rather than disperse in an electronic cloud, the fibers may clump together and fall to the ground. When this occurs, tufts or clumps of chaff can be discernable to the naked eye, but it is unlikely that chaff found would accumulate in soil and water in quantities that would negatively affect their uses or damage these resources.

The component of chaff that has the potential to negatively affect soil or water chemistry is aluminum, which tends to break down in acidic and highly alkaline environments. Laboratory and field analyses (Air Force 1997a) indicate that the pH of water in the soil or in a water body is the primary factor that determines the stability of the aluminum coating of chaff. The coating is the most soluble and likely to release aluminum if the soil or water pH is less than 5.0 (extremely acidic) or greater than 8.5 (strongly alkaline). In arid conditions such as those found in the ROI, soil pH tends to be neutral to high, but there is usually not enough water in the soil to react with the aluminum (Air Force 1997a). As described in Section 3.4, water bodies in the ROI are neutral to slightly alkaline, less than the threshold necessary to deteriorate the aluminum coating. Chaff that falls into surface water would be chemically stable. No impact to water bodies would be anticipated, even in the case of a highly unlikely event such as an entire clump of undispersed chaff falling into a small, confined water body.

Data on the chemical properties of the soils in the five counties that encompass most of the ROI, Chaves (Natural Resources Conservation Service [NRCS] 2002a), De Baca (NRCS 2002b), Guadalupe (NRCS 2002c), Lincoln (NRCS 2002d), and Roosevelt (NRCS 2002e), were reviewed. According to these data, there are three soil series that have a pH in the surface layers ranging between 7.9 and 9.0. These soil series represent a very small percentage of the total area that could be affected, and all but one have a very low potential for soluble chemicals in the soil being lost to surface runoff or leaching into groundwater. The low percentage of soils in the ROI with a high enough pH to react with aluminum, in combination with the low soil water content, results in conditions that would be extremely improbable for aluminum concentrations to be produced from chaff particles that weather on the ground.

No significant impact to physical resources would occur due to the deployment of chaff.

FLARES

The M-206 flares used in training missions are designed to be fully consumed before reaching the ground, with a failure rate estimated to be less than 1 percent (Air Force 1997a). In rare cases when a dud flare or some of the materials from the burned flare reach the ground, the components that have the greatest potential to affect soil and water chemistry are minute quantities of chromium, magnesium, aluminum, boron, and barium. However, only magnesium and boron showed levels in sufficient concentrations for concern in field and laboratory tests on flares, and then only in acidic environments that do not occur in soil or water within the ROI (Air Force 1997a). The residual plastic, nylon, felt, and aluminum-coated wrapper materials that fall to the ground are basically inert and are not in concentrations that could affect physical resources. As noted in the discussion under chaff, the total deposition of chaff and flare residual materials under the airspace averages one piece per 9 acres per year.

Any fires could adversely affect vegetation, increase soil erosion, and result in sediment delivery in surface water bodies. There is a very low probability for fires to occur as a result of a burning flare striking the ground. This is due to the low failure rate of less than 1 percent

combined with a 2,000 feet AGL minimum release altitude for fire conditions below high and 5,000 feet AGL for high or greater fire conditions. There have been no fires attributable to Cannon-based aircrews in the MOAs. Sections 4.3, 4.5, and 4.8 contain additional discussion of potential consequences from fire.

The potential for adverse impacts to physical resources would be essentially unchanged after deployment of flares. The likelihood of a flare-caused fire that would significantly damage surface resources would remain low. There would be no significant impacts to physical resources due to the chemical composition of flare materials that reach the ground.

Other

No ground activities are proposed that would interfere with oil and gas development or production. Airspace changes are proposed in the parts of Chaves County where gas and oil wells already exist. Over 31 existing oil wells and 42 existing gas wells within five sections in Roosevelt County (New Mexico Oil Conservation Division 2003) are under the existing airspace. Mineral development has proceeded in this area under the airspace in the past, and little impact from proposed airspace changes would be anticipated because the airspace floor altitudes of 500 feet AGL would be higher than any equipment used in exploration or mineral extraction. Sonic booms over a drilling rig would be unusual but could startle workers on the ground similar to the effect created by a loud thunderclap. Sonic booms are discussed further under Noise, Section 4.2.

4.4.3.2 Alternative A, the Air Force Preferred Alternative

Effects to physical resources under Alternative A are comparable to those described in Section 4.4.3.1. The activities under the preferred alternative, Alternative A, would have no significant impacts to physical resources within the ROI.

4.4.3.3 Alternative B

Physical resources would be affected essentially the same under Alternative B as described in Section 4.4.3.1. The ROI for Alternative B would be slightly smaller without the creation of the Capitan MOA/ATCAA. No significant impacts to physical resources would occur under Alternative B.

4.4.3.4 No-Action

The effects to physical resources under the No-Action Alternative would be the same as current conditions. Natural and manmade fires occur throughout the arid west. The land under the Pecos airspace complex regularly experiences fast moving range fires. Chaff and flares are currently authorized for use in the existing Pecos, Taiban, Sumner, and restricted airspaces. No changes to physical resources would occur under this alternative.

4.5 BIOLOGICAL RESOURCES

4.5.1 METHODOLOGY

Four areas of consideration are used to identify the potential environmental consequences to habitat, wild plants and animals, and livestock. These areas are (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 any ecological ramifications. Impacts to resources would be considered significant if special-status species or habitats are adversely affected over relatively large areas or disturbances cause significant reductions in population size or distribution of a special status species.

The Air Force has contacted the United States Fish and Wildlife Service (USFWS) with respect to threatened, endangered, and proposed species in the ROI. Because no ground disturbance is proposed and flare use would not significantly increase the likelihood of fires, potential or occupied habitat for federally listed or proposed species would not be impacted. Noise from subsonic and supersonic flights are unlikely to cause population-level effects on listed or proposed wildlife. Furthermore, the proposed action would not destroy or adversely modify critical habitat as defined under the Endangered Species Act (ESA). Therefore, it is anticipated that NMTRI would not affect species listed or proposed for listing in accordance with the ESA.

Effects on humans are discussed in relation to their interaction with agricultural resources. Other effects on humans (e.g., human health or annoyance) are presented in Section 4.2, Acoustic Environment; Section 4.3, Safety; and Section 4.8, Socioeconomics.

4.5.2 ISSUES AND CONCERNS

Specific issues and concerns were identified for biological resources during scoping meetings and reiterated during the public comment period on the Draft EIS. These issues and concerns are related to the potential effects of (1) low-altitude overflights in existing and expanded airspace, (2) sonic booms, and (3) chaff and flare use. Although there can be differences in noise characteristics between low-altitude subsonic flights and supersonic overflights (e.g., duration and frequency and accompaniment with visual stimulation), noise effects from both sources will be combined in the discussion below. Due to the high altitude (30,000 feet MSL) of aircraft in the air traffic study area, no impacts to biological resources would occur; therefore, the air traffic study area is not discussed further in this section.

In the following discussion, published literature is reviewed on the potential impacts of aircraft noise and chaff and flares on wildlife and livestock. For most wild species in the ROI, no specific studies on their response to aircraft noise are available. A discussion of general patterns of animal response to noise and published studies on effects of aircraft noise on wild and domestic animals is included in this section. Potential impacts to receptors in the ROI, including special-status species, are discussed in Section 4.5.3, Environmental Consequences.

4.5.2.1 AIRCRAFT NOISE

Specific concerns for livestock expressed during public review include the following:

- Startle response injury due to trampling or uncontrolled running or flight.
- Decrease in milk production.

- Decreased food intake, weight loss.

For humans, the potential concerns include the following:

- Injury to rider if a horse is startled.
- Reduced recreational (notably hunting) success if a species is startled.

Potential general issues related to noise effects on wildlife may also include the following:

- Startle response injury due to trampling or uncontrolled running or flight.
- Increased expenditure of energy, particularly during critical periods.
- Decreased time spent on life functions (e.g., seeking food or mates).
- Temporary masking of auditory signals from other animals of the same species, predators, or prey (e.g., noise could prevent an animal from hearing the approach of a predator).
- Damage to eggs or nestlings if a bird is startled from its nest.
- Exposure of eggs or young in nest if a parent flees.
- Increased risk of predation when startled animals flee from nests, roosts, or other protective cover.
- Site abandonment.

THE PRIMARY CONCERN WITH NOISE IMPACTS IS THE "STARTLE EFFECT" FROM SUDDEN ONSET NOISE ASSOCIATED WITH LOW OVERFLIGHT OR SONIC BOOMS.

The following section provides an overview of published literature regarding potential impacts to biological resources. The review of the noise effects literature shows that the most documented reaction of animals newly or infrequently exposed to aircraft noise is the "startle effect." Although an observer's interpretation of the startle effect is behavioral (e.g., the animal runs in response to the sound or flinches and remains in place), it does have a physiological basis. The startle effect is a reflex; it is an autonomic reaction to loud, sudden noise (Westman and Walters 1981, Harrington and Veitch 1991). Increased heart rate and muscle flexion are the typical physiological responses.

The literature indicates that the type of noise that can stimulate the startle reflex is highly variable among animal species (Manci et al. 1988). In general, studies have indicated that close, loud, and sudden noises that are combined with a visual stimulus produce the most intense reactions. Rotary wing aircraft (helicopters) generally induce the startle effect more frequently than fixed wing aircraft (Gladwin *et al.* 1988; Ward *et al.* 1999). Animals can habituate to fixed wing aircraft noise as demonstrated under controlled conditions (Conomy *et al.* 1998; Krausman *et al.* 1998) and by observations reported by biologists working in parks and wildlife refuges (Gladwin *et al.* 1988). However, species differ in their ability to habituate to aircraft noise.

Conomy *et al.* (1998) found that black ducks (*Anas rubripes*) exhibited a significant decrease in startle response to actual and simulated jet aircraft noise over a 17-day period, but wood duck (*Aix sponsa*) response to jet noise did not decrease uniformly following initial exposure. External physical variables, such as landscape structure and wind, can also lessen the animal's perception of and response to aircraft noise.

Research on the effects of aircraft noise on wildlife has largely focused on behavioral effects. Most studies of physical effects (e.g., heart rate, blood chemistry) have been restricted to captive or semi-captive animals. Furthermore, researchers have concentrated on the larger and more easily studied species, such as elk and raptors. Some species groups have been studied only rarely (e.g., reptiles and amphibians, neotropical migrant songbirds). McClenaghan and Bowles (1995) emphasized the research difficulty in distinguishing potential long-term effects on free-ranging wild populations due to aircraft noise compared to other environmental factors.

Several studies have investigated aircraft noise effects on domestic animals. Reviews of available information are found in Manci *et al.* (1988), United States Forest Service (USFS) (1992), and in Air Force documents (1994a, b; 2001f).

Wild Ungulates and Game Species. Wild ungulates appear to vary in sensitivity to aircraft noise. Responses reported in the literature varied from no effect and habituation to panic reactions followed by stampeding (Manci *et al.* 1988, Weisenberger *et al.* 1996). Luz and Smith (1976) observed that pronghorn antelope did not run until a helicopter was 150 feet AGL. Stephenson *et al.* (1996) found that mule deer had larger home ranges in areas with ground-based military training than the control group of deer (i.e., no ground based military training). However, they were unable to distinguish potential effects due to military aircraft. Reactions of captive elk (*Cervus elaphus*), pronghorn antelope, and bighorn sheep (*Ovis canadensis*) to sonic booms decreased with exposure (Workman *et al.* 1992). For pronghorn, initial responses were an increased heart rate which returned to normal within 1½ minutes, running for short distances, and increased alertness. By the third exposure to a sonic boom, the animals' heart rate response had decreased by half and they did not run. Krausman *et al.* (1998) studied the response of wild bighorn sheep in a 320 hectare (1.2 square miles) enclosure to frequent F-16 overflight at 120 meters AGL. Heart rate increased above preflight level during seven percent of the overflights but returned to normal within 120 seconds. No behavioral response by the bighorn sheep was observed during the overflights. Aircraft noise has the potential to be most detrimental during periods of stress, especially winter, gestation, and calving (DeForge 1981). However, wildlife management agencies regularly use helicopters and fixed-wing aircraft for radio tracking and surveying wild ungulate populations (e.g., Krausman and Hervert 1983).

Raptors. Most studies have found few negative effects of aircraft noise on raptorial birds. Ellis *et al.* (1991) examined behavioral and reproductive responses of several raptor species to low-level flights and sonic booms. No incidents of reproductive failure were observed and site re-occupancy rates were high (95 percent) the following year. Several researchers found that ground-based activities, such as operating chainsaws or an intruding human, were more disturbing than aircraft (White and Thurow 1985, Grubb and King 1991, Delaney *et al.* 1997). Red-tailed hawks (*Buteo jamaicensis*) and osprey (*Pandion haliaetus*) appeared to readily habituate to regular aircraft overflights (Andersen *et al.* 1989, Trimper *et al.* 1998). Mexican spotted owls did not flush from a nest or perch unless a helicopter was as close as 330 feet (Delaney *et al.* 1997). Johnson and Reynolds (2002) reported on the response of Mexican spotted owls to low altitude (1,400 feet AGL) jet overflights of owl territories in narrow canyons in Colorado.

Behaviors ranged from no response to sudden turning of the head. These behaviors did not exceed those observed before and after each fly-by. Nest attendance, time-activity budgets, and provisioning rates of nesting peregrine falcons (*Falco peregrinus*) in Alaska were found not to be significantly affected by jet aircraft overflights (Palmer *et al.* 2003). On the other hand, Andersen *et al.* (1990) observed a shift in home ranges of four raptor species away from new military helicopter activity, which supports other reports that wild species are more sensitive to rotary-wing aircraft than fixed-wing aircraft.

Waterfowl and Other Waterbirds. In their review, Manci *et al.* (1988) noted that aircraft can be particularly disturbing to waterfowl. Conomy *et al.* (1998) suggested, though, that responses were species-specific. They found that black ducks were able to habituate to aircraft noise, while wood ducks did not. In colonial nesters, effects may be more dramatic due to the crowded nature of the nesting colonies. Burger (1981) found that herring gulls (*Larus argentatus*) responded intensively to sonic booms and many eggs were broken as adults flushed from nests. One study discussed by Manci *et al.* (1988) described the reproductive failure of a colony of sooty terns (*Sterna fuscata*) in the Dry Tortugas reportedly due to sonic booms. However, based on laboratory and numerical models, Ting and Garrelick (2002) concluded that sonic boom overpressures from military operations with existing aircraft are unlikely to damage avian eggs. Nesting California least terns (*Sterna albifrons browni*) did not respond negatively to a nearby missile launch (Henningson, Durham and Richardson 1981).

Reptiles. Desert tortoise (*Gopherus agassizii*) newly exposed to simulated subsonic aircraft noise initially adopted a defensive response by "freezing" their activity for up to 113 minutes (Bowles *et al.* 1999). During subsequent exposure, the response was a milder defensive state for less than five minutes. Response to sonic booms was limited to brief periods of adopting an alert or watchful behavior.

Small Mammals. The burrows of some small mammals may reduce their exposure to aircraft noise. Francine *et al.* (1995) found that kit foxes (*Vulpes macrotis*) with twisting tunnels leading to deeper burrows experienced less noise than kangaroo rats with shallow burrows. Small mammals exposed to frequent and loud aircraft noise can develop enlarged adrenal glands. Chesser *et al.* (1975) found that house mice (*Mus musculus*) trapped near an airport runway had larger adrenal glands than those trapped two kilometers from the airport. In the lab, naïve mice subjected to simulated aircraft noise also developed larger adrenal glands than a control group. The implications of enlarged adrenals for small mammals with a relatively short life span are undetermined.

Livestock. As with wildlife, the startle reflex is the most commonly documented effect on domesticated animals. Results of the startle reflex are typically minor (e.g., increase in heart rate and nervousness) and do not result in injury. Exceptions may occur when animals are crowded in small enclosures such as corrals or feedlots, where loud, sudden noise may cause a widespread panic reaction. However, such negative impacts were only observed when aircraft were less than 330 feet AGL (USFS 1992). Between 1994 and 2005,

LIVESTOCK CAN BE STARTLED BY NOISE BUT TYPICALLY BECOME HABITUATED. NO IMPACTS TO LIVESTOCK ARE ANTICIPATED FROM THE PROPOSED ACTION OR EITHER ACTIVITY ALTERNATIVE.

five cases were reported of cattle injury under the Pecos MOA where cattle in an enclosed pen bolted into barbed wire. Each response was attributed to a low-level aircraft overflight. These responses occurred under existing conditions. Additional details are contained in Chapter 6.0 and the response to comments section of this Final EIS.

Numerous studies have found little direct evidence linking aircraft noise or sonic booms to decreased rates of milk production, weight loss, or lower reproductive success (Manci *et al.* 1988). Head *et al.* (1993) did not find a decrease in milk yields or milk components when 36 Holstein cows were exposed to jet aircraft noise; the cows also showed little to no behavioral responses. Many studies documented that all types of livestock habituate to aircraft noise (see reviews in Manci *et al.* 1988). Espmark *et al.* (1974) noted minimal behavioral reactions, such as general muscle contraction, ear and tail twitching, or walking or running a short distance (up to 20 meters), in cattle and sheep exposed to 28 sonic booms. They noted that cattle and sheep were, "less disturbed towards the end of the test period, thus indicating that adaptation had taken place" (Espmark *et al.* 1974). Livestock grazing has been an acceptable land management practice on Air Force ranges for decades. At Melrose AFR, the Air Force leases approximately 52,000 acres to ranchers for cattle grazing (Air Force 2001e).

No controlled studies of the responses of mounted horses to aircraft noise are available. Anecdotal reports indicate that horses with riders startle when surprised by a low-altitude overflight, but responses varied with the horse, rider, terrain, and other conditions. Several anecdotes noted that horses gallop or bite or kick in response to low-altitude overflights (Manci *et al.* 1988); however, no documented injuries to horses or riders were reported, and there was evidence that horses adapted to aircraft noise.

Several studies on the effects of noise on poultry were reviewed in The Impact of Low Altitude Flights on Livestock and Poultry (Department of the Air Force 1993). The report found that the major impact concern for poultry from low altitude flying arises from pileups in turkey flocks (i.e., where turkeys pile together in a concentrated area often resulting in death from suffocation or overheating); pileups of chickens were not reported. The report also concluded that low altitude flights result in no effects on chicken growth and reproduction functions (e.g., egg laying). As stated in Section 3.8.2.3 of the Draft EIS, hogs, pigs, horses, and poultry together comprise 1 percent of the livestock within the seven county ROI.

There is little direct evidence that aircraft noise or sonic booms can cause eggs to crack or result in lower hatching rates. Stadelman (1958) did not observe a decrease in hatchability when domestic chicken eggs were exposed to loud noises measured at 96 dB inside incubators and 120 dB outside. Bowles and Seddon (1994) found no difference in the hatch rate of 4 groups of chicken eggs exposed to 1) no sonic booms (control group), 2) sonic booms of 3 psf, 3) sonic booms of 20 psf, and 4) sonic booms of 30 psf. No eggs were cracked by the sonic booms and all chicks hatched were normal.

4.5.2.2 CHAFF AND FLARES

No additional chaff or flare usage is proposed within the affected airspace. The same number of RR-188 chaff and M-206 flares as are currently used would be deployed throughout the airspace including the new and expanded airspace. Specific issues and potential impacts of chaff and flare on biological resources are discussed below. These issues have been identified by Department of Defense (DoD) research (Air Force 1997a, Cook 2002), General Accounting Office review (United States General Accounting Office 1998), independent review by a Blue

Ribbon Panel of experts (Spargo 1999), resource agency instruction, and public concern and perception. Potential effects can be either direct or indirect. Direct effects would be the ingestion or inhalation of chaff filaments or fragments and physical external effects (such as skin irritation). Effects on water and forage quality would be indirect. Fire risk on arid rangelands is the primary concern of flare use. Fire effects can be both direct (i.e., mortality) or indirect (e.g., habitat changes). These issues are evaluated for their potential of occurrence and the effect on biological resources, given occurrence.

Ingestion of Chaff or Flare Residual Materials. The release of chaff and flares results in chaff filaments, plastic sliders and caps, felt spacers, and flare wrapping material falling to the ground. Residual pieces would average one piece per 9 acres per year. Chaff filaments are conservatively estimated to be 0.005 ounces per acre per year. Because of the nature of disposition and the low rate of application and dispersal of chaff filaments during defensive training, wildlife and livestock would have little opportunity to ingest chaff filaments or end caps. Although some chemical components of chaff are toxic at high levels, such levels could only be reached through the ingestion of many chaff bundles or billions of chaff filaments. Previous studies have shown that cattle avoided consuming clumps of chaff in their feed (Barrett and MacKay 1972). When calves were fed chaff thoroughly mixed with molasses in the feed, no adverse physiological effects were observed pre- or postmortem. Additionally, given the low proportion of water bodies in the ROI, it would be extremely rare that waterfowl or bottom-feeding animals would encounter chaff fragments or concentrated levels. Overall, it is not expected that wildlife or livestock would encounter or consume chaff or be negatively affected by chaff if it were accidentally ingested.

Another concern expressed by ranchers related to chaff and flare plastic pieces or wrapping material (similar to stiff duct tape) potentially contributing to bovine hardware disease. Hardware disease, or traumatic reticuloperitonitis, results when a cow ingests a foreign object, such as a nail, wire, or metallic object. The object can become lodged in the wall of the stomach and can penetrate into the diaphragm and heart, resulting in pain and infection. In severe cases animals can die without treatment. Treatment consists of antibiotics and/or surgery. Statistics are not readily available, but one study documented that 55 to 75 percent of cattle slaughtered in the eastern U.S. had metallic objects in their stomachs, but the objects did not result in damage (Moseley 2003). Dairy cattle are typically more vulnerable to hardware disease due to the confined nature of dairy operations. Many livestock managers rely on magnets inserted into the cow's stomach to prevent and treat hardware disease. The magnet attracts nails, wires, or other metallic objects, thereby preventing them from traveling to the stomach wall.

The culprit of bovine hardware disease is often a nail or piece of wire greater than 1 inch in length, such as that used to bale hay (Cavedo *et al.* 2004). Although no documented case exists, range cattle or other livestock could feasibly ingest residual materials of the M-206 flares; however, the plastic materials of the end cap and slider and the flexible aluminum wrapping are less likely to result in injury than a metallic object. There have been no reports of livestock ingesting residual chaff or flare materials on lands in and adjacent to Melrose AFR where chaff and flares and grazing have coexisted for over 30 years (Air Force 2001e).

Inhalation of Chaff Filaments. No specific research has been conducted on the potential for chaff inhalation by wildlife, nor have any negative effects been reported for wildlife, livestock, or humans (Air Force 1997a, Spargo 1999). Humans can inhale particles less than 10 microns in diameter (USEPA 1997). Air Force chaff filament size is approximately 0.04 inches in diameter

and 0.3 to 1 inch in length, which is too large for inhalation. On the ground, chaff degrades over time to aluminum or silica particles that are indistinguishable from ambient soil materials. Chaff particles on the ground can be degraded in size to less than 10 microns and are indistinguishable from soil fragments of the same size. Chaff fragments do not display asbestos-like characteristics and do not pose asbestos-like health risks. The number of degraded or fragmented particles is insufficient to result in disease (Spargo 1999). Therefore, inhalation of chaff filaments with adverse effects to wildlife, livestock, or humans is unlikely.

Physical External Effects. Unfragmented chaff is similar in form and softness to, yet smaller than, very fine human hair. No studies have evaluated or reported on negative effects associated with direct contact to chaff filaments. A field study on an Air Force range did not find chaff filaments in bird nests or animal burrows (Air Force 1997a). On a military range subject to decades of chaff and flare use, seven nests of the woodrat, a notorious gatherer of odd objects, were reviewed. None was found to contain chaff filaments or end caps. Chaff filaments may be generally unavailable or unattractive to wildlife and no negative effects are expected from direct contact.

Water Quality. The influences of chemical components of chaff and flare on water quality are discussed in detail in Section 4.4.3.1. Confined aquatic habitats may be at risk if there were a potential large-scale accumulation and decomposition of chaff fibers or dud flares. Wetland areas are a small percentage (< 0.5 percent) of the area to be exposed to chaff and flare release under the Proposed Action or alternatives. Most wetlands and water bodies are within the Pecos River Valley. Because chaff would be broadly distributed with low density in any one area, it is unlikely that chaff would be detectable or significantly accumulate within confined water bodies.

Under normal pH, the decomposition of chaff is extremely slow. Only under very high or low pH could the aluminum in chaff become soluble and toxic (Air Force 1997a). Few organisms would be present in water bodies with such extreme pH levels. Given the small amount of diffuse or aggregate chaff material that could possibly reach water bodies and the moderate pH of regional water bodies, water chemistry would not be expected to be affected.

The magnesium in flares can be toxic at extremely high levels, a situation that could occur only under repeated and concentrated use in localized areas. Flare ash would disperse over wide areas; thus, no impact is expected from the magnesium in flare ash. The probability of an intact dud flare falling to the ground during training is exceedingly low (<1 percent; Air Force 2001d). The probability of an intact flare then falling into an aquatic system is even smaller, particularly given the low proportion of water bodies in the ROI. Since toxic levels would require several dud flares to fall in one water body, no effect of flares on water quality would be expected.

Forage Quality. For a complete discussion of the activity of aluminum in soils, see Section 4.4.3.1 Given the exceedingly low concentrations of chaff deposition under the airspace, coupled with the non-reactive, arid, neutral to alkaline environment of the ROI, mobility of aluminum would not be expected to occur. Aluminum would likely remain inactive in an elemental state and be indistinguishable from ambient soils. Plants would not be expected to uptake any increased concentrations of aluminum. Therefore, no additional aluminum would enter the food chain or affect plant growth under the Proposed Action or alternatives.

Fire Potential. Fire risk and fire-frequency are a concern in arid environments. Although native vegetation in the Southwest is considered fire-adapted, past and current land-use

practices as in 2004, in combination with drought and invasive species, have altered fire regime and ecosystem processes (Brown 1994). Ecosystem changes include (1) the introduction and spread of invasive and exotic plants, which promotes the spread and intensity of fire or become established following fire; (2) habitat fragmentation by fire, leading to increased vulnerability of isolated populations; and (3) increased wind erosion of soil following fire. Therefore, even though most native species of the high plains are adapted to and even benefit from wildfire, any fire could result in direct losses and indirect negative effects. Fires could also result in livestock and property losses.

Vegetation growth affects fire potential. During years with above normal or exceptional levels of precipitation, the overall fire risk may vary from the regional norm. When green, the vegetation reduces fire risk and when dry it increases the risks of fire. Such variations in fire risk normally occur during a natural multi-year cycle. Above normal levels of vegetation were cited as a contributing factor in the November 2005 fire that spread off of Melrose AFR.

In most of the ROI, use of defensive flares is currently authorized. For NMTRI, the only new area potentially affected by flare use would be under the Capitan ATCAA where flares could be deployed above 18,000 feet MSL. The lower eastern, western, and southern expansion in the altitudes in the Pecos MOA complex currently are under ATCAA and MOA airspace authorized for M-206 flare use. Flares would be released above 2,000 feet AGL and are designed to burn out within approximately 400 feet of the release altitude (Air Force 2001d). Complete combustion of the magnesium pellets would occur at more than 1,600 feet AGL. Plastic or mylar materials from flares that do reach the ground, such as end caps, would not have the ability to start a fire. The percentage of flares that malfunction is small (<1 percent probability for all categories of malfunction; Air Force 2001d). The extremely rare dud flares that do not ignite at release and falls intact to the ground contains magnesium, which is thermally stable and requires a temperature in excess of 1,200 degrees Fahrenheit (°F) for ignition. Self-ignition is highly unlikely under natural conditions. Proposed changes in management practices for flare releases to a minimum altitude of 5,000 feet AGL during high fire conditions or above are not expected to change the potential for a flare-caused fire in the ROI beyond what might normally occur under existing conditions. Cannon AFB has a fully staffed and equipped fire department and mutual aid agreements with fire departments in the region.

4.5.3 Environmental Consequences

Based on the discussion of issues and concerns in Section 4.5.2 above, potential impacts to biological receptors considered in this analysis could result from (1) noise disturbances from low-altitude overflights and sonic booms or (2) a flare-caused fire. The discussion of potential effects on special-status species examines the list of species with known or potential occurrence in the counties in the ROI (Appendix H). Cited references are used to determine which species have a reasonable probability of occurrence in the ROI for all or part of the year and may potentially be impacted by the Proposed Action or an alternative. Federally listed species emphasized in this discussion are three endangered species (Kuenzler hedgehog cactus, interior least tern, and northern aplomado falcon), two threatened species (Pecos sunflower and bald eagle), two candidates for listing (sand dune lizard and lesser prairie-chicken), and eight species of concern (mountain plover [*Charadrius montanus*], peregrine falcon, western burrowing owl, yellow-billed cuckoo [*Coccyzus americanus*], Bell's vireo [*Vireo bellii*], Baird's sparrow [*Ammodramus bairdii*], black-tailed prairie dog, and swift fox). Several aquatic species (e.g., fish

and snails) were not considered further because (1) they are mostly known from outside the ROI, near Bitter Lake National Wildlife Refuge (NWR) and Roswell; (2) these species would be largely protected from fire in their aquatic environment; and (3) no impacts to water quality are expected.

As discussed in Section 4.5.2.2., chaff, the physical components of flares and end caps have been documented to have no effect on natural living resources, agricultural resources, special-status species, or humans (e.g., Air Force 1997a, 2001d). No environmental consequence is anticipated from chaff use under the Proposed Action or alternatives.

4.5.3.1 Draft EIS Proposed Action

Noise

No significant effects of aircraft noise on wildlife, livestock, or humans working with livestock would be expected. As stated in Section 4.5.2.1, animals have generally demonstrated an ability to habituate to loud, regular noises, such as low-altitude overflights and sonic booms. As referenced in Section 4.5.2.1, five cases of low-level overflights were attributed by a commenter on the Draft EIS to livestock injury and the death to three calves between 1994 and 2005 (see Chapter 6.0). Although extremely rare, such accidents can occur. The Air Force has established procedures for dealing with damage claims that begin by contacting the Cannon AFB Public Affairs Office.

For most of the airspace, subsonic noise from aircraft overflights, as measured by L_{dnmr}, would not be expected to change noticeably from current levels (presented in Section 3.2.2.1). Because the number of sorties would not change in the Proposed Action, noise on the ground under existing airspace would typically be less, since events would be distributed over a larger area. New expansion areas (eastern expansion of Pecos North Low, southern expansion of Pecos South Low, and western expansion of Pecos MOA/ATCAA) and the proposed Capitan ATCAA would experience an increased level of aircraft noise. The greatest increase in noise occurs in the Pecos East and possibly west and south, expansion areas where military aircraft noise increases from L_{dnmr} 16 dB to L_{dnmr} 42 dB. There will be an increase in average noise to 42 dB from ambient conditions of 25 to 36 dB. Animals in this area may be temporarily more sensitive to noise due to lower previous exposure (Workman *et al.* 1992). The new noise level would be comparable to that experienced by receptors for decades in most of the Pecos South MOA. Special-status species that may breed in these areas include sand dune lizard, northern aplomado falcon, peregrine falcon, lesser prairie-chicken, yellow-billed cuckoo, western burrowing owl, Bell's vireo, black-tailed prairie dog, and swift fox. Based on general ability of animals to habituate to noise (Andersen *et al.* 1989, Workman *et al.* 1992, Krausman *et al.* 1998, Trimper *et al.* 1998), no significant adverse impacts to populations of these species would be expected.

Short-term reactions to new noises may include temporary shifts in habitat use or activities. For example, prairie dogs and swift foxes might spend more time in their burrows, where they would be somewhat insulated from noises (Francine *et al.* 1995). A sudden onset low-level aircraft overflight could disturb lekking prairie-chickens, however they would be expected to resume lekking activities within a short period of time. Given the infrequency of low-level overflight of any specific area within the airspace (outside of Melrose AFR) and the temporary nature of the disturbance, a noticeable effect on breeding success or population size of the lesser prairie-chicken conservation areas would not be expected and impacts would be less than

significant. Ellis *et al.* (1991) observed that raptors—including the peregrine falcon—rarely flushed from their nests in response to aircraft overflights as close as 490 feet AGL. With less than 1 percent of training time below 1,000 feet AGL, sudden onset low-level subsonic noise events under the Pecos MOA complex would be the exception.

A greater number of NMTRI sorties would include supersonic flight and supersonic flight would occur at lower altitudes than under existing conditions. Consequently, animals would be exposed to louder noise levels from sonic booms than they are at present. The F-16 supersonic training is projected to principally occur at altitudes above 20,000 feet MSL. Current levels are about 0.2 sonic boom per day (or one boom every five days) with a CDNL value of 41 dB in the center of the airspace. Supersonic flights would produce an expected 0.6 sonic booms per day (or two booms every three days) with a CDNL value of 52 dB toward the center of the airspace. Supersonic noise at the edges of the airspace would increase from the current level of 33 CDNL to about 45 CDNL. In all areas, animals may initially react negatively to louder or greater numbers of sonic booms, as discussed above, but habituation is expected for most species (Ellis *et al.* 1991, Workman *et al.* 1992, Bowles *et al.* 1999). Sonic boom overpressures would rarely be greater than 4 psf which is not at a level that would damage eggs of wild or domestic birds.

Several special-status species are rare in New Mexico, but could be present during spring and fall migration, particularly along the Pecos River (New Mexico Department of Game and Fish [NMDGF] 2002a, 2002b). These are brown pelican, piping plover, mountain plover, black tern (*Chlidonias niger*), interior least tern, peregrine falcon, bald eagle, and Baird's sparrow. These temporary visitors may not be habituated to aircraft noise. Migrating birds require quality stopover habitat to rest and eat. Noise disturbance, therefore, could cause individual special-status birds and other migratory birds (e.g., ducks and geese) to leave their stopover area prematurely (Belanger and Bedard 1989). However, negative impacts to special-status populations would not be expected.

Winter is a stressful time for many wild species. Additional expenditure of energy could be harmful to an individual that was already stressed by lower food supplies in winter (DeForge 1981). Wild ungulates and livestock may flee from an aircraft that is low and directly overhead (Weisenberger *et al.* 1996). Wintering bald eagles are sensitive to noise disturbance (Grubb and King 1991) and may be disturbed by aircraft noise. However, because of the short duration of a noise event occurring at a particular location on the ground, any resulting physiological or behavioral disturbance would be short-lived.

Even if an animal were habituated to aircraft noise, a particularly close or loud noise event could result in a startle reaction and potentially negative side effects (e.g., increased heart rate, fleeing, potential for injury when confined) (Harrington and Veitch 1991). Thus, it is the individual extreme event—for example, a low flying F-16 directly overhead—that could result in negative impacts to individual wildlife, livestock, or humans. The Sound Exposure Level (SEL) noise metric is the appropriate measure for evaluating this impact to wildlife and livestock. An SEL event >95 dB is likely to trigger the

ANIMALS, SUCH AS THIS RAVEN, THAT BECOME HABITUATED TO AIRCRAFT NOISE COULD STILL HAVE A STARTLE REACTION FROM LOW LEVEL OVERFLIGHT OR A SONIC BOOM.

startle reflex in animals (Air Force 1998). SELs for various aircraft types and overhead altitudes are summarized in Table 3.2-4. SELs >95 dB could occur when aircraft are flying within 500 to 2,000 feet of the receptor. An animal in the footprint of a sonic boom may also react to the loud "bang-bang" sound, which is different than the rumble they may hear on a regular basis from more distant sonic booms or distant thunder.

The behavioral and physiological effects of the startle reflex are discussed above in Section 4.5.2.1. Overall, studies have demonstrated that effects are of short duration and rarely result in injury or negative population effects. Specific concerns for human safety (e.g., responses of horses with riders and human workers on structures, such as windmills) were expressed during scoping. Because the same number of sorties will operate in the reconfigured airspace, the probability of a subsonic noise event >95 SEL occurring directly above an individual animal or human is unchanged. Animals and humans in the existing and expanded Pecos MOA would have a possibility of experiencing a sudden onset low-level noise event.

Maximum A-weighted sound levels (L_{max}) are reported in Table 3.2-2. None of these values is at a level which would cause known physical damage to the ears of humans or animals.

In summary, for most of the airspace, average noise exposure from subsonic flight would be comparable to that experienced in the current airspace, which has not resulted in significant negative impacts to wildlife, livestock, or humans working with livestock. The Pecos expansion areas could experience the greatest increase in noise, to a level comparable to current exposure in the Pecos South MOA. Because the proposed NMTRI expansion of the airspace would not include an increase in number of sorties, the likelihood of a particularly loud event (>95 SEL) occurring directly above an individual animal or human would be the same as current conditions. Noise from supersonic flight would increase in all parts of the airspace, but at levels that would not be expected to significantly impact biological resources. Resident wildlife and livestock experiencing new noise levels may initially experience negative effects and may temporarily shift habitat use or activities as a result (Harrington and Veitch 1991). Based on previous studies (reported in Section 4.5.2.1), most wild species and livestock are expected to habituate and return to normal activities. Additionally, poultry operations are not expected to be impacted by the noise levels because there are no poultry operations within the ROI and poultry comprise less than 1 percent of all livestock in the ROI. Studies have concluded that there are no adverse impacts from noise from low level flights on chickens (Department of the Air Force 1993). Individuals or groups of migratory birds could be negatively affected because these temporary visitors may not be habituated to aircraft noise and the disturbance may or may not cause them to leave migratory habitat prematurely. Entire populations would not be expected to be impacted although the response of many species to aircraft noise has not been studied, species may vary in their response and ability to habituate to aircraft noise, and the long-term affects to wildlife of exposure to aircraft noise has not been studied. The long-term effects of noise change upon species or populations cannot be predicted with complete certainty.

FIRE

Increased fire risk was a concern expressed during public scoping and at public hearings. The number of flares used would not increase and flare use would be changed from a minimum altitude of 2,000 feet AGL to a minimum altitude of 5,000 feet AGL under high fire conditions. Factors that would lessen the potential environmental impacts from a fire are (1) the operational altitude restrictions for the release of flares; (2) the very low incidence of flare malfunction; (3) the provisions for supporting fire suppression; and (4) the adaptations of many species to grassland fires. Fire is discussed further in Section 4.3.3, Safety. The proposed raising of the floor for flare deployment during periods of high fire danger and the continued use of flares above 5,000 feet AGL during any fire conditions is expected to not noticeably change the fire risk from existing conditions.

FIRES ARE A REGULAR CONSTITUENT OF THE AREA UNDER THE AIRSPACE. THEY CAN RESULT IN SUBSTANTIAL SHORT-TERM DAMAGE TO VEGETATION AND RANGE INFRASTRUCTURE.

Even though a flare-caused fire would be an extremely rare event, a wind-driven fire could spread to other areas in the ROI. While fires are a regular constituent of the environment of the Southwest, they can result in substantial short-term damage to vegetation, damage to rangeland infrastructure such as fencing, and may injure or kill animal species unable to escape. Many plant and animal species of the Southwest are adapted to fire; those species that have experienced population declines may be at a greater risk because loss of individuals may negatively affect genetic viability of the population. Kuenzler hedgehog cactus, a federally endangered species, has declined from its native range due to commercial collection. As numbers are low and the cactus is not fire-resistant, any fire could imperil this species (Matthews 1994). The sand dune lizard, a candidate species, may be unable to escape a fire. Most birds and mammals would be able to escape or avoid a fire; however, losses to restricted or specialized habitat could indirectly affect population survival. Wetlands and riparian areas are restricted in distribution and abundance in the ROI (Table 3.5-1), yet a diverse array of species depend on them (Knopf *et al.* 1988). Pecos sunflower, interior least tern, yellow-billed cuckoo, Bell's vireo, and Pecos River muskrat (*Ondatra zibethicus ripensis*)would be affected by loss of wetland and riparian vegetation. Wintering bald eagles could be impacted if roost trees are lost to a fire. While burned snags could be used for several years until the snags decompose and fall, the recruitment of new large trees could take decades. Fire could also result in loss of quality grasslands for swift fox, northern aplomado falcon, and Baird's sparrow. In contrast, peregrine falcons may not be affected by fire or resulting habitat changes (Snyder 1991).

Some species may benefit from habitat changes following fire. These include mountain plover, burrowing owl, black-tailed prairie dog, and lesser prairie-chicken. Potential breeding habitat for mountain plovers exists in the ROI, although New Mexico is at the edge of the species' distribution. It is more likely that mountain plovers use New Mexico grasslands during migration (Air Force 1999). Burrowing owls are resident throughout the ROI. Mountain plovers and burrowing owls typically prefer areas with short vegetation; historically, this habitat was available at prairie dog colonies and in areas where bison congregated (Klute *et al.*

2003; USFWS 2003). Fire could open up dense, shrubby stands and reduce tall grasses, thereby making the habitat more suitable for these species (Howard 1996). Prairie dogs could also recolonize newly burned areas, which in turn would benefit mountain plovers and burrowing owls.

Lesser prairie-chickens are found in mid- to short-grass prairies, typically with a shrubby component of shinnery oak (*Quercus havardii*) or mesquite. Lekking sites are on bare to sparsely vegetated areas, and wildlife management agencies often use prescribed fires to maintain or create lekking habitat (Snyder 1992). However, nesting and brood-rearing areas with sufficient food and cover must be nearby; therefore, a hot, intense burn could result in habitat loss.

Fire, whether of natural or man-made origin, could also affect agricultural resources, including crops, livestock, livestock forage, and infrastructure such as fences or outbuildings. Livestock may need to be moved to new areas until the land recovers. Furthermore, the loss of forage or infrastructure would be an economic impact for private landowners affected. Any fire damage, however unlikely, resulting from a flare would be handled in accordance with the existing Air Force procedures.

4.5.3.2 Alternative A, the Air Force Preferred Alternative

Noise levels, use of chaff and flares, and consequences to biological and agricultural resources would not be appreciably different between the Draft EIS Proposed Action and Alternative A, the preferred alternative. Wildlife and livestock in Pecos MOA expansion areas and under the Capitan ATCAA would experience new but low levels of noise from subsonic flight. Noise from supersonic flight would increase in all parts of the airspace, but at levels that would not be expected to significantly impact biological resources. Resident wildlife and livestock experiencing new noise may initially experience negative effects, and may temporarily shift habitat use or activities as a result of noise effects. Wild species and livestock are expected to habituate and return to normal activities. Migrating birds may not have the opportunity to habituate, but populations are not expected to be negatively impacted.

4.5.3.3 Alternative B

Alternative B has similar airspace changes to the Draft EIS Proposed Action except that the Capitan MOA/ATCAA would not be created. In Alternative B, biological and agricultural resources under the proposed Capitan MOA/ATCAA would not experience new military aircraft overflights, sonic booms, or chaff and flare use.

Without the Capitan MOA/ATCAA, noise levels would be slightly higher in the remainder of the airspace; however, the difference is so small that it would be indiscernible and would not be expected to negatively impact biological or agricultural resources. In general, with no substantial change in total overflights, impacts to biological and agricultural resources would be similar between the Draft EIS Proposed Action and Alternative B.

4.5.3.4 No-Action

Under the No-Action Alternative, wildlife, livestock, and humans would continue to experience current noise levels from subsonic and supersonic flight. The proposed Pecos MOA expansion areas and Capitan ATCAA would not be exposed to new noise levels. Supersonic flight would also continue to occur above 30,000 feet MSL in the Pecos airspace complex. The use of chaff and flares would continue in the current airspace and fire risk would not change. Existing

actions have not resulted in significant impacts to biological and agricultural resources; therefore, no impacts are expected under the No-Action Alternative.

4.6 Cultural Resources

4.6.1 Methodology

Impact analysis for cultural resources focuses on assessing whether the Proposed Action or alternatives have the potential to affect cultural resources that are eligible for listing in the National Register of Historic Places (NRHP) or have traditional significance for American Indian groups. Under Section 106 of the National Historic Preservation Act (NHPA), the proponent of the action is responsible for determining whether any historic properties are located in the area; assessing whether the proposed undertaking would adversely affect the resources, and notifying the State Historic Preservation Officer (SHPO) of any adverse effects. An adverse effect is any action that may directly or indirectly change the characteristics that make the historic property eligible for listing in the NRHP. If an adverse effect is identified, the federal agency consults with the SHPO and federally recognized American Indian tribes to develop measures to avoid, minimize, or mitigate the adverse effects of the undertaking.

Direct impacts 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 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 and are harder to quantify.

The NMTRI proposal does not include on-the-ground activities that typically can cause direct or indirect adverse effects to archaeological sites eligible for listing on the NRHP. There will be no direct activities such as construction or demolition, clearing, grading, paving, utility installation, or earth moving. NMTRI does not include indirect on-the-ground effects, such as those that could occur from increased use of areas near or adjacent to archaeological sites, possibly resulting in vandalism, erosion, or other adverse effects. Similarly, the type of actions that could result in direct effects to historic buildings and structures eligible for listing in the NRHP that might typically occur as a result of demolition or renovation are not part of the Proposed Action or alternatives.

Effects to cultural resources as a result of NMTRI could stem from changes in the noise or visual environment. The introduction of material to archaeological sites or standing structures from the use of chaff and flares could also be considered an effect. Traditional cultural resources have the potential to be affected by any of these actions.

4.6.2 Issues and Concerns

To date, few issues or concerns specifically related to cultural resources within the project area have been identified. Few NRHP-listed cultural resources have been identified within the project area. Of the federally recognized American Indian tribes contacted by the Air Force, the Mescalero Apache Tribe of Mescalero, New Mexico, and the Jicarilla Apache Nation of Dulce, New Mexico, have indicated they have no specific concerns. Appendix C contains correspondence from the Mescalero Apache and Jicarilla Apache. The Comanche Tribe of Lawton, Oklahoma, the Apache Tribe of Andarko, Oklahoma, and the Kiowa Tribe of Carnegie,

Oklahoma have not responded to Air Force requests for consultation. The New Mexico SHPO also has not identified any specific concerns. The Air Force continues to consult with the Mescalero Apache Tribe; the Jicarilla Apache Nation of Dulce, New Mexico; the Comanche Tribe of Lawton, Oklahoma; the Apache Tribe of Andarko, Oklahoma; and the Kiowa Tribe of Carnegie, Oklahoma.

In the past, Fort Sumner State Monument experienced impacts "from low-level overflights (less than 500 feet) [and] from aircraft noise associated with sustained flight activity...at higher altitudes" (personal communication, Smith 2005). The noise level made it difficult at times for Monument staff to give tours and for Navajo visitors to conduct ceremonies and prayers. Communication with the Air Force about these adverse conditions resulted in the 111 acres of the Monument being declared a Noise Sensitive Area (NSA), after which the noise environment improved (personal communication, Smith 2005).

Elements of NMTRI can be divided into four categories: change in the shape of existing airspace, addition of new airspace, lowering the altitude for supersonic flight, and deployment of chaff and flares in the new and expanded airspace.

Actions that result in a change in the use of airspace by aircraft typically have little impact on archaeological resources. In the case of NMTRI, proposed changes in airspace occur primarily in areas routinely overflown by military aircraft. However, scoping comments raised concerns about the effects of vibrations on buildings, which can translate to concerns about the effects of vibrations from low-level flights and sonic booms on historic properties. There are numerous resources under the extensive airspace that have not been evaluated for eligibility in the NRHP. Most archaeological sites, by their very nature of existing below the ground surface, are not affected by vibrations, because they are typically shielded by the surrounding dirt matrix. Above-ground structures, including archaeological sites and buildings, could potentially be affected by vibration and changes in setting related to the introduction of increased noise and visual intrusion from overflights. Traditional cultural resources could also be affected by changes in setting.

Studies have established that subsonic noise-related vibration damage to structures, including historic buildings, requires high sound levels generated at close proximity to the structure in a low frequency range. Even under these conditions, the potential for damage to historic structures is small (Wyle Laboratories 2003). Similarly, sonic booms, especially ones that generate over 10 psf, have some potential to cause window breakage in buildings or damage to older structures, including historic structures. Brittle elements such as windows and plaster can weaken with age, and become susceptible to breakage at low boom levels. The anticipated number and likely concentration of sonic booms is in areas that do not have a number of historic resources. There is a low potential for structural damage to architectural resources or for displacement or breakage of components in most archaeological resources under the Proposed Action or alternatives (see Section 4.2.2). In the unlikely event of damage, the Air Force has established procedures for claims. Appendix G presents data on the susceptibility of various conventional and unconventional structures to sonic booms.

There is little potential for chaff to have physical or chemical effects on cultural resources (Air Force 1997a). Chaff strands are broken down by natural forces, which render the strands difficult to detect in the surrounding environment (Air Force 1997a). Because of the breakdown of the chaff fibers and the wide dispersion of chaff, it is unlikely that chaff residual components

such as end caps would accumulate in sufficient quantities to impair the appreciation or use of cultural resources or Native American traditional areas through visual effects.

Potential concerns regarding flare use include fire risk and aesthetic issues. Existing procedures require deployment of flares above altitudes that are designed to ensure a complete burnout of flares before they contact the ground. Cannon AFB regulations prohibit release of flares below 2,000 feet AGL (refer to Section 4.3). Potential inadvertent releases of flares or failure of the flare to function properly has a low likelihood (less than 1 percent), but could result in a fire. NMTRI proposes to change the use of flares to a minimum deployment altitude of 5,000 feet AGL during times of high fire danger or above. This is expected to result in an essentially unchanged fire risk from existing conditions.

Cultural resources can be damaged by fire, smoke, fire suppression, or fire rehabilitation actions. Potential fire-related damage to cultural resources would be minimized using existing procedures to control fire risk. In small quantities, flare residual components do not alter landscape conditions and have little effect on the overall aesthetic quality of cultural resources (Air Force 1997a). Section 4.7, Land Use, provides additional consideration of landscape issues.

4.6.3 Environmental Consequences

4.6.3.1 Draft EIS Proposed Action

Five NRHP properties underlie the airspace of the Proposed Action (refer to Table 3.6-1). These include three buildings, a railroad bridge, and the ruins of Fort Sumner, all in the vicinity of the town of Fort Sumner. No historic properties are beneath the air traffic study area. Although no traditional cultural resources have been identified as such in the project area, a portion of the Long Walk National Historic Trail also passes beneath the airspace. Navajo visit Fort Sumner State Monument to conduct ceremonies and prayers commemorating The Long Walk and their ancestors' confinement at Bosque Redondo in the 1860s (personal communication, Smith 2005). Current conditions for all resources include overflights by military and civilian aircraft, including flights at supersonic speeds above 30,000 feet MSL. Neither the noise nor the visual presence of these overflights have affected the National Register eligibility of the resources. An NSA over Fort Sumner State Monument reduces the noise over this resource (see Section 4.6.2).

Under the Draft EIS Proposed Action, the number of supersonic events throughout the airspace would increase relative to current conditions. Supersonic flights at 10,000 feet MSL could increase the frequency and intensity of sonic booms. Fort Sumner is identified as a population avoidance area for training flights and noise events will be spread out over the project area. The NSA over Fort Sumner State Monument will continue to be enforced. A comparison of the Proposed Action sonic boom environment (Figure 4.2-2) with the cultural resource historic areas (Figure 3.6-1) suggests that there is little likelihood of supersonic impacts to historic properties.

Chaff and flares are unlikely to adversely affect cultural resources. The material residue from both falls to the ground in a dispersed fashion and does not collect in quantities great enough to adversely affect the National Register status of archaeological or historical resources.

Through the IICEP process, the Air Force contacted the New Mexico SHPO, the Mescalero Apache Tribe of Mescalero, New Mexico, the Jicarilla Apache Nation of Dulce, New Mexico, the Comanche Tribe of Lawton, Oklahoma; the Apache Tribe of Andarko, Oklahoma; and the Kiowa Tribe of Carnegie, Oklahoma. In response to this contact, the New Mexico SHPO has not

expressed any concerns over cultural resources within the ROI (Appendix C). The Mescalero Apache Tribe of Mescalero, New Mexico, and the Jicarilla Apache Nation of Dulce, New Mexico, have both indicated they have no concerns with the Proposed Action (Appendix C). The other tribes contacted - the Comanche Tribe of Lawton, Oklahoma; the Apache Tribe of Andarko, Oklahoma; and the Kiowa Tribe of Carnegie, Oklahoma - have not communicated with the Air Force regarding the NMTRI proposal.

Fort Sumner State Monument commented on the cultural significance of the Monument to the Navajo. The Monument expressed concern that the existing NSA over the Monument should be maintained at its current size, at a minimum. In addition, the Monument wants assurance that overflights will be adjusted if future flight activity has a "significant negative impact on the operation of Fort Sumner State Monument" (personal communication, Smith 2005). The Air Force has no plans to modify the NSA.

4.6.3.2 Alternative A, the Air Force Preferred Alternative

Effects to cultural resources under Alternative A would be similar to those under the Draft EIS Proposed Action, five NRHP properties, all in the vicinity of Fort Sumner, underlie the airspace, as does part of the Long Walk National Historical Trail. Airspace changes, including alterations in the MOA floors, expansion of boundaries, establishment of new airspace, and changes in the distribution of sonic booms would not be expected to have an adverse effect on cultural resources, provided existing avoidance areas are maintained. Chaff and flares will not accumulate in quantities great enough to affect the NRHP eligibility of this resource type. No traditional cultural resources have been identified within the project area.

4.6.3.3 Alternative B

Under Alternative B, J-74 would be moved to the north as with the Draft EIS Proposed Action, but the Capitan MOA/ATCAA would not be added. Because there are no identified NRHP-listed cultural resources under the Capitan MOA/ATCAA airspace, the effects to cultural resources under Alternative B are the same as under the Proposed Action. No adverse effects are anticipated to the five NRHP properties under the airspace from supersonic flight, additional overflights, lowering the airspace floor, or deploying chaff and flares as long as existing avoidance areas are maintained. No historic properties have been identified under the air traffic study area.

4.6.3.4 No-Action

Under the No-Action Alternative, there would be no change to effects to cultural resources. There would continue to be overflights throughout the project area, including supersonic operations, at elevations above 30,000 feet MSL. Chaff and flares would continue to be deployed throughout the existing airspace. The five NRHP-listed cultural resources would continue to experience the audible and visual effects of overflights, which do not impact their NRHP eligibility. The NSA over Fort Sumner State Monument would be maintained. There would be no change in the susceptibility of these resources to the effects associated with residual chaff and flare materials.

4.7 Land Use and Recreational Resources

4.7.1 Methodology

Land use and recreational resources are evaluated to determine if any proposed project activity is incompatible with existing land use or adopted land use plans or policies. In general, land use impacts would be considered significant if they would (1) be inconsistent or noncompliant with applicable land use plans and policies, (2) prevent continued use or occupation of an area, or (3) be incompatible with adjacent or nearby land use to the extent that public health or safety is threatened.

Recreation resources would be affected if there were a change in access, availability to a recreation site or activity, or a change in the recreational opportunities.

PUBLIC SCOPING MEETING FOR THIS EIS IDENTIFIED SEVERAL LAND USE RELATED ISSUES AND CONCERNS.

4.7.2 Issues and Concerns

Five general areas of concern regarding land use were identified during scoping for this EIS. These areas of concern are as follows:

- Would the Proposed Action or an alternative affect land access?
- Would restrictions on property occur, including restrictions on use as a result of the Proposed Action?
- Would the Proposed Action or an alternative interfere with the building of wind farms, radio or cell transmission towers, or similar structures?
- Can sonic booms distort electric systems such as phone systems?
- Is there a potential to expand Cannon AFB or Melrose AFR?

These and other land use and recreational aspects are discussed below.

4.7.3 Environmental Consequences

4.7.3.1 Draft EIS Proposed Action

The four basic elements to the Draft EIS Proposed Action include modifications to the existing airspace, creation of new airspace primarily consisting of a MOA/ATCAA to bridge two existing MOAs, authorization to lower the floor for supersonic operations in the training airspace from 30,000 feet MSL to 10,000 feet MSL (approximately 5,000 to 6,000 feet AGL), and authorization for chaff and flare use in new and expanded airspace. Each of these elements and associated potential consequences to land use is described below.

Modifications to the Existing Airspace. Land under the NMTRI airspace is predominantly agriculture or range land. There would be no anticipated change in general land use patterns, land ownership, land management plans, and special use areas for the lands underlying the additional proposed airspace. The Draft EIS Proposed Action would involve strictly a change in airspace and not a land acquisition. There is no proposal to expand Cannon AFB or Melrose AFR as part of NMTRI. NMTRI would not affect land access in any way. Changes in airspace designation, expansion, and modification of airspace have not historically affected land uses and are not anticipated to affect existing land usage. Military aircraft currently train in ATCAA

airspace that overlies the entire proposed Pecos airspace complex. Depending on the airspace, the training may range from 500 feet to 30,000 feet and above. This current airspace is depicted on Figure 1-3 and described in Table 2-1. Land uses such as wind farms and towers that have height and land requirements would not be affected by the action. Structures in excess of 200 feet currently have FAA warning requirements (see Section 3.1.2). These requirements would apply to new structures under or outside the military training airspace. (Refer to Appendix G for the applicable portions of the FAA circular.)

The Draft EIS Proposed Action extends the Pecos Low MOA with a floor of 500 feet AGL to the west, east, and south under the existing Sumner ATCAA (see Section 2.2.1.1). This will increase the noise levels in those areas as described in Section 4.2.3.1. The resulting average noise levels are below the 55 dB identified by the USEPA as being protective of the public health and welfare (USEPA 1974). Some public concern was expressed that the changes in noise levels may affect property values; Section 4.8, Socioeconomics, discusses this concern.

The Bureau of Land Management (BLM)-designated Areas of Critical Environmental Concern (ACECs) and Special Recreation Management Areas (SRMAs) under the airspace would not likely be affected by the Draft EIS Proposed Action for the following reasons. All but one of the sites are currently under the Pecos MOA where the airspace floor is 500 feet. These sites would have a slightly lower noise level as flights are distributed to other airspace. The estimated military aircraft noise level in the Martin-Antelope Gyp Cave, located under the extension of the Pecos South expansion, would be expected to increase from 16 to 28 DNL. With an estimated ambient noise level from 25 to 36 dB, this change could be detected but overall remains low at this site. If aircraft training in the Pecos South expansion were comparable to other portions of the Pecos South MOA, average noise levels could be 42 DNL. Access to land would remain unaffected and noise levels would remain below 55 dB. Management of these resources would continue as at present.

Recreational hunting was identified as a concern by participants in scoping meetings. Approximately 89 percent of the pronghorn antelope taken annually are on private property. Hunters pay for hunting rights on the ranches under the airspace and at least one rancher was heard to say that he netted more income annually from antelope than he did from cattle. Since ranches under the existing airspace currently have successful recreational hunting, it is not likely that hunting on ranches under the new or expanded airspace would be detrimentally affected. In the extremely rare case of a low flying aircraft or a sonic boom causing game to startle during a hunt, the hunter would likely be annoyed. Even in such a case, land used for recreation activities such as hunting would not be affected by NMTRI.

Under the Draft EIS Proposed Action, the Section 4(f) properties are discussed in Appendix I.

Creation of the Capitan MOA/ATCAA. The Draft EIS Proposed Action included a Capitan MOA/ATCAA. There would be no anticipated change in general land use patterns, land ownership, land management plans, special use areas, agriculture, or ranching for the lands underlying the proposed Capitan MOA/ATCAA area.

There is one SRMA under the Capitan MOA/ATCAA area. Torgac Cave is part of the Roswell Cave Complex ACEC. With no change to access and negligible noise impacts, it is not expected that this resource would be affected.

Authorization to Lower the Floor for Supersonic Operations from 30,000 feet MSL to 10,000 feet MSL. Under the Draft EIS Proposed Action, supersonic operations would be permitted at

altitudes above 10,000 feet MSL (5,000 to 6,000 feet AGL). This action would result in an estimated two sonic booms about every three days. Average noise levels for sonic booms would be close to the USEPA noise level where 3.3 percent of the population could be highly annoyed by the noise environment (see Section 4.2). Some individuals, primarily toward the center of the airspace, may be annoyed by the increased sonic boom environment (see Section 4.2).

The BLM ACECs and SRMAs are located at the estimated edge of the 50 CDNL sonic boom contour (Figure 4.2-2). Management of these areas is not expected to change although recreationists may be annoyed by the increased frequency of sonic booms.

Supersonic operations would not change in general land use patterns, land ownership, land management plans, and special use areas on the lands underlying this airspace. There is no land acquisition or any changes to access to recreation areas or public/private land associated with NMTRI. Agriculture, the predominate land use, would not require a change in land management.

Chaff and Flare Use in New Airspace. Military aircraft are currently assessed to use RR-188 chaff, M-206 defensive flares, other flares, and ordnance in Restricted Airspace over the Melrose AFR. In airspace outside the Restricted Airspace, including the Pecos and Taiban MOAs, and the Sumner ATCAA, only RR-188 chaff and M-206 flares have been assessed for use. Under the Draft EIS Proposed Action the use of RR-188 chaff and M-206 defensive flares in the new and modified airspace would also be authorized.

There would be no anticipated change in general land use patterns, land ownership, land management plans, or special use areas for the lands underlying the airspace associated with chaff and flare use. This is consistent with other areas throughout the country where chaff and flares have been used. NMTRI does not increase total chaff or flare use within the airspace. The release of chaff and flare end caps and other residual materials together would average one piece per 9 acres per year. Although the likelihood of encountering any chaff or flare residual components is low, if such were found it could result in annoyance to the observer. During public hearings on the Draft EIS, flare residual materials from unassessed flares and end caps from assessed flares or chaff were displayed by a participant at the hearings. Participants expressed annoyance at finding residual flare and chaff materials on private property. For additional information, please see the public comments section of this Final EIS, Chapter 6.0.

Chaff fibers are extremely difficult to discern from naturally occurring materials found in the area (Air Force 1997a). Chaff fibers break down to the consistency of background materials. Animals do not typically consume chaff (see Section 4.5.2.2), and it is unlikely that modern chaff or its residual components would accumulate in sufficient quantities to impact land uses, affect recreational resources, or even be found. In rare instances, chaff does not deploy correctly and rather than disperse in a large cloud, the fibers may clump together and fall to the ground. When this occurs, tufts or clumps of chaff can be discernable to the naked eye. These tufts may catch on vegetation or blow across the landscape with the wind. Tufts may stay together or separate into individual fibers to some degree as the wind blows. Depending upon the context, the chaff may appear to resemble naturally occurring tufted seed pods or be viewed as foreign material.

During scoping meetings and public hearings, participants expressed concern regarding potential detrimental effects to property values due to the presence of chaff or flare residual

components and the fire hazard of flares. Use of chaff and flares would be directly correlated to the pilot's response to a threat within the airspace. Residual deposition of chaff or flare end cap materials would be the result of altitude of chaff use, wind directions, and wind speeds. Due to the dispersal nature of deployed chaff and flares, the average wind in the area, wind at altitudes, and the altitude at which chaff and flares are deployed, chaff or flare materials could be carried on wind currents outside, and, possibly, back inside the airspace. This analysis assumes that all chaff and flare end caps would be concentrated on lands under the airspace. This conservative assumption could produce a higher annual concentration of chaff or flare materials than may actually be experienced under the airspace.

With regard to both chaff and flares, the likelihood of adverse impacts associated with these elements is low. For example, in the proposed and existing airspace, chaff concentrations would be estimated to be approximately 0.14 gram (0.005 ounce) per acre per year. An estimated one flare would be dispensed annually in the proposed and existing airspace over each 80 acres. The risk of fire associated with flare use is extremely low and virtually indistinguishable compared to other potential sources of fire (e.g., lightning, campfire). Current property values in the region presumably account for existing environmental conditions and fire hazard in the region. In the unlikely incidence of a flare-caused fire, the Air Force has established procedures for damage claims reimbursement. Section 4.8, Socioeconomics, further discusses property values, and Section 4.3, Safety, further discusses control of fire.

Chaff and flare use are widely dispersed when used within MOAs (Air Force 1997a), reducing the potential for encountering residual components on private residences or within sensitive land use areas. Fort Sumner State Monument and a variety of ACECs and SRMAs underlie the existing airspace designated for both chaff and flare use. Chaff or flare residual components have not been identified in these areas of public visitation at a level that would disturb scenic quality or diminish the recreation experience. The potential for chaff or flare use changing land use, land ownership, or land management practices is negligible.

4.7.3.2 Alternative A, the Air Force Preferred Alternative

Under Alternative A, impacts from modifying the existing airspace would be less than the Draft EIS Proposed Action. Alternative A does not propose relocating J-74. In addition, Alternative A as mitigated, does not include a Capitan MOA and reduces the Capitan ATCAA.

There would be no anticipated change in general land use patterns, land ownership, land management plans, and special use areas for the lands underlying the additional airspace. Alternative A involves strictly the airspace and not any land acquisition. Access and the current land uses would not be affected. Consequences from noise and chaff and flare use would be essentially as described for the Draft EIS Proposed Action. As depicted on Figure 1-3 and described in Table 2-1, all the land except that under the Capitan ATCAA is currently overflown at higher altitudes.

The noise levels would be as shown in Table 4.2-2. The resulting noise levels are below the 55 dB identified by the USEPA as being protective of the public health and welfare at a level below which adverse noise impacts are not expected (USEPA 1974). Most land use environmental consequences would be as described for the Draft EIS Proposed Action with the exception of the J-74 corridor and the Capitan corridor. Under Alternative A, there would be no consequences to the J-74 corridor and there would be no discernible consequences to lands under the reduced Capitan ATCAA.

4.7.3.3 ALTERNATIVE B

Alternative B includes all elements of the Draft EIS Proposed Action except that the Capitan MOA/ATCAA would not be established to connect the Beak MOA/ATCAA and the Pecos/Sumner complex.

Under Alternative B, impacts from modifying the existing airspace, noise, and chaff and flares would be essentially the same as described for the Draft EIS Proposed Action. There would be no anticipated change in general land use patterns, land ownership, land management plans, and special use areas for the lands underlying the additional airspace. Noise conditions under the Capitan MOA/ATCAA corridor would remain at baseline levels.

4.7.3.4 NO-ACTION

Under the No-Action Alternative, land uses would remain the same. Supersonic flight would continue above 30,000 feet MSL in the Pecos airspace complex. The use of chaff and flares would continue in the current airspace and the fire risk would not change. Existing actions have not resulted in significant impacts to land use. No impacts are expected under the No-Action Alternative.

4.8 SOCIOECONOMICS

4.8.1 METHODOLOGY

The socioeconomic impact analysis addresses the potential effects of the proposed airspace modifications, supersonic flight, and chaff and flare use on the social and economic resources of the ROI. These social and economic resources are defined in terms of population and economic activity. Air Force personnel levels and 27 FW operations and maintenance procedures would not change from current conditions with any NMTRI alternative. Therefore, no direct impacts to employment or income would occur.

Potential secondary socioeconomic effects of the Draft EIS Proposed Action, Alternative A, and Alternative B have been evaluated for airspace use, noise conditions, and fire hazard in the affected area. The potential physical and biological effects of the airspace modifications, changes in use, and chaff and flare use were evaluated to determine their potential impacts on human and livestock populations, economic pursuits, and land values in the ROI.

4.8.2 ISSUES AND CONCERNS

Issues and concerns involving socioeconomic resources were identified during public scoping and public hearings on the Draft EIS. Concerns related to property values, economic pursuits, damage to structures, and safety. Public concern was expressed regarding potential detrimental environmental conditions associated with NMTRI that could reduce land values in the affected area. There was concern that wildlife and livestock in the affected areas may be vulnerable to noise events and fire hazard leading to negative economic impacts to the agriculture and recreation industries. Concerns were raised regarding

PUBLIC CONCERN HAS BEEN EXPRESSED REGARDING POTENTIAL EFFECTS ON LAND VALUES UNDER THE AIRSPACE.

potential hazards to structures or activities associated with oil and gas extraction and wind power generation. The risk of fire damage to range lands and area infrastructure, including livestock and fences, was identified as a concern. Potential safety issues related to joint airspace military training use and general aviation flight were identified as public concerns.

4.8.3 Environmental Consequences

Based on the issues and concerns noted in Section 4.8.2 above, potential socioeconomic impacts were evaluated related to three elements: (1) modifications in airspace use, (2) noise disturbances from overflights and sonic booms, and (3) flare-caused fire hazard. The other resource analyses (e.g., airspace management, noise, safety, physical and biological resources) were reviewed to determine the potential consequences to these resources which may further result in social or economic impacts within the region.

4.8.3.1 Draft EIS Proposed Action

Airspace Modifications

The Draft EIS Proposed Action proposed to shift J-74 north of its current location. Existing MOAs would be expanded east, west, and south under existing MOA and ATCAA airspace. New MOA and ATCAA airspace would be created and supersonic flight would be authorized at lower altitudes. Flight activity, in terms of the number of annual sortie-operations flown, would remain the same as under current conditions and would be distributed in a larger volume of airspace. The amount of chaff and flare use would remain the same and be distributed in a larger volume of airspace. For additional discussion of these issues, also see Section 4.1, Airspace and Range Management, and Section 4.3, Safety.

Reconfiguration of J-74 was identified through the Draft EIS review process as potentially causing impact to commercial traffic. Appendix I contains a discussion of Department of Transportation 4(f) resources within the Air Traffic Study Area.

The proposed MOA expansions would not prohibit general aviation use. MOAs are joint use airspace and both military and civil pilots are required to operate under see-and-avoid rules of flight. During scoping meetings and public hearings on the Draft EIS, charter aircraft pilots expressed concern that they did not feel safe within the existing MOAs under see-and-avoid rules and requested improved communications when military training aircraft were in the vicinity. The Capitan MOA/ATCAA could affect commercial and general aviation flights between Roswell and the Corona VORTAC. The Capitan MOA is not proposed as part of Alternative A, the preferred alternative.

The proposed supersonic flights at 10,000 feet MSL are expected to have little or no economic impact. The duration of supersonic flight would be brief and not be expected to have any effect on other aircraft flying the region. No impacts to elevated ground structures such as wind energy operations, oil and gas exploration or production are expected. Section 4.1.3 provides additional discussion of general aviation and towers within the airspace.

There is little to suggest that airspace modifications under the Draft EIS Proposed Action would impact land values in the affected area. The complex nature of property valuation factors makes any estimation of the potential effects of airspace modifications on land values highly speculative. Ranching operations, communities, and private airports all exist and function under the existing Pecos airspace. Other socioeconomic factors, such as business activity, employment, interest rates, and land scarcity (or availability) are much more likely to affect

property values than an altitude redistribution of flight pattern changes in existing training aircraft overflights. Neither the somewhat reduced training flight activity under the existing Pecos MOAs nor the somewhat increased training flight activity under the expanded Pecos MOAs is expected to increase or decrease the value of property under the airspace.

Noise Disturbances

The total number of training sorties flown is not projected to change under the Draft EIS Proposed Action. The relatively low acoustical effects can be attributed to the dispersion of training flights into a larger volume of airspace. Average noise levels would be slightly reduced from current conditions in the existing airspace. Some receptors in the expanded Pecos MOA would experience higher levels of noise. Animals and humans in these areas are expected to be temporarily more sensitive to noise due to lower previous exposure. Animals and humans under the Pecos airspace complex would be exposed to higher noise levels than currently experienced. For a more detailed discussion, see Sections 4.2, Noise and 4.5, Biological Resources.

The typical human response to noise effects associated with aircraft overflights is annoyance. The USEPA has identified a DNL of 55 dB to be a level protective of the public health and welfare. This represents a threshold below which adverse noise effects are generally not expected. Noise levels for the Draft EIS Proposed Action and all alternatives are below this level. There are changes in the predicted noise levels in some areas, particularly the Pecos MOA expansions. The noise level in those areas could increase to 42 dB and is likely to be noticeable. However, this is well below the USEPA-identified level. No adverse noise effects to humans are anticipated.

Concern was expressed at public hearings that noise conditions may negatively affect wildlife and livestock in particular. During the public review of the Draft EIS, five cases of loss or injury to penned livestock were attributed to low flying aircraft between 1994 and 2005. Animals have demonstrated that they can habituate to loud, regular noises such as low-level flights and sonic booms. The levels of noise anticipated as a result of NMTRI could startle penned individual livestock but are not expected to result in biological effects that would impair overall animal populations.

Individual low-altitude subsonic overflights or higher-altitude sonic booms could result in short-term negative impacts to wildlife, livestock, or humans (e.g., increased heart rate, flight, potential injury). The low population of less than one person per square mile in the remote affected area and the relatively small increase in supersonic noise events from one per five days under current conditions to two per three days make it highly unlikely that flight activity associated with NMTRI would result in any significant social or economic impacts. It is possible that an individual or animal could be startled by an overflight or sonic boom at a specific time and place, but such an event would be difficult to predict given the rural nature of the area, the dispersed nature of flight operations, and the large airspace area. Speculation regarding potential injury to humans as a result of startle reaction to sonic boom has not been supported by any documented incidents or studies.

Recreational hunting for game mammals and birds was identified as a concern by participants in scoping meetings and public review of the Draft EIS. Approximately 89 percent of the pronghorn antelope taken annually are on private property. Hunters pay for hunting rights on the large ranches under the airspace. Since ranches under the existing airspace currently have

successful recreational hunting, it is not likely that hunting on ranches under the new or expanded airspace would be detrimentally affected. In the extremely rare case of a low flying aircraft or a sonic boom causing a game species to startle during a hunt, the results would likely be temporary annoyance to the hunter. Land used for recreation activities such as hunting would not be affected by the Draft EIS Proposed Action. Overall, economic impacts to the recreation and agriculture industries as a result of noise are not anticipated under the Draft EIS Proposed Action.

Damage to property or structures due to changes in noise conditions is not anticipated under the Draft EIS Proposed Action. The noise levels and overpressures anticipated to occur under proposed supersonic flight activity would not normally be sufficient to cause damage to windows or buildings in good repair. Depending on the aircraft altitude and attitude, overpressures could cause window damage. One example of a broken window in 2001 attributed to a sonic boom was presented during public comments on the Draft EIS. Older windows or fragile items could vibrate or be damaged by sonic booms.

Outdoor structures such as water towers, wind turbines, and radio towers are routinely subject to wind loads far in excess of sonic boom pressures and are sufficiently resilient to withstand the anticipated overpressure. In the unlikely event of property damage due to Air Force activity, the Air Force has established procedures for damage claims. There is little likelihood of land values being affected by the changes in airspace or airspace use associated with the Proposed Action.

Chaff and Flare Use

Chaff and flare use in the existing airspace would continue as under current conditions. Under the Draft EIS Proposed Action, chaff and flare use would be authorized in the new and expanded airspace. More discussion of chaff and flares may be found in Sections 4.3 Safety, 4.4 Physical Resources, and 4.5 Biological Resources.

Through numerous studies, chaff has never been found to be specifically harmful to wildlife, domestic animals, or humans. Chaff dispenses widely when ejected from aircraft and can travel for long distances before settling to the ground. Once settled to the surface of the earth, chaff breaks down to constituent parts indistinguishable from soil. Chaff is highly unlikely to accumulate in quantities that would result in any negative impact to surface conditions on land or water. Furthermore, it is highly unlikely that chaff debris or residual flare components would accumulate in sufficient quantities to affect property values or land uses. As noted in Section 4.7.3.1, some individuals could express annoyance if a chaff or flare end cap, wrapper, or other residual material were found on their property or at a recreation location, but this is not expected to affect land values or regional economics.

M-206 flares are designed to be fully consumed before reaching the ground. Under the Draft EIS Proposed Action, flare use would occur in the new and expanded airspace. Flare use in existing airspace could be somewhat reduced from current conditions due to the proposed greater volume and no change in the total number of flares. The risk of fire as a result of flare use is minimal due to the low failure rate and procedures that require flare use above 2,000 feet AGL or, during high or greater fire conditions, above 5,000 feet AGL. Cannon AFB-based F-16s have not produced flare-caused fires in the MOAs. Concerns with fire of any cause, however, are real and the use of flares under any fire condition minimally increases fire risk. Any additional fires of a non-natural source may adversely affect vegetation, injure wildlife or

livestock, and destroy property such as fences and outbuildings. On November 30, 2005, a training munition released by a B-1B aircraft at the Melrose AFR started a fire that burned 26,000 acres of grazing and farmland and damaged or destroyed privately owned structures, fencing, wells, livestock, animal feed, and crops. These impacts were not the result of a flare, but any potential loss of forage, livestock, or infrastructure due to fire could result in economic impacts to affected landowners. The Air Force follows established procedures for claims in the event that an Air Force-caused fire should occur and subsequently damage livestock or infrastructure.

In summary, the airspace use and related activities associated with the Draft EIS Proposed Action are not expected to have any significant adverse impacts on the human, social, or economic resources of the region. Recreational land use, ranching operations, wind energy operations, oil and gas exploration and production, and other economic pursuits are not expected to experience any limitations or negative effects as a result of implementation of the Proposed Action.

4.8.3.2 Alternative A, the Air Force Preferred Alternative

Alternative A would not move J-74 or create the Capitan MOA. This would result in no substantial impact to the commercial aviation flight tracks, and no requirement for an FAA 4(f) analysis. Other consequences of Alternative A, including the effects of supersonic flight and chaff and flare usage are the same as those described under the Draft EIS Proposed Action. Airspace use and related activities associated with Alternative A are not expected to have any significant adverse impacts on the human, social, or economic resources of the region. Economic pursuits in the region are not expected to experience any limitations or negative effects as a result of implementation of the Alternative A.

4.8.3.3 Alternative B

Under Alternative B, J-74 would be reconfigured and the Capitan MOA/ATCAA would not be created. Potential effects associated with the new Capitan airspace would not occur under Alternative B, and thus commercial and general aviation traffic would be unaffected in this area. Potentially impacts could occur to commercial aircraft with any relocation of J-74. Other effects from airspace modifications, noise, and chaff and flare use would be essentially the same as described for the Draft EIS Proposed Action. No significant adverse effects on the socioeconomic resources of the region are expected.

4.8.3.4 No-Action

Under the No-Action Alternative, airspace use and related activity would remain the same as under existing conditions. Flight activity, noise levels, and chaff and flare use would not change. No effects to socioeconomic resources described under the Proposed Action would occur.

4.9 Environmental Justice

4.9.1 Methodology

The low-income communities and the minority and youth population under the current airspace and the NMTRI airspace were quantified based on census data (see Table 3.9-1). These numbers were compared with state and national population data to determine whether any disproportional low-income, minority, or children population concentrations were located

under the proposed airspace. In addition, the air traffic study area was evaluated for minority and low-income communities.

4.9.2 Issues and Concerns

Federal agencies are required by law to address potential impacts of their actions on environmental and human health conditions in minority and low-income communities. Furthermore, they must identify and assess environmental health and safety risks that may disproportionately affect children.

4.9.3 Environmental Consequences

The environmental justice analysis examines the potential for disproportionate effects of the proposed airspace modifications, supersonic flight, and chaff and flare use on minority or low-income communities or youth populations in the ROI.

4.9.3.1 Draft EIS Proposed Action

Table 4.9-1 presents the percentages of minority, low-income, and youth populations in the State of New Mexico, the ROI counties, and the area under the NMTRI airspace. The land under the affected airspace has a lower proportion of minorities, approximately the same proportion of low-income, and a somewhat lower proportion of children as the regional ROI and the state as a whole.

Table 4.9-1. Comparative Environmental Justice Data

	Percentage of Population		
Geographic Area	*Minority*	*Low-Income*	*Youth*
State of New Mexico	55.3	18.4	28.0
ROI Counties	43.1	20.0	28.0
Land Under the Affected Airspace	29.6	18.2	24.7
Air Traffic Study Area	66.3	20.7	25.6

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. No American Indian communities or reservations are located within the affected area. American Indian tribes and bands with traditional connections to the land under the airspace were contacted as part of this analysis. Traditional resources are discussed in Section 4.6, Cultural Resources.

The youth population in the ROI is similar, in proportion, to the state level. These populations of children are concentrated in the ROI counties' urban areas, which lie outside the affected area. Due to these factors, there would be no anticipated disproportionate impact to the human health or environmental conditions in minority communities, in low-income communities, or effects on children as a result of implementing the Proposed Action.

4.9.3.2 Alternative A, the Air Force Preferred Alternative

Under Alternative A there would be no anticipated disproportionate impact to the human health or environmental conditions in minority communities, in low-income communities, or

effect on children. The population under the air traffic study area would be avoided by the preferred alternative, Alternative A.

4.9.3.3 ALTERNATIVE B

Alternative B would reduce the area under the expanded or new airspace potentially affected by military aircraft. In the area under the Alternative B airspace, there would be no disproportionately high or adverse impacts to minority or low-income communities or effects on children.

4.9.3.4 NO-ACTION

Airspace use in the Pecos MOA complex would remain unchanged under the No-Action Alternative. There are no disproportionately high or adverse impacts to minority or low-income communities or effects on children under the airspace.

5.0 CUMULATIVE EFFECTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

5.1 CUMULATIVE EFFECTS

Council on Environmental Quality (CEQ) regulations stipulate that the cumulative effects analysis in an Environmental Impact Statement (EIS) 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" (40 Code of Federal Regulations [CFR] 1508.7).

The first step in assessing cumulative effects involves defining the scope of other actions and their interrelationship with the proposed action or alternatives (CEQ 1997). The scope must consider other projects that coincide with the location and timetable of the proposed action and other actions. Cumulative effects analyses evaluate the interactions of multiple actions.

5.1.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

5.1.1.1 CANNON AIR FORCE BASE AND OTHER MILITARY ACTIONS

A series of actions have occurred that are interrelated with the Proposed Action or alternatives. This section identifies past, present, and reasonably foreseeable actions that could cumulatively affect regional environmental resources.

PAST AND PRESENT ACTIONS

Recent past and present military actions in the region were considered as part of the baseline or existing conditions in the region of influence (ROI). As presented in Table 5.1-1, these actions were considered for their relevance to the New Mexico Training Range Initiative (NMTRI).

TABLE 5.1-1. PAST AND PRESENT MILITARY ACTIONS

Action	*Environmental Documentation*[1]	*Relevance to NMTRI*
Joint Training Exercise (JTX) Roving Sands	United States Air Force (Air Force) 1994b	Yes
Proposed Force Structure Changes and Related Actions at Cannon Air Force Base (AFB) New Mexico	Air Force 1995	Yes
Proposed Force Structure and Foreign Military Sales Actions	Air Force 1998	No, a management action only
Defensive Training Initiative (DTI)	Air Force 2001e	Yes
Use of White Phosphorus Rockets at Melrose Air Force Range (AFR) New Mexico	Air Force 2003	No, NMTRI has no change to Melrose AFR use
The Deactivation of German Air Force F-4F Aircraft Operations at Holloman AFB, New Mexico	Air Force 2004c	Yes

Action	*Environmental Documentation*[1]	*Relevance to NMTRI*
Cannon AFB Wing Infrastructure Development Outlook (WINDO) Plan	Air Force 2004d	No, NMTRI has no change to infrastructure or use
Decision by the Republic of Singapore to terminate training operations at Cannon AFB	N/A - Foreign Military Decision	Yes, affects the number of F-16 aircraft training in the Pecos complex
Base Realignment and Closure (BRAC) Act of 2005 decision to include Cannon AFB on the closure list unless other missions for the base are identified	Department of Defense (DoD) 2005	Yes, affects the purpose and need beyond first quarter Fiscal Year (FY) 09

Note: 1. Full citations are provided in Section 6.0, References, of this Draft EIS.

Each environmental document or other information regarding the actions was reviewed to consider the implication of each action and its synergy with the Proposed Action. Of particular concern were potential overlap in affected area, and project timing. Shared aircraft operations were also a consideration. As depicted in Table 5.1-1, five of these actions were considered to have potential for cumulative effects. This is summarized below.

JTX Roving Sands is an annual air defense exercise in New Mexico and Texas sponsored by the United States (U.S.) Army. This exercise has included Cannon AFB-managed airspace and aircraft. A variety of aircraft, including helicopters, may use Cannon AFB-managed airspace during such an exercise. Occasional users have been incorporated into the EIS analysis. No change would occur to the overall occasional and joint use under the Proposed Action or alternatives.

German Air Force operations at Holloman AFB are distant enough from Cannon airspace that there is currently, and would continue to be, limited use of Cannon airspace. The Air Force issued a Final Environmental Assessment (EA) in September 2004, entitled "Deactivation of 20 Fighter Squadron and F-4F Training by German Air Force at Holloman Air Force Base, New Mexico." This proposal reduces flights in the Beak and Talon Military Operations Areas (MOAs) near Holloman, although a slight reduction in use of the Pecos MOA could occur. Creation of the proposed Capitan MOA/Air Traffic Control Assigned Airspace (ATCAA) would not increase traffic between Holloman AFB and Cannon AFB.

Several past and ongoing actions occur at Cannon AFB. The F-16s were based at Cannon AFB in 1995. Current aircraft operations of these aircraft were considered for NMTRI as presented in Section 2.0 and further described in Section 3.1, Airspace and Range Management. In 2001, the use of defensive measures throughout Cannon airspace was assessed.

As part of NMTRI, RR-188 chaff and M-206 flare use, as originally defined by DTI, would expand to the new airspace. The total number of chaff bundles and flares deployed would not be expected to change under the Draft EIS Proposed Action or Alternative A or B. The effects of this use, and proposed modifications to flare restrictions, are analyzed in this Draft EIS.

In 2003, Cannon AFB was authorized to use white phosphorus rockets. Since they are restricted to Melrose AFR, this would not be affected by NMTRI.

Cannon AFB recently completed an EA for its WINDO Plan (Air Force 2004d). This plan allows for infrastructure development and improvement projects at Cannon AFB and Melrose AFR. In

general, types of activities included in the WINDO Plan would involve construction of new base facilities; upgrade, repair and alterations of facilities and infrastructure; replacement and expansion of facilities; and demolition of facilities. These base activities do not interact with or affect the NMTRI proposal or alternatives.

Environmental analysis was conducted in the spring of 2005 to inactivate the 428 FS and no longer have Republic of Singapore Air Force F-16 flight training at Cannon AFB. Ten Royal Singaporean Air Force F-16s departed Cannon by late summer 2005. This action resulted in a personnel reduction of 135 permanent Royal Singapore Air Force and 97 Air Force positions. In FY 04, Royal Singapore Air Force operations in Cannon's airspace (including airspace not affected by the NMTRI proposal) accounted for approximately 2,146 sorties (~13.8 percent of total sorties) and in FY 05 approximately 1,352 sorties (~10.6 percent of total sorties).

Since the Draft EIS was issued, the Defense BRAC Commission received and considered a May 2005 recommendation from the Secretary of the Department of Defense to close Cannon AFB. A final report (September 2005) from the Commission to the President recommended Cannon AFB remain open as an enclave until at least December 31, 2009, and that the 27 FW be disestablished. In the interim, the Secretary of Defense was to seek other missions for assignment to Cannon AFB. As a result of this search, Air Force Special Operations Command (AFSOC) was designated as the new mission for Cannon AFB and Melrose AFR.

NMTRI intends to change airspace size and configuration necessary to enhance the combat capabilities and survivability of New Mexico aircrews. As noted in the Draft EIS, NMTRI is intended to support the existing training mission of F-16 squadrons at Cannon AFB and of the New Mexico Air National Guard (NMANG). The 18 F-16s assigned to the 150th Fighter Wing (150 FW) of the NMANG need airspace adequately sized and configured to train as they will fight and be prepared for worldwide deployment under their Aerospace Expeditionary Force (AEF) responsibilities. As such, planes assigned to the 150 FW and transient aircraft, including the B-1B aircraft, noted in Section 2.2.1.5 of the EIS, would continue to train in Cannon's airspace and use Melrose Range. The 150 FW currently flies approximately 960 sorties in the Melrose Pecos and Taiban airspace. As stated in their letter dated 11 August 2006 (refer to Appendix C), the 150 FW expects their usage to "increase approximately 25 percent if the Cannon fighter jets are dispersed."

Reasonably Foreseeable Actions

Cumulative analysis also requires consideration of reasonably foreseeable actions. The NMANG is proposing to create the Smitty MOA underneath the current CATO MOA, which is 60 miles southwest of Albuquerque. An EA analyzing this action is underway. Creation of this new MOA would not affect Cannon AFB or its airspace, nor would it reduce the NMANG's use of the Pecos MOA complex.

Cannon AFB is involved in the Air Force housing privitization initiative. The contractor for this project would manage, upgrade, demolish, and construct family housing units for Cannon AFB over a 50-year period. Since this action will occur on the base, and NMTRI does not affect any on-base resources, there is no influence on NMTRI.

In June 2006, AFSOC was designated as the new mission for Cannon AFB and Melrose AFR. On August 24, 2006, a Notice of Intent for an EIS appeared in the *Federal Register*. Based on this initial information, it is anticipated that the project components will involve geographic areas that do not overlap the NMTRI study area. That is, the focus of AFSOC use will be Melrose

AFR, as well as infrastructure and personnel changes at Cannon AFB. Changes to Melrose AFR or Cannon AFB are not included in the NMTRI proposal since the focus of NMTRI is entirely on airspace. While the AFSOC proposal, as currently presented, does include use of the existing airspace, it does not require the proposed NMTRI airspace modifications. Furthermore, the AFSOC does not operate F-16s, which are the primary users discussed and analyzed in the NMTRI document. The range of aircraft and munitions likely for use in the AFSOC beddown were not analyzed for NMTRI. Therefore, while AFSOC's use is a reasonably foreseeable action, there are not any cumulative impacts between NMTRI and AFSOC that need to be understood before making the NMTRI decision. The direct, indirect, and cumulative impacts of the AFSOC beddown will be analyzed in a separate EIS.

5.1.1.2 OTHER FEDERAL ACTIONS

Other past, current, and future federal actions in the area could also contribute to cumulative effects of the Proposed Action or alternatives. Federal agencies with jurisdiction within the ROI include the Bureau of Land Management (BLM), Bureau of Reclamation, U.S. Army Corps of Engineers (USACE), U.S. Fish and Wildlife Service (USFWS), Federal Aviation Administration (FAA), Federal Highway Administration, and Federal Energy Regulatory Commission. Potential actions, within the area and occurring in the same time frame as NMTRI, were identified and considered in preparation of this Draft EIS.

BUREAU OF LAND MANAGEMENT

The BLM manages approximately 472,436 acres (14.6 percent) within the NMTRI ROI. Activities on BLM land include livestock grazing, oil and gas development, and recreation. The Roswell Field Office published its *Resource Management Plan* in 1997 (BLM 1997a). The BLM completed an EA for its *Fire and Fuels Management Plan Amendment*; the Decision Record was signed in September 2004. A Draft EIS is currently available for a proposal to upgrade and operate a refined petroleum products pipeline in New Mexico. This pipeline runs through Chavez, Lincoln, and Guadalupe counties.

BLM PLANS INCLUDE DEVELOPMENT OF FACILITIES, SUCH AS THESE AT THE HAYSTACK MOUNTAIN OFF-ROAD VEHICLE AREA, TO SUPPORT OTHER BLM RECREATIONAL AREAS. THESE PLANS ARE NOT INCONSISTENT WITH MILITARY TRAINING WITHIN THE AIRSPACE.

UNITED STATES FISH AND WILDLIFE SERVICE

The USFWS is currently preparing an EA to evaluate the proposed release of northern aplomado falcons in eastern New Mexico and west Texas. It is not known at this time whether aplomado falcons would be released in the ROI.

BUREAU OF RECLAMATION

The Bureau of Reclamation operates the Carlsbad hydroelectric project, which includes Santa Rosa (a USACE dam), Sumner, Brantley, and Avalon dams on the Pecos River. The Bureau of Reclamation continues mechanical clearing of salt cedar (*Tamarisk* spp.), an exotic and invasive shrub. The goal of this project is to restore native riparian vegetation communities along the Pecos River.

FEDERAL AVIATION ADMINISTRATION

The FAA routinely evaluates modifications to local airports including new runways, runway extensions, and air traffic control towers. A number of projects in the area were evaluated for relevance to NMTRI. For example, a Finding of No Significant Impact (FONSI) was issued for a new airport in Vaughn. The Lubbock, Texas airport is also planning an expansion. Although these airports are outside of the ROI for the Proposed Action or alternatives, use of shared airspace was identified as a concern during scoping. Section 3.1 describes the coordination of overlapping airspace in the vicinity of the Proposed Action.

5.1.1.3 NON-FEDERAL ACTIONS

Non-federal actions include State of New Mexico, county, and private projects. General ongoing state activities include oil, gas, and grazing leases on state trust lands, land exchanges, road projects, and improvements to state parks. For example, Sumner Lake State Park, just outside the northern boundary of the Pecos/Taiban MOA, is currently upgrading its facilities.

Some land development projects are occurring under the airspace. Such projects include the construction of the Bosque Redondo Memorial at Fort Sumner to commemorate the "Long Walk" of some 8,000 Navajo People from their homeland to life in captivity at Bosque Redondo during the 1860s. The Memorial will include an exhibit space, resource rooms, and educational facilities as a forum for interpretation of the fort and surrounding reservation (Museum of New Mexico 2001b). Fort Sumner is under the existing Pecos MOA.

Wind energy development is expanding in New Mexico. New Mexico is ranked 12th in the U.S. for wind power potential (Pacific Northwest Laboratory 1991). There is currently one utility-scale wind power plant operating in New Mexico, with a second facility in development. Completed in 1999, the New Mexico Wind Energy Center is 20 miles northeast of Fort Sumner. It is owned by FPL Energy and is located on private and state land. The Caprock Wind Ranch, owned by Cielo Wind Power, is on private land near Tucumcari in Quay County. Existing and potential wind energy development are included in the safety and socioeconomic sections of this EIS.

The dairy industry is a significant economic benefit to eastern New Mexico. For example, Chaves County ranks 11th in the nation for milk production. Dairy is expected to continue to be a major influence in the region. However, dairy operations are outside the potentially affected airspace and are not expected to have a cumulative effect in conjunction with the NMTRI Proposed Action or alternatives.

5.1.2 CUMULATIVE EFFECTS ANALYSIS

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 yet identified when the Proposed Action or alternative are considered together, and identifies what those impacts might be.

AIRSPACE AND RANGE MANAGEMENT, ACOUSTIC ENVIRONMENT, AND SAFETY

The deactivation of the F-4F training squadron at Holloman AFB minimally reduced the number of high-altitude missions flown in air superiority training within the Pecos airspace complex. Discontinuing of the Singapore training mission reduces the number of F-16 C/D aircraft at Cannon AFB and reduces the number of F-16 aircraft training operations within the Pecos airspace complex by approximately 15 to 20 percent.

The BRAC 2005 action, when implemented, would disestablish the 27 FW and distribute its aircraft to other bases to meet the Primary Aircraft Authorization (PAA) requirements established by the BRAC recommendations of the Secretary of Defense. This would reduce the number of F-16 aircraft training in the airspace to the NMANG F-16s and transient aircraft.

The cumulative effect of these actions would be to reduce the number of annual sorties within the Pecos airspace complex. This would be expected to result in noise levels throughout the Pecos expanded MOAs below the 55 decibel (dB) identified by the U.S. Environmental Protection Agency (USEPA) as a level below which environmental impacts would not be expected. The cumulative Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) levels would be below those identified for each airspace in Table 4.2-2.

Cumulative sonic booms under most of the training airspace would be an estimated one per four to one per five or more days. This compares with the existing one per five days under existing conditions. The cumulative effects of sonic booms would not be expected to be noticeably different from existing conditions and the same percentage of residents as existing would be expected to be annoyed by sonic booms.

Improvements or expansion of airports under the proposed military airspace would be expected to have avoidance agreements comparable to those for Fort Sumner to ensure safe operation of military and general aviation within the airspace. Airspace consequences are not expected to be different than those identified in Section 4.1, Airspace and Range Management. No significant cumulative impacts are projected to occur from the Draft EIS Proposed Action, Alternative A or Alternative B interacting with other military, federal, or non-federal actions, for airspace and range management or for noise or safety.

PHYSICAL AND BIOLOGICAL RESOURCES

No cumulative impacts to physical and biological resources are expected from the Draft EIS Proposed Action or an alternative. The NMTRI proposal does not include any construction projects, nor does it involve changes at Cannon AFB. Therefore, any on-the-ground projects would not be expected to interact with the proposed airspace changes. Upgrades to local airports would not involve changes to the airspace. Potential cumulative changes in airspace use would result in some changes to noise levels on the ground, especially under and near Melrose AFR. Therefore, there could be localized cumulative noise effects to biological resources. However, noise effects on wildlife tend not to be cumulative. As discussed in the biological resource analysis, the literature indicates for many different types of animals in many different types of environments that responses of unconfined wildlife to aircraft overflight, if

any, are minor and transitory in duration, and response from wildlife diminishes with successive exposures, indicating habituation.

Additionally, no significant adverse effects on habitat have been associated with aircraft overflight in the project area. As indicated in Chapters 4.0 and 5.0, no substantial effects of chaff and flare use on the physical or biological environment has occurred.

Cultural Resources

There are no projected adverse effects to cultural resources as a result of the Draft EIS Proposed Action, Alternative A or Alternative B. NMTRI should not add to any adverse effects to cultural resources resulting from other projects, either recently completed, ongoing, or proposed within the project area.

Any federal project that includes ground-disturbing activities has the potential to adversely affect cultural resources and is subject to National Environmental Policy Act (NEPA) compliance and Section 106 consultation. Such projects include construction, including wind farms, pipelines or other facilities; highway work; or any other ground-disturbing undertaking that affects public land.

Land Use and Recreational Resources, and Socioeconomics

The airspace use and related activities associated with the NMTRI proposal are not expected to have any significant adverse impacts on land use or ownership, or to populations or economic activity in the ROI. Recreational land use, ranching operations, wind energy operations, oil and gas exploration and production, and other economic pursuits are not expected to experience any limitations or negative effects under implementation of the Proposed Action or alternatives separately or concurrent with cumulative actions.

The incremental effects of NMTRI, in combination with potential impacts associated with reasonably foreseeable future actions described in the previous sections, would not be expected to create any significant or adverse cumulative effect to land use in the region.

Environmental Justice

Airspace use and related activities associated with the NMTRI proposal are not expected to have any significant adverse impacts separately or cumulatively on minority or low-income communities. The incremental effects of this proposal, in combination with potential impacts associated with the reasonably foreseeable future actions described in the previous sections, would also not be expected to have any cumulative effects on children.

5.2 Other Environmental Considerations

5.2.1 Relationship Between Short-Term Uses and Long-Term Productivity

CEQ regulations (Section 1502.16) specify that environmental analysis must address "...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 the short-term benefits of the proposed alternatives compared to the long-term productivity derived from not pursuing the proposed alternatives.

A short-term use of the environment is generally defined as a direct consequence of a project in its immediate vicinity. Short-term effects could include localized disruptions and higher noise levels in some areas. Under NMTRI, short-term uses of the environment would be negligible. No construction projects are proposed. Depending on their location, humans and animals cumulatively experience somewhat increased levels of noise in some areas. Humans and animals would continue to be exposed to one sonic boom per five days (or one per four days toward the center of the airspace). Aircraft noise levels would be below the USEPA-identified level of 55 dB. As presented in Section 4.2, the acoustic environment under the Pecos MOA complex does not exceed 43 dB. The relatively low acoustical effect can be attributed to the dispersion of training flights into a larger volume of airspace. The military training that occurs in the NMTRI airspace results in noise effects that are transitory in nature. Noise effects would be short term and would not be expected to result in permanent damage or long-term changes in wildlife and livestock productivity or habitat use.

The NMTRI proposal largely involves changes in airspace and would not impact the long-term productivity of the land. Cumulative use of chaff and flares would be comparable to existing use and would not negatively affect the long-term quality of the land, air, or water. Airspace changes are procedural and do not affect long-term productive use of natural resources.

5.2.2 Irreversible and Irretrievable Commitment of Resources

NEPA CEQ regulations require environmental analyses 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). Primary irreversible effects result from permanent use of a nonrenewable resource (e.g., minerals or energy). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., disturbance of a cultural site) or consumption of renewable resources that are not permanently lost (e.g., old growth forests). Secondary impacts could result from environmental accidents, such as accidents or fires. Natural resources include minerals, energy, land, water, forestry and biota. Nonrenewable resources are those resources that cannot be replenished by natural means, including oil, natural gas and iron ore. Renewable natural resources are those resources that can be replenished by natural means, including water, lumber and soil.

For NMTRI, most impacts are short-term and temporary, or longer lasting but negligible. Short-term reactions of wildlife or livestock could include temporary shifts in habitat use or activity, but long-term habituation is expected. Military training necessarily involves consumption of nonrenewable resources, such as gasoline for vehicles and jet fuel for aircraft. Cumulatively, training operations would decrease from current levels, so reduced military energy consumption is expected. No irreversible or irretrievable effects are expected for cultural resources or other natural resources, including land and water.

Secondary impacts to natural resources could occur in the unlikely event of an accidental fire, caused by an aircraft mishap, fire that escaped Melrose AFR, or an improperly deployed flare. However, while any fire can affect agricultural resources, wildlife, and habitat, the increased risk of fire hazard due to NMTRI operations is very low.

6.0 COMMENTS AND RESPONSES

This chapter contains comments received from federal, state, and local agencies, and the general public during the public comment period for the Draft Environmental Impact Statement (EIS). The 45-day public review process began with the publication of the Notice of Availability of the Draft EIS in the *Federal Register* on January 7, 2005. Either a hard copy or compact disc (CD) of the Draft EIS was distributed to individuals who requested a copy and to agencies and repositories that are required to have a copy. Appendix C includes a list of the libraries and repositories that were provided a hard copy or CD of the Draft EIS for the purpose of making the document available for public review. The Draft EIS also was posted on the World Wide Web at http://www.cevp.com, the Air Combat Command (ACC) Environmental Analysis website, as well as on the Cannon AFB website at http://www.cannon.af.mil, both of which are accessible to the public.

In accordance with the National Environmental Policy Act (NEPA), public and agency comments were reviewed and incorporated into this Final EIS. The United States Air Force (Air Force) and Federal Aviation Administration (FAA) have considered these public and agency comments in the decision making process. This chapter presents the testimony from the public hearings and other comments received during the public review process that occurred following publication and distribution of the Draft EIS. Public hearings are a regulatory requirement of the Council on Environmental Quality (CEQ) regulations implementing the NEPA and Air Force Instruction (AFI) 32-7061, as promulgated in 32 Code of Federal Regulations (CFR) Part 989, (Environmental Impact Analysis Process).

Public comment was encouraged at each of the four public hearings in January 2005, and in newsletters and other publications. It was noted that these comments would be published in the Final EIS (and that providing personal information on those comments was considered consent to publish it). The formal public comment period ended on February 22, 2005.

This chapter includes a narrative description of the Air Force comment and response process, a directory of commenters, copies of public comments, transcripts, agency comments, and associated response codes and responses.

6.1 COMMENT RECEIPT AND REVIEW

Comment Receipt: Comments on the Draft EIS included both written correspondence and verbal testimony received during the 45-day public comment period. All comments received during that period are included in the Comments section following the directory.

Comment Review: In accordance with 40 CFR 1503.4, comments were assessed and considered as follows:

- Each letter or testimony was assigned an identification number and each comment letter and each individual's verbal comments was read and reviewed carefully.
- Within each comment letter or testimony, substantive comments were identified and bracketed. Three guidelines were used for determining substantive comments:
    1. The comment questioned the proposed action, alternatives, or other components of the New Mexico Training Range Initiative (NMTRI).

2. The methodology of the analysis or results was questioned.

3. The use, adequacy, or accuracy of data was questioned.

- The bracketed comments were reviewed by environmental resource specialists who drafted the responses. In some cases, similar comments were assigned the same response. If the same comment was repeated within the same letter or verbal comments, it was bracketed the first time it appeared.
- The individual bracketed comments were assigned a response code. These responses are organized alphabetically and may be found in the Responses section immediately following the comments.

Comment Organization: The comment letters are printed in numerical order and are organized into three sections:

- Written comments and submitted letters - public written comments begin with 0001.
- Public hearing transcripts and summaries - verbal comments begin with 2000.
- Agency letters - agency written comments begin with 3001.

6.2 Locating Your Comments and Responses

A directory (Table 6-1) to locate your name begins on page 6-3. As noted on the public displays, sign-in and comment sheets, providing your name in the EIS process meant that you understood that your name and comment would be made a part of the public record for this EIS. An identification number was assigned to your comment letter and is located in the upper right hand corner of the letter or next to your name in the verbal testimony.

Table 6-1 provides an alphabetical listing of commenters by last name. Look for your last name in the first column and note the comment identification number in the fourth column. This is a number that was assigned to your comment and appears on your letter or next to your verbal comments.

Written comments, submitted letters, public hearing transcripts, and agency letters are located immediately following the directory (beginning on page 6-9). All substantive comments within each comment letter and verbal testimony were bracketed and given a response code. Response codes are printed next to the bracket in the right margin of the comments. Every bracketed comment has a corresponding response. Each response is designed to be read along with the comment it addresses. Air Force responses to comments are located immediately following the comment section (see page 6-227). They are organized alphabetically by response code. The first page of the responses provides a key to the response codes.

The responses refer to both the Draft EIS and Final EIS documents, as appropriate. For example, if the commenter suggests a deficiency in the Draft document, the response may refer to the Draft EIS for clarification. If the Final EIS includes amended information, the reader will be directed to that section of the Final EIS.

Public and agency involvement is an important part of the NEPA process, and all letters and their associated comments whether bracketed or not are taken into consideration by the Air Force in its decision making process.

TABLE 6-1. DIRECTORY OF COMMENTERS

Last Name	*First Name*	*Organization*	*Letter #*	*Date of Comment*	*Response Code*
		New Mexico State Historic Preservation Office	3004	2/8/2005	GE-1
Allyn	David D.	New Mexico Pilots Association	0009	2/5/2005	GE-1
Andreas	Andy & Mary		0019	2/14/2005	GE-1
Bailey	Randy	PMR Inc.	0031	2/19/2005	AM-5
Bigler	Ishmel & P.		0027	2/17/2005	NP-9, NO-9, SO-3, PN-1, NP-21, EJ-1, NP-20, AM-11, NO-10, NP-15
Bird	Bill		2003	1/24/2005	GE-1
Boone	Pat		2001	1/24/2005	NO-6, NO-7
Braganza	Bonnie	U.S. Environmental Protection Agency	3014	2/16/2005	GE-1
Brokenbek	Dr. Art	House Municipal School	3005	2/17/2005	GE-1
Canning	R.A.	Canning Ranches, LLC	0001	1/21/2005	PN-1, BI-1, NO-1, SA-2
Carter, III	Powhatan	County of DeBaca, Office of County Commissioners	3006	2/13/2005	LU-2, AM-13, NP-3
Cook	Carolyn	Aviation Association of Santa Fe	0013	2/10/2005	AM-5
Cordes	Robert C.	American Airlines	0036	2/21/2005	AM-2, DP-6
DuBois	Carter	New Mexico Pilots Association	2019	1/28/2005	DP-3, SA-1
Elliott	A.S.	Gottomitee, Ltd. and El Bigote Cattle Co., LLC	0004	1/28/2005	AM-19, AM-2, BI-3, BI-4, BI-5, PR-1, PR-2, NP-12, NP-11, CM-1

Last Name	*First Name*	*Organization*	*Letter #*	*Date of Comment*	*Response Code*
Elliott	Tex & Jan	Gottomitee, Ltd. and El Bigote Cattle Co., LLC	0038	2/22/2005	DP-2, AM-19, NP-11, NP-17, NP-19, PN-1, DP-7, DP-4, PN-4, DP-5, NP-1, SA-8, SA-5, SA-6, SA-9, SA-10, SA-7, NO-11, NO-13, NO-14, NO-15, BI-20, NO-16, NO–21, NP-3, BI-12, BI-13, BI-22, BI-14, BI-15, BI-16, BI-17, BI-18, BI-19, BI-20, BI-21, CM-2, BI-8, BI-23, CM-3, PR-4, NP-12, PR-5, SO-4, LU-3, PR-5, SO-8, SO-9, AM-20, NP-25, AM-5, AM-10, NO-3, NO-17
Elliott	Mr.		2006	1/27/2005	NP-18, NP-12
Elliott	Mr.		2014	1/27/2005	GE-1
Elliott	A.S.		2024	1/28/2005	NP-12
Elliott	A.S.		2028	1/28/2005	NP-14, NP-12
Ellis	David		2026	1/28/2005	AM-8, AM-5
Essary	Don		0039	2/20/2005	SO-5
Goodloe	Sid		2004	1/24/2005	NO-8, SO-6, PN-1
Greathouse	Jack		0022	2/19/2005	PN-1, AM-2
Greathouse	Ross		0037	2/19/2005	PR-3
Greathouse	Betty Jo		0041	2/19/2005	NP-9, SO-7, PR-6, SO-5, PN-3
Greathouse	Betty Jo		2007	1/27/2005	NP-9, SO-7, PR-6, BI-9, PN-3
Greathouse	Ross		2008	1/27/2005	GE-1
Greathouse	Betty Jo		2016	1/27/2005	PN-1
Hall	Jennifer	Holland & Hart	0035	2/23/2005	GE-1
Harden, Jr.	Senator Clinton D.	New Mexico State Senate	3011	2/14/2005	GE-1
Haumont	John		0034		NP-20, NO-12, NO-9, NP-18, BI-1, NP-22, NP-23, AM-4
Haumont	John		2002	1/24/2005	GE-1
Hoglan	Bill		0021	2/21/2005	PN-1
Huey	Diana		0002	1/24/2005	GE-1
Ingham	Kenneth		0010	2/7/2005	AM-5

Last Name	*First Name*	*Organization*	*Letter #*	*Date of Comment*	*Response Code*
Ingle	Senator Stuart	New Mexico State Senate	3002	1/25/2005	GE-1
Karwick	Bernard		0033	2/17/2005	NO-11, AM-2, AM-5, PN-1
Kernan	Senator Gay G.	New Mexico State Senate	3001	1/24/2005	GE-1
Kinser	Jodee		0023	2/19/2005	NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15
Kinser	J.B.		0026	2/19/2005	NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15
Kirkpatrick	Lisa	State of New Mexico, Department of Game & Fish	3013	2/20/2005	BI-24, BI-11
Lofland	Sean E.		0029	2/19/2005	NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15
Mack	Michael	Village of Fort Sumner	2013	1/27/2005	SO-1, AM-6
Maddox	Ronda		0028	2/19/2005	NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15
Martin	Tom		2005	1/24/2005	GE-1
Martin	Sherman W.	Village of House	3008	2/16/2005	GE-1
McCaslin	Loren		2022	1/28/2005	GE-1
McCaslin	Karen		2023	1/28/2005	GE-1
McInnes	Willie & Nettie Fuchs		0005	1/28/2005	NO-2, NP-3
McVinnie	David J.	Bode Aviation, Inc.	0007	2/4/2005	AM-3, SO-2, DP-1
Melinat	Carl		2020	1/28/2005	GE-1
Moberly	Terry		2025	1/28/2005	GE-1
Moore	Rep. Brian K.	State of New Mexico, House of Representatives	3003	1/26/2005	GE-1
Murphy	Michael		0015	2/12/2005	NO-4
Murphy	Bruce	Murphy Land & Cattle Co.	0016	2/14/2005	NO-5
Ornelas	Orlando		0024	2/19/2005	NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15

Last Name	*First Name*	*Organization*	*Letter #*	*Date of Comment*	*Response Code*
Russell	Sharon G.		0032		NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15
Russell	Sharon		2011	1/27/2005	NP-20, NP-21
Russell	Sharon		2017	1/27/2005	GE-1
Russell	Sharon		2027	1/28/2005	GE-1
Scurlock	Dan		0008	2/5/2005	NP-1, NP-4, NP-5, NP-6, NP-7, BI-6, BI-7, AM-12, AM-13, NP-4, AM-14, NP-8, NP-1, AM-1
Scurlock	Dan		2009	1/27/2005	GE-1
Scurlock	Dan		2015	1/27/2005	BI-6, CU-4, NP-6, NP-13, PN-2, CU-1, AM-1
Smith	Gregory S.	Fort Sumner State Monument, Department of Cultural Affairs	3007	2/7/2005	CU-2, CU-3
Smith	Donald R.	U.S. Department of Transportation, Federal Aviation Administration	3010	2/22/2005	AM-15, DP-3, AM-18, AM-9, AM-16, DP-6
Smoot	Jeanette		0003	1/25/2005	AM-1, NO-2, BI-2, AM-2
Spencer	Stephen R.	U.S. Department of the Interior, Office of Environmental Policy and Compliance	3012	2/18/2005	NP-16
Standford	Melvin		0025	2/19/2005	NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15
Stevens	David M.		0030	2/16/2005	AM-5
Taylor	Buddy & Donna		0040	2/15/2005	PR-7, NO-18, BI-25, SA-4, SA-2, NP-2, LU-1, NP-3, AM-1, SO-5
Terrell	Richard	New Mexico Energy, Minerals and Natural Resource Department, New Mexico State Park & Recreation Division	3009	2/22/2005	GE-1
Thomas	Joe		2018	1/28/2005	GE-1

Last Name	*First Name*	*Organization*	*Letter #*	*Date of Comment*	*Response Code*
Tibbets	Kelly		0020	2/19/2005	NP-9, NO-9, SO-3, PN-1, NP-21, NP-20, AM-11, NO-10, NP-15
Trapp	John C.	Aviation Association of Santa Fe	0011	2/9/2005	AM-5
Uslan	Steve	U.S. Pilots Association & New Mexico Pilots Association	2000	1/24/2005	AM-5, SA-3
Vaughan	Charles G.	Vaughan & Cibola Ranch	0014	2/11/2005	NP-10, PN-1
Vaughn	Charles		2010	1/27/2005	GE-1
West	Leona & Jake		0043	4/22/2005	NP-3
West	Leona		2012	1/27/2005	AM-1, BI-10, NP-3
Whelchel	Mary		0018	2/14/2005	GE-1
Williams	Heidi	Aircraft Owners and Pilots Association	0017	2/14/2005	AM-2, SO-1, SA-1
Wood	Percy G.		0006	1/31/2005	AM-2, SO-1, AM-5, PN-2
Woody	Dwain	Woody Investments, LLC	0042	6/16/2005	GE-1
Woody	Dwain		2021	1/28/2005	AM-7
Young	Col. Allan		0012	2/10/2005	NP-9

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Comments

0001

R.A. Canning
[redacted]
Capitan, New Mexico
[redacted]

CANNING RANCHES, LLC

January 21, 2005
HQ ACC/CEVP
129 Andrews St. Ste 102
Langley AFB, VA 23665-2767

ATTN: Mrs. Brenda Cook

Dear Sirs:

First, I should identify myself so that you understand the seriousness of my complaint. For the past 40 years I have owned and operated a 64,000 acre cattle and horse ranch on the north side of the Capitan Mountain. I own and maintain 7 houses on this ranch. I am also airport manager for the Block Ranch Airport at Capitan, NM.

I do not believe the Air Force needs additional air space in New Mexico. The White Sands Missile range presently covers over 10,000 square miles of New Mexico from north of El Paso to about 50 miles south of Albuquerque. I believe the military could share use of this area of over 6 million acres. **PN-1**

Another big advantage to using the missile range would be to keep all the military trash in one location rather than spread the trash i.e. plastic, flares and chaff, around. Chaff, in the form of metallic strips would not be easily digested by cattle, sheep or wildlife. **BI-1**
We do not benefit from additional sonic booms which rattle our windows and crack our adobe houses. **NO-1**

Our livestock do not need the added danger from range fires started by flares being dropped. **SA-2**

Since the military already has a large portion of New Mexico, I suggest that the present area is adequate and can be jointly used. By not expanding the area all these undesirable results would be confined to an area when no people reside and visitors are only allowed by invitation. This present area is also posted against trespass by both humans and domestic animals.

Yours truly,

R. A. Canning
RAC/fdc
CC: Congressman Steve Pearce
Senator Pete V. Domenici

0002

Roswell **Written Comment Sheet**
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 1/24/05

PLEASE PRINT **GE-1**

I support the training range initiative, I feel that it will be beneficial for national defense in that it will allow pilots to train more fully.
In addition to reasons of defense, Cannon is vital to local economy.
Far from sounding like an annoyance, the planes are a reassurance.

**** CONTINUE ON BACK FOR MORE SPACE ****

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	Diana Huey
ORGANIZATION:	
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Clovis, NM [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0003

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: Jan. 25, 2005

PLEASE PRINT

Thanks to each and all service personell for protecting our nation!

Changes in flying practices to effect our livelyhood as well as peace + quiet. At present low flying craft use our homes as targets, as they pass by. This noise is often hazardous to us, working livestock. We have had Tied horses break loose, tearing up equipment and fencing. Cattle stampeded over fences, injuring them and destroying corrals + fences. This is expensive to operators and handlers. Our children + grandchildren are frightened into hysterics by the sight + sounds of low flying craft. We asked the pilots to use other targets than our working facilities and homes. AM-1

Many wells have been damaged or ruined by vibrations from low flying craft + sonic booms. Cemented structures are cracked from this same type practice. NO-2

Animals do not adapt to these practices. When startled they do react, even if it is on a regular basis. Wild life is also part of our livelyhood. They are effected by the vibrations and are very sensitive to loud sounds. BI-2

We will appreciate any consideration in the adaptation of any future practices or changes.

(over)

**** CONTINUE ON BACK FOR MORE SPACE ****

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	Jeanette Smoot
ORGANIZATION:	Cattle ranching
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Capitan, New Mexico [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0003

P.S.

(private)

local air craft that uses our air space is currently Threatened. We see no changes in New practices. How military craft flying has already caused problems and dangers to working flyers. I imagine pleasure craft is effected also. This is a result of air currents as military planes pass by. AM-2

We wish to be reasonable, but our every day lives and livelyhood is effected. If sonic booms are so harmless, why are they not practed over populated areas??

Thank you.

Jeanette Smoot

Citizen, Taxpayer + producer.

0004

Clovis **Written Comment Sheet**

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 28 JAN 2005

PLEASE PRINT

ENCLOSED ARE 2 PAGES OF COMMENTS FOR OPTIONS REQUIRED BY NEPA AND/OR FAILURE TO ADEQUATELY "INVESTIGATE" THE IMPACTS TO THE ENVIRONMENT. NO ONE EVER HAS COME TO MY PROPERTY TO ASCERTAIN WHAT WE HAVE ON THE GROUND.

YOU HAVE ESSENTIALLY CONDEMNED OUR LAND FOR USAF TRAINING. THIS IS APPROVED BY "FONSI" WITH FALSE AND FRAUDULENT STATEMENTS. 9 DAMAGE CLAIMS IN LESS THAN 7 YEARS, ALL WITHIN THE N.S.A. AND ABOVE MY HOUSE.

THIS IS JUST A PART OF MY RESPONSE. MORE SUBSTANTIATION WILL FOLLOW.

1 OF 3 PAGES.

**** CONTINUE ON BACK FOR MORE SPACE ****

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	A. S. ELLIOTT
ORGANIZATION:	GOTTOMITES, LTD. & E4 BIGLOTE COTTLE CO, LLC
ADDRESS:	[redacted]
CITY/STATE/ZIP:	FORT SUMNER, NM [redacted] UVALDE, TX [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0004

Comments Regarding New Mexico Training Range Initiative
Draft Environmental Impact Statement

My comments this evening will focus on four issues regarding the Draft Environmental Impact Statement.

1. Aircraft impacts on structures on the ground, people and aviation
2. Aircraft impacts on livestock and wildlife
3. Impacts of chaff and flare
4. General quality of the analysis

I. Aircraft Impacts on Structures, People and Aviation

Effect of Wake Vortices on People and Structures

The EIS must fully examine the effect of wake vortices on ground structures, including windmills and cattle management structures such as fences and corrals. Mitigation of the known impacts of these wake vortices should include compliance with the Federal Aviation Administration's guidelines. FAA avoidance rules include 1) avoiding congested areas of a city, town, settlement, or any open-air assembly of persons by 1,000 feet and 2) avoiding any person, vessel, vehicle, or structure by 500 feet. These guidelines are particularly applicable as mitigation measures when aircraft are maneuvering (pulling Gs) and not just flying straight and level. **AM-19**

Impacts to Aviation

The EIS must examine the aeronautical effects, including impacts to civil and commercial aviation, that will result from the action. Civil and commercial aviation are part of the modern human environment and NEPA requires the EIS address the action's impacts to these parts of our environment. **AM-2**

II. Aircraft Impacts on Livestock and Wildlife

General Comment Regarding Analysis of Impacts to Animals

The DEIS concludes that animals will be expected to quickly habituate to increased aircraft and suggests that impact is minimal. However, even the DEIS recognizes that species differ in their ability to habituate to aircraft noise. The DEIS should examine and identify the specific impacts to individual species, which will differ and may be severe. The severity should not be minimized through general conclusions. **BI-3**

Impacts to Livestock

The EIS must examine the impacts to livestock. The analysis of such impacts should follow the protocol in Air Force's handbook titled "Impacts of Low Altitude Flight on Livestock and Poultry." The current DEIS does not include a number of studies that document the negative effects of livestock and domestic animals. Appropriate studies should be included in the EIS and their results considered as part of the analysis. The EIS should also include mitigation of **BI-4**

impacts to livestock including, identification of and avoidance of areas of concentrated livestock and significant cattle operations such as El Bigote Cattle Company. BI-4

Impacts to Wildlife

The DEIS recognizes that pronghorn antelope are typical mammals associated with the plains-mesa grassland where increased flights will occur. However, the DEIS's analysis of the impacts to pronghorn antelope is cursory at best. The DEIS should fully consider the impacts to the pronghorn antelope, as well as other native species, and include in its analysis readily available studies specifically addressing aircraft impacts to pronghorn antelope and appropriate mitigation measures. BI-5

III. Impacts of Chaff and Flare

The DEIS concludes there will be no significant impact to soil and water as a result of chaff and flare. The DEIS states there is supposed to be no residue from flare, which is supposed to be entirely consumed upon use, and it estimates minimal residue over a broad area from chaff. One problem is that the DEIS assumes normal operation of chaff and flare, which is not always the case. PR-1 Also, in the analysis of impact to the physical resources of the environment, the DEIS should adequately consider the visual impact from non-biodegradable chaff residue and residue that results from improperly discharged chaff and flare as such residue accumulates over time. PR-2 This residue is trash and the DEIS should contain a mitigation measure that provides for the proper cleanup, removal, and disposal of these items. NP-12

4. General Comments Regarding Quality of the Analysis

Discussion of Mitigation

NEPA regulations require that the EIS contain an adequate and reasonably complete discussion of mitigation measures that is supported by data. Air Force Environmental Impact Analysis Procedure regulations also require that mitigation be addressed. As identified in prior comments, there are mitigation measures for this action that the DEIS does not fully consider. The EIS should provide mitigation measures that ensure that disturbance to persons, structures, animals and property from low-level operations is minimized. Furthermore, the EIS should provide measures that limit the amount of airspace used for military operations to the minimum amount required. NP-11

Discussion of Cumulative Impacts

The EIS must consider the cumulative effects of past, present and reasonably foreseeable actions. The DEIS only examines "recent" actions in the past, since 1995. The scope of the past cumulative impacts is not sufficiently broad to create a baseline against which to compare the effects of the proposed action. The scope of the EIS cumulative impacts analysis must be broad enough to make clear the overall impact that can be expected as actions have accumulated and as they will accumulate. CM-1

SUBMITTED BY A S ELLIOTT
@ CLOVIS SCOPING MEETING 28 JAN 2005
A S Elliott

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 1-28-2005

PLEASE PRINT

Dear Ms. Cook
Our ranch is in Range 18 & 19 Lincoln County, New Mexico
We worry that more sonic booms and low flying planes will damage our Dwelling and Buildings and water tanks. NO-2

1. We have one deep water well 640ft deep in range 19 one-440ft deep in range 18, 2 windmills on top each
2. Dwelling 40ft X 40ft on cement foundation covered with steel Pane
3. Shearing Barn 110ft X 30ft on cement foundation tile Block cement
4. Bunk House 25ft X 14ft " " " tile Block cement
5. Garage - Tool house 40ft X 25ft on cement " tile Block cement
6. Saddle Barn 110ft X 20ft " " " " " "
7. Pump house 10ft X 8ft " " " " " "
8. We have 3 steel water tanks on cement foundations
   1 - 6ft X 25ft in range 19 Lincoln county, N. Mex
   1 - 6ft X 25ft in range 18 Lincoln county N. Mex.
   1 - 6ft X 15ft " " " " " "

We wish our Air Force well in training, but we do expect to have our damage covered - Should something happen. Thank You for hearing my Comment! NP-3

**** CONTINUE ON BACK FOR MORE SPACE ****

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	Willie M. Innes and Nettie Fuchs
ORGANIZATION:	Rancher
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Roswell, N. Mex [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0006

[redacted]
Roswell, NM [redacted]

January 31, 2005

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

My Dear Ms. Cook,

I am writing as a private citizen. My views are my own, and not those of my employer, neighbors or any organization I have been or am a part of. I wish to draw attention to three issues regarding New Mexico Training Range Initiative (NMTRI).

1. The airspace surrounding Roswell International Air Center (ROW) may be characterized by a big "X," with the legs representing flight ways to and from ROW. To the north are the current Pecos Military Operations Areas (MOA's), and to the west are the Beak MOA's. Talon and Bronco MOA's are south and east. These MOA's are restricted; to the west they are above 12,500 feet mean sea level (MSL). The northern ones are essentially from the ground up. The hours of operations are 6:00 am to 6:00 pm for the western and 8:00 am to 8:00 pm for the northern ones; on week days. Should the MOA be extended, it would make such areas contiguous from SW of ROW to NE thereof. My concern is that the NMTRI would cut off scheduled air carrier operations between ROW and Albuquerque (ABQ). This is the only air carrier service available in ROW. Air carriers do not operate on "see and avoid." They are under instrument flight rules from ROW through Corona and on into ABQ. Detouring around the MOA's would be time consuming, and very expensive for the current carrier. Sufficiently expensive that they may cancel service between ROW and ABQ. Absent that service, it is a 3 to 4 hour car ride to ABQ. This would present an inconvenience at the best; missed flights and economic loss would be highly probable. **AM-2**
2. The Roswell Daily Record has detailed business opportunities that have been bought out by the Economic Development Commission. Some of these businesses, reported in the last few weeks, have involved aviation. I'm sure that any firm contemplating using ROW for its surrounding air space would think twice about the ever declining options for use. Even current businesses, like AAR, Baldwin Aircraft Painting and the Flight Research Training Center, might find other venues more inviting. **SO-1**
3. Finally, as a private pilot, I agree with prior comments. Capable pilots can "see and avoid" during good weather, even though the aircraft may have different speeds. It is a hazard that can be mitigated with radar coverage. Such coverage is not detailed in any of the current proposals. All pilots should check the airspace notices (NOTAMS) prior to flight, but the military would have to assure that the information is there. And this is only available during good weather to private pilots. Scheduled air carriers usually operate under Instrument Flight Rules (IFR) which has no "see and avoid." **AM-5**

0006

I attended the presentation held at Goddard High School in Roswell. I was impressed with the talents of the pilots present, but do not feel that expanding the airspace is all that is needed, nor sufficient, to prepare them for actual combat. Nothing does that short of combat itself. **PN-2**

Sincerely,

Percy G. Wood

Percy G. Wood

CC: The Roswell Daily Record

BODE AVIATION

4 February 2005

Bode Aviation, Inc.
[redacted]
Albuquerque, NM [redacted]

Ms. Brenda Cook
HZ ACC/CEVP
129 Andrews Street, Ste 102
Langley AFB, VA 23665-2769

Ms. Cook

Subject: Comments on the New Mexico SUA expansion.

The proposed expansion of special use airspace, specifically the creation of a Capitan MOA, would have significant safety of flight ramifications, as well as economic implications.

The area east of the Capitan Mountain, north to Gallinas Peak (just south of Corona VOR) is located in the leeward side of rugged, mountainous terrain. As a pilot who travels the route at low level, the strong westerly winds in the region can create severe low-level turbulence and mountain wave activity. I've been forced to climb on several occasions, just to control the turbulence. **AM-3**

The Victor airway, V68-83, is a major corridor for flight between the west coast to Texas, the Gulf, and points east. The massive SUA airspace block, which starts at R-5107 and runs south to the Mexican boarder, forms a wall, which can only be circumnavigated at low level by traversing the area to the North near Albuquerque.

Lastly, the citizenship in New Mexico relies heavily on general aviation for travel to and from the state capital, the state's largest city, and the only significant medical facilities in the state. The proposed airspace would add significant time and expense to these operations and could interfere with life-saving operations. **SO-2**

As a minimum, the floor of the proposed airspace should be limited to 18,000 MSL. **DP-1**

Respectfully;

David J. McVinnie, MCFI
Chief Flight Instructor
Bode Aviation, Inc.
[redacted]

5 February, 2005

Ms. Brenda Cook
NM Training Range Initiative EIS Project Manager
HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769

Ms. Cook:

Here are some questions re the NMTRI-EIS Project for your attention and response:

1) The Bush administration has attempted since early 2001 to exempt the U.S. military from all environmental regulations including EISs. What is Cannon Air Force Base's view of this effort? And yours? **NP-1**

2) What is the total budget, current and last fiscal years, for CAFB? **NP-4**

3) I recently received the names of 16 individuals who were Air Force (in some capacity) in attendance at the January 27 hearing in Fort Sumner. What was the total cost to the taxpayers for their salaries, travel and other expenses? The total cost of EISs - all hearings? **NP-5**

4) Following Lt J. Gerlin's announcement that all USAF's reps would answer our questions before the formal hear- **NP-6**

Mec

1) "...following ... Gearing's announcement that all USAF's maps would answer our questions before the formal hear- NP-6

0008

2

Scurlock to Cook

ing, I asked several questions of Bob Van Tassel, none of which he would answer directly. So, what is his academic background, work experience, major publications, experience in the American Southwest, and total salary (fee) for the project? NP-6

5) In the cover sheet text of the NM TRI - EIS (draft) is the statement that the Proposed Action would have "no noticeable effects on other environmental resources" excepting "some airspace and noise consequences". Considering all of my personal experiences with the USAF as an eco-cultural specialist and concerned citizen, and those expressed by other De Baca County citizens on the evening of January 27, how can the AF justify such a statement? NP-7

[to p. 3]

0008

2

ing, I met Bob Van Tassel and asked him first, what his academic and work experience were, and he answered non-sensically with a smirk. He did the same when I asked what his fee as a consultant was, then, as I pressured him to give a direct, sensible answer he replied "I make more than I did as a carpenter." No matter his intent, his response (or lack thereof) was unprofessional. The USAF response?

6) Why are terms like "biologically significant" and "biologically insignificant" not defined in the glossary or explained in the text? BI-6

7) In my Valley, Plains and Sky (2001) I have identified other extirpated species in the study area. My work is the only in-depth (albeit preliminary) environmental history of the area. Why were such basic published works (there are other relevant publications that were apparently not consulted) overlooked? (see pp. 3-38 and H-13-14). BI-7

8) In Section 4.5.2 (pp 4-29 - 4-37) it is pointed out that various adverse impacts have been observed or measured from jet overflight noise on wildlife, yet in several instances the conclusion is that no "significant effects" would occur. What are "significant" vs "non- BI-6

0008

. 4

significant effects"? (This is another example of the use of ambiguous terms to justify USAF degradation of the environment, but yet terms are not defined anywhere in the EIS. Why not?

BI-6

I cease making comments here. The EIS draft is inadequate, but the USAF will basically do what ever those at command level (including the president) want to do.

Sincerely,

Dan Scurlock

Dan Scurlock
Environmental Historian,
Archeologist, Naturalist
[redacted]
Fort Sumner, NM [redacted]

P.S. I misspoke at the January 27 hearing; the proposed expansion of the USAF training area of 3300 square miles is larger than the area of Delaware, which is 2,057 square miles.

Exhibit "A"
Submitted by Dan Scurlock
[redacted], Box 126
505-714-3773 Ft. Sumner 88119

CANNON AFB HEARING
Fort Sumner, NM
1-27-05

0008 (cont.)

ENVIRONMENTAL JUSTICE SURVEY RESULTS

Fort Sumner Partners in Environmental Justice sent out a survey to 188 Fort Sumner and De Baca County Residents. There were 72 responses. The survey asked residents to identify environmental health issues important to the people of this area. Environmental health is based on the belief that the environment affects our health. The environment includes the relationships between our health, and our homes, workplaces, schools and the outdoors. The following is the result of that survey:

1. **Average years in De Baca County: 36**
2. **Chemicals or pollutants people are exposed to at home:**

Bug killers:	45
Dust/sawdust:	42
Paint thinners or other solvents:	27
Homemade remedies/cosmetics:	11
Soldering:	9
Other:	5
Heavy metals:	3
Imported/unglazed pots:	3
Don't know:	2
None:	15

3. **Chemicals or pollutants people are exposed to at work:**

Bug killers:	24
Dust/sawdust:	21
Paint thinners or other solvents:	14
Soldering:	5
Heavy metals:	1
Other:	4
Don't know:	2
No:	35

4. **Environmental concerns:**

Water quality:	56
Crime:	49
Animal control:	26
Air quality:	23
Land use:	22
Land development:	20
Environmental contamination:	20
Rodents:	20
Noise:	16
Odor emitting industries:	13
Diseases associated with keeping animals:	12
Livestock control:	12
Pesticides/herbicides:	12
Safe food:	12
Unsafe work environment:	10
Excess artificial light at night:	4
Other:	4

5. **Which environmental concerns would you like to learn more about:**

- Land development & land use
- Water
- Animal control
- Crime
- What Ft. Sumner is doing & how much longer before we have safe drinking water.
- Rodents
- Unsafe work environment
- Medical problems related to environmental contamination
- Combining the city, county, and state police employed locally makes an almost ridiculous number. However, we seldom hear anything about their efforts to control illegal drugs, repeat drunk drivers, etc.
- Rules & regulations on feed lot operations
- Noise
- Pesticides/herbicides

1

- Medical problems
- Odor emitting industries

6. What is the most important environmental health problem in De Baca:

- Water quality
- Carbon Monoxide
- Air pollution
- Stress from outside sources such as irrigation rights for farmers
- Livestock & pet control
- Lack of emergency room
- Skunks
- Dust, weeds, & cottonwoods
- Lack of environmental control
- West Nile Virus
- Lack of or poor coordination of law enforcement resources
- Mental health

7. How does the above affect you and your family:

- Overall health
- We have to buy our drinking water, breathing problems
- Everyone has stress from one form or another. Stress causes people to argue, to become physically ill, among other problems
- Livestock in city limits causes flies
- We don't know how it affects us
- Smell from neighbors' pets makes us sick
- One never knows when a family member may need emergency care.
- Allergies

8. Water concerns:

Having safe water for drinking/household use:	56
Having enough safe water for drinking/household use:	52
Having enough water for livestock/fields:	42
Safety of private well water:	37
Irrigation rights:	34
Having safe water for livestock/fields:	27
No concerns:	1

9. What people consider eyesores:

Accumulation of litter/debris on property:	60
Abandoned cars:	54
Abandoned buildings:	50
Illegal dumping:	29
Graffiti:	24
Billboards:	6
Other:	3
None:	2

10. Most important health concerns in your family & neighborhood:

- Having immediate health care, permanent doctor, hospital.
- Sewage disposal and household waste
- No nursing home
- Availability of medical treatment after 5:00 on weekdays and weekends
- Water
- Available, affordable, qualified healthcare
- Stress
- Cancer
- Osteoporosis
- Air quality control
- No assisted living
- Allergies
- Animal control
- No trash pickup outside the village.
- Diabetes

11. Who do you talk to about environmental problems:

Friend:	28
Family member:	26
Spouse:	24
Healthcare provider:	18
Community organization:	13
Government agency:	12
Elder:	1
Other:	2

12. How many acres do you use:

10 acres or more:	29
½ acre:	12
½-1 acre:	8
1-2 acres:	5
2-5 acres:	5
5-10 acres:	5
None:	4

13. How do you use this land:

Primary residence:	56
Agriculture:	25
Livestock:	24
Personal landscaping:	21
Open space:	11
Small business:	11
Recreation:	5
Other:	1

14. Land use concerns:

Unpaved roads:	18
Agricultural changes:	16
Cost of buying land:	10
Commercial & housing developments:	7
Limited availability of utilities:	6
Escalating price of land & homes:	6
Other:	5
No concerns:	20

15. Best way for receiving information:

Newspaper articles:	44
TV:	28
Community meetings:	13
Radio:	7
Internet or websites:	6
Workshops:	3

16. Where do you go most often for your family's healthcare:

De Baca Family Practice Clinic:	60
Roswell:	7
Clovis:	6
Albuquerque:	3
Other:	10

17. What does environmental health mean to you:

- Not only chemicals, air, and water, but noise, crime, and quality of life.
- Physical and mental health interrelated with environmental conditions
- What the land gives back to you for your health
- The well-being of the land, air, water, structures, and people you come in contact with daily.
- Clean air, clean water, no dairies
- Maintenance & protection of the Earth and in return, people's health.
- Not to have to worry about drinking a glass of water.
- Conservatively looking to the future & safe-guarding individual rights to safe water, air, noise, cleanliness, and safety.

0008

Comments:

- Love small town atmosphere, but believe we could use some more light industry, manufacturing diversity, without solely relying on agriculture and schools.
- Ft. Sumner's big problem is the way elected officials act—City & County. We are too small to survive this, money-wise.
- I love being able to step outside and breathe fresh air.
- I would love to see an urgent care center—fully staffed, 24 hours per day. I am considering leaving F.S. to be closer to a hospital.
- I would like to see a litter law and see it enforced, especially in the park and slough. It would mean a cleaner town and fines could go to other areas needing money.

4

"Exhibit B"

0008 (cont.)

Thursday, 18 July
2002. 1330 hours
- 1350 hours

Senator Jeff Bingaman
703 Hart Senate Office
U.S Senate
Washington, D.C. 20510-3101

Dear Jeff:

I write this just minutes after Cannon Airforce Base jets screamed over Fort Sumner, a now common occurrence since 9-11-01 and the installation of new radar and other electronic instrumentation in the new "fly over zone" (2001) which apparently they (pilots, etc.) feel is justified in spite of assurances by a staff (of) (public planning) eleven uniformed and civilian consultants whose salaries we taxpayers support, and in writing in an expensive EIS statement, that "there will be no flyovers above populated areas like Fort Sumner". Clearly these were blatant lies or an expression of no understanding that "macho, gung-ho, top-gun" pilots will fly anywhere, any time, at whatever altitude, and at whatever speed.

My experience with the Air Force having essentially "free-rein" dates to 1968-69 while working at Chaco Canyon National Cultural Park and visiting Canyon de Chelly National Monument. Jets were flying at elevations below 1000 ft. (above ground level) and their engine noise and sometimes sonic booms caused cracking in the ruins at these two national treasures which we taxpayers were (and are) protecting from vandalism (among other things). The Air Force, then and now, supposedly were (and are) protecting our freedoms. For me that means a serene environment, free (as possible) from jet emissions, and noise the chaff and other materials being dropped on towns, ranches, farms, etc. Just yesterday, it was reported by KOAT-TV, Channel 4 in Albuquerque, that an Air Force aircraft dropped dummy bombs on a house in Alamogordo and a highway in the area. As yet, I have heard no explanation from the AF, no apology. In fact, I have never heard or read an outright admission to, or apology for a "mistake" made by any of their personnel over a 37 year period!

Back in 1970, while employed by the NPS at Everglades NP, we

had almost constant, low-level flyovers of helicopters and jets, disturbing visitors, park programs, rare and endangered wildlife, and more. After that, I moved to Austin and witnessed air space and low-level flight violations, as I did in Albuquerque from 1977 to 1998.

And just to give one more example of the "attitude and policy" the Marine pilot and co-pilot who killed 18 Italians when they flew into the cables of a tram car less than 100 feet above the ground, received only a "tap on the wrist, which apparently is what male pilots do to one another rather commonly anyway.

So, as we hunker down in our houses here, hoping our cattle and other livestock survive the "sounds of freedom", and as we breathe in fuel emissions from the jets and hope that another one doesn't crash, killing school children and starting a catastrophic fire, we pray, or curse, or write letters like this (or do all three), while knowing that all of these actions are simply for naught. Considering the above scenarios, the bombing of innocent people in Afghanistan and the level of violence (both civilian and military personnel) (in the U.S.),

0008

police brutality, CEOs and high-level corporate managers riffing off all of us, and the on-going erosion of personal rights guaranteed by the Bill of Rights, the Constitution, and various court decisions over the last 200+ years, caused by executive orders and congressional acts issued or passed (supposedly) to protect our national and personal security, I am not proud to be an American. At this moment in our history as Pogo stated in 1968 (or '69), "We have met the enemy and they is us!"

Painfully, Sincerely,

Dan Scurlock

Dan Scurlock
[redacted]
Fort Sumner, NM [redacted]
[redacted]

Exhibit C

0008 (cont.)

PETE V. DOMENICI
NEW MEXICO

COMMITTEES:
BUDGET
APPROPRIATIONS
ENERGY AND NATURAL RESOURCES
INDIAN AFFAIRS
GOVERNMENTAL AFFAIRS

United States Senate
WASHINGTON, DC 20510-3101

August 24, 2001

Mr. Dan Scurlock
Route 1, Box 16-L
Fort Sumner, New Mexico 88119

Dear Dan:

This is just a brief note of thanks to you for sending me a copy of your letter to Linda DeVine regarding the Defensive Training Initiative. I'm glad to have the opportunity to review it.

Again, thank you for keeping me informed of the issues most important to you. Please continue to keep me apprised of your concerns.

Sincerely,

Pete

Pete V. Domenici
United States Senator

PVD:dm

www.senate.gov/~domenici
PRINTED ON RECYCLED PAPER

Exhibit "D", Cannon AFB Hearings 1-27-03 **0008**

from Dan Scurlock

JEFF BINGAMAN
NEW MEXICO

703 HART SENATE OFFICE BLDG.
WASHINGTON, DC 20510
(202) 224-5521
IN NEW MEXICO—1-800-443-8658
TDD (202) 224-1782
senator_bingaman@bingaman.senate.gov

United States Senate

0008 (cont.)

August 29, 2002

COPY

Colonel Nicki Watts
Congressional Inquiry
SAF/LLI
1160 Air Force Pentagon
Washington, DC 20330-1160

Dear Colonel Watts:

I am contacting you on behalf of my constituent, Dan Scurlock, from Fort Sumner, New Mexico, who has a problem of special interest to your department. Enclosed is a copy of the letter he sent to me regarding the issue.

Because of the desire to be responsive to all inquiries, I respectfully request that you study the problem and respond back to my Roswell, NM office with the result of your investigation. The address is listed at the bottom of this letter.

Thank you for your attention to this matter.

Sincerely,

Jeff Bingaman
United States Senator

JB/ric

PLEASE REPLY TO:

☐ 625 SILVER AVE., SW, SUITE 130
ALBUQUERQUE, NM 87102
(505) 766-3636

☐ 148 LORETTO TOWNE CENTRE
505 SOUTH MAIN
LAS CRUCES, NM 88001
(505) 523-6561

☐ P.O. BOX 1977
118 BRIDGE STREET, SUITE 3
LAS VEGAS, NM 87701
(505) 454-8824

☑ 105 WEST THIRD, SUITE 409
ROSWELL, NM 88201
(505) 622-7113

☐ 119 E. MARCY, SUITE 101
SANTA FE, NM 87501
(505) 988-6647

"Exhibit E"

0008 (cont.)

8 Oct., 2002

Sen. J. Bingaman
U.S. Senator
Washington, D.C.

Dear Jeff -

Thanks for your August 29 letter responding to my concern for flyovers of the U.S. Air Force base in Fort Sumner. As yet I have received no written reply from the Defence Dept. on the B1/AF, nor telephone call. What I did "receive" about two weeks later, in the early afternoon, was a fighter jet which flew directly over my house, just above the ridgeline of my roof. I assume that's the "official" U.S. AF response to my critical letter, or simply the act of an immature pilot. Either way, the act confirmed that the Air Force doesn't care where, when, or how they fly in populated areas, nor do they any problem with outright lies made at public hearings or in other public statements, written or oral.

As you are aware, a Cannon AF Base jet crashed near Fort Sumner a

few weeks back, killing the pilot. A crash in town potentially would kill others as well.

Clearly the armed services have a "green light" from the Bush-Cheney administration, which has been in a war-mongering role, especially over the last few months. I am embarrassed by their stance and rhetoric - sabre-rattling at Iraq and other countries perceived to be a threat against the White House (not to me). I hope you will speak out loud and widely against this war-posturing and waste of resources.

I guess there is nothing you can do about the USAF at Cannon. Wiser leaders in the future will end the blatant disregard for the rights of U.S. citizens. I am reminded of a line from a Pete Seeger song - "we'll poison them coyotes till the last cat and dog are dead."

Dan Scurlock

[redacted]

F.S. NM [redacted]

[redacted]

The AF jets fly over the village as I write.

Cannon: USAF Hearings "Exhibit A"
Fort Sumner

JEFF BINGAMAN
NEW MEXICO

703 HART SENATE OFFICE BLDG.
WASHINGTON, DC 20510
(202) 224-5521
IN NEW MEXICO—1-800-443-8658
TDD (202) 224-1792
senator_bingaman@bingaman.senate.gov

United States Senate

COPY

November 7, 2002

Colonel Nicki Watts
Congressional Inquiry
SAF/LLI
1160 Air Force Pentagon
Washington, D.C. 20330-1160

Submitted by
1-27-03

Dear Colonel Watts:

I am again writing on behalf of my constituent, Dan Scurlock. I have not received a reply to my inquiry dated August 29, 2002 on behalf of my constituent. For your information, I am enclosing a copy of my last letter to you.

I would appreciate receiving any information you can share so that I can respond to my constituent's request for assistance. Please send your response to the attention of Colonel Watts in my Colonel Watts office listed at the bottom of this letter.

Thank you for your prompt attention to this matter.

Sincerely,

Jeff Bingaman
United States Senator

JB/rdv

PLEASE REPLY TO:

☐ 625 SILVER AVE., SW, SUITE 130
ALBUQUERQUE, NM 87102
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505 SOUTH MAIN
LAS CRUCES, NM 88001
(505) 523-6561

☐ P.O. BOX 1977
118 BRIDGE STREET, SUITE 3
LAS VEGAS, NM 87701
(505) 454-8824

☐ 105 WEST THIRD, SUITE 409
ROSWELL, NM 88201
(505) 622-7113

☐ 119 E. MARCY, SUITE 101
SANTA FE, NM 87501
(505) 988-6647

0008 (cont.)

CANNON AFBase HEARINGS : QUESTIONS

2-4-05

Pilot training period ? hours — ? AM-12

Turnover, personnel ? - Any from 2001 still flying in airspace ? AM-13

No. of Jet Aircraft at Cannon — NP-4

Type - Jet Fuel Consumption ? / hour flight time ? — AM-14

Tons of emissions and breakdown of chemical compounds, solids ? — NP-8

(~~Nuisance~~ Military attempt to shed all environ. regs ? Pentagon) NP-1

USAF - please answer these questions.
WS

Pilot training ?

Turn over personnel ?

0008 (cont.)

JET FLYOVER 2-5-05

At 8:00am - 8:01 AM 3 F-16 jet fighters flew over central Fort Sumner, from SW to NE, at ca. 1000' elevation, spaced ½ mile apart, with tree-hawk maneuvers. Decibel level high. At 8:36 am same? planes returned flying east to west over village. AM-1

Wes Sinclair
Fort Sumner, NM

0008

2

few weeks back, killing the pilot. A crash in town potentially would kill others as well.

Clearly the armed services have a "green light" from the Bush-Cheney administration, which has been in a war-mongering role, especially over the last few months. I am embarrassed by their stance and rhetoric – saber-rattling at Iraq and other countries perceived to be a threat against the White House (not to me). I hope you will speak out loud and widely against this war-posturing and waste of resources.

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Dan Scurlock

[redacted]

F.S. NM [redacted]

[redacted]

The AF jets fly over the village as I write.

0008 (cont.)

Cannon: USAF Hearings "Exhibit F" Fort Sumner

JEFF BINGAMAN
NEW MEXICO

703 HART SENATE OFFICE BLDG.
WASHINGTON, DC 20510
(202) 224-5521
IN NEW MEXICO—1-800-443-8658
TDD (202) 224-1792
senator_bingaman@bingaman.senate.gov

United States Senate

COPY

November 7, 2002

Colonel Nicki Watts
Congressional Inquiry
SAF/LLI
1160 Air Force Pentagon
Washington, D.C. 20330-1160

Submitted by 1-27-03

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Thank you for your prompt attention to this matter.

Sincerely,

Jeff

Jeff Bingaman
United States Senator

JB/rdv

PLEASE REPLY TO:

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☐ 148 LORETTO TOWNE CENTRE, 505 SOUTH MAIN, LAS CRUCES, NM 88001, (505) 523-6561
☐ P.O. BOX 1077, 118 BRIDGE STREET, SUITE 3, LAS VEGAS, NM 87701, (505) 454-8824
☐ 105 WEST THIRD, SUITE 409, ROSWELL, NM 88201, (505) 622-7113
☐ 119 E. MARCY, SUITE 101, SANTA FE, NM 87501, (505) 988-6647

0009

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 2-5-05

PLEASE PRINT GE-1

I AM FOR ALTERNATIVE B PROVIDED THE CORRIDOR BETWEEN CORONA AND ROW HAS RADAR AND COMMUNICATIO COVERAGE BELOW 12,500 FEET

**** CONTINUE ON BACK FOR MORE SPACE ****

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	DAVID D. ALLEN
ORGANIZATION:	NEW MEXICO PILOTS ASS.
ADDRESS:	[redacted]
CITY/STATE/ZIP:	SANTA FE N.M. [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0010

[redacted]
Albuquerque, NM [redacted]

February 7, 2005

Ms. Breada Cook
HZ ACC/CEVP
129 Andrews St., Ste 102
Langley AFB, VA 23665-2769

Dear Ms. Cook:

This letter is a comment on the proposed expansion of the Pecos and Beak military operations areas (MOAs) in New Mexico.

I am a private pilot who regularly flies between Albuquerque and Carlsbad, NM. This route takes me through the area that will be affected by the proposed expansion (V68-83 and V291). The minimum enroute altitudes (MEAs) for that area are 9,000MSL. However, when receiving VFR advisories along that route and above the MEA (e.g., 9,500MSL and 10,500MSL) problems often occur:

- the controller informs me that they have lost radar coverage, or
- I am unable to communicate with the next controller after a hand-off.

Higher altitudes work fine.

It concerns me that you want to make a ceiling of 12,500MSL for general aviation flights in the area. If I cannot fly low due to ATC limitations and I cannot fly high due to this enlarged airspace, no options remain. AM-5

Please raise the floor of the proposed airspace that affects this route to 15,000MSL. This would allow general aviation flights to proceed safely.

Sincerely,

Kenneth Ingham

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS) Fort Sumner, 1-

Thank you for your input! **DATE:** 2-6-05

PLEASE PRINT

HAVING ATTENDED TWO PUBLIC HEARINGS (2001, 2005) ON NMTRI EIS, IT IS CLEAR THAT THE USAF - BUSH ADMINISTRATION HAS DESIGNATED THE MIDDLE PECOS BASIN (S. OF SANTA ROSA TO N. OF ROSWELL AND WEST TO ALMOST VAUGHN FROM MELROSE BOMBING RANGE) AS A "NATIONAL SACRIFICE AREA. AND CLEARLY THIS SECOND HEARING IS JUST ANOTHER FORMALITY AS THE DECISION TO IMPLEMENT THE "PROPOSED ACTION" HAS ALREADY BEEN MADE, AND AS A RESULT THE SOCIO-ENVIRON DEGRADATION WILL CONTINUE. THIS INCLUDES THE DIMINISHMENT OF A QUALITY LIFE FOR ALL CURRENT AND FUTURE RESIDENTS OF THE IMPACTED REGION - HUMAN AND ANIMAL. SPECIFICALLY AIR QUALITY WILL CONTINUE TO DECLINE; NP-8
THE NOISE LEVEL FROM OVERHEAD JETS WILL INCREASE; SCENIC VIEWS WILL BE ADVERSELY IMACTED BY AIRCRAFT AND THEIR DROPS; LIVESTOCK AND WILDLIFE WILL BE SUBJECTED TO THE FOREGOING; AND CULTURAL RESOURCES (AND THERE ARE DOZENS ELIGIBLE FOR NOMINATION TO STATE/NATIONAL REGISTERS) ARE IMPERILED. AND THESE ARE JUST THE MAJOR IMPACTS WE HUMANS CAN RECOGNIZE; THERE ARE OTHERS WE NO DOUBT CANNOT RECOGNIZE UNTIL THE DEGREDATION IS WELL UNDERWAY. CAN ANY, OR ALL, OF THESE IMPACTS BE JUSTIFIED IN THE NAME OF NATIONAL SECURITY AS VIEWED BY CAREER POLITICIANS AND MILITARY BUREAUCRATS? (over)

**** CONTINUE ON BACK FOR MORE SPACE ****

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NAME:	DAN SCURLOCK
ORGANIZATION:	FRIENDS OF FORT SUMNER
ADDRESS:	[redacted]
CITY/STATE/ZIP:	FORT SUMNER, NM [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

I THINK NOT. WE HAVE AGAIN MET AN ENEMY OF OUR OWN SHORT-SIGHTED CREATION.

Dan Scurlock
ENVIRONMENTAL HISTORIAN/
ARCHEOLOGIST, NATURALIST

0009

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 2-5-05

PLEASE PRINT GE-1

I am For ALTERNATIVE B Provided The CORRIDOR BETWEEN CORONA And ROSWELL RADAR And COMMUNICATIONS COVERAGE BELOW 12500 FEET

****** CONTINUE ON BACK FOR MORE SPACE ******

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NAME:	David D. Allyn
ORGANIZATION:	New Mexico Pilots Ass.
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Santa Fe N.M. [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0010

[redacted]
Albuquerque, NM [redacted]

February 7, 2005

Ms. Brenda Cook
HZ ACC/CEVP
129 Andrews St., Ste 102
Langley AFB, VA 23665-2769

Dear Ms. Cook:

This letter is a comment on the proposed expansion of the Pecos and Beak military operations areas (MOAs) in New Mexico.

I am a private pilot who regularly flies between Albuquerque and Carlsbad, NM. This route takes me through the area that will be affected by the proposed expansion (V68-83 and V291). The minimum enroute altitudes (MEAs) for that area are 9,000MSL. However, when receiving VFR advisories along that route and above the MEA (e.g., 9,500MSL and 10,500MSL) problems often occur:

- the controller informs me that they have lost radar coverage, or
- I am unable to communicate with the next controller after a hand-off.

Higher altitudes work fine.

It concerns me that you want to make a ceiling of 12,500MSL for general aviation flights in the area. If I cannot fly low due to ATC limitations and I cannot fly high due to this enlarged airspace, no options remain. AM-5

Please raise the floor of the proposed airspace that affects this route to 15,000MSL. This would allow general aviation flights to proceed safely.

Sincerely,

Kenneth Ingham

Kenneth Ingham

0011

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! **DATE:** 02/09/05

PLEASE PRINT

I WOULD LIKE TO ENCOURAGE ADOPTION OF ALTERNATIVE PLAN B FOR THE SAFETY OF USAF AND GA AIRCRAFT & CREWS ALIKE. AT PRESENT THERE IS INADEQUATE RADAR AND RADIO COVERAGE AT THE LOWER ALTITUDES IN THAT GENERAL AREA AND IT IS ALREADY A BAD SITUATION IN THE CORRIDOR BETWEEN MOAS. THE OTHER ALTERNATIVES ONLY MAKE THIS SITUATION MORE DANGEROUS.

AM-5

**** CONTINUE ON BACK FOR MORE SPACE ****

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NAME:	JOHN C. TRAPP
ORGANIZATION:	Aviation Assoc of Santa Fe
ADDRESS:	[redacted]
CITY/STATE/ZIP:	SANTA FE, NM [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0012

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! **DATE:** 10 FEB 05

PLEASE PRINT

IT WOULD APPEAR, AFTER ALL THE CONCERNS VOICED AT THE PUBLIC HEARINGS, THAT THE AIR FORCE SHOULD DEVELOP A LEASED GRAZING PROGRAM ON AND AROUND THE RANGE PROPERTY SO THAT GRAZING ANIMALS COULD HELP TO CONTROL THE GROWTH OF "TUMBLE WEEDS" AND OTHER WIND BLOWN TRASH VEGETATION.

(I SEEM TO REMEMBER THIS HAVING BEEN DONE IN THE PAST ON VARIOUS RANGES)

NP-9

**** CONTINUE ON BACK FOR MORE SPACE ****

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NAME:	Col. Allan L. Young
ORGANIZATION:	27th TFW Retiree
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Clovis, New Mexico [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0013

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: 2/10/05

PLEASE PRINT

Please choose Alternative Plan B for the Changes the military are seeking in Size + Shape of MOA's in Southeastern New Mexico. Air Force + GA Pilots need Space and communication to keep Safe. At low altitudes there is NO Radar Coverage and poor radio communication in that area. I ask that the Air Force will have Radar equipment and the FAA to operate it So that GA + Military planes will have Safe Flights thru this area - We need to be Seen - AM-5

****** CONTINUE ON BACK FOR MORE SPACE ******

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NAME:	Carolyn Cook
ORGANIZATION:	Aviation Assoc. of Santa Fe, N.M.
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Santa Fe, N.M. [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0014

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: 11 FEB 05

PLEASE PRINT

I WANT TO BEGIN BY SAYING THAT I WANT OUR MILITARY TO BE THE BEST TRAINED IN THE WORLD. I HAVE TWO SONS IN THE ARMY SO THERE LIVES AND THEIR LEADERSHIP DEPEND ON IT. ON THE OTHERHAND MY FAMILY AND WAY OF LIFE DOESN'T HAVE TO BE DISRUPED BY THE AIR FORCE. I WAS AT THE PUBLIC MEETING (I THINK IT WAS IN 2002) IN 2002, WHERE THE AIR FORCE TOLD US A BUNCH OF LIES. THEY [redacted] WERE NOT LIES AT THE TIME, BUT AFTER THE PECOS MOA CHANGE WENT INTO AFFECT. THIS TIME A NEW GROUP OF OFFICERS CAME AND TOLD US A NEW STORY. THEY WERE ALL VERY NICE AND RELATED TO US THE NEXT CHAPTER IN THE PECOS MOA EXPANSION THEY WANT TO INCREASE THE SUPER SONIC FLIGHTS BY 175%. NOW I [redacted] ASK A QUESTION. IF EVERY RANCHER & FARMER AND FOLKS WHO LIVE IN THE TOWNS THAT [redacted] THIS EXPANSION EFFECTS WHERE TO DISAGREE ON THE EXPANSION, WOULD IT STILL GO INTO EFFECT? I SAY THAT IN ALL PROBABILITY IT WILL. I FOR ONE THINK AND [redacted] BELIEVE THAT THE ONLY REASON THAT THE AIR FORCE HOLDS PUBLIC MEETINGS IS TO SATISFY THE LAW. IN OTHER WORDS THE DECISION HAS ALREADY BEEN MADE. [redacted] NP-10

I HAVE SOME IDEA'S OF MY OWN THE AIR FORCE COULD THINK ABOUT. WE HAVE OUR MILITARY PERSONAL STATIONED ALL OVER THE WORLD. WHY CAN'T THEY DO THERE SUPER SONIC TRAINING IN ONE OF THE COUNTRY'S OVER SEAS? THEY WOULD BE CLOSER TO WHERE THEY MIGHT BE NEEDED AND COULD EVEN BE MORE REALISTICK. PN-1

I WANT TO SAY THAT I AM NOT IN FAVOR OF LOW LEVEL SUPER SONIC FLIGHTS. THE AIR FORCE WON'T FIX THE THINGS THEY BREAK OR DESTROY IN THE PROCESS.

****** CONTINUE ON BACK FOR MORE SPACE ******

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NAME:	CHARLES G. VAUGHAN
ORGANIZATION:	VAUGHAN & CIBOLA RANCH
ADDRESS:	[redacted]
CITY/STATE/ZIP:	FORT SUMNER, NEW MEXICO, U.S.A. [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0015

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 2/12/2005

PLEASE PRINT

I own a ranch in the affected area at House, NM. The present training flights are disruptive but tolerable. Sonic booms would be intolerable. I suggest that you eliminate the Sonic Booms but go ahead and expand the fly-over area. Thank you for your consideration. NO-4

**** CONTINUE ON BACK FOR MORE SPACE ****

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NAME:	Michael Murphy
ORGANIZATION:	
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Melrose, NM [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0016

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 2/14/05

PLEASE PRINT

We own a ranch located six miles West of House NM and six miles east of House. Bombing runs to the Melrose Range start over the Alamosa Creek lake on our property. These flights have not caused any problems with the environment or to our cattle. A few more flights would not be disruptive provided the noise (jet exhaust) got no worse than now. Sonic booms would be very disruptive to our way of living and to our cattle. Please explain how you intend to mitigate Booms and exhaust noise (at low altitude). NO-5

**** CONTINUE ON BACK FOR MORE SPACE ****

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NAME:	Bruce Murphy
ORGANIZATION:	Murphy Land & Cattle Co
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Melrose, New Mexico [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

AIRCRAFT OWNERS AND PILOTS ASSOCIATION
AOPA [redacted]
Frederick, MD

February 14, 2005

Ms. Brenda Cook
HQ ACC/CEVP
129 Andrews St., Ste. 102
Langley AFB, VA 23665-2769

RE: Draft Environmental Impact Statement for the New Mexico Training Range Initiative

Dear Ms. Cook;

The Aircraft Owners and Pilots Association (AOPA), representing over 400,000 general aviation pilots, submits the following comments in response to the Draft Environmental Impact Statement (DEIS) for the New Mexico Training Range Initiative (NMTRI). AOPA opposes the Capitan Military Operations Area (MOA) in light of the significant negative impacts on Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) traffic transiting the area between Roswell, New Mexico and points northwest. AOPA contends that the Air Force has failed to analyze the flight safety impacts to general aviation associated with lowering the floor for supersonic operations from 30,000 feet MSL to 10,000 feet MSL and the impacts associated with expanding a lights-out approved MOA. AM-2

AOPA's 2003 Policy and Issue Survey of its members shows that a full 73% of the general aviation pilot population deviates around MOAs, in part because of the inability to get accurate "real-time" status information on that airspace. In fact, our members ranked the ability to receive "real-time" status of Special Use Airspace (SUA) as its second most important airspace issue facing general aviation. Deviations around the expanded SUA complex will more than triple flying time and in turn economically impact operators who are forced to more than triple operating costs to avoid the airspace area. SO-1

Impacts on General Aviation

AOPA is particularly concerned the DEIS failed to adequately evaluate several aeronautical impacts associated with the proposed SUA initiative. The expansion of the Pecos South High and Low MOAs will eliminate access to V291 and the creation of the new Capitan MOA will compress traffic into a narrow 3,500 feet corridor along V68-83. In effect, a small portion of V68-83 below 12,500 feet would remain as the only airway available for IFR transitions around an SUA complex encompassing nearly 3,300 square miles. AM-2

As part of the NMTRI the Air Force is also proposing to authorize supersonic flight below the current 30,000 feet MSL floor. The proposed changes would allow supersonic flight down to 10,000 feet MSL, or approximately 5,000 to 6,000 feet AGL in the expanded and existing SUA, including the new Capitan MOA. AOPA is gravely concerned with the potential impacts to flight safety if general aviation air traffic is forced to "see-and-avoid" F-16's maneuvering at supersonic airspeeds. Such a situation presents undeniable risks to flight safety for both military and general aviation pilots. The DEIS failed to address the critical impacts to flight safety if nonparticipating air traffic occupy the same airspace as maneuvering supersonic military aircraft. Furthermore, the Pecos MOA complex is approved for lights-out military training and the DEIS failed to address the impacts to flight safety the expanded lights-out approved MOA would impose upon nonparticipating aircraft transitioning the airspace. SA-1

AOPA Recommendations

AOPA strongly recommends the final EIS address and analyze the following items:

- Impacts to flight safety directly related to civil aircraft operating "see and avoid" in the same airspace as maneuvering supersonic military aircraft.
- Impacts to civil aviation flight safety as a result of increasing the size of lights-out approved MOAs.

AOPA understands the Melrose Air Force Range (AFR) is one of few ranges approved for training with the Joint Direct Attack Munitions (JDAM) and the Advanced Medium-Range Air-to-Air Missile (AMRAAM) weapons systems. However, the intended military operations in this particular SUA complex present several additional hazards to nonparticipating aircraft that are not present in most MOAs. Therefore, a proper analysis of the potential impacts to flight safety must be fully addressed to ensure the safety of civilian pilots will not be jeopardized by the proposed action.

Considering the impacts to airways V68-83 and V291, the hazardous lower supersonic operations, expanded lights-out operations in the Pecos MOAs, combined with the lack of real-time status information, AOPO recommends Alternative B as analyzed in the DEIS. Alternative B would allow expansion of the Pecos High and Low MOAs, however it would not create the Capitan MOA/ATCAA. Alternative B provides civil pilots the available option to efficiently deviate around the expanded SUA complex without creating additional flight safety concerns associated with the creation of the Capitan MOA.

0017

Ms. Cook
Page 3
February 14, 2005

AOPA appreciates the opportunity to comment on the DEIS for the NMTRI and looks forward to working with the Air Force to help mitigate potential airspace impacts associated with the NMTRI.

Sincerely,

Heidi J. Williams
Director
Air Traffic Services

0018

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: 2-14-05

PLEASE PRINT GE-1

To whom it may concern.

I realize that the Service Reps. believe they need more space for training. And I guess they feel they have the right for what ever.

I'm just a plain citizen that lives in your area already. Wasn't supposed to be but we are. Some times when the sonic booms go off it is just like an explosion around here. Every thing shakes & shivers. Now you want even lower flying and a whole lot more often. Canceling out make area.

I don't believe that's fair. I also don't believe in my heart that writing this is going to mean any-thing because you'll do what ever any way. It matter's how anyone feels.

****** CONTINUE ON BACK FOR MORE SPACE ******

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NAME:	MARY Whelchel
ORGANIZATION:	Concerned Citizen
ADDRESS:	[redacted]
CITY/STATE/ZIP:	ST. Sumner NM [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0019

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: 02-15-05

PLEASE PRINT GE-1

See Attachments (2)

**** CONTINUE ON BACK FOR MORE SPACE ****

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NAME:	F.A. "Andy and Mary L. Andreas
ORGANIZATION:	
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Ft Sumner, N. M. [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

Andy & Mary Andreas

From: "Andy & Mary Andreas" [redacted]
Sent: Monday, February 14, 2005 1:21 PM

I felt priviledged to be able to attend the Air Force meetings in Ft. Sumner twice. I was impressed and "Oh so proud" of all of the men and women. I talked with several of them, but one, the young pilot at the last meeting, had been to Iraq and had been trained here in the attacks at a high level-when he arrived in Iraq, his hands were tied because he had not trained at low levels of attack. He is about the age of my younger brother, the fighter pilot. How, tell me how can we complain of the noise, the sonic booms, maybe breaking a window, the cattle running. My God, we should get

down on our knees and thank God and all of the Military for what they do for all of us and our country. I say, if the Air Force needs more space to train, high, low, or in between, so they will be more effective and stay alive to come back home to us, "how dare we not agree with the military". They know what they need, we do not. Thank God for all of our Military and God watch over them every minute of every day. We both are so very proud of
all of our men and women in all the branches of the Military. They have dedicated and willing to give up their lives every hour of every day for their Country and all of us. You make us so very proud to be Americans. We, Andy and I and our family love our Country so much. Think of us as your
family who truly cares about each and everyone of you and our hearts go out to you. We pray each and every one of you return home unharmed. FLY HIGH,
FLY LOW, we're with you up there. When we hear you flying over us, high, low, wherever, we feel so very safe and secure. God Bless you all and bring you all home safely. Always, F.A."Andy" and Mary L. Andreas, [redacted]

Ft. Sumner, New Mexico [redacted]

2/14/2005

Andy & Mary Andreas

From: "Andy & Mary Andreas" [redacted]
Sent: Monday, February 14, 2005 3:32 PM

FOR YOUR INFORMATION : The following is a narrative about the family of
F.A. "ANDY" and MARY L. ANDREAS, [redacted] Ft. Sumner, New Mexico-[redacted]
Mary was born in Roswell, New Mexico in 1928. Andy was born in Wapato, Washington in 1928. He joined the Army Air Force and was shipped to Sheppard Air Force Base at Wichita Falls, Texas for his training. He then was shipped to Roswell Air Force Base at Roswell, New Mexico where I lived
and we met and married in 1947. To go back a few years, I must say that my father, Wiley Grizzle was in the Navy(guess he started it all). Andy and I had 3 children, two boys and one girl. We farmed at Muleshoe, Texas then moved to Ft, Sumner in 1955. Andy had three brothers in WWII, one a Marine,
two in the Navy and he was in the Air Force. I had three brothers in WWII, the older one was pilot on a B25 and was going overseas, but developed a hernia and did not go. The second brother was a gunner on a bomber and his plane was shot down and he was a prisoner in Germany for 22 months, walking
all over Germany, eating anything he could get his hands on. Mom would send
him cookies and he said by the time he got them they had worms in them but he ate them any way. He wrote a book from the notes he kept while a prisoner. The youngest brother was a fighter pilot flying several planes, the last one was th P51. He went on many missions day and night-he was shot

down and went down with his plane over Belgium in 1945. My family lived about 4 miles East of the Air Base in Roswell-those huge Bombers would fly right over our house so they were very low and very loud and the house would

shake all over, but we did not complain because we knew the pilots had to fly and prepare to go overseas to fight. My family and Andy's family were forever in "harms way" every second of every day-forever waiting to get a letter from our men. I met Andy while he was stationed at Roswell in the

2/14/2005

Medics. We married and had 3 children, 2 boys and 1 girl. Our son Mike, the older one enlisted in the National Guard for 6 years and during those years was attending Airplane Mechanics School at the Base in Roswell. Our second son, Pat, joined the Army and was shipped to Tay Ninh-that was a "hell hole" if there ever was one. He was forced to move into a Bunker at night to sleep. He was a mechanic on the Helicopters. They couldn't get parts they needed to always repair the helicopters so they would wire them together or whatever it took to get them in the air again. He truly was in a "hell hole" there. He had a premature son while there and the copter had to wait until it was safe to fly him out of there. He was "IN HARMS WAY" all the time, every minute of every day while he was there. He would be working on the Copters and the enemy would lop the mortars in where he was

working, so close to where he was working, killing some of his "buddies" while they worked, only feet away from him. Oh, dear God! This is why our military must have every advantage ,know all they can about where they are and Tactics they must use wherever they are to protect themselves and their planes. We should never allow them to have anything less. Pat has two sons, both of which joined the Marines and served a big part of their time in the Gulf, one on a ship and the other on land in a tank. Both served in the Gulf War-really wanted to get Saddam, but were not allowed to. They both served their time protecting our Country and felt a "priviledge to do so". Our daughter, Kathy, married and her husband joined the Army but did not go over seas, but served his time. I do not know what our Great Grandchildren will be doing, but you know, I'll bet if there is war, some of them will be right here in the middle of it. So now you see why Andy and I feel so very strongly about our Country and why we feel so very proud of "ours" and so very proud of ALL OF YOU and why we know "YOU HAVE GOT TO HAVE
THE TRAINING, AND THE BEST OUT GREAT COUNTRY CAN SUPPLY FOR YOU." WE thank
all of you for all you do for us and our Country. We want to thank you too for the very nice picture of the F-16C Fighter Falcon from the 524th Fighter
squadron, 27th
fighter Wing, Cannon Air Force Base, New Mexico.. I'm going to frame it and hang it up and enjoy it and when I am gone, I will pass it on to our son, Pat. Very Sincerly, Andy and Mary Andreas [redacted] Ft. Sumner,

2/14/2005

0020

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: 2-19-2005

PLEASE PRINT

Kelly Tibbets
[redacted]
Portales NM [redacted]

INTRO:

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1 of 5 KAT

0020

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2 of 5 KAT

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3 of 5

"As many as 40 commercial flights per day, flying just north of Fort Sumner will be re-routed". (Albuquerque Journal - 2/9/05)

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WE HEREBY FORMALLY REQUEST to see the raw data which backs this statement. Do newborn babies (needing 18 – 20 hours of sleep) habituate?

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Sincerely,

4 of 5

0020

Pictures are attached.

End of this document.

Kelly A. T. Roberts

[redacted]

PORTALES NM [redacted]

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0021

BILL HOGLAN

[redacted]

Reference the comments for Military Restricted Areas over New Mexico of every type. I personally did not see a comment period until the 21 Feb cut off. I hope you will at least read my concerns and consider them in your decision.

I find it unjustified that in a time that our military is the smallest ever, with fewer airplanes than in the past that the U.S. Government has to keep taking airspace for their training! New Mexico is a state that the Government has pretty much taken over and left little decision as how a pilot is to get across it. Hundreds of miles of the state are off limits from north of El Paso to nearly Albuquerque.

There are many training areas across the country. With the small number of pilots in the military now, there is just no justification for this continued take over and extension of "play" areas for military pilots. PN-1

The information on the status of military areas of all types is difficult to obtain and very vague. These fast moving toys flown by very lucky people are using our credit card to rule the skies and care little for the hundreds of thousands of civilian pilots and airplanes. The feeling out here is: If the U.S. Government could have it's way there would only be military and commercial airplanes in the sky!

Bill Hoglan

Retired FAA/USAFR, Pilot and aircraft owner.

HQ ACC/CEVP
129 Andrews St., Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

[redacted]
Portales, NM [redacted]
February 19, 2005

Subject: Comments On The Melrose AFA Initiative – MOA Expansion

My name is Jack A Greathouse. I was born in Clovis, NM and later my parents moved our family West of Floyd, NM, on a ranch where my Father Clarence S. Greathouse homesteaded in 1907, in the Territorty of New Mexico.

I was raised up on this ranch west of Floyd. I have seen the various changes after World War II in the US Army Air Corp and the US Air Force taking and using land Southwest of Melrose, NM and West of Floyd, NM.

Their wants, not needs, are to have more and more room to practice Bombing. No one would possibly believe the take over about every ten or fifteen years of practice space for the update of airplanes.

My cousin in 1942 or 1944, stationed at the Clovis Air Corp Base, in Clovis, NM, flew as a bombardier on the B-29 aircraft. Their local target range was a 160 acres just Southwest of Melrose, NM. They did make much longer flights to other states nearby from time to time.

Using very rough, rounded figures, the first bombing range for jets at the Clovis Air Base was SW of Melrose with approximately 7,000 Acres. From then on about every ten or twelve years was increased by tripling the size 21,00 acres, to 58,000 Acres, to 78,000 Acres. This was the last land condemned and purchased. The last expansion of land condemned and purchased resulted in evicting a rancher dying with cancer from his beautiful home. I do not mean they came and loaded him up in a truck. The family had to move to a new location in Portales, NM.

We understand MOA and the training of the jets from CAFB this

0022

must be available for realistic flights of our modern jets coming out of Cannon. CAFB has several of these already and new they want an expansion of one of these for more realistic flying. This new area they list as the proposed expansion of 700 Sections or 448,000 Acres. This is no small expansion by any means. CAFB could use an existing MOA which they wanted ten or twelve years ago. The MOA is named the Mt. Dora MOA and contains 3.9 MILLION acres. What realistic training they could get using that area! They say it is too far Cannon. The Mt. Dora MOA is only a little over 100 miles from Cannon. The new proposed expansion SW edge is about 100 miles from Cannon. PN-1

Cannon needs to use all the available space they now have without interfering with business flights from Odessa, Texas, to Albuquerque. AM-2

The reason that ranchers are resistant to this new MOA expansion is they will be used as a flying area but there will be flares and chaff dropped on the surface of tha pastures. Thus the Air Force will be using both the air space and land. This is a new and different approach than ever before. They will not be compensated for using tha land to dump refuse on.

It is my hope that the Air Force will prepare an understandable document for our young people as to why they see you force their parents and grandparents to give and give for your wants when there are available other alternatives.

Thank you, Jack A Greathouse

cc: Senator Pete Domenici
Senator Jeff Bingaman
Rep. Tom Udall

0023

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: Feb 17, 05

PLEASE PRINT Jodee Kinser

[redacted]

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0024

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Draft Environmental Impact Statement (EIS)

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PLEASE PRINT Orlando Ornelas

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HOWEVER, IN THE TRADITION OF PIONEERS, WE DO LIKE TO LOOK INTO THE EYES OF THOSE PEOPLE DETERMINING OUR FATE AND OUR LIVELIHOOD.

Sincerely,

O.O.

4 of 5

Pictures are attached.

End of this document.

[redacted]

O.O.

5 of 5

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: 2-19-2005

PLEASE PRINT Melvin Standford
Floyd, NM [redacted]

INTRO:

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EJS

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EJS

2 of 5

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EJS 3 of 5

0025

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Evelyn J Stanford
Melvin Stanford by EJS

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End of this document.

5 of 5

EIS

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: Feb 19,

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JR FRASER
[redacted], Portales NM [redacted]

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Draft Environmental Impact Statement (EIS)

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L.D.B.
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Sincerely,

Ashmel D. Bigler
A. Bigler

4 of 5

Pictures are attached.

End of this document.

Has a study ever been conducted of Roosevelt County unborn children and animals?

EJ-1

Ashmel D. Bigler
P. Bigler

5 of 5

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

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PLEASE PRINT

Ronda Maddox [redacted] Portales, NM [redacted]

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NP-9

How can we believe this EIS study, when CAFB will not even acknowledge the current environmental problem? The current problem is NOT an act of God. The intelligence

RM 1 of 5

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L. D. B.
D. B.

3 of 5

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The Clovis News Journal (1/13/05) stated "the expansion would mean 'some airspace and noise consequences'." Brenda Cook stated in the Roswell, NM meeting that domestic and wild animals would quickly "habituate" to the sonic booms.] NO-10

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HOWEVER, IN THE TRADITION OF PIONEERS, WE DO LIKE TO LOOK INTO THE EYES OF THOSE PEOPLE DETERMINING OUR FATE AND OUR LIVELIHOOD.

Sincerely,

Lelmer D. Bigler
P. Bigler

4 of 5

Pictures are attached.

End of this document.

Was a study ever been conducted of Roosevelt County unborn children and animals?

EJ-1

Ashmael D. Bigler
P. Bigler

5 of 5

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: 2/19/05

PLEASE PRINT

Ronda Maddox Portales, NM [redacted]

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NP-9

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RM 1 of 5

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2. Your study says that those buildings which are structurally sound will NOT be affected by the sonic booms. These counties are inhabited by modest income families. Most people in the U.S. would think we are "poor". So, we did NOT have the money to repair the structural damage caused by sonic booms in the 1960's, 1970's, etc.

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3. You also address economic impact in your EIS study. The EIS document says that no significant economic hardship will be realized by the people who have nurtured this land for the last 5 to 65 years. Someone needs to tell this to those people who had cows on the land they had leased from CAFB before the "no graze" went into effect. When CAFB put the 2-year "no graze" into effect those people had to sell their cattle, during a market that was not conducive to selling. (You can't put 100 + cows in your back yard.) One of those fine individuals now has no health insurance, failing health and no money. Actually, I suspect a lot of those people fall into that same category: no health insurance, old enough to retire, but having their budget significantly altered by the acts of others. **SO-3**

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RM

2 of 5

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RM

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End of this document.

[redacted]

5 of 5

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: 2.19.05

PLEASE PRINT: Dean E. Lofland

Portales, NM [redacted]

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4 of 5

0029

Pictures are attached.

End of this document.

Sean Stafford [signature]

[redacted]

Portales NM [redacted]

[redacted]

5 of 5

0030

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! **DATE:** February 16, 2005

PLEASE PRINT

My name is David M. Stevens. I am a General Aviation Pilot and frequently fly between Ruidoso, Roswell, Albuquerque, Santa Fe and Midland Lubbock. As I understand the Initiative, the ability to safely navigate this airspace would be seriously reduced. While I understand the need for realistic training environments for our military, and while I ardently support our military, I do not want to see our ability to safely navigate this airspace disappear. I believe there needs to be a "flight corridor" for General Aviation to and from the above locations that would facilitate safe G.A. traffic. White Sands Missile Range has such a corridor. **AM-5**

Alternatively, certain altitudes could be specified for G.A. traffic. There may be other alternatives. Please do not make this area unsafe for Military and General Aviation traffic. Military pilots are too busy and going too fast to see G.A. traffic. There must be a solution that will allow realistic training without depriving General Aviation of the right to safely navigate this airspace.

Thank you
[signature]

**** CONTINUE ON BACK FOR MORE SPACE ****

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	David M Stevens
ORGANIZATION:	
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Roswell, NM [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0031

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input!

DATE: February 19, 2005

PLEASE PRINT

My name is Randy Bailey. I am a General Aviation Pilot and frequently fly between Ruidoso, Roswell, Albuquerque, Santa Fe and Midland Lubbock. As I understand this initiative, the ability to safely navigate this airspace would be seriously reduced. While I understand the need for realistic training environments for our military, and while I ardently support our military I do not want to see our ability to safely navigate this airspace disappear. I believe there needs to be a "flight corridor" for General Aviation to and from the above locations that would facilitate safe G.A. traffic. White Sands Missile Range has such a corridor. AM-5

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Thank you
Randy Bailey

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NAME:	Randy Bailey
ORGANIZATION:	DMR Inc.
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Ruidoso, NM [redacted]

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Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
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DATE: Feb 19-05

PLEASE PRINT
Sharon G. Russell [redacted]
Floyd NM [redacted]

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and the means to avoid this problem was shared with the appropriate Bombing Range personnel when the tumbleweeds were 3 to 4 inches tall. How simple it would have been to put the cattle back on the "buffer zone". They would have eaten the green tumbleweeds and gotten fat doing so. It would have been a win/win/win all the way around. But, alas, no one listened. Apparently no one at the Bombing Range understood the magnitude of "no action", even though it was explained to them.

2. Your study says that those buildings which are structurally sound will NOT be affected by the sonic booms. These counties are inhabited by modest income families. Most people in the U.S. would think we are "poor". So, we did NOT have the money to repair the structural damage caused by sonic booms in the 1960's, 1970's, etc.

Put another way, all of our homes and building will fall down with the next round of sonic booms. This is what was stated by Air Force personnel during your presentations in Roswell, Santa Rosa, Ft. Sumner and Clovis. (This was emphasized with an overhead projection of these sonic boom facts during all 4 presentations of the EIS.) Those buildings which are NOT structurally sound WILL BE DAMAGED BY SONIC BOOMS. NO-9

3. You also address economic impact in your EIS study. The EIS document says that no significant economic hardship will be realized by the people who have nurtured this land for the last 5 to 65 years. Someone needs to tell this to those people who had cows on the land they had leased from CAFB before the "no graze" went into effect. SO-3 When CAFB put the 2-year "no graze" into effect those people had to sell their cattle, during a market that was not conducive to selling. (You can't put 100 + cows in your back yard.) One of those fine individuals now has no health insurance, failing health and no money. Actually, I suspect a lot of those people fall into that same category: no health insurance, old enough to retire, but having their budget significantly altered by the acts of others.

4. We don't understand why CAFB can not use the Dora MOA. We think it is time for someone else to share in the wonderful "will not affect your environment", "you will 'habituate' to the pleasant awakening of 'sonic booms'", and "the value of your land will plummet" drastically scenario. PN-1 The Dora MOA has 3.9 million acres. Approximately 10-12 years ago CAFB promoted (A)

5. We don't understand why we only get 3 – 4 weeks for comments. The EIS study team had 18 months or so ???? NP-21

6. Many of us DID NOT RECEIVE any notification that the EIS study was even taking place. Some of us who were ***not notified***, reside right next door (i.e. adjacent) to the existing Melrose Bombing Range (just an oversight?). We were not included in the "scoping" !!! I thought it would be a requirement that notices be sent "registered, certified, return-receipt requested, etc. (or was that not in your budjet?)" to make sure the owners of these private lands (for 100 years) were properly notified, before major events occurred to the land that we love. NP-20

(A) the Dora MOA. That location ~~allowed~~ allows for continued expansion, which has been a proven event 2 of 5, again and again. It started in the 60's or 70's with the [illegible]

7. Lets talk ***ECONOMIC RUIN !!*** *As noted above, people have lost money due to the actions of the CAFB.*

Due to the existing tumbleweed problem, insurance companies are refusing to insure our homes, shops, carports, calving barns (all buildings), farm equipment, irrigation sprinklers, cars, trucks (everything !!). They state that our land and homes are a MAJOR FIRE HAZARD. If / when this fire occurs, we farmers and ranchers will lose EVERYTHING !!! We are talking millions (possibly billions) of dollars in LOSS !!!

It seems apparent to me / us that the tumbleweeds MUST BE a problem — or the insurance companies would be GLAD to take farmers' and ranchers' money (as they did for the past 40 to 50 years).

Some of these farmers and ranchers have obtained "certified written appraisals" on everything they own, stating the replacement values. It is public record (as stated in one of your 4 meetings) that these farmers' and ranchers' will hold CAFB responsible for the losses incurred IF THEIR HOMES / FARMS / RANCHES ARE DESTROYED BY FIRE DUE TO THE TUMBLEWEEDS.

FOR ANY FARMER OR RANCHER WHO HAS NOT DONE SO, IT IS HIGHLY RECOMMENDED THAT YOU OBTAIN A CERTIFIED WRITTEN APPRAISAL as soon as it can be done. PROTECT YOUR ASSETS.

8. *Clovis News Journal (1/1/05) stated "There is a lot of research taken before we can go forward with any type of expansion", said 1st Lt. Jennifer Geeslin of CAFB's public affairs office. However, when an environmentalist visited with [redacted] of the Floyd community, [redacted] comments and concerns were quickly forgotten. [redacted] explained how she has observed the decline of health in the cows, horses, dogs, cats and yes, people. The immune systems of every living thing is being / has been / and will continue to be depleted as long as the CAFB fails to act as a responsible entity in the community. (Yes, we can provide the raw data to prove this. It will be submitted, as a supplement to this document as soon as possible.)*

Our question: Does anyone really care what is happening TODAY in the environment surrounding the existing Melrose Bombing Range? Do you think it is healthy to throw tumbleweeds every day, breathing in the minute particles from this "Russian Thistle"?

If you DO NOT CARE TODAY, how can we ever believe you that you will care in the future?

9. Lets discuss safety, in terms of air traffic. AM-11

3 of 5

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"As many as 40 commercial flights per day, flying just north of Fort Sumner will be re-routed". (Albuquerque Journal - 2/9/05)

"No radio transmission is available starting about 30 miles north of Roswell until about 10 miles east of Albuquerque, Uslan said." (Portales News Tribune – 1/25/05)

"No one in their right mind would go in these," Uslan said of the connecting bridge (i.e. Capitan MOA). (Albuquerque Journal – 2/9/05)

"Usland said he believes the Air Force would violate the 12,500 foot deck during its combat fighter pilots nearly breaking the sonic boom ~~hazards~~ poses to civilian aircraft." (Albuquerque Journal – 2/9/05)

"We can't fly in the area when they are hot," said DuBois, who is a pilot for Angel Flight, a charity that flies critically ill patients for medical treatment." (Albuquerque Journal – 2/9/05)

"The F-16s will be allowed to fly as low as 500 feet off the ground in military areas outside the Capital bridge." (Albuquerque Journal – 2/9/05)

10. Lets discuss LOSS OF OUR LIFESTYLE.

The Clovis News Journal (1/13/05) stated "the expansion would mean 'some airspace and noise consequences'." Brenda Cook stated in the Roswell, NM meeting that domestic and wild animals would quickly "habituate" to the sonic booms. **NO-10**

WE HEREBY FORMALLY REQUEST to see the raw data which backs this statement. Do newborn babies (needing 18 – 20 hours of sleep) habituate?

We have run out of time. You know we don't get very long to respond to a study that took months to complete. There are many other concerns we would like to discuss with you.

WE FORMALLY REQUEST THAT WE BE ALLOWED TO ATTEND THE FINAL HEARING IN VIRGINIA (BEFORE A MILITARY JUDGE). WE DON'T EVEN HAVE TO BE ALLOWED TO SPEAK. **NP-15**

HOWEVER, IN THE TRADITION OF PIONEERS, WE DO LIKE TO LOOK INTO THE EYES OF THOSE PEOPLE DETERMINING OUR FATE AND OUR LIVELIHOOD.

Sincerely,

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Pictures are attached.

~~End of this document.~~

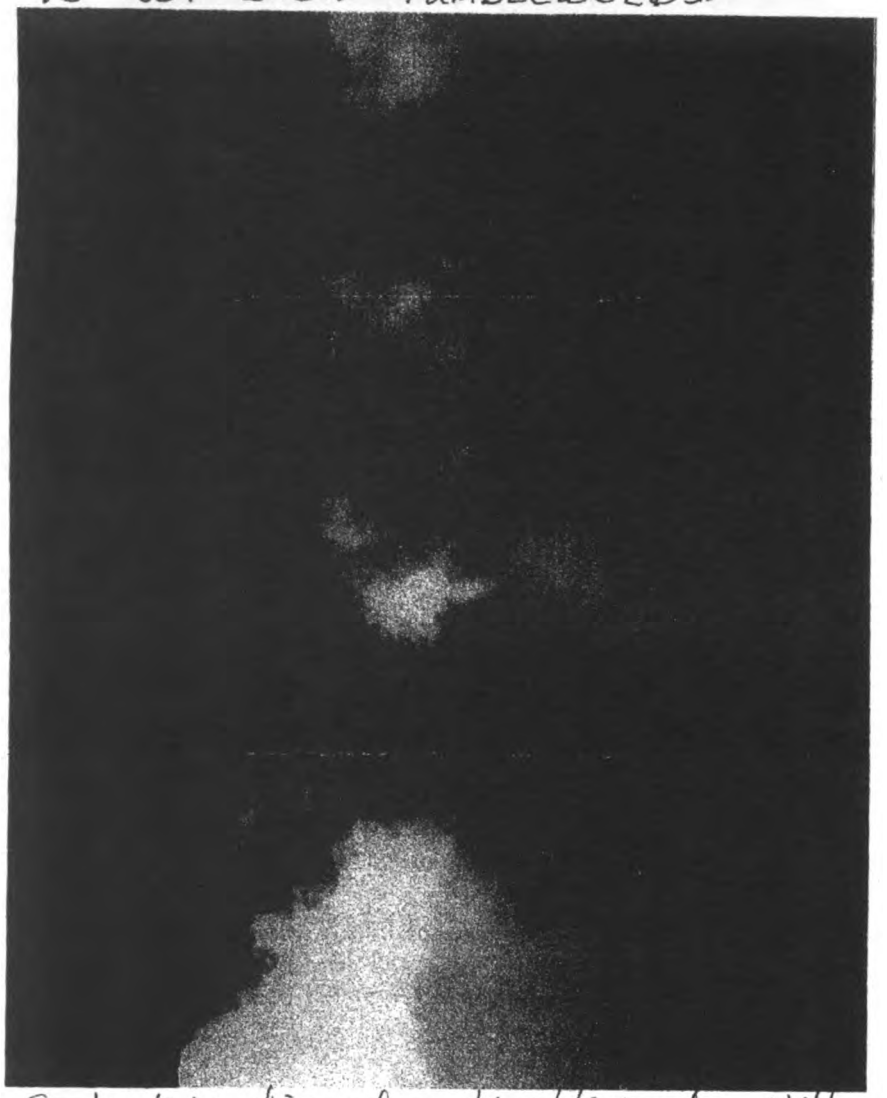
The "Odessa American" stated "Southwest Airlines spokeswoman Brandy King said she was unaware of the Air Force's plans. ~~and that~~"

"Even though the training area is more than 100 miles northwest of Odessa-Midland, Uslan said residents here would hear the booms. "They're not going to be terribly obnoxious, but you'll hear them . . ."

End of this document.

5 of 5

One Bolt of lightning 100% humidity, RAINING on Jan 30th, 2005!! This IS NOT EVEN TUMBLEWEEDS.



8-foot in diameter tumbleweeds will BURN MILLION OF DOLLARS OF PROPERTY, KILL ~~RESIDENTS~~ IN NM and Texas.

February 17, 2005

Ms. Brenda Cook
HZ ACC/CEVP
129 Andrews St., Ste 102
Langley AFB, VA 23665-2769

Re: Capitan and Pecos MOA EIA comments.

Dear Ms. Cook,

I have an interest in property and a private airstrip about 30 miles North of Roswell, N.M. I believe that the EIS fails to adequately address the concerns of people living under the MOAs in that the effects on people and livestock from sound, especially from supersonic activity, are understated. **NO-11**

The EIS also fails to address the environmental concerns of people with private airstrips in the area and the general public who fly through that area. **AM-2**

As you know, New Mexico already is heavily impacted by military airspace the most notable being the White Sands Range. People now have to fly North or South for more than an hour to avoid that airspace when transiting East or West. Your proposal does not address the environmental impact of shutting down the major North-South corridor on the East of the White Sands range to IFR traffic and to VFR traffic that does not want the risk of transiting a MOA. The environmental consequence of re-routing these aircraft is significant. When a MOA is instituted in an area such as this the number of transiting GA aircraft will be much higher because there is no economical way around the airspace. Thus the danger to the public and the military pilots will be much higher and the increased statistical probability of a serious accident and the attendant environmental damage is not addressed. **AM-5**

The EIS should also consider the better alternative of using existing MOA or restricted airspace, including the White Sands Range by coordination. **PN-1**

Sincerely,

Bernard Karwick
[redacted]
Sag Harbor, NY [redacted]

I am writing in response to the Draft of the EIS for the New Mexico Range Training Initiative.

I am a rancher in the revised area of operations that will soon be affected by the implementation of this new range training initiative. I have both pro and con feelings about this initiative. I live in the area know as the Lower Pecos MOA, that currently has a "hard deck" lower minimum of 11,00ft MSL. Before the public announcement of this initiative, we had regular occurrences of low flying military aircraft below 500 ft. AGL. And before some Air Force or government bureaucratic says something. I am a trained private pilot since 1983, I have over 14 years of working around aircraft and airports working as an aircraft mechanic. I have been a certified weather observer at general aviation airports with IFR approaches. I also served as Fire Direction Control for field artillery, navel gun fire, and air strikes. So, that being said, I have personally seen at least three military aircraft at or below 150 ft AGL. After the announcement of this initiative, these low flights stopped. I believe that after this initiative has been implemented, these encroachments will resume.

It is nice to see that the Staff Officers of the Air Force and the limited intelligence of our elected officials finally acknowledge that the training that they imposed during the late 70"s through the late 90's is wholly inadequate for the real world of combat. It is such a loss for the American taxpayer to have paid for so many "top of the line simulators", to only find that the simulators left our pilots unable to perform their mission to protect and defend our country. I also find that our elected officials, that be city, county, state, and federal, tried to slip this through without public comment (other than the limited notice required by law), from the people that would most be affected by this proposal. Several people in the affected area knew nothing about this initiative. NP-20

I do believe that our military must have the most realistic training possible in order to engage the enemy's of the United States of America. I believe that the Air Force should engage in live fire training like those conducted by the United States Marine Corps. The aircraft taking off from Cannon Air Base should be taking off with full live combat loads and engage targets with the

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same live loads.

As a rancher, in the affected area, I must disagree with the changes in the area of operations and methods that will be implemented for the following reasons:

1. The increase in sudden noise from both sub sonic and super sonic aircraft will cause stress on captive animals. In reading the EIS and talking to the sound expert that was available at the Public Hearings, I was not convinced of the levels of noise that has been reported or expected. If this report is to be considered true, then the area needs to include Cannon Air Force Base and surrounding communities that depend on the base for their livelihood. This would cut down on the travel and loiter time. The pilots could simulate a true combat area, by taking off and hitting supersonic at the minimum level, and engage the targets with minimum cost in fuel and time. According to the Draft EIS sound analyses, there will be no apparent increase in overall noise that would bother the citizens in the area. NO-12

2. The over pressure caused by supersonic aircraft at the lower limit will cause damage to older structures located within the area of operations. Again, I believe the sound analyses in the EIS is misleading. NO-9

3. In talking to area ranchers that have been here over the last 20 years and currently in the normal flight path to the Melrose Bombing Range. There has been many reports of sonic and subsonic aircraft spooking confined livestock and the livestock destroying both corrals and range fences. It will be just a matter of time before some one gets hurt or fatally injured with the enlargement and proposed usage of the area of operations.

4. Also in talking to area ranchers, The expended flares and caps reported in the draft EIS does not match the objects found on area ranches. The plastic caps found on area ranches are larger and if you talk to any veterinarian that is not on the government payroll, you will find that livestock will consume them and it may cause a blockage of the digestive track leading to death of the animal. NP-18 BI-1

5. The Air Force does not have good relations with the public within the military operations areas. When and incident happens and is reported, There doesn't appear to be any open and civil exchanges with those involved.

I can see the political necessity for this initiative to be implemented to keep Cannon Air Base off the base closing list. Since there are so few of us that will be affected and we can not get the support of our elected officials, this initiative will probably go through. I ask for the following recommendations to be considered:

1. The Air Force makes an attempt to make personal contact the owners and people living in the affective area. This to ask permission to survey buildings and corrals for reference in case damages is caused by a U.S. Air Force or allied aircraft. **NP-22**

2. That there be a number to call, at least one to two weeks, before a rancher gathers and hold livestock to brand or wean livestock, to allow the Air Force to maybe change or amend an operation to reduce the noise that may scare or spook livestock. Not all ranchers make these gathers at the same time and with a little communication any incidents may be avoided and with such a large MOA, there should be only a minimum conflict of area. **NP-23**

3. The Air Force work with the local Air Defense Units of the National Guard to at unspecified times to simulate either good or incomplete intelligence with regards to ground units that may be mobile in the MOA. This would be useful on a couple of points. First, This would give some realism for the pilots in not knowing when they might over fly an suspected enemy unit and would allow the air defense unit to try to surprise said pilots. Second, This would give the ranchers in the area the knowledge that a other military unit would be on hand to observe any incidents that may happen. **AM-4**

Again, I must say that, I see the reason for this initiative, but under the current situation, I must be against this initiative. Thank you for the opportunity to express my opinion in this matter.

Sincerely

John Haumont

[redacted]

Roswell, NM

[redacted]

HOLLAND&HART
THE LAW OUT WEST

Jennifer Hall
[redacted]

February 23, 2005

VIA OVERNIGHT MAIL

Mr. Troy Anderson
HQ ACC/CEVP
129 Andrews St., Suite 102
Langley AFB, VA 23665-2769

Re: NMTRI DEIS

Dear Troy: **GE-1**

Enclosed is the signed signature page for the comments to the NMTRI DEIS that our firm submitted on behalf of El Bigote Cattle Co., Gottomitee, Ltd. and A.S. "Tex" and Jan Elliot. You will be receiving those comments, post marked yesterday, February 22, 2004, by regular mail. Due to a formatting problem with the signature page, I had to re-format and re-print the page prior to the signature page. I would very much appreciate your replacing page 48 and the signature page with the enclosed pages once you receive our comments by regular mail. Please call me if you have any questions or concerns.

Also, if you will, please confirm to me by collect call to the phone number listed above that you have received the comments and inserted these two pages.

Thank you for your assistance in this matter.

Sincerely,

Jennifer Hall

JH/bb
Enclosure

Holland & Hart LLP
[redacted]
Aspen, CO
Aspen Billings Boise Boulder Cheyenne Colorado Springs Denver Denver Tech Center Jackson Hole Salt Lake City Santa Fe Washington, D.C.

0035

U.S. Bank Plaza
[redacted]
Boise, Idaho [redacted]

Jennifer Hall
Holland & Hart LLP
[redacted]
Aspen, Colorado [redacted]

Counsel for El Bigote Cattle Co., LLC, Gottomitee, Ltd., A. S. "Tex" and Jan Elliott

3341209_4.DOC

REPLACED W/SIGNED PAGE
25 Feb 05
Jay M Anderson

0035

comments.

Respectfully submitted this 22nd day of February 2005.

Murray Feldman
Holland & Hart LLP
U.S. Bank Plaza
[redacted]
Boise, Idaho [redacted]

Jennifer Hall
Holland & Hart LLP
[redacted]
Aspen, Colorado [redacted]

Counsel for El Bigote Cattle Co., LLC, Gottomitee, Ltd., A. S. "Tex" and Jan Elliott

3341209_4.DOC

American Airlines

Robert C. Cordes
Vice President
Operations Planning and Performance

February 21, 2005

Mr. Troy Anderson
Air Combat Command
129 Andrews Street
Langley AFB, VA 23665

Dear Mr. Anderson,

We have reviewed the Draft Environment Impact Statement (DEIS) for the New Mexico Training Range Initiative. We do not concur with the proposal as presented.

Our primary area of concern centers on the operational impact to the non-participating aircraft that will have to be routed around the training airspace when it is in use. Air traffic is already required to fly many extra miles around the White Sands missile range complex, and this proposal adds to these distances when training activity is present. **AM-2**

Alternative B of the proposal requires the relocation of J74 around the north end of the Pecos and Sumner Air Traffic Control Assigned Airspace (ATCAA), approximately 17 miles north of its current route between Texico VORTAC (TXO) and Corona VORTAC (CNX). Although Alternative A does not require moving J74, the net effect is the same as all non-participating aircraft will be routed around the active airspace. J74 is used extensively by en route traffic and there are many aircraft on direct routes through the Pecos and Sumner ATCAAs in the same area as the jet route. **AM-2**

The report does not address the CNX transition of the Worth Standard Instrument Departure (SID) from the Dallas/Fort Worth (DFW) terminal area, which takes flights through the middle of the training airspace. This SID was brought to the attention of the Commander of the 27th Fighter Wing during a meeting at Albuquerque Airport (ABQ) on February 6, 2004. The meeting included representatives from various airlines, the Albuquerque Air Route Traffic Control Center (ZAB), the Federal Aviation Administration (FAA) Southwest Region (ASW) Air Traffic Division, and the New Mexico Base Planning Support Commission. The CNX transition has been a published route for more than 12 years and has been a common direct route from the DFW terminal area for at least 20 years. **AM-2**

When the Reese Military Operating Areas (MOA)/ATCAAs were modified into the current Bronco MOA/ATCAA configuration for Cannon Air Force Base (CVS) F16 use several years ago, the Bronco 1 ATCAA was capped at FL260 to deconflict participating aircraft from traffic on the CNX transition of the Worth SID. Routing flights via the TXO transition and around the north end of the Pecos and Sumner ATCAAs will add a minimum of 21 nautical miles (nm) to the route flown. **AM-2**

In 2005 American Airlines has averaged 19 flights per day on the CNX transition. The additional fuel to circumnavigate the Pecos and Sumner ATCAAs for these flights will cost at least $741,000 per year. The number of flights using the CNX transition varies from day-to-day due to upper winds and other factors, and the transition is used a higher percentage of the time during the spring and summer months. Currently we have 51 flights a day between DFW and the southern California market and this will increase to 54 in May of this year. Flights to Hawaii and other Pacific destinations also use this route as required. **AM-2**

[redacted] Dallas/Ft. Worth Airport, Texas [redacted]

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We fully understand the need for realistic combat training for our military personnel. However, the location of this proposal has a significant adverse impact to the commercial aviation industry at a time when it cannot be afforded. We strongly support the development of military training airspace that does not conflict with existing major air traffic flows. The segregation of these two important airspace uses is in the best interest of both the military and commercial aviation. It allows for the growth and development of commercial routes and markets, and also provides flexibility in the development of training scenarios for combat training with little or no restrictions.

The White Sands missile range complex requires the east-west traffic flow to file route north or south of the restricted airspace. This creates a natural "shadow" of the White Sands complex where comparatively few aircraft fly (see Attachment 1). The Lancer MOA/ATCAA and the Bronco 3 and 4 MOA/ATCAAs were developed with this in mind. The development of MOA/ATCAA airspace inside the "shadow" of the White Sands complex must be fully explored and utilized before the infringement of additional airspace requirements in other areas. This may require the complete redevelopment of MOA/ATCAA airspace boundaries within the "shadow" area, a difficult but necessary task. **DP-6**

We appreciate the opportunity to comment on this important issue. If you have any questions, please contact Robert Deering, Air Traffic Systems Manager, at 817-967-7195.

Sincerely,

cc: Al Madar
Robert Deering

Attachment

to circumnavigate the Pecos and Sumner ATCAAs for these flights will cost at least $741,000 per year. The number of flights using the CNX transition varies from day-to-day due to upper winds and other

AM-2

[redacted] Dallas/Ft. Worth Airport, Texas [redacted]

[redacted]

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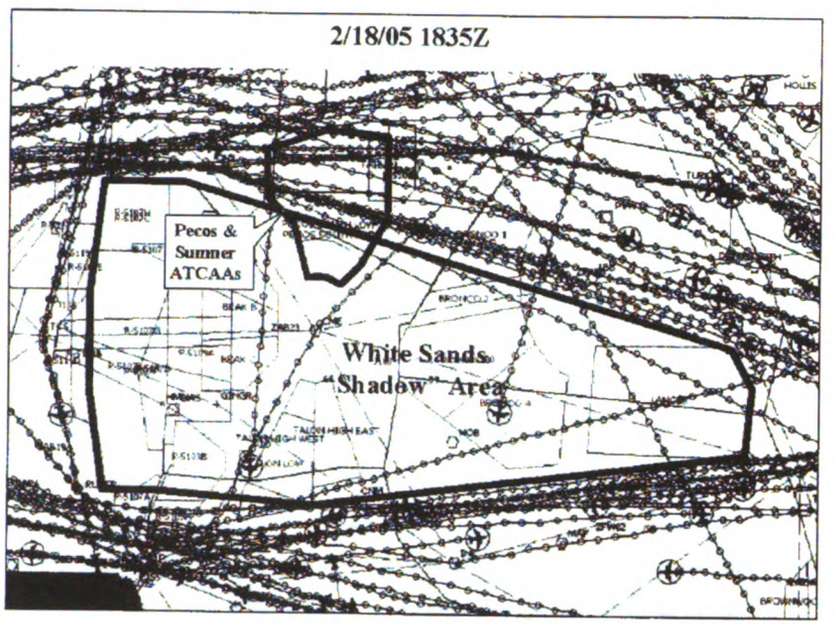
Attachment 1
White Sands Missile Range
"Shadow" Area



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Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! **DATE:** 2-19-05

PLEASE PRINT

****** CONTINUE ON BACK FOR MORE SPACE ******

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	Ross Greathouse
ORGANIZATION:	
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Portales NM [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

Dear Military Personals,

Thank you for receiving this comment on the draft Environmental Impact Training Range Initiative (NMTRI) concerning my future dealing with our Government, in the past and today. Life continues for those want to continue in life, with German planes bombing and practicing in White Sands, New Mexico with 500 German families living in the area. Great for the community, selling this and that, more income dollars around to be used in the area, that makes it great. Clovis, New Mexico has 100 families from Singapore practicing their bombing at the Melrose Bombing Range, that's great, more money for the environment of Clovis, New Mexico and area. Good job Royal Singapore Air Force, what's wrong no land in Singapore or they just learning how to press the trigger button at the right time? Go red; white, and blue, for we will let you fly your flag in our country, and of course take your American money, for that's what it takes, after all you are in the United States.

People's life needs change, and change is constantly taking place in our lifetime, so who are we changing, the United States seems to be turning on me. People ask well " what are you doing with it" what does that matter it is are land and we can do what we want, wrong the Air Force has been involved for years, getting what they want, when and stopping all activities in the area, that could make me a dollar. To help ensure my thinking, I'm looking into buying land in Iraq; maybe I can make a quick dollar or receive a quick car bomb, what's the difference through the government or Iraq's law. People are already talking about the greatest airspace Cannon Air Force Base has to offer, and think, I didn't know it has already passed. The military are also sending personal out

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into a different environment across the seas into a foreign country, after putting the cause onto the individuals. An individual, who cares, The United States has put miles between us with no mental thought of the one's it is affecting. A person has life, but where does one's heart live, the Committee of Fifty seems to be beating O.K. for an ultimate outcome. One must place the mind of others into the support for our nation, a nation sharing the air-space, techniques and who knows what else, when are the Iraqis coming over to join the military here to learn more and better options. The final decision is in the hands of the government and those hands are busy with more than two hands could perform.

Singing songs about how my Grandfather coming over to see future happenings in the United States, talking of the land of the free. Things change and sorry might be said while you twist it in deeper, but sorry is never mentioned. The oil and gas companies have stopped lease on mineral rights long ago, and my wind charging units will not open their arms, for the arms are the military and their forces swing the head of wind personal not wanting to mess with the government. Right or wrong, the government is in charge taking the great ones down, until, you wonder...and there are some landowners very quiet, wondering "what wallets were filled?" Ironic, Social Security Benefits losing money, the government will take the young in for they know how to receive money, the military jobs or any jobs, like a puppet on a string. The question is out there, but questions will continue until the military answer with, "Now we need this and that." Good and bad in each individual makes life uncertain, sure there is some good, but it doesn't seem like it's full today.

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Unbelievable the people living so close to the bombing range, I think the range got closer. Close, closer, and closest, kind of like a noose pulling out the life blood of our land. As a result my multi million dollar investor for wind- chargers has backed out, thanks. Look on the bright side, soon the cattle will have silver hair from the big sonic booms due from the chaffs in the practice bombing leaving 99.9% aluminum. Sounds like the only chaff that is occurring is on the people that haven't been paid off, who have already lost land through you. I wonder if anyone out there has done any studies in regards to the aluminum seeping into the water supply. What kind of effects will it have on the already dwindling supply of water? PR-3

A person cannot control one's dreams, but dreams become nightmares, quickly like the air force has occurred in my life. People in the military, one from New York, one from Singapore, two from Germany and three or four from who knows where and who cares where! We are becoming the training ground for our adversaries! Go America!

I've started an underground ranch house, so I wonder what the schedule of the practice bombings will occur so that I can open up an observation tower with the sonic booms occurring three times a day. Telescopes are already in, and going to be in place soon. It won't be long, you will have more air-space and who knows what kind of people will be flying, who knows where and what kind of ammunition, like I've got a big red X on me.

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Life is short with life being enjoyed, sure nice you put, please mail in by February 21, 2005; on President's Day after the weekend, the pigeons are off. The planes are flying and wanting to fly faster and shoot some wilder bullets. Fastest is what we are looking for some get the gold mines and others get the shaft. I'm sending my written commits to V.A.

AMERICA GET OUT OF OUR COUNTRY

Again, thank you for taking out my active role in this environmental analysis process.

Sincerely,

Ross Greathouse

Ross Greathouse

COMMENTS OF

EL BIGOTE CATTLE CO., LLC,
GOTTOMITEE, LTD., AND
TEX AND JAN ELLIOTT

ON THE

DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR

NEW MEXICO TRAINING RANGE INITIATIVE

Submitted by:

Murray Feldman
Holland & Hart LLP
U.S. Bank Plaza
[redacted]
Boise, Idaho
[redacted]

Jennifer Hall
Holland & Hart LLP
[redacted]
Aspen, Colorado
[redacted]

Counsel for El Bigote Cattle Co., LLC, Gottomitee, Ltd., and A. S. "Tex" and Jan Elliott

February 22, 2005

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A. The Commenters.

El Bigote Cattle Co., LLC, Gottomitee, Ltd., and A.S. "Tex" and Jan Elliott ("Commenters"), by and through their undersigned counsel, hereby submit these comments on the Draft Environmental Impact Statement ("DEIS") for the New Mexico Training Range Initiative ("NMTRI") dated January 2005.

The Commenters own ranching property, a beef cattle operation, and residences that will be, are, or have been directly overflown and physically invaded by the proposed and ongoing Air Force activities, and they live, own businesses, and recreate within the region to be adversely affected by the Air Force actions. *See* **Exhibit A** for a general location of some of this property. The Commenters are also members of regional and other associations dedicated to the preservation and protection of the New Mexico ranching culture and heritage including the New Mexico Farm and Livestock Bureau, New Mexico Cattle Growers Association, and the Paragon Foundation.

A.S. "Tex" and Jan Elliott are owners of El Bigote Cattle Co., LLC and managing general partners of Gottomitee, Ltd. Mr. Elliott resides full-time and Mrs. Elliott resides part-time at the property affected by the Air Force actions. The Elliotts and their sons, daughters, daughters-in-law, grandchildren, family and friends frequently visit, work, and recreate on the land they own in De Baca County, New Mexico, and in the past they frequently traveled to and from their property by private aircraft. The Elliotts enjoy the scenic beauty, bountiful wildlife and environmental resources, and tranquility of this unique country. Wildlife is present on their scenic ranch and is a major source of enjoyment by Mr. and Mrs. Elliott and their family and invitees for both viewing and hunting, although wildlife populations are in decline due to drought and other environmental disturbances.

Gottomitee, Ltd. owns the Gottomitee Ranch (the "Ranch"), the property in De Baca County that will be affected by the Air Force actions. El Bigote Cattle Co., LLC leases the Ranch from Gottomitee, Ltd. El Bigote is engaged in a cattle operation and its employees rotate the cattle throughout the Ranch. Gottomitee, Ltd. conducted commercial hunting operations on the Ranch until drought conditions forced abatement. Upon subsidence of the drought, Gottomitee, Ltd. will resume commercial hunting activities. Gottomitee, Ltd. is presently conducting wildlife feed supplementation to improve hunting and tourism operations on the Ranch that promote the Ranch's historical and environmental values.

Gottomitee, Ltd., El Bigote Cattle Co., LLC and Tex and Jan Elliott will be adversely affected by the Air Force's NMTRI expansion including, among other things, expansion of subsonic and supersonic overflight, which will pass directly over the Ranch and the expansion of chaff and flare use over the Ranch, the residue of which physically invades and pollutes the Ranch. They will also be adversely affected by the wake vortex effects from low flying aircraft, interference with civil and commercial aviation access, and the cumulative effects of this action when added to those of other past, present, and reasonably foreseeable future activities in the area. The NMTRI will directly interfere

with the use, enjoyment, employees' quality of life and safety, and economic operations associated with the Ranch.

B. DEIS and Comment Summary.

The DEIS outlines the proposals by the Air Force to expand F-16 training area and military and civil airspace in New Mexico. The Proposed Action and two action alternatives are comprised of four elements: modifying the configuration of existing airspace (including expanding the size, operational altitudes, and usefulness of the Pecos Military Operations Area Assigned Airspace and moving Jet Route J-74 and deconflicting commercial traffic five to seven nautical miles (nm) north of the modified training airspace); creating new airspace (the Capitan MOA/ ATCAA to connect the existing Beak MOA and the expanded Pecos MOA); flying at supersonic speeds above 10,000 feet above mean sea level or approximately 5,000 to 6,000 feet above ground level in the airspace; and extending the use of defensive countermeasures (chaff and flares) to the new and modified airspace. The DEIS also contains two alternatives and a no-action alternative.

The NMTRI DEIS suffers from three key flaws, among others, concerning the scope of the DEIS analysis. *See* 40 C.F.R. § 1508.25.

1) There is no discussion or identification of the existing noise and other impacts from ongoing MTR activity occurring in the same area and over the same property of the Commenters as the NMTRI proposed action. The DEIS acknowledges that the proposed action area includes an area traversed by portions of the following MTRs: IR-113, VR-100, VR-125, VR-1107, and VR-1195. The Commenters' property is located beneath the Pecos North High and Low MOAs and the Pecos South High and Low MOAs, and is also traversed by portions of IR-113, VR-1107, and VR-1195. Yet, the DEIS fails to present a descriptions of or analysis of the baseline and cumulative effects of these existing MTRs as part of the NMTRI action. **DP-2**

   NEPA requires such a consideration both in terms of the environmental baseline and the cumulative effects of the NMTRI when effects of that action are added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. 40 C.F.R. § 1508.7. "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." *Id.* The absence of these considerations from the DEIS violates NEPA and cannot be upheld. *Grand Canyon Trust v. FAA*, 290 F.3d 339, 345-47 (D.C. Cir. 2002) (setting aside NEPA analysis that addressed only incremental noise impacts of a new airport as compared to existing airport and did not address the cumulative noise effects of all air traffic in the area; "Because there is no analysis of cumulative noise impact on the [area] against which the additional noise impact of the replacement airport can be evaluated, the FAA's error in ignoring cumulative impact of man-made noise is not harmless . . . for the FAA has impermissibly taken 'a foreshortened view of the impacts which could result from the act' of

constructing the replacement airport;" the agency could not "ignore the total noise impact in the area of identified environmental concern."); *United States Air Tour Ass'n v. FAA*, 298 F.3d 997, 1018-19 (D.C. Cir. 2002) (setting aside FAA noise model that excluded noise from non-tour aircraft when addressing noise effects in establishing air tour limits for Grand Canyon National Park area; "by failing to account for noise from other aircraft that fly over the Grand Canyon—for example, from commercial jets, general aviation, and military flights—the model arbitrarily overstates how quiet the park really is.").

2) The DEIS has no discussion or identification of wake vortex effects from low-level overflights of high speed military aircraft. These warplanes will be flying down to 500 feet above ground level. *See, e.g.*, DEIS at ES-3; *see also* Albuquerque Sectional Aeronautical Chart (74th ed. Oct. 28, 2004) (listing MOA use altitudes down to 500 feet AGL for both Pecos North Low and Pecos South Low MOAs). Wake vortex effects can be significant and can cause extensive damage to ground structures and property and pose a risk of harm to persons, livestock, or wildlife on the ground. There is also a significant risk of damage to aircraft in flight from wake vortex or turbulence effects. *See, e.g.*, FAA, Aeronautical Information Manual Ch. 7, § 3 (wake turbulence) ("peak vortex tangential speeds exceeding 300 feet per second have been recorded"). The FAA states that "vertical separation of 1,000 feet may be considered safe," AIM § 7-3-4.a.3. (2003), yet the DEIS provides for high-speed, low-level flight below this level of safety at just 500 feet AGL. The DEIS fails to examine what the potential adverse wake vortex effects are from such operations or what mitigating measures may be taken to avoid and minimize these adverse effects. Previously, the United States Court of Appeals for the Fifth Circuit has held that it was error for the Air Force to fail to take a hard look at the wake vortex effects of low-level, high-speed training operations. *See Davis Mountains Trans-Pecos Heritage Ass'n v. FAA*, No. 02-60288, Slip Op. at 13-18 (5th Cir. Oct. 12, 2004). Similarly here, the Air Force is required to take a hard look at and adequately evaluate potential wake vortex effects. One possible approach for doing so and a consideration of the incredible strength of these wake vortex effects is outlined in the attached copy of the Second Declaration of Ronald O. Stearman, P.E. from the *DMTPHA* case. **Exhibit B.** **AM-19**

3) The DEIS contains no discussion or identification of potential mitigation measures for adverse environmental effects. Under the CEQ NEPA regulations and the Air Force's own EIAP regulations, a draft EIS must contain such a discussion. *See, e.g.*, 40 C.F.R. §§ 1502.14(f), 1502.16(h), 1508.25(b); 32 C.F.R. § 989.22; 32 C.F.R. § 989.10(a); 40 C.F.R. §§ 1502.9, 1502.10. The DEIS identifies adverse environmental effects, yet fails to discuss any mitigation measures to address these adverse environmental effects, much less containing the required reasonably complete discussion of measures to mitigate to the fullest extent possible harmful environmental effects. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989). "Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." *Id.* at 352. Moreover, "[p]ublication of an EIS, **NP-11**

both in draft and final form, also serves a larger informational role. . . . and, perhaps more significantly, provides a springboard for public comment . . . ." *Id.* at 349.

By not allowing for public review or comment on proposed mitigation measures in the DEIS, the Air Force is precluding the public from reviewing and commenting on proposed measures at a time and in a way that would obligate the agency to respond to the substantive comments, to consider those comments in its decisionmaking, and to circulate those comments with the final EIS. These fundamental failures go to the very core of the NEPA process. *See* 40 C.F.R. § 1500.1(b); *Robertson*, 490 U.S. at 349 ("action-forcing" procedures of NEPA "ensure[] that the agency, in reaching its decision, will have available, and will carefully consider detailed information concerning significant environmental impacts"); *see also* 32 C.F.R. § 989.22(a) (EIAP documents must "indicate clearly whether mitigation measures (40 CFR 1508.20) must be implemented for the alternative selected. . . . Both the public and the Air Force community need to know what commitments are being considered and selected, and who will be responsible for implementing, funding, and monitoring the mitigation measures."). Thus, it is erroneous for the Air Force to exclude a discussion of mitigation measures from the DEIS.

These and the other errors described below require that the Air Force withdraw, revise, and recirculate the DEIS before proceeding with its applications to the FAA for the proposed airspace changes or before proceeding with implementation of the proposed action. These defects also document that the EIS process is so flawed that any final EIS based on this draft would not provide an adequate basis on which the FAA may make its independent airspace decisions and satisfy its independent duty to fulfill its NEPA responsibilities. *See* 40 C.F.R. § 1502.9; *California v. Block*, 690 F.2d 753, 772 (9th Cir. 1982); *DMTPHA v. FAA*, No. 02-60288, Slip. Op. at 18, 20 (5th Cir. Oct. 12, 2004) (FAA violates NEPA when it adopts inadequate Air Force EIS); 32 C.F.R. § 989.28(b) (outlining NEPA review process for airspace proposals with FAA).

C. Request For Inclusion of Comments

The Commenters specifically request that all of these comments and exhibits be included as part of the administrative record in this matter. *See County of Suffolk v. Secretary of Interior*, 562 F.2d 1368, 1384 & n.9 (2d Cir. 1977) (addressing scope of NEPA administrative record); *Silva v. Lynn*, 482 F.2d 1282, 1283 (1st Cir. 1973) (same); *see also Thompson v. United States Dep't of Labor*, 885 F.2d 551, 555 (9th Cir. 1989) (administrative record consists of all documents and materials directly or indirectly considered by agency and includes evidence contrary to agency's position). The Commenters further request that all documents, articles, and reports cited in these comments be included as part of the administrative record in this case. If the Air Force is unable to locate the documents referenced by the Commenters that are not included as exhibits to these comments, copies may be obtained by contacting the Commenters' counsel at the address listed at the end of these comments. NP-17

The Commenters also specifically request that these comments be considered by and responded to by the FAA in any NEPA evaluation it undertakes for NMTRI. NP-19

COMMENTS

II. The Air Force's Statement of Need is Based on the Present Location of F-16 Aircraft and Training Facilities and is Unreasonably Narrow. PN-1

The DEIS's statement of purpose and need is unreasonably narrow and therefore effectively eliminates the analysis of reasonable alternatives. *See, e.g., Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 812 (9th Cir. 1999). Because the stated goal of the project necessarily dictates the range of reasonable alternatives, an agency cannot define the goal so narrowly that only one alternative would accomplish the agency's objective. *See Friends of the Southeast's Future v. Morrison*, 153 F.3d 1059, 1066 (9th Cir. 1998). Courts agree that the purpose and need of the project cannot be so narrowly defined as to make the EIS a "foreordained formality." *City of Bridgeton v. FAA*, 212 F.3d 448, 458 (8th Cir. 2000).

The purpose and need section of the DEIS provides that the 27th Fighter Wing (27 FW) at Cannon Air Force Base (AFB) needs "access to local training airspace that provides as realistic a combat environment as feasible." *DEIS at 1-10.* The DEIS does not analyze a variety of alternatives involving transporting Cannon AFB units to other locations that presently have adequate training space or could develop adequate training airspace. *DEIS at 2-24.* The DEIS asserts that other locations, like the White Sands Missile Range, in southern New Mexico, are "distant" and "would not maximize training time." *Id.* The DEIS also never even considers a complete relocation of the Cannon AFB to a location that presently has adequate training space or could develop adequate training airspace. Thus, in narrowly defining the need for new military training airspace to support units stationed at Cannon AFB as a "local" need, the Air Force narrows the potential range of alternatives to be considered. Effectively, it eliminates relocation or transportation of Cannon AFB units as options, and dictates an on-site "local" remedy, which necessarily must result in expansion of the airspace around Cannon AFB.

III. The DEIS Contains an Inadequate Scope of Alternatives DP-7

NEPA requires that as part of its preparation of an EIS, an agency must "study, develop, and describe appropriate alternatives to recommended courses of action," 42 U.S.C. § 4332 (2)(E), and discuss alternatives that it has considered, 40 C.F.R. § 1502.14. The agency's discussion of reasonable alternatives forms the "heart" of the EIS. *Id.* NEPA mandates that federal agencies "provide legitimate consideration to alternatives that fall between the obvious extremes." *Colorado Envtl. Coalition v. Dombeck*, 185 F.3d 1162, 1175 (10th Cir. 1999). More specifically, NEPA is violated when an agency dismisses the consideration of an alternative "in a conclusory and perfunctory manner that [does] not support a conclusion that it was unreasonable to consider them as viable alternatives." *Davis v. Mineta*, 302 F.3d 1104, 1122 (10th Cir. 2002).

The DEIS fails to adequately study, develop and describe appropriate alternatives to the proposed course of action. The alternatives analyzed by the DEIS represent only slight variations of the Proposed Action, with nearly identical environmental impacts. Furthermore, a variety of alternatives, that might have lessened environmental impacts while meeting the general purpose and need, were summarily rejected on a conclusory basis or not considered at all.

A. Alternatives Selected are Identical to the Proposed Action DP-4

The DEIS discusses the impacts of the Proposed Action, two alternatives, Alternatives A and B, and a no-action alternative. The DEIS notes that the action alternatives have virtually identical impacts as the Proposed Action. "Alternative A would have fewer effects on airspace and essentially the same environmental effects on other resources as the Proposed Action." *DEIS Cover Sheet.* "Alternative B would have essentially the same environmental effects as the Proposed Action." *Id.* The DEIS's more detailed summary comparison of the Proposed Action and the alternatives reflects the same conclusion: there is virtually no difference between the Proposed Action and the alternatives. *See DEIS at 2-33 – 2-38, Table 2-12 – Summary of Impacts by Resource.*

For example, the potential impacts to the acoustic environment are identical. For Alternative A, "[n]oise levels generally would be comparable to the Proposed Action." *DEIS at 2-34.* For Alternative B, "[n]oise levels generally would be comparable to the Proposed Action." *Id.* For the Proposed Action, "[t]he projected change from 168 to 467 supersonic sorties per month would result in an average increase of sonic booms from one per five days to two per three days." *Id.* For Alternative A "[s]onic boom levels would be CDNL 52 dB with an average of two booms per three days towards the center of the airspace." *Id.* For Alternative B, "[t]he sonic boom consequences would be the same as for the Proposed Action." *Id.*

The potential impacts to safety are also identical. For the Proposed Action, "[n]o aspects of the Proposed action would be expected to create new or unique ground safety issues." *DEIS at 2-35.* For Alternative A, "[n]o specific proposals associated with Alternative A would create new or unique ground safety issues." *Id.* For Alternative B, "[n]o specific proposals associated with Alternative B would create new or unique ground safety issues." *Id.* Similarly, for Alternative A, "[g]round ordnance, flight safety, and flare risks are comparable to the Proposed Action." For Alternative B, "[g]round ordnance, flight safety, and flare risks are the same as under the Proposed Action." *Id.*

The DEIS concludes that the impacts to the physical resources are the same. For Alternative A, "[p]otential effects would be the same as under the Proposed Action." *DEIS at 2-36.* For Alternative B, "[p]otential effects would be the same as under the Proposed Action." *Id.*

The DEIS also concludes that the impact to the biological resources is the same. For Alternative A, "[e]ffects to biological and agricultural resources would be essentially the same as those described under the Proposed Action." *DEIS at 2-36.* For Alternative

B, "[e]ffects to biological and agricultural resources would be essentially the same as those described under the Proposed Action." *Id.*

The DEIS concludes that the impact to the cultural resources are identical. For Alternative A, "[e]ffects to cultural and historical resources under Alternative A would be essentially the same as those under the Proposed Action." *DEIS at 2-37.* For Alterative B, "[e]ffects to cultural and historical resources under Alternative B would be essentially the same as those under the Proposed Action." *Id.*

The impacts to land use and recreation are identical. For Alternative A, "[e]ffects to land use and recreation under Alternative A would be similar to those under Proposed Action." *DEIS at 2-37.* For Alternative B, "[e]ffects to land use and recreation under Alternative B would be similar to those under Proposed Action." *Id.*

The socioeconomic impacts are the same. For Alternative A, "[p]otential effects in the affected area below airspace modification would be the same as under the Proposed Action for changes in noise, sonic booms, chaff, flares, and risk of fire." *DEIS at 2-38.* For Alternative B, "[p]otential effects in the affected area below airspace modification would be the same as under the Proposed Action for changes in noise, sonic booms, chaff, flares, and risk of fire." *Id.*

Finally, the environmental justice impacts are identical. The DEIS projects no impacts related to environmental justice issues or effects on children for the Proposed Action or Alternatives A and B. *DEIS at 2-38.*

In fact, the only apparent difference in impacts between the alternatives and the Proposed Action are impacts relating to airspace and range management. Under Alternative A, J-74 will not be relocated. However, due to deconfliction action the Air Force will take under Alternative A, the impacts are still virtually identical to the Proposed Action and Alternative B. *See DEIS at 4-9* (10 to 40 civil aircraft per day will be re-routed). Under Alternative B, the Captain MOA/ATCAA airspace will not be established. *DEIS at 2-33.* However, the DEIS does not identify any new or different impacts to airspace and range management as a result of this change. *See DEIS at 4-10.* Accordingly, even where there appears to be difference between the Alternatives and the Proposed Action, the impacts are the same.

It goes without saying that when the alternatives selected are so similar in their nature that the resulting impacts of those alternatives is identical of that of the proposed action, the EIS fails to include an adequate range of alternatives. NEPA mandates that federal agencies "provide legitimate consideration to alternatives that fall between the obvious extremes." *Colorado Envtl. Coalition,* 185 F.3d at 1175. In this DEIS, because only one extreme is represented in the alternatives, the range of alternatives is not reasonable.

B. Conclusory Dismissal of Reasonable Alternatives

The DEIS also summarily dismissed or failed to analyze reasonable alternatives, further evidencing that the range of alternatives considered is not reasonable. As PN-4

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discussed above in Section II, the narrowly drafted statement of purpose and need dictates that the DEIS not examine reasonable alternatives, including relocation of Cannon AFB to other locations with adequate training airspace or the ability to develop adequate training airspace. Complete relocation, including an analysis of the associated costs, should be considered as an alternative in the DEIS. PN-4

Similarly, as briefly discussed in Section II, the DEIS provides a conclusory dismissal of alternatives that involve expansion of services at other locations and transport of the Cannon AFB units to those locations for training. With respect to considering the use of the Mt. Dora MOA, the DEIS states it is "located at a distance from Cannon AFB," "[t]he distance would force pilots to significantly reduce training time" and it is "not adjacent to a training range and does not permit training in the full spectrum of missions and tactics." *DEIS at 2-24.* The DEIS fails to identify what the distance is from Cannon AFB to Mt. Dora or discuss what proximity is required to meet the purpose and need. Similarly, with respect to the use of the White Sands Missile Range in southern New Mexico, the DEIS again makes conclusory remarks that it is "is distant from Cannon AFB and would not maximize training time" without any supporting data or discussion. Conclusions of this nature must be based on some data. *Blue Mtns. Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1214 (9th Cir. 1998). The DEIS's conclusory dismissal of alternatives involving use of other locations is unsupported, and as such, the range of alternatives considered is inadequate.

C. No Action Alternative Inadequately Analyzed.

Generally, the DEIS concludes the no-action alternative would "reduce training opportunities and increase costs." *DEIS Cover Sheet.* The DEIS does not include any data supporting the conclusion that costs would be increased. *See DEIS at 2-23.* There is also no data supporting the idea that training opportunities would be reduced. *Id.* Furthermore, it is not even logical that maintaining the status quo would "reduce" opportunities and "increase" costs. The no-action alternative maintains the status quo, so costs and opportunities should be expected to remain the same. Perhaps the DEIS's argument for increased costs and reduced opportunities is a logical argument for a comparison to an action alternative, but not as a description of maintaining status quo. Accordingly, the description of the no-action alternative is inadequate due to the absence of any data or logical argument supporting the description. DP-5

IV. The DEIS Contains an Inadequate Discussion of Key Resources in the Affected Environment and Fails to Fully Evaluate Impacts of the Proposals. NP-1

NEPA requires that an agency candidly disclose in its EIS the adverse environmental effects of its proposed actions. 42 U.S.C. § 4332(A)-(C). Federal agencies must ensure the scientific integrity of the EIS by considering appropriate studies and data, and identifying any methodologies used. 40 C.F.R. § 1502.24. The agency must respond to credible opposing points of view, and it may not ignore reputable scientific opinion. *See, e.g., Seattle Audubon Soc'y v. Espy*, 998 F.2d 699, 704 (9th Cir. 1993); *Public Service Co. v. Andrus*, 825 F. Supp. 1483, 1496-99 (D. Idaho 1993); *see also Sierra Club v. Watkins*, 808 F. Supp. 852, 864-69 (D.D.C. 1991). An agency's

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NEPA analysis must expose scientific uncertainty regarding the risk of a proposed action and inform decision makers of the full range of responsible scientific opinions on the environmental effects of the proposed action. ***Friends of the Earth v. Hall***, 693 F. Supp. 904, 926, 934 (W.D. Wash. 1988). It must consider the "degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." 40 C.F.R. § 1508.27(b)(5). An agency may not rely on conclusory statements unsupported by data, authorities, or explanatory information. *Neighbors of Cuddy Mountain v. USFS*, 137 F.3d 1372, 1379-81 (9th Cir. 1998).

A. The Safety Impact of the Proposals Has Not Been Adequately Analyzed.

1. Improper Methodology

The DEIS states that "[t]he primary public concern with regard to flight safety is the potential for aircraft accidents." *DEIS at 3-25.* Though the DEIS states "[i]t is impossible to predict the precise location of an aircraft accident, should one occur," the DEIS does predict a mishap rate based on historical data on mishaps at all installations, and under all conditions of flight. *DEIS at 3-26.* The DEIS states that "F-16C aircraft have flown more than 3,336,700 hours since the aircraft entered the Air Force inventory during Fiscal Year 1985. Over that period, 120 Class A mishaps have occurred and 113 aircraft have been destroyed." *Id.* Based on this data, the DEIS calculates the Class A mishap rate at "3.60 per 100,000 flight-hours, and an aircraft destroyed rate of 3.39." *Id.* Based on that rate, and the fact that the 27 FW and NMANG aircrews typically flew 5,320 F-16 sorties and 3,733 hours annually in the NMTRI airspace, the DEIS calculates that a Class A mishap "would be statistically predicted to occur once every 7.4 years." *Id.* More precisely, the DEIS states that "[t]o place this into context, based on the number of sorties flown, the statistically predictive probability of a Class A Mishap is 0.000024 or one chance in almost 42,000." *Id.* Though not expressly stated, it is implicit in the DEIS analysis that Class A mishaps are expected to be extremely rare and thus, of inconsequential impact. This implication is entirely incorrect. SA-8

The DEIS recognizes that there have been six Class A mishaps involving Cannon AFB based F-16s since 1995. *Id.* What the DEIS fails to examine is the fact that the actual number of mishaps far exceeds the number predicted in the DEIS. In addition, the DEIS also overlooks another astonishing fact, two of the Class A mishaps occurred within 10 miles of the Ranch residence, on a neighboring ranch, and one occurred on the Ranch, within a mile of the Ranch Headquarters. Additionally, those three mishaps all occurred within a four-year period. In short, a review of the historical record of Class A mishaps belies the DEIS predictions. SA-5 SA-6

Courts have recognized that where an EIS uses a model or method to develop estimates of environmental impacts, the agency must "explain the assumptions and methodology used in preparing the model and, if the methodology is challenged, must provide a complete analytic defense." *United States Air Tour Ass'n v. FAA*, 298 F.3d 997, 1008 (D.C. Cir. 2002). Here, the EIS's approach to calculating or predicting the safety impacts of the proposals lacks a rational relationship to the reality it purports to represent

and it is therefore arbitrary. *See Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998); *United States Air Tours Ass'n*, 298 F.3d 997, 1019 (D.C. Cir. 2002) (FAA's use of the noise model for establishing air tour limits in Grand Canyon National Park was arbitrary).

Given the disparity between the DEIS predictions and reality, the EIS safety methodology is apparently inapplicable to Cannon AFB flights. Though it is the agency's duty to develop and utilize appropriate methodologies, the Commenters suggest that the disparity might be the result of the failure to consider factors unique to the Cannon AFB flights. For instance, the AIB Report for the F-16 crash on the Ranch acknowledges that only one of four ground avoidance systems is routinely used, or reliable, due to the relatively flat terrain under the Pecos MOA. United States Air Force Aircraft Accident Investigation Report, F-16 Fighting Falcon, 87-0316, p. 31, first section in the front part of the document. The EIS discussion must consider other relevant factors such as the documented high number of F-16 incidents in the ROI. Whatever method the agency selects for the analysis of safety impacts, it must acknowledge such unique circumstances or the analysis is otherwise inapplicable and arbitrary. **SA-5**

Thus, because the prediction methodology bears no rational relation to reality, the Air Force failed to take the requisite hard look at safety effects, and it failed to adequately explain and disclose in the EIS the basis for the analysis presented. These shortcomings violated NEPA's informed consideration and scientific integrity requirements. *See* 40 C.F.R. §§ 1502.16, 1502.24. **SA-9**

Further, the methodology fails to consider the safety impacts contribution from other aircraft using the MOA and MTRs in this area. Those aircraft and units may have different accident rates, and the overall cumulative effect on safety must be addressed in the DEIS. **SA-10**

2. Inadequate Safety Impacts Incident Discussion

The DEIS states that "[t]he 27 FW maintains detailed emergency and mishap response plans to react to an aircraft accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to major mishaps, whether on or off base." *DEIS at 3-27.* However, past events indicate that the response plan has not adequately protected the Commenters.

For instance, in the 9 Sept 2002 case of a F-16 that crashed into the Ranch, Mr. Elliott's son, Stephen, was the first to respond to the scene of the accident. Stephen approached the accident site, unaware of what had caused a loud explosion and a fire. As he neared the fire, he picked up what he thought was a small piece of hide from a just weaned calf. Stephen immediately realized it was a piece of scalp from a human and quickly surmised that the fire was probably an aircraft. Stephen called Mr. Elliott, who then called Cannon AFB Command & Control to advise them they had an aircraft down. Tech Sgt. Thompson told Mr. Elliott he was not aware a Cannon AFB aircraft was down until, while still on the phone with Mr. Elliot, Sgt. Thompson called Air Force Range Melrose and confirmed that indeed an aircraft was down.

What this scenario indicates is that Mr. Elliot and his fellow ranchers in the ROI are most likely going to be the first responders to aircraft accidents and they will be exposed to the immediate health hazards, including emotional trauma, that such incidents present. The EIS does not address the likely health and safety impacts of documented incidents and is therefore inadequate. **SA-7**

B. The Noise Impact of the Action Has Not Been Adequately Analyzed. **NO-11**

1. Nature of the Ranch

The Ranch, operated by El Bigote Cattle Co., LLC has a unique rural character. The Ranch, steeped in territorial history and western folklore, has been in the Elliott/Gates family since 1960. The time honored cowboy ways of great grandfather A.E. "Lonnie" Gates, respected South Texas/Eastern New Mexico cattleman, combined with the rich traditions of the Llano Estacado ranching community are still present on the Ranch today.

Ranch work in this area of New Mexico continues to be done by "neighboring." This tradition means that neighbors, some driving 20-30 miles, arrive at the Ranch as early as 5:00 a.m. for breakfast, take care of gathering, sorting and working of cattle and sharing the noon meal before heading home to their own chores. Ranches usually have a spring workday and a fall workday utilizing the "neighboring" system. The cold, snowy winter months in De Baca County keep ranchers busy feeding cattle and breaking up ice in frozen tanks; springtime brings new calves and foals, fence and windmill maintenance; warmer summer days require cattle work and grazing rotations; and beautiful fall weather chores include round-up and delivery days at the Ranch.

The Ranch also participates in Billy the Kid's Last Ride, reenacting William Bonney's escape from jail at Lincoln and his ride to Fort Sumner, New Mexico. This annual event traverses the Ranch and involves an overnight stay by trailriders at the Ranch's historic West Camp. This is an endurance ride, beginning in late April, lasts for nine to ten days and this event promotes tourism and New Mexico history.

The most pervasive characteristics of the Ranch and its operation are its natural beauty and tranquility. See **Exhibit C,** depicting Buffalo Springs area of Ranch. These characteristics transport the Elliotts, El Bigote employees, visitors and paying guests from the modern world back in time through the Ranch's history. The historic Buffalo Springs, West Camp headquarters, primitive rock homesteads and corrals are abundant on the Ranch along with the folklore that interests all history buffs, photographers and artists.

Although the area affected by the Air Force proposals is sparsely populated, the region of influence overlays numerous special use areas and noise sensitive locations, including the Commenters' property. Despite the adverse effect noise can have on such areas, in addition to the adverse effect noise can have on human experience of the enjoyment of nature and solitude, the DEIS fails to adequately analyze the noise impacts that would be created by the Proposed Action.

2. The Inapplicability of the Air Force Noise Analysis to Private Wilderness and Similar Outdoor Recreation Settings. NO-13

The Air Force's own experts acknowledge, both in litigation testimony and in their publications, that the "issue of the application of aircraft noise modeling methods to outdoor recreational settings . . . remains unresolved to this day." Sanford Fidell Decl. ¶ 41 (filed in *GOLD v. DOD*, No. 92-0189 S BLW (D. Idaho) (executed May 7, 1999)); *see also* Sanford Fidell & Laura Silvati, "Relating the Annoyance of Aircraft Overflights to Their Audibility by Outdoor Recreationists," paper presented at NOISE-CON 90, University of Texas, Austin, Texas, October 15-17, p.340 ("The well-known dosage-response relationship developed by Schultz (1978) for general transportation noise experienced in high population density areas, cannot be directly applied to the outdoor recreational case . . . .").

It is well established by the statements and publications of the Air Force's scientists that the Schultz curve, as updated in the Feingold et al. (1994) on which the NMTRI noise analysis is premised, is not applicable to the prediction or determination of noise effects on outdoor recreation experiences. *See DEIS 4-11.* In a paper delivered at the Air Force sponsored NOISE-CON 90 conference, Robin Harrison, *et al.* stated that the Schultz curve assumptions and methodologies "are not appropriate in the assessment of the impact of aircraft overflights on wilderness visitors." *Robin T. Harrison, Lawrence A. Hartmann, and William Makel, "Annoyance From Aircraft Overflights In Wilderness,"* NOISE-CON 90, University of Texas, Austin, Texas, October 15-17, 1990, pp.327-28. Similarly, the Forest Service overflight study notes that the "appropriateness of a long-term cumulative noise metric such as L_{dn} for purposes of predicting reactions to overflights by short-term visitors to recreation sites is questionable." (U.S. Forest Service 1992 (as cited in DEIS) at 2-21).

As Air Force researchers Fidell and Silvati have stated:

> Noise modeling techniques and assumptions originally developed for military airfield and urban airport planning are not readily adapted to Park and Wilderness settings . . . . The difference between residential and outdoor recreational exposure to aircraft noise, as well as the differences in purposes for characterizing aircraft noise exposure, are sufficiently great to suggest the need for an alternative approach to preparing aircraft noise contours. The alternative approach should provide the basis for answering the question "How far from here must an airplane fly if it is not to impact the area of interest?" rather than "How much noise does an aircraft flying here produce there?"
>
> In other words, the preferred means of modeling aircraft noise impacts in Park and Wilderness settings is from the perspective of the observer, not the source. Furthermore, since audibility is the issue of primary concern in low ambient noise conditions, explicit consideration must be given to signal to noise ratios rather than absolute sound pressure levels. These considerations suggest that observer-based audibility contours are more

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> useful than source-based emission contours for use in analysis of aircraft noise impacts in Park and Wilderness settings.

Fidell and Silvati, *supra*, at 341-342.

However, despite this wide recognition that the Schultz curve and general L_{dn} measurements are not readily applicable to quantifying noise from the outdoor recreationist's perspective, the Air Force fails to provide any alternative theoretically-based noise impact prediction methodology for the outdoor recreation, ranching, and private wilderness/wildlands at issue here. *Cf. National Parks and Conservation Ass'n v. FAA*, 998 F.2d 1523, 1532-33 (10th Cir. 1993). Nor does it follow the advice of its own consultants and apply an alternative observer-based approach to describing predicted noise impacts. The Air Force's failure to do so violates NEPA's requirement to ensure the professional and scientific integrity of the DEIS, it ignores its own consultants' reputable scientific opinion, and it fails to fully identify in the DEIS the "degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks." 40 C.F.R. § 1508.27(b)(5).

3. The Air Force Fails to Consider other Reasonable Scientific Opinions Regarding Noise Impacts NO-14

Miedema (1998) established that the source of noise has to be considered in predicting annoyance. **Exhibit D.** The study further establishes that aircraft noise is more annoying than other noise sources. *Id.* The noise curves the NMTRI uses are based on a blend of sources, which, according to the Miedema study, depresses the predicted annoying effect of aircraft noise. Miedema (2001) reviews the confidence intervals of noise predictions based on different sources using the datasets from Miedema (1998). **Exhibit E.**

The Miedema studies present a scientific opinion that suggests that many more people will be annoyed and a greater impact to the acoustic environment will result than that predicted by the methodologies used in the DEIS. The DEIS must discuss and incorporate this reasonable scientific opinion and disclose this opinion to the public and the decision maker. *Center for Biological Diversity v. U.S. Forest Service*, 349 F.3d 1157 (9th Cir. 2003) (agency should not ignore reputable scientific opinion, even if it presents an opposing view).

4. The Air Force Noise Analysis Contains Other Flaws.

(1) Failure to Include Documented Impacts NO-15

The DEIS states that the increase in supersonic sorties are expected to increase from 168 to 467 per month. *DEIS at 4-17.* "The increase in sonic booms from supersonic activity would be noticeable and can be intrusive." *Id. at 4-19.* Yet, contrary to these statements, the DEIS concludes "[i]n general, the sonic boom environment for the Proposed Action is not expected to have significant adverse effect on humans or animals." *Id.* The documented history of overflight claims belies this conclusory statement.

It is documented that serious aircraft overflight impacts can occur from Air Force combat training operations. For instance, the Air Force's own documents indicate that it "routinely has about $10 million in claims pending relating to aircraft overflight issues .... [T]he claims typically result in disbursements of about $3.3 million each year." U.S. Air Force, Human Systems Center, Environmental Planning Directorate, Brooks AFB, Texas, Final Report, *Requirements Analysis for Noise* at 16 (Oct. 31, 1996) (Exhibit F). Given the Air Force's own recognition of the substantial monetary damage claims that arise from its aircraft overflight operations, it is incongruous to suggest that its extensive combat training operations in the region would not have a similar significant environmental effect, particularly when supersonic sorties are expected to increase from 168 to 467 per month. *DEIS at 4-17.*

BI-20

The DEIS also fails to recognize the record of site-specific claims relating to noise impacts in the affected area. The DEIS contains no analysis of the numerous claims or complaints that have been previously submitted in the affected area, of which the Commenters are only aware of through conversations with neighbors. The DEIS must disclose and address those claims and complaints. Furthermore, the DEIS contains no analysis of the claims of which the Commenters are personally aware. For instance, Mr. Elliott has reported numerous low-altitude fly overs and sonic booms that have impacted his property. **See Exhibit G.** In addition, Mr. Elliott has documented and submitted claims for structural damage, livestock death, a broken window, equipment and fence damage to his property that resulted from noise and sonic boom impacts. **See Exhibits H - O.** Mr. Elliot has incurred additional damages, such as the loss of a windmill during a period of time with virtually no recorded winds, but being unable to identify the exact aircraft involved and the exact time of the incident, he was not able to avail himself of the claims process.

Because the noise analysis ignores the historical impact of military overflights nationwide and in the affected area it is incomplete and inadequate.

(2) Failure to Identify Data and Methodology Problems

Under NEPA, the Air Force must disclose shortcomings in its noise evaluation methodology in the DEIS, and it must account for the range of potential impacts that might occur given the uncertainty in the methodology and data collection methods for that methodology. *See, e.g.*, 40 C.F.R. §§ 1502.24, 1500.1(b). The Air Force's noise evaluation in the DEIS fails to acknowledge the scientific shortcomings of the methods used, and therefore it fails to candidly disclose in the DEIS the risks of the proposed actions.

NO-16

For example, the Air Force itself has repeatedly acknowledged that its noise analysis methodology is an imperfect predictor of noise impacts and resulting annoyance. In its fiscal year 1996-97 Environment, Safety and Occupational Health Strategic Plan, the Air Force states that "the methods used to gather the information required [for NOISEMAP] is [sic] extremely vulnerable to litigation. The current data collection methods do not provide indisputable data. In fact, the accuracy of the data is totally

NO-21

dependent upon human interpretation and therefore, extremely vulnerable to human error." USFY 96/97 ESOH Strategic Plan at 1a **(Exhibit P).**

The Air Force itself has also noted "no quantitative dosage-response relationship has been developed for predicting annoyance in these circumstances [where Air Force operations are occurring over lands used for outdoor recreation purposes]." *Id.* at 1b. Similarly, the Air Force acknowledged that it has no accurate method of predicting annoyance from the combined effects of exposure to subsonic operations and supersonic operations. *Id.* at 1c. And, the agency has also admitted that "there exists no systematic methodology for assessing the impacts of aircraft noise and sonic booms to humans, animals and structures. Environmental impact analysis process (EIAP) documents presently use a variety of noise description and assessment models/data bases, often being of questionable scientific value." *Id.* at 2d.

Also, the DEIS states that "[aircraft operations in military airspace...generate a noise environment somewhat different from other community noise environments." *DEIS at G-6.* The DEIS claims that its DNL metric noise assessment prediction methodology "represents these differences" and is adjusted to "account for the 'surprise' effect of the sudden onset of aircraft noise events on humans" citing a work by Plotkin and two works by Stusnick et al. for this conclusion. *Id.* However, an examination of the Stusnick studies makes clear the inapplicability of these calculation methodologies to the affected area. The Stusnick studies were done in houses and a laboratory in southern Virginia, in an area where many homes were present and where streets and aircraft contributed to background levels of noise. This environment has little application of relevance to the vastly scattered ranching settlements and wide-open spaces of the Llano Estacado ranching communities. Thus, the DEIS assertion that its DNL metric accounts for surprise effect does not support its attempt to use this technique to predict or describe noise effects to the wildlands, ranchlands, and outdoor settings of the Llano Estacado ranching communities.

NO-16

The Air Force must disclose these shortcomings of its data and methodology in the DEIS, and it must undertake further analyses of potential environmental impacts to account for the extremely large analytical shortcomings of the methodologies it has applied. 40 C.F.R. § 1502.24.

5. Inadequate Disclosure of Claims Process Issues

NP-3

The DEIS states that "[t]he Air Force has established procedures for damage claims." *DEIS at 4-19.* Implicit in this statement is the concept that the claims procedures adequately mitigate damage claims. However, past events indicate that the claims procedures have not adequately addressed the Commenters' noise damages.

For instance, in September 2001, Mr. Elliott submitted a claim for a window that was shattered as a result of a sonic boom. **See Exhibit M.** Mr. Elliot was able to document the time of the fly over. 27FW/PA confirmed it was one of their aircraft. Part of the claim involved an amount to compensate Mr. Elliot for documented time he spent attending to the broken window, specifically meeting with a carpenter, not the

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administrative time lost filing the claim. The claims process denied his claim for documented time lost. **See Exhibit Q.** Though the claim process may handle the hard costs involved in noise damage claims, it is no way compensates ranchers in the affected area for the constant interruptions of their lives and businesses or the countless hours they loose to dealing with the damage. Because the EIS does not consider these documented impacts of noise, its discussion is inadequate. Additionally, the DEIS must disclose the limits and conditions of the Air Force compensation program in order to evaluate its scope and effectiveness in addressing the unavoidable adverse environmental effects that will occur.

C. **The DEIS Fails to Adequately Assess Livestock Impacts.** BI-12

The DEIS provides that almost 99% of the airspace expansions will be over rangeland, 69% of which is private land. *DEIS at 3-39.* Yet, the DEIS includes a very small review of published articles on the affects of noise and aircraft disturbance to livestock, and suggests that "[m]any studies documented that all types of livestock habituate to aircraft noise." *DEIS at 4-32.* The DEIS further states that "[n]o controlled studies of the responses of mounted horses to aircraft noise are available." Yet, "[a]necdotal reports indicate that horses with riders startle when surprised by a low-altitude overflight . . .." *Id.* Despite the lack of studies and anecdotal evidence of the startle effect, the DEIS analysis ends with the premise that "there was evidence that horses adapted to aircraft noise." *Id.* The miniscule section of the DEIS addressing rangeland impacts fails to address the potential health and safety problems involving traditional rangeland management.

1. Selective Review of Applicable Literature

The biggest concern with the DEIS's very brief livestock section is that it first fails to fully acknowledge the numerous adverse affects of aircraft noise and overflights to domestic animals, and then it concludes that it is unlikely that there will be negative impacts to livestock or humans associated with managing those livestock. The DEIS omits a number of studies or portions of studies that document negative effects to livestock and domestic animals. These include: BI-13

a) Kovalcik and Sottnik (1971)

Kovalcik and Sottnik (1971) suggest that gradually increasing noise levels instead of immediate exposure to high intensity noise reduces the response by animals. This is contrary to studies cited by the DEIS. *Id. at 4-32.* They reported that in the case of immediate exposure to high intensity noise (about 105 dBA), livestock consumption of feeds declined, milk yield was reduced, and the intensity of milk release decreased (Kovalcik and Sottnik 1971). Because overflights would not commence gradually under the proposals, this study suggests that some negative affect may occur. Moreover, the potential for decreased milk yields is again of great concern to the Commenters' cow-calf operations, especially where the calves and yearlings being grown for market are relying on the mother cow's milk yields for the bulk, if not total, of the first year's nutrition and weight gain. BI-22

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b) Espmark et al. (1974) BI-14

As indicated in the DEIS, Espmark *et al.* (1974) concluded that sheep and cattle had little negative response when exposed to low-altitude subsonic flights in their study. However, the authors also stated that animals under different environmental conditions would display other and more severe reactions than they reported. Espmark *et al.* also reported that impacts may be greater in gestating animals because they jumped backward in response to being startled. These potential gestational impacts are of great concern to the Commenters' cow-calf operations. The authors also found that sheep reacted more strongly than cattle, and that cattle did not adapt to low level flights when subjected to 10 flights at elevations between approximately 150 and 650 feet AGL over a two day period. This is contrary to the DEIS assertion that livestock habituate. *DEIS at 4-32.* Finally, the authors noted that their study gives no clear indication about the effect of subsonic flights upon the animals, because they had "insufficient data due to the small number of overflights." (Espmark et al. 1974).

c) Oda (1960)

In another study of dairy cows, Oda (1960) found that dairy cows had lowered lactation curves caused by high intensity noise. This again is contrary to studies cited by the DEIS. *See Id. at 4-32.* BI-15

d) Head et al. (1993)

Head *et al.* (1993) conducted a study on dairy cows using recorded jet aircraft noise, and reported no statistically significant effects; however, existing literature suggests that animal stress may be more pronounced when an object is seen. Casady and Lehmann (1966) pointed out that reactions to subsonic, low-level aircraft noise were more evident than reactions to sonic booms, and several other studies verify that animals respond to both auditory as well as visual stimulus from low-level flights (Bond 1971, Bell 1972). Additionally, in Head *et al.* (1993) researchers did not know the prior exposure of the cows they used in their study to jet noise exposure, but noted that jet noise was rare in the vicinity of their dairy research farm. BI-16

2. Failure to Address Other Air Force Information on Livestock Effects

The DEIS cites Gladwin et al. 1988 as support for its analysis of potential impacts to animals from noise. DEIS at 4-30. As a preliminary matter, Gladwin et al. 1988 is a collection of noise-related research abstracts, many of which concern the effects of aircraft noise and sonic boom on domestic animals and wildlife. It is not in and of itself a "study" and presents no interpretations or overall conclusions based on the abstracts themselves. If the preparers of the EIS wanted to cite information presented in this book of abstracts, they should have cited the individual studies themselves, which vary greatly in scientific merit, conclusions reached, and direct applicability to the NMTRI overflight and livestock situation. BI-17

Also, the DEIS fails to cite to or consider the US Handbook (1993) on "The Impact of Low-Altitude Flights on Livestock and Poultry." That report "applies to BI-18

environmental planners, EIAP managers and project managers who work with affairs." *Id.* The handbook does not plainly support any of the general conclusions stated in the DEIS. In fact, this document presents abstracts and conclusions that directly contradict what is stated in the NMTRI Environment Impact Statement. The following direct excerpts from the handbook, with some additional comments by me in brackets, illustrate this fact: BI-18

a. "Cattle in corrals or feedlots sometimes stampede when aircraft fly low overhead, breaking through the fences and injuring themselves.".

b. "[L]osses to multiple farmers could effect the economy of an area.".

c. "A potentially high overall impact can occur if resources [i.e., livestock and poultry] are present in substantial numbers throughout the area under the airspace.".

c. "[P]otential impacts on individual farmers can be high if one or more sensitive operations [i.e., barns, feedlots, stockyards, gathering pens and corrals] is present anywhere under the proposed airspace.".

e. "Numerous claims of animal or production losses have been made against the U.S. Air Force . . . payment has been made for certain claims in which the Air Force investigators believed that aircraft could have caused the losses, as described in the Air Force's Handbook of Veterinary Claims (Milligan et al. 1983)."

f. "Milligan et al. (1983) cites five cases in which low altitude jet flights caused cattle kept in corrals or feedlots to stampede. Each case involved one to several dead and injured cattle and damage to fences. In each case, the Air Force made payments to the ranchers to compensate their losses.".

g. "Heuwieser (1982) exposed five cows to flyovers by six different aircraft. Effects were variable and principally characterized by increased heart rate and abortions. Three abortions occurred, and the other two cows showed a hormonal response that is associated with abortion.".

The report cited in e. above, the U.S. Air Force's internal document addressing the actual adverse impacts of Air Force low-altitude flight operations on domestic animals and wildlife, "Handbook of Veterinary Claims" (Milligan et al. 1983), also BI-19

presents information that directly contradicts the conclusions presented by the DEIS. This reference states that its purpose is to "serve as a guide for claims officers and appointed investigating veterinarians or other experts to process claims for damage to domestic animals, fowl, fish, and wildlife." The Handbook makes numerous points directly contrary to statements and conclusions presented in the DEIS. The authors of the DEIS, in providing the conclusion that NMTRI aircraft overflights are not going to cause adverse impacts on livestock, omitted the following important statements made and information in Milligan et al. (1983). BI-19

a. "Between 2 March 1968 and 30 November 1982, a total of 628 claims for damage to animals have been filed against the US with the face value totaling $3,859,541.38."

b. The Air Force, after thorough investigation, compensated a farmer for the deaths of 13,134 turkeys caused over a ten day period by Air Force aircraft. The monetary amount paid to the farmer for this loss of 38% of his flock is not reported. In another claim involving the deaths of 22,497 turkeys killed directly as the result of Air Force jet aircraft overflights "at an estimated speed of 420-480 knots and altitude of 150-200 feet," the Air Force paid $271,299 to the turkey farmer as compensation.

c. Again after careful, professional investigation by the Air Force, a rancher was compensated for the death of three corraled cattle caused by high speed low altitude aircraft fly overs. The monetary award is not stated.

d. A cattle rancher was awarded $3,670.73 for damage to his corraled cattle (including the death of one and permanent injury to another) caused by overflights of US low-altitude B-52s. In another claim regarding cattle and low-altitude, high-speed jet aircraft, the U.S. Air Force awarded $1,751.65 to a rancher for the deaths of three of his calves. The Air Force also awarded $17,772.57 to a rancher for damages caused to cattle (including death and injuries), fences, and surrounding cropland occurring as the direct result of low-altitude high-speed Air Force jet aircraft overflights.

3. Exclusion of Historical Reports of Livestock Response

In addition to ignoring scientific literature indicating negative impacts of noise on livestock, the DEIS fails to include documented incidents of negative livestock reactions. BI-20 For instance, Mr. Elliott submitted a claim in 1996 for damage to a yearling heifer that resulted from a very low overflight by a B-1 Bomber. See **Exhibit J**. Mr. Elliott reported the overflight to the Air Force upon its occurrence. Id.. Nearly a week later, a

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yearling heifer wandered in from the pasture on its knees and missing its hooves. After investigating the incident, Mr. Elliott was able to determine that the animal had been startled while in a confined area of the pasture and fled into the fence. **See Exhibit R** depicting yearling and fence. This behavior is consistent with the DEIS, which indicates that sudden noise may cause a panic reaction in animals when they are crowded into small enclosures. *DEIS at 4-23.* Becoming tangled, the yearling heifer pulled away from the fence, pulling off her hooves in the process. Referring only to "colloquial" reports of scattered livestock, the DEIS ignores the historical record regarding the impacts of noise on livestock.

The DEIS also fails to include references to evidence of livestock attempts to consume metallic objects discarded by Air Force on the Ranch. Attached as **Exhibit S** are photos of a metal object that was left behind from the 2002 F-16 crash on the Ranch, discussed in detail in Section IVA.2. There are markings on the metallic object and damage to ends of object in the exhibit that can be attributed to chewing by livestock. This object was also found in an area with evidence of trampling by cattle. The DEIS fails to address the likelihood of livestock ingestion of metal scrap that has historically been left behind by the various NMTRI actions.

The DEIS does not consider livestock consumption of flare canisters, because the Air Force predicts that the canisters are consumed in deployment DEIS at ES-6. With regards to chaff and flare end caps, which the DEIS acknowledges "will be discarded onto the Ranch, the DEIS states "[t]here have been no reports of livestock ingesting flare end caps on lands in and adjacent to Melrose AFB where chaff and flares have been used for over 30 years." *DEIS at 4-33.* **BI-21**

In addition to being based on the false assumptions that the NMTRI will not result in trash other than chaff and flare caps being discarded onto the Ranch (see infra Section IV(E)(1) for a more detailed discussion of these issues) the DEIS also completely ignores the likelihood that discarded objects may result in Traumatic Reticuloperitonitis or bovine hardware disease. Hardware disease is caused when a bovine ingests a relatively heavy and sharp metallic object. The object falls to the floor of the rumen and is pushed forward into the reticulum. The contractions of the reticulum force the object into the peritoneal cavity where it initiates inflammation. If the object penetrates close to the heart and migrates forward, an often fatal infection will result. Occasionally the inflammation will irritate the vagus nerve. This nerve controls rumen contractions and inflammation around the vagus disrupts this function. The result of an impaired vagus nerve is bloat, noted especially on the upper left side, and fluid accumulation on the lower right.

Treatment involves insertion of magnets into the animal's rumen The purpose of the magnets is to prevent the movement of the metal objects farther through the remaining three stomachs. Secondly, a broad-spectrum antibiotic should be administered to control infection. Confinement of the animal will buy time so that the stomach can wall off the hole created in the stomach. Cattle with extensive infection in the abdomen or in the heart have a very poor prognosis. These cattle will die of starvation despite any attempt to encourage feed intake. Certain cases will respond only to surgery and physical

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removal of the object. If the peritonitis can be controlled after the object is removed the prognosis is good for these cattle.

Prevention of hardware disease in cattle revolves around managing animal feed and animal areas so they avoid ingestion of heavy sharp metallic objects. As discussed in greater detail below in Section IV(E)(2), because of the Air Force's continuous trespasses onto the Ranch, the Commenters are incapable of managing the range and keeping it free of garbage. Placing magnets in the animal as a preventative measure is cost prohibitive and is not 100 percent effective. Also, if enough metal is ingested the magnet will exceed its magnetic capacity. In addition, there are documented cases of heavy plastic items causing hardware disease and magnets do not work in these cases because a magnet will not stabilize the migration of the object.

Because the analysis of impacts to livestock is based on false assumptions, fails to discuss at all site-specific records of consumption of metallic objects and ignores widely available and documented evidence of bovine hardware disease and its impacts, the DEIS's discussion of the NMTRI impact to livestock is inadequate. **BI-21**

4. The DEIS Fails to Consider the Cumulative Impacts on Livestock.

As discussed in Section V below, NEPA requires a DEIS evaluate the full scope of impacts including those that are direct, indirect, and cumulative. 40 C.F.R. § 1508.25(c). The cumulative impacts is "[t]he impact on the environmental which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. 40 C.F.R. § 1508.7. Courts have stated that 40 C.F.R. § 1508.7 requires that the agency "consider cumulative impacts of the proposed actions which supplement or aggravate the impacts of past, present, and reasonably foreseeable actions." *Oregon Natural Resources Council v. Marsh*, 832 F.2d 1489, 1497-98 (9th Cir. 1987), *rev'd on other grounds.*

The Air Force has been operating military training over the affected area for years. The DEIS must consider the cumulative effects of these past actions together with the impacts of the NMTRI proposal. The DEIS's unbelievably brief analysis of the cumulative impacts to biological resources contains only seven sentences (and also includes the analysis of impacts to the physical resources). This section is entirely conclusory and does not consider the cumulative incremental impacts of existing use of the training space and the proposed NMTRI uses. *See Grand Canyon Trust v. FAA*, 290 F.3d 339, 345-47 (D.C. Cir. 2002); *Neighbors of Cuddy Mountain vs. U. S. Forest Service*, 137 F.3d 1372 (9th Cir. 1998). **CM-2**

The 1993 Air Force Handbook (Exhibit S) discusses the effects of low-level aircraft flights on livestock and poultry,[1] but is not properly addressed in the DEIS. In this instance, the Air Force failed to conduct the required cumulative impact analysis of a proper scope to include an evaluation of the impact of the proposed DEIS actions together with the other past, present, and reasonably future actions. BI-8

D. The DEIS Fails to Adequately Assess Wildlife Impacts.

1. The DEIS Fails to Adequately Consider Direct Wildlife Impacts.

The area beneath the overflights is rich in wildlife species diversity. The DEIS reports at least 52 representative reptiles, amphibians, birds and mammal species in the three ecological communities making up the affected area. *DEIS at 3-35 – 3-37.* Furthermore, the impacted area includes seven endangered species that may occur, five species currently listed as proposed endangered, six threatened species potentially occurring in the ROI, two candidates for federal listing, and seven insect-species of concern, for a total of 26 special status species. *DEIS at 3-38 – 3-39; see also Appendix H.*

The most serious points lacking from this section that purportedly addresses the impacts of overflights on wildlife are as follows: (a) a large body of literature on studies of overflight impacts on animals has been overlooked and literature that is referenced selectively to favor the conclusion that overflights and noise do not harm animals, and (b) failure to adequately consider overall impact to habitat.

a) A Large Body Of Literature On Studies Of Overflight Impacts On Animals Has Been Overlooked

The DEIS lacks an approach or effort to ensure the professional scientific integrity of the document. The authors have not considered a large body of literature that exists on the subject of noise disturbance and aircraft overflight impacts to wildlife. BI-23

The use of selective literature in the DEIS to support the conclusion that there will be no significant impact to wildlife further documents the lack of a thorough and genuine disclosure of the available data, and an incomplete investigation of potential impacts. In addition, the DEIS lacks many citations to verify the statements asserted. While several studies are alluded to, and results briefly listed, there are often no citations of these studies for the reader to explore.

The DEIS section discussing animal responses to overflights states broadly that "animals have generally demonstrated an ability to habituate to loud, regular noises, such as low-altitude overflights and sonic booms." DEIS at 4-35. There are several problems with this statement. First, the Air Force has previously acknowledged for this same area

[1] The DEIS cites a 1994 Air Force Position Paper on the Effects of Aircraft Overflights on Large Domestic Stock (see, e.g., DEIS at References 6-9). However, this paper was not reasonably available for public review during the DEIS comment period, in violation of NEPA's requirements. *See* 40 C.F.R. § 1502.21. BI-19

and for activities that form part of the purported DEIS baseline that: "In general, the long-term effects of aircraft overflights on wildlife are unclear. Reported animal responses vary greatly among species, and the ability of species to adapt to overflights also varies." U.S. Air Force, ALCM/Talon MOA EA at 4-25 (1997).

Second, the statement is inconsistent with the range of varying findings described in the research literature. For instance, the DEIS addresses mule deer and pronghorn antelope only in general passing, if at all, even though they are found throughout the region. Examples of studies that list variable responses to overflights are Workman et al. (1992), and Luz and Smith (1976). Workman et al. (1992) found that pronghorn would run when subjected to military jets flying at 5000 feet AGL, and Luz and Smith (1976) found a range of responses to low flying (150 to 400 feet AGL) helicopters, ranging from no change to running. Exclusion of such information suggests that the DEIS authors did not fully disclose the potential or likely effects of the proposed actions.

A study on how bighorn sheep react to helicopter overflights in the Grand Canyon (Stockwell et al. 1992) describes how sheep modify their behavior in the presence of aircraft, and decreased their foraging efficiency by 43% in winter and by 17% in summer in the presence of helicopter overflights. Effects of overflights on bighorn sheep are not discussed in the DEIS. However, other studies have reported the following: "Responses of bighorn sheep to low-level overflights (100 to 990 feet AGL) have included no response (Krausman and Hervert 1983), accelerated heart rates (Workman et al. 1992; MacArthur et al. 1979), and abandonment of the area (Lamp 1989)." *See* ALCM/Talon MOA EA at 4-26. By broadly summarizing only a portion of the available literature, selectively reporting their findings, and then concluding that there will be no significant impact to wildlife from the proposed action, the Air Force failed to consider the range of respected scientific opinion available in the general literature on this point. BI-23

For instance, Krausman and Hervert (1983) reported that bighorn sometimes do not respond to fixed-wing aircraft (they did not evaluate jets) overflights between 100 and 990 AGL, but they also reported that 19% of sheep were greatly disturbed and ran from less than 330 feet to 1.2 miles. MacArthur et al. (1979) reported responses to overflight helicopters ranging from no response, to accelerated heart rate, to running when the aircraft was 490 to 660 feet AGL, well above range of some overflights under the proposed action.

Workman et al. (1992) reported accelerated heart rate in response to jet aircraft overflights, and the decibel levels were only 74 dBA, well below the noise that will accompany the overflights for the proposed action. An investigation of Lamp (1989) does not find the exact height of the overflight except to say that it is <3000 feet; this suggests that the height of the flights investigated which caused abandonment of the area may have been substantially higher than the 100 to 500 AGL flights of the proposed MTR modifications. Lamp (1989) only observed 11 low-level overflights, a very small sample by his own admission, and he considered his work a preliminary study.

Third, the Air Force's "habituation" statement is inconsistent with the lack of long-term studies to support such a conclusion. No long-term studies of overflights or

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noise are cited. It may be that bighorn sheep or other large mammals have only temporarily accelerated heart rates in response to low overflights, but the cumulative effects of short-term stress and increased heart rate should be discussed in the DEIS. Krausman et al. (1993a, b) and Weisenberger et al. (1996) found that accelerated heart rates were temporary and therefore concluded that those temporary changes would not be detrimental to populations. However, it should be acknowledged in the DEIS that accelerated heart rate is an indication of excitement or stress in animals. In addition, Weisenberger et al. (1996) suggested that interaction of noise with other environmental factors should be evaluated using free-ranging animals, instead of the captive animals that were used in their study.

On other points as well as the DEIS wildlife analysis is similarly overly-generic and flawed. The DEIS cites Ellis et al. (1991) to suggest that raptors, including peregrine falcons, are only temporarily affected by low-level overflights and to noise in general, in the form of "increased alert behavior, temporarily stopping current activities, increased heart rate." However, the FWS (1998) in a biological opinion on Air Force low-level, high-speed flight activities in the same areas cites studies that have determined that low aircraft overflights do disturb raptors, including flushing from nests and hunting areas. They also note studies that suggest that human activities within breeding and nesting territories may cause raptors to change home ranges. FWS concludes that definitive information on the effects of overflights on peregrine falcons is not available. **BI-23**

In short, the DEIS fails to consider numerous factors and applicable studies, and did not weigh the potential significance of environmental effects of the proposed action in light of the intensity and context of probable effects. Information is drawn mostly from sources such as other military reports, internal government reports not subject to peer review, preliminary studies, studies not applicable to the proposed action, and telephone conversations to conclude that biological resources including protected species are not likely to be significantly impacted by the proposed action. A large body of literature on the topic of animal responses to overflights and noise is not cited, and some of the literature that is cited is used selectively to bolster the "no likely significant impacts" conclusion.

2. The DEIS Fails to Consider the Cumulative Impacts on Wildlife. **CM-3**

Although the DEIS identifies various factors that will impact wildlife in the region (e.g., noise from aircraft, chaff and flare, loss of habitat, etc.), it does not consider the cumulative impact of all these effects on the wildlife in the proposed area. While exposure to low flying aircraft and ground-disturbing activities may have a minimal impact on certain species or specific animals, the combined effect of all the stresses on the wildlife may have a significant impact. The cumulative, potentially synergistic, effect of all the potential stresses on wildlife, including the ongoing drought, must be adequately identified in order to adequately assess the true impacts on wildlife. *Cf. National Wildlife Fed'n v. FERC*, 801 F.2d 1505 (9th Cir. 1986) (acknowledging need to evaluate cumulative impacts of development on fish and wildlife).

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Only short-term responses by animals are discussed. The possibility of cumulative effects on wildlife from thousands of overflights each year is dismissed. However, the DEIS does not provide data to support this or many other "sweeping" conclusions of no significant impacts. In short, the DEIS wildlife and biological resources discussion lacks scientific credibility, and it does not indicate evidence that the authors conducted a thorough and genuine investigation of the likely aircraft-induced impacts to domestic animals and wildlife occurring in the overflight areas.

In this instance, the Air Force failed to conduct the required cumulative impact analysis of a proper scope to include an evaluation of the impact of the proposed DEIS actions together with the other past, present, and reasonably future actions.

E. The DEIS Fails to Adequately Analyze the Impacts to Physical Environment

1. DEIS Ignores Historical Record on Size, Type and Quantity of Chaff and Flare Residue. **PR-4**

The DEIS states that "[f]lares are designed to be fully consumed prior to reaching the ground" *DEIS at ES-6.* "Chaff fibers would be expected to be 0.005 ounces per acre per year and one-inch by one-inch plastic end caps from chaff and flare use would be approximately one per 40 acres per year." *Id.* "On rare occasions, the chaff may not wholly separate and may fall to earth as a clump." *DEIS at 2-12.* Flares would be deployed at a minimum altitude of 2,000 feet AGL and are designed to burn out after falling approximately 400 feet. *DEIS at 2-23.* Of all flares expended, only an estimated 0.01 percent were actually found on the ground as duds. DEIS at 4-22. The evidence of the historical effects of chaff and flare are contrary to these assertions, upon which use belies these conclusory statements.

Attached as **Exhibit T** are photos of chaff and flare residue removed from the Ranch. These photos document numerous entire flare canisters that Mr. Elliot has collected on the Ranch. As the photos indicate, all of these canisters are approximately 4 x 8 inches in size. These photos evidence the reality that well more than the percentage of flares are malfunctioning and physically invading the Ranch. These photos also document a collection of plastic end caps, all of which are over the predicted size of 1 x 1 inch. Their quantity and size suggests the DEIS predictions are incorrect. Also included in the Exhibit are photos of chaff that Mr. Elliot has collected from his property. Again, contrary to the DEIS's assertion that chaff will deploy in clumps on rare occasions" the chaff has been found in numerous places on the Ranch in large visible clumps.

The DEIS fails to consider the reality of the impacts of the prior training activities and their predictions bear no rational relation to what has occurred.

2. DEIS Fails to Consider the Significance of Violations of Local Law Resulting from Discarded Chaff and Flare and Aircraft Crash Debris on Private Property NP-12

a) Continuous Intentional Trespass

New Mexico has long recognized the tort claim of trespass. *See P.G. Adams v. Heisen*, 423 P.2d 414 (N.M. 1967); *Thompson v. Fahey*, 607 P.2d 122 (N.M. 1980). Trespass is defined as a direct infringement of another's right of possession of his property. *Pancho v. Martinez*, 636 P.2d 308 (N.M. Ct. App. 1981) One is subject to liability to another, irrespective of whether he thereby causes harm...., if he intentionally (a) enters land [of another or] causes a thing or third person to do so...." *See Restatement (Second) of Torts* § 158.

The Ranch is private property and the Commentors have the right to exclusive possession. By deploying ordnance and objects, including chaff, flare canisters, and aircraft and aircraft parts, onto the Ranch, and abandoning those objects on the Ranch, the Air Force is directly infringing on the Commenter's right of exclusive possession and is committing a continuous intentional trespass.

b) Littering

New Mexico law also prohibits littering in private land. *N.M. Stat Ann. § 30-8-4.* Littering is defined as "discarding refuse . . . on private property not owned or lawfully occupied by the person, expect with the consent of the owner, lessee or occupant thereof." *Id.* at § *30-8-4 (2)* Refuse is defined as "any article or substance which is commonly discarded as waste; or which, if discarded on the ground, will create to an unsanitary, offensive or unsightly condition. *Id. at § 30-8-3.*

The Ranch is private property. The Commenters have not granted permission to the Air Force to discard chaff, flare canisters, end caps, and aircraft and aircraft parts on their Ranch. These items are unsightly, offensive and unsanitary with regards to the health of the Commenters and their livestock. By continuously and knowingly discarding these items on the Ranch, the Air Force is violating New Mexico law.

As used in NEPA, "significantly" requires consideration of context and intensity. With respect to intensity, or severity of the impact, agencies are required to consider whether the action threatens a violation of Federal, State, or local law. *40 C.F.R. § 1508.27.* The DEIS repeatedly state that there will be no significant impact to the environment as a result of the expanded use of chaff and flare. *See DEIS at ES-6, 2-36, 4-26 and 4-27.* In making these conclusions, the DEIS fails to examine the ongoing violations of New Mexico law that resulted from its prior military training and will inevitably result from the NMTRI.

3. The DEIS Fails To Consider The Impacts Of Aircraft Accidents PR-5

The DEIS states that the potential for impacts to physical resources are the result of chaff and flare use. *DEIS at 4-25.* The DEIS does not consider the documented aircraft crashes that have impacted the Ranch and the ROI associated with NMTRI to

date and the failure of the Air Force to adequately address the resulting damage. As discussed in these comments, in September 2002, an F-16 crashed onto the Ranch. The Air Force and authorized agencies deployed into the Ranch to investigate and the clean up the site. **Exhibit U**, attached, is a series of photos taken from the F-16 crash site on the Ranch. Some of the photos demonstrate the extensive debris field. Human remains were marked with white flags while aircraft or engine parts were marked in red. The photos also indicate the scattering effect of the debris. The crater from the aircraft was also deep, penetrating into the caliche layer of the soil. After clean up, the Air Force left behind not only numerous small pieces of aircraft, but some of the flags used to mark the debris field. See **Exhibit V**. The Air Force also damaged the natural state of the terrain around the debris filed by driving heavy equipment and vehicles off road in natural pasture areas. Id.

The DEIS does not analyze the impacts of these incidents on the physical resources and is therefore inadequate.

F. The DEIS Fails to Adequately Analyze the Impact of the Proposed Action on Traditional Lifestyles, Culture and Quality of Life.

The DEIS fails to adequately describe or consider the myriad ranching activities occurring beneath the proposed low-level training activities. To identify these flaws, first a representative description of typical activities during the ranch production year is presented below, together with a discussion of the potential disruption and impact on these activities from the proposed actions. The DEIS fails to account for how these various ranch barns and corral structures and the uses of them (including residential use) will be protected from the harmful (and in some instances of ranch houses potentially unconstitutional violations of the Third Amendment) intrusions of the proposed NMTRI activities. All of these impacts and a description of the existing environment are overlooked in the DEIS. SO-4

1. Impact on Traditional Lifestyles, Culture and Quality of Life by Season

a) Fall.

At this time, cattle are gathered and moved progressively through several pastures by family members and neighbors to get them in position for the round-up. Potential overflight impacts may occur during horse shoeing, colt riding, "warming-up" of pastured horses, spreading out and sweeping cattle before the riders (often precarious and requiring patience, caution, and an undisturbed environment), and allowing the cows and calves an undisturbed opportunity to "pair-up" at each new destination. The calves will tend to fall back while the cows tend to move forward in the herd causing stress in both to relocate their momma or calf. The startle effect can cause injury to man and beast during shoeing, distract horses, cause them to buck, scatter the cows, run the calves away from the gather or the drive, and run calves away from the "pairing-up" effort. A horse being shod can weigh 1,100 pounds. If the horse is startled, it could drag its hoof and a nail across a farrier's leg and cause serious injury. Horseshoeing is a dangerous time to work

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with these animals, and not a time for startle effects and low-level disruptions by warplanes.

The scheduling of the workdays and hiring of extra cowboys and/or contacting neighbors to help is next. They come from the local area as well as friends from many other places around the country. Potential impacts: The startle effect and the cultural and heritage impacts can reduce the willingness to work in this environment, increase the risks to riders and horses through the startle effect, and make it less rewarding culturally to work here.

Next is the workday gathering and driving of the cattle (the cows are now pregnant, with grown calves to be weaned). Some of these days are shipping days, when calves are sorted off, weighed and sold and loaded onto cattle trailers. Keeper calves are later moved to a weaning trap after processing. The cows, weighing between 900 and 1,200 pounds, are then palpated, and culled cows are sorted off and moved to holding pastures for later sale. This operation progresses for several weeks. The culled cows are later shipped, and the remaining cows are driven back to their winter pastures. The weaned calves are sorted by size and sex into more marketable groups to obtain weaning weights as a measure of our production. Then they are all vaccinated for multiple health reasons and fed preconditioning rations through weaning. The extra cowboys are then paid off and resume similar operations on other ranches in the area. Impacts: Startle effect on gathering, driving, and sorting and danger to cowboys and/or veterinarians and animals during examinations. These individuals are trying to keep the animals calm during this process, yet still have to work with, examine, and sort them. The startle effect when sorting calves off cows and loading trucks can easily injure men and animals when hundreds of confined cattle are suddenly shifted. The startle effect on heifers being palpated can make observation difficult. The first calf heifers are combined into a separate group and smaller size pasture for closer observation and for special nutrition and calving assistance. The nature of the ranchers' cattle (selected or purchased to be tame, unlikely to stampede when gathered or corralled) is important to marketability, performance, and health. The startle effect will scatter them and cause the negative training that careful handling seeks to avoid.

After weaning 45 – 90 days, the calf crop is sorted and weighed again and shipped to either wheat pasture or moved to separate pastures as stocker yearlings. This concludes Fall Works, usually about mid-December. Impacts: The calves are stressed from separation from the cows. Additional stress affects health and marketability from the learned behavior of fearing assembly and handling. How the ranchers handle them and how they learn to respond is important to their future performance. The ranchers try to reduce stress as much as possible and train them to not fear assembly. This maintains their natural herding instinct and improves controllability, health, and biological performance. Unnecessary startling of cattle is carefully avoided by the cowboys because fleeing is a natural response; handlers have to be very careful not to reinforce such behavior.

Range assessment is an ongoing evaluation of the grass resources. This continuing survey provides the data necessary for assessing both the current forage availability and

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the long-term range condition trends. The data is then used for decisions pertaining to stocking rates and grazing distribution. The goal is to regulate and manage grazing to maintain and improve range condition. Large pastures have been reduced in size to facilitate greater herd effect to graze large numbers of cattle through smaller pastures to achieve a longer rest period. This is facilitated with two-wire electric fence that is very susceptible to livestock fleeing from the startle effect. Wires and gates have to be repaired from being trampled by fleeing livestock. Impacts: The startle effect will prevent being able to control the distribution of the cattle. The distribution control will be lost not only in the portion of each pasture that is directly under the routes, but also in each entire pasture that a route crosses. The impact of the startle effect stems from both the danger and difficulty of driving the cattle and the scattering of the cattle away from the zones to which they are moved. Overgrazing will occur in the areas to which the cattle are startled, and the harmful effects of under-utilization will occur in the zones from which they are startled. There is a similar impact from the unnatural distribution of wildlife that will occur. Wildlife such as deer and antelope help to control and promote the forbs and brush that cattle do not consume. The aircraft exhaust emissions released at such low altitudes may also have a deleterious effect on the range. Large quantities of unburned or partially burned fuel will be carried straight to the ground by wake turbulence, without the opportunity to be dispersed into the larger volume of air at higher altitudes. This direct fuel and particulate absorption by the range can be very harmful. The invasion and proliferation of brush is a particularly difficult range management problem, and it has been determined that the higher CO levels help the brush to compete with the grass. The proliferation of brush is especially wasteful of groundwater and rainwater. The fuel and exhaust particulates dispersed at such low altitudes will settle directly onto any surface water such as dirt tanks, streams, springs, and ponds.

b) Winter.

The cattle are fed supplemental feeds to maintain health and performance and to aid digestibility of the dormant grass. This is done by several methods. In some areas the men drive trucks into the pastures, honk the horn, and wait for the cattle to approach. This takes time and patience but it provides the assurance of consumption and offers the opportunity to count and observe the cattle. Mineral and protein blocks and molasses feeders are strategically located in pastures where cattle can consume supplement as needed. Impacts: The startle effect will drive the cattle away from feeding locations. There is also a direct danger to the men while either driving the feed trucks or standing among the cattle. The cattle are also in the last trimester of pregnancy at this stage of production and are more vulnerable to injury or disruption. This time is of special concern given the research findings cited in the literature of the potential adverse overflight effects on gestating animals. However, there are no steps proposed in the DEIS to mitigate, limit, or address these impacts.

The cattle are gathered and moved as necessary to properly utilize winter forage and water availability. Impacts: The startle effect poses a hazard to the men on horseback and will scatter the cattle that they are gathering and driving. The flat areas have many packrat and badger holes and other hazards such as sinkholes. Lest one assume that there are fewer hazards to riders and horses in the flats, it must be said that there are actually

more accidents when horses are tripped by holes hidden in the grass. Because of the brush and numerous draws, it will be very difficult for pilots flying at extreme low altitudes and supersonic speeds to see cowboys, horses and cattle.

At this time, the Commenters also deal with the management of hunters and other recreational groups. Impacts: The startle effect and noise will decrease the desirability of visiting the ranch for lease hunting and eco-tourism uses, and will increase the hazards. The effects on wildlife distribution and numbers will decrease hunting and observation opportunities. The noise distracting shooters is an additional hunting hazard, as well as being startled while hiking. Sleep will be disturbed by any night operations, and the buildings that the guests use will be subjected to structural damage. The quiet and serenity of this area is particularly desirable to guests.

The cows begin calving in March, and they must be frequently observed for nutritional assessments and any developing calving problems. This is accomplished either while feeding or on horseback. Impacts: The startle effect can disrupt observation, drive cows away from unprotected newborn calves, and endanger the riders.

The heifers begin calving in February, a month earlier. They require quiet and special attention to prevent calving dystocia. This is much more intensive than calving cows, since it is essential to check the herd every few hours. The pastures selected for this purpose are usually close to a corral so that each heifer that begins labor can be penned and assisted as necessary. The heifers do not know how to protect the calves from the predators that haunt the calving areas, and some of them do not accept their calves right away, so it is necessary to pair them up and put them into a separate herd as soon as they calve. Impacts: The startle effect can disturb calving, drive the heifers away from the calving areas, and upset the horses. There will be an additional hazard to the men on foot among the penned heifers or assisting the calving.

Many repair and improvement projects are accomplished during the winter months. These include such things as windmill repair and maintenance, fence repair, corral repair, and erosion/roadwork. See **Exhibit W.** Impacts: The startle effect will be hazardous to persons working with tools or machinery, and especially to anyone atop windmills, buildings, ridges, or water tanks. The force of the jet wash from a heavy overflying bomber aircraft can be enough to topple windmills and fences, and damage other structures. The Commenters have lost one windmill tower and motor that destroyed a plastered steel water trough when knocked over by apparent wake turbulence as no strong wind was noticed.

Bulls are gathered, sorted, and examined in squeeze chutes for fertility in preparation for the start of the breeding season. Impacts: The startle effect will be dangerous for men on horseback or on foot around the bulls. The disruption while they are penned for examinations can be especially hazardous, and they can tear down the pens if they are all stampeded together.

On or about May 15, the men begin driving the bulls and distributing them to the various cow herds. Impacts: Bulls are hard to drive in a herd (harder to drive than cows),

since they do not usually stay together well, and some of them will frequently stop to fight. The startle effect of the low flying jets will make the job more difficult and dangerous by startling both the bulls and the horses.

c) Summer Branding.

As calving is completed, the planning for summer branding begins. This involves contacting the extra cowboys, planning the schedule, and preparing the corrals and equipment. Impacts: The Commenters' reputations for having a good and pleasing work environment is important to their being able to get help when needed. The hazards to men, horses, and equipment caused by the startle effect of the low flying, high-speed warplanes will put this reputation at risk. The disruption of the quiet and traditional environment by the noisy intrusions will also undermine the motivations for working at the Commenters' ranching operations. Cowboys are essential to these operations.

The regular hands begin gathering and driving cattle in preparation for branding, and the spring works crew is hired. Impacts: The startle effect will scatter the cattle being driven, run some of the calves off, and cause horses to buck or bolt.

During the daily branding operation, cattle are gathered and penned. The calves are sorted off, roped, vaccinated, dehorned, bull calves castrated, earmarked and branded. The branding operation is very fast paced in order to minimize stress on the calves and to keep them separated from the cows for as short a time as possible. Two mounted cowboys heel rope calves and drag them to two or three pairs of flankers. The branding irons are heated by a propane-fueled torch that is noisy. Torch noise, cows and calves bawling, children laughing, men talking and hoorahing at missed loops are familiar and acceptable branding activity noises. About 100 calves per hour are worked this way, and the traditional techniques are carefully followed to minimize the risks of injury to men and animals. As each day's branding is completed, the calves are turned back out with their mothers while the mounted riders hold the herd together long enough to allow them to quietly pair up again. Impacts: The startle effect of the low flying jet fighters and bombers will cause a number of significant and dangerous disruptions. Horses can be expected to buck and rip their tied reins from the pens; the men working on the ground among them and the cattle will be at risk. The work will be disrupted, calves will run off, and the opportunity to quietly pair-up the cows and calves again will be disturbed. Some of the branding pens are located in remote areas and are very difficult to see from the air. These remote unrecognized locations will increase the probability of direct overflights and the resulting hazards. During a 1979 branding, Mr. Elliott's cowboys were startled by a four-ship sortie of NMANG A-7s that passed directly above the corrals at 100' AGL. The noise startle effect caused the cowboys to think the fuel hose had ruptured. The cowboys scattered fearing a possible propane fire and explosion. There is no discussion in the DEIS of how pilots will either locate or avoid these operational facilities. Even if these effects are only infrequent, it will be far too often for the men, ranches, and livestock affected.

At each branding, dry cows (cows without calves) are sorted out of the herd. The cowboys hold the herd together with their horses, and one or two men ride into the herd to cut the dry cows out. The dry cows are then driven to a separate pasture for later

accumulation to sell as packer cows. Impacts: The startle effect poses a danger to the riders and the cutting and sorting efforts will be wasted when the herd is scattered. The startle effect will also make it very difficult to succeed in driving the dry cows to another pasture. Once the herd has been scattered, it is likely that the whole day's work will be lost since it is essential to avoid delays that prevent getting the branding done before it gets too hot. Overheated cattle will suffer considerable stress and may even die.

As the spring work is concluded, the day work cowboys are paid off, neighbors thanked, horses and gear are loaded into trailers to return home Impacts: After extremely long days, the startle effect creates a danger to the horses and men while the horses are loaded into trailers. There is an additional risk of startling the drivers and horses while trailering.

The dry cows are gathered, driven to an assembly point, and loaded into trucks for shipment to a sale. Impacts: The startle effect poses a danger to men and horses, and can scatter the cows. There is a particular danger to startling the cows while they are being loaded. Men will be on the ground among them as they are driven up loading chutes into the trucks in 50,000 pound groups.

d) Summer Production.

Following the spring work, usually around late April to early May, the summer production period begins. These activities include: repairs, roadwork, maintenance, and special projects that continue throughout the summer. Potential impacts are: The startle effect creates the risk of injury to men working outside, especially when operating machinery and using tools. In July 1998, two F-16s passed directly overhead Ranch headquarters at 450'AGL, startling Mr. Elliott as he worked. After reporting to 27FW/PA, Mr. Elliott also called a Col. Breedlove to report the incident. After repeated requests to acknowledge FAR violation and more than a year after the incident, Mr. Elliot was told the avionics on an F-16 can be ten miles off, so there was no way of confirming the incident.

Considerable time and effort are spent in assessing forage and water conditions, and gathering and moving cattle as necessary. This provides the ungrazed grasses the opportunity to be partially harvested to avoid lignation of the plants. At the same time this practice allows the grasses and forbs in the improved watering zones to be deferred and re-seeded. Impacts: The startle effect will pose a risk to riders, horses, and cattle during the drives, and it will also cause the calves to run away from the drive. It is often necessary to return to the herd on subsequent days to prevent their returning to the fresh grass in the areas that are being deferred, and the startle effect will drive them away. Aircraft are used occasionally for range, distribution, and water assessments, and there will be a very serious risk of collision with the speeding warplanes.

During late August, the men begin picking up the bulls at the end of the breeding season. This involves riding through all the herds, sorting the bulls off, and driving the bulls to pens where they can be loaded into trailers and hauled to the bull pastures. Impacts: The startle effect is very hazardous to horses and riders, and can scatter the bulls that are hard to drive anyway. Once the bulls have been accumulated into pens,

there will be the additional risk of startling them into tearing the pens up or injuring the men who are loading the trailers.

Yearlings held over from the previous calf crop are gathered in late summer or early fall, and shipped to buyers or special contract sales. Impacts: The startle effect can make riding and gathering very hazardous, and can scatter the drive. Yearlings are particularly energetic and can be trained by the disruptions to run away and be hard to handle. This is a serious disadvantage to both the Commenters and their customers. The startle effect will also make loading the cattle into trucks very hazardous. In addition, any yearlings scattered that cannot be found in time for the sale will have to be sold separately later. They bring a much lower price in small quantities.

The cowboys occasionally ride through the herds to inspect the cattle and pick-up and brand any unmarked calves. Impacts: The startle effect poses a danger to riders and horses, and can scatter the calves, especially during branding operations.

Late summer is the time to begin the preparation and planning for fall work and the marketing, preconditioning, and grazing decisions. Impacts: The startle effect that causes calves to run away and become harder to handle can affect their biological performance, reputation, and marketability. For instance, yearling operators who buy from the El Bigote Cattle Co., LLC value the animals' tameness and performance. They have been willing to pay a premium for these traits, and they will surely note any change.

Tourists and guests come to visit the ranch in the summer, and preparations are made to manage their visits. Impacts: The quietness, serenity, and remoteness are among the greatest attributes of this region. The noise, smoke, startle impact hazards, and disruptions to wildlife and birds will diminish the desirability of visiting here. Sleep will be disrupted by the noise, and the guest buildings themselves will risk structural damage. The startle effect will also pose a hazard to vehicle operators on ranch and public roads.

Predator control continues in the summer when necessary for the protection of calves and deer and antelope fawns. For instance, The Ranch is currently working to preserve their antelope herds and do not allow hunting of that species. Predator control operations are performed by State trappers and contracted shooting from aircraft. Impacts: The aircraft used may be unable to see and avoid the very fast fighters and collisions are a very real hazard. The antelope in particular are very vulnerable to losses through the startle effects, and the resultant increased need for predator control will place more pressure on the predators themselves.

2. Exclusion of Recorded of Impacts to Lifestyle.

a) Frequent Military Training within Close Proximity to Ranch Structures and Residences.] LU-3

The DEIS also does not consider the impact that military training has had on the Commenters lifestyle or the way that the NMTRI will add to this impact. Attached as **Exhibit X** is a series of photos documenting the proximity with which the Air Force has been conducting activities over the Ranch. The photos were taken from the Ranch, often

from the front porch of the Ranch residence and with a basic point-and-shoot camera with a limited zoom capacity. Most of these photographs were taken while the Air Force had agreed not to fly within close proximity to the Ranch headquarters and residence. The photos depict planes that are within 500 feet of the ground, within less than a mile of the Ranch residence and engaged in maneuvers within this distance, which significantly increases noise impacts. What is not entirely obvious from the Exhibit is the frequency with which these events have occurred. The Commenters have over fifty photos of military aircraft within close proximity of residential and commercial structures on the Ranch. These photos evidence the extreme visual and noise impacts that past military actions have had on the Ranch and these impacts have not been adequately considered.

b) Aftermath of Aircraft Accidents PR-5

The DEIS also does not consider the impacts that aircraft accidents will have on the affected area. Attached as **Exhibits U and V** is a series of photos taken from the 2002 F-16 crash on the Ranch. Several of the photos depicted the magnitude of the crash site, with small flags indicating the location of aircraft parts and human remains. There are also photos showing how miniscule many of the aircraft pieces were and how widely they were distributed. These photos also show the Ranch headquarters in the background, evidencing how close the F-16 came to the people who live and work in the area and will be affected by NMTRI. Finally, there are pictures of the site after the Air Force concluded its investigation and clean up which show that flags, aircraft debris were left behind. Photos also depict that the pasture was destroyed in the impact zone and around the impact zone by the use of heavy equipment off of roads and across the pasture. The final photo in this series is a pile of the aircraft parts the Commenters have collected from the site, all of which were left behind.

Though the DEIS predicts that Class A mishaps are rare, as discussed above, they have occurred on or near the Ranch at a high rate. They have also occurred in close proximity to residential structures. Furthermore, these accidents permanently scar and pollute the land and change the peaceful way of life the Commenters have enjoyed. The DEIS must consider the impacts that aircraft accidents have on the land and the way of life of those people underlying the training area. SO-8

V. The DEIS Fails to Consider the Full Scope of Cumulative Impacts for the Proposed Actions.

The DEIS fails to evaluate properly the full scope of past, present, and reasonably foreseeable military training and other activities occurring in the same area and affecting the same area as the NMTRI proposed actions. Under the applicable NEPA regulations, the scope of an environmental document must include the range of actions, alternatives, and impacts to be considered in that document. 40 C.F.R. § 1508.25. The impacts to be considered include those that are direct, indirect, and cumulative. *Id.* § 1508.25(c). CM-2

The CEQ regulations require the discussion of cumulative impacts in environmental impact statements. *See* 40 C.F.R. § 1508.7; *Thomas v. Peterson*, 753 F.2d 754, 758 (9th Cir. 1985); *LaFlamme v. Federal Energy Regulatory Comm'n*, 852 F.2d 389, 402 (9th Cir. 1988) (individual project cannot be considered in isolation without

considering the net impact that all projects in an area may have on the environment). The regulations define a "cumulative impact" as:

> The impact on the environmental which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

40 C.F.R. § 1508.7.

In this instance, the DEIS fails to adequately identify or discuss the impact of past Air Force activities in the region so that the aggregate cumulative effect of past, present, and reasonably foreseeable future actions may be identified. The DEIS cumulative impact discussions specifically do not include any consideration of the environmental impacts attributable to past federal actions. This failure to consider and evaluate the cumulative impact of recent federal actions in the same geographic area is entirely inconsistent with NEPA's cumulative impact assessment requirement.

The present DEIS does not properly consider or identify the cumulative impacts of these recent past actions together with the proposed and reasonably foreseeable actions in the same EIS as required by the CEQ regulations and applicable case law. By doing so, the Air Force has thwarted the full disclosure and informed decisionmaking purposes of NEPA, and has understated the potential environmental impact of its proposals. The other past cumulative actions that must be considered in the cumulative impacts analysis in the DEIS include the noise, traffic, and other effects from aircraft passing through the same airspace. CM-2

Several important cases elaborate on the cumulative impact analysis required by the CEQ regulations. First, in 1987 the Court of Appeals for the Ninth Circuit stated that 40 C.F.R. § 1508.7 requires that the agency "consider cumulative impacts of the proposed actions which supplement or aggravate the impacts of past, present, and reasonably foreseeable actions." *Oregon Natural Resources Council v. Marsh*, 832 F.2d 1489, 1497-98 (9th Cir. 1987), *rev'd on other grounds*, 109 S. Ct. 1851 (1989); *see* Terence L. Thatcher, *Understanding Interdependence in the Natural Environment: Some Thoughts on Cumulative Impact Assessment Under the National Environmental Policy Act*, 20 Envtl. L. 611, 624-625 (1990).

Second, the Fifth Circuit addressed the issue by stating a five element standard for what constitutes a "meaningful cumulative-effects study." *Fritiofson v. Alexander*, 772 F.2d 1225, 1245 (5th Cir. 1985), *abrogated on other grounds*, *Sabine River Auth. v. United States Dep't of Interior*, 951 F.2d 669 (5th Cir. 1992). The standard requires the EIS to identify:

(1) the area in which effects of the proposed project will be felt;

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(2) the impacts that are expected in the area from the proposed project;

(3) other actions—past, proposed, and reasonably foreseeable—that have had or are expected to have impacts in the same area;

(4) the impacts or expected impacts from these other actions; and

(5) the overall impact that can be expected if the individual impacts are allowed to accumulate.

The standard requires that "probable impacts be identified and considered." *Fritiofson*, 772 F.2d at 1245 n.15.

The DEIS contains primarily a superficial cumulative impact analysis that applies an inappropriate baseline and fails to meet the NEPA standards for such an evaluation. First, the depth of discussion is shallow. The discussion of cumulative impacts must demonstrate an analytical approach and identify and consider the impacts. Instead, the DEIS only briefly mentions and then dismisses potential cumulative effects.

Second, the DEIS arbitrarily limits itself to cumulative impacts from reasonably foreseeable actions. The regulations clearly state that an EIS must consider past and present actions, yet the Air Force expressly limited the review to future actions. Past actions are relegated to the baseline condition upon which the NMTRI proposal rests. This is not allowed by the CEQ regulations. The choice of which cumulative actions to evaluate is not discretionary. Past actions that have a cumulative affect when combined with the proposed action must be evaluated. The wholesale increase in military warplay operations and more intensive overflights and mission profiles are substantial past actions that must be examined together with the proposed actions in the cumulative impact analysis. That analysis is not limited to the proposed action, but includes analysis of the proposed action's aggravation of past, present, and future actions. *Oregon Natural Resources Council*, 832 F.2d at 1497-98.

The DEIS lacks a legally adequate consideration of cumulative impacts. The brief DEIS discussion on cumulative impacts is vague and conclusory. This is not allowed under NEPA. *See Neighbors of Cuddy Mountain vs. U. S. Forest Service*, 137 F.3d 1372 (9th Cir. 1998) (general statements regarding "possible" effects and "some risk" cannot provide required cumulative impacts analysis supported by appropriate data). Thus, the DEIS fails to meet the requirements of NEPA and must be withdrawn for revision of the cumulative impact analysis so that the public and agency decision makers are fully informed of the complete scope of environmental impacts from the proposed actions. Despite the wide range of potential adverse impacts and potential cumulative effects occurring from the past, ongoing, and planned actions in the proposed action area, when considered together with the additional stress imposed by the proposed NMTRI actions, these adverse cumulative effects are not properly evaluated in the DEIS. Thus, the agencies have failed to identify and carefully review a relevant area of environmental concern, and the agency's evaluation is not reasonable in light of this

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improper analysis. Accordingly, the DEIS must be withdrawn or a proper supplemental DEIS prepared to fully evaluate the environmental impacts of the proposed actions.

VI. The DEIS Fails to Contain An Adequate Analysis of the Potential Impact on Private Property Rights and Land Values. SO-9

The Commenters' property affected by the NMTRI proposals is a large ranch located in the middle of De Baca County, New Mexico. There are private landing strips for civil aviation air travel access located on many of the properties neighboring the ranch. The Ranch property consists of variable topography that ranges from flat to gently rolling to rugged hills and valleys. The property has adequate fencing, improvements, watering facilities, and other accouterments necessary to utilize the Ranch as economic agricultural operation and also for economic recreational purposes, including permit hunting. The Elliotts are investigating using the Ranch for eco-tourism. For such ranch properties in the area, recreational hunting leases are a significant income or income potentially consumed by property owners.

Significant wildlife resources are present on the Ranch property and have important value implications that the DEIS indicates may equal or exceed the net income realizable from ranching operations. The market value of permit hunting in the area ranges from $1,000.00 to $3,000.00 per head for mule deer. Hundreds of dollars per day can be charged for quail and varmint hunting. Pronghorn antelope are also present in the area and the market value for mature bucks exceeds $1,500.00 per head.

From a property valuation and potential economic impact perspective, the Air Force's proposed uses of the ranch properties, and overflights of the homes located on these properties, for military warplane low-level, high-speed overflights, represents a significant change in use, intensity, and frequency of use over the previous use of the airspace overlying the property. This significant change in use has serious implications for the property value of both the houses located on the property and the overall ranch property. SO-9

The NMTRI proposal is a major change of airspace use that has substantial implications to the landowners' value of the property, income stream, recreational use, and Eastern New Mexico ranching culture and lifestyles. For instance, the proposed military training uses will interfere with and cause a potentially dangerous situation in the use of private aircraft for agricultural, recreation access, and cattle operations to the subject properties. Private airstrips are major value components in improvements of remote eastern New Mexico ranches such as these in terms of utility, replacement cost, and marketability of the properties. As indicated in the DEIS, many local residents are fearful of flying under "see-and-avoid," VFR rules and curtailment of their flying can be expected. AM-20

Indeed, the FAA itself, and the Air Force, acknowledge that "see and avoid" flying in an active MOA is discouraged and the effects of civil aviation pilots avoiding active MOAs must be addressed in the environmental analyses. The DEIS suggests that a MOA designation does not prevent access to the MOA by non-participating aircraft such

as civil and commercial aircraft. Yet the Air Force has previously stated that non-participating IFR traffic "must obtain an air traffic control clearance" to enter a MOA if it is active. (RBTI FEIS at 4-5 (2000)). Indeed, the purpose of a MOA is "to separate or segregate certain nonhazardous military activities from IFR traffic." 14 C.F.R. § 1.1.

The FAA's "Joint Use Policy" clarifies that MOA special use airspace is "available for access by nonparticipating aircraft during periods when the airspace is not needed by the using agency [i.e. the Air Force] for its designated purpose." FAA Order 7400.2E (Procedures for Handling Airspace Matters) § 21-1-8.a. Those joint use procedures are to be specified in a "letter of agreement" between the using agency and the controlling agency. (*Id.* § 21-1-8.d.). Although VFR pilots are not denied access to a MOA, FAA planners are instructed that "the potential of the aeronautical impact due to VFR pilots electing to deviate around the MOA when active should be evaluated when processing a MOA proposal. Consider the proposed MOA size and location, and the extent of non-participating VFR operations in the affected airspace." (*Id.* § 21-6-3.e.). Thus, the MOA when "active" does restrict access by non-participating aircraft. A recent January 2005 article in the AOPA Pilot magazine (**Exhibit Y**) confirms that the Air Force does not want civil or commercial traffic in active MOAs and is actively campaigning to discourage such use. The DEIS discussions should reflect these realities instead of propagating the undesirable notion that non-military traffic is free to use the MOA airspace at any time.

The rugged terrain and topography of the ranch areas which provides potential warplane pilot training challenges are the same features that make this area and these ranches desirable for recreational activities and locations on the subject properties. However, the proposed uses and overflights will adversely affect the income stream or consumptive use of the properties for such purposes (and residential purposes) by the current owners.

The value loss of the subject properties due to their proposed or continued use as military aircraft training areas may range, at a minimum, between $50.00 to $100.00 per acre considering only current recreational income potential of $25.00 to $50.00 per acre per year and the capitalization rate of .03 or 3 percent return on area ranchland properties. Additional value losses due to reduced agricultural income and stigma effects for potential purchasers may also be realized.

Overall, the proposed Air Force training activities will effectuate a transfer of wealth away from those properties (including both the ranch properties and ranch home properties) subjected to low-level, high-speed military warplane overflight activities, encroachments, loss of air rights, and the associated effects, to those properties that are not so encumbered. The properties not so encumbered include those over which the Air Force determined to locate its operations away from, such as several populated areas, and some other developed ranch and farm areas such as dairies.

The definition of the highest and best use of the subject properties includes that use which is legal, achievable, and returns the highest rate of return or value to the

property owners. The subject properties' highest and best use is as private recreational land, cattle ranching, and commercial recreational uses. Land prices in this eastern New Mexico area tend to capture and reflect the potential for future development of approximately 40-plus acre tracts as long-term land investments, grassland retirement sites, and weekend home sites. The rapid growth of the American southwest and in adjacent metropolitan areas including Santa Fe, Albuquerque, Phoenix and San Antonio, areas has resulted in the subdivision of some larger ranch properties outside those areas. One can expect these trends to slowly alter the eastern New Mexico area.

The region's existing noise pollution, clean air, quiet clear skies, clean water and natural beauty has increased the potential and attractiveness for such development in the area. Private "wilderness" or nature retreats as a highest and best use is presented in an article by Wilson (1991) **(Exhibit Z)**. In his "Case for Environmental Real Estate Market," he concludes that "if environmental real estate is a contemporary market, real estate counselors need to recognize that supply and demand factors influence its value." The U.S. government's purchases, for condemnation at market value, of approximately 50 million acres of wildland and related areas for the national park system since 1970 is confirmation that such a market exists and is the highest and best use of land in particular areas, including the subject properties.

Nature retreat/reserve use, agricultural operations and recreational income/rents (whether realized or consumed by the owners) all operate in concert as the current highest and best use of the subject properties. The importance of hunting and eco-tourism income is important to ranchland owners, including the owners of the subject properties, because this income stream is less volatile than agricultural income and has relatively lesser expenses associated with the activities thus generating a greater net operating income.

The DEIS does not provide any specific analysis of how warplane overflights will avoid or give reasonable notice of being closer than 500 feet to any person, vessel, vehicle, or structure. Ranching employees, their horses, hunters, hikers, bird watchers, eco-tourists, recreational guests, and campers may be subject to excessive noise event exposures (even at a 500-foot overflight) on a random, uncontrollable basis. The value implications to the desirability, marketability, and mortgagability of these properties is serious. **AM-20**

One related aspect of a claim Mr. Elliott submitted for a dead steer calf startled into a fence by a low flying B-1 bomber was the impact it had on his hunting operation. Mr. Elliott had an unavoidable conflict requiring him to leave the ranch immediately after the fence was downed, resulting in the death of the steer. Operating in a traditional "neighboring" ranch environment, Mr. Elliott relied on the kindness of paying gentlemen hunters on his property to repair the fence. Undeniably, the hunters' experience was interrupted as a result of the low flying bomber associated with the military training. Similar circumstances can be expected with the expansion.

The capitalized value of one mule deer mature buck with an average $2,000.00 present value in the current New Mexico sporting market is $20,000.00 ($2,000.00 + .10

cap rate = $20,000.00) or $66,667.00 rounded at prevailing rates of return (.03 or 3% cap rates) on many ranches in New Mexico ($2,000.00 ÷ .03). The loss or migration of these deer or potential populations equates to a significant loss of property value of the owners of the subject property.

The potential for temporary disturbance to vacationers and others in the region has a concomitant long-term effect to private ranch owners who lease or charge access fees for hunting and recreation. However, the DEIS does not address this potential impact for private property value implications.

The DEIS discussions effectively discount the importance and value of traditional ranching, ranching families, and ranching as a way of life for owners, employees occupying the land full time, and visitors who pay to experience the New Mexico ranching culture. The New Mexico ranching culture, its equipment, livestock, and improvements are a way of life that has actual and realizable value for the property owners and those recreational, nature tourism, and other guests who pay to experience and visit part of that culture and lifestyle.

Previously, the Air Force acknowledged that overflying military aircraft, even at 500 feet above ground level "may startle, annoy, or disturb sleep of people exposed to [such] noise levels." *See* USAF, ALCM/Talon MOA Final EA (June 9, 1997) at 4-11. The land use and value implications of this noise exposure, disturbance, and annoyance in regard to the highest and best use of the property can be severe.

Military jet aircraft overflights through private land airspace that occur at non-scheduled times can have serious economic implications to property values, including both land and residential (home) values. In the real estate appraisal literature, noise is considered "unwanted sound" and its impact on real property market values is compensible. The diminution in market value due to noise value can and should be found in the marketplace through effect on values, rental rates, or income. *See, e.g.*, Joe Kern, *Noise: Is It Compensible? How Is It Measured?*, 43(2) Real Estate Appraiser Journal 31-38 (1977). The dollar value required to cure or replace the areas affected by noise (unwanted sound) is the measure of the damage to the value of the property for special use properties such as the subject properties that are recreational and ranch properties.

Research in the real estate appraisal literature has identified, reported, and developed the Noise Depreciation Sensitivity Index (NDSI) that provides an indication of the percentage change in property value per decibel change in the noise level for affected real properties. The NDSI was based on summaries of the results of studies from 13 different airports, and considered the impact of commercial aviation traffic on real estate values in the urban environment. The NDSI reported that the majority of the percentage change in property value per decibel (measured as the L_{dn} day-night average) was from .50 percent to .60 percent per decibel, with the mean value at .58 percent reduction in value per each decibel level increase in the noise impact. *See* Marvin Frankel, *Aircraft Noise and Residential Property Values: Results of a Survey Study*, The Appraisal Journal, January 1991, at 96-110. SO-9

Applying the NDSI approach to representative properties in the region and the noise impact increases from the significant military overflight increases outlined in the DEIS, a property value impact to the subject properties of at least a 7 percent reduction from the NMTRI actions, and a cumulative reduction of 10 percent or more, would be expected. This reduction is based on the mean per decibel reduction of .58 percent of value with a decibel level increase of approximately 12 dB or more on some portions of the NMTRI airspace that overlay ranching properties. This reduction estimate is a tentative figure based on the poor data presented in the DEIS which is often missing information that would be used for a more descriptive valuation analysis.

Applying the DEIS noise level figures for the representative properties, and comparing them with the projected noise levels presented there, yields a projected cumulative dB increase of up to approximately 17 dB or more from Air Force overflights depending on the particular area under consideration over the subject properties. Applying the .58 percent per decibel property value decrease factor to the 17 dB increase over natural background noise levels for the subject properties yields a projected cumulative property value decrease of almost 10 percent for the subject properties.

Significantly, the actual property value decrease from the proposed actions could be significantly greater given the much greater annoyance with military training overflight noise in rural and wilderness areas as measured by and acknowledged by previous Air Force research. As mentioned above, the NDSI figures were developed from surveys of airport studies using commercial airport traffic in urban environments. The Air Force has noted in other research and publications that overall annoyance of residents beneath military training routes averages 11.7 times greater than its model predictions. Researchers working for the Air Force have also stated that the general dosage-response relationship for annoyance from transportation noise applied by the Air Force cannot be directly applied to outdoor recreational settings. Thus, the anticipated property value impact likely would be higher here, and could be as high as a 25 percent or more decrease in value.

It is important to note again that the valuation depreciation estimates above are based on the poor and spotty information presented in the DEIS, and that the DEIS does not present complete (or even field-measured baseline data) that would allow for a more descriptive assessment of negative property valuation impacts to be made. Significantly also, the Air Force in the DEIS analysis makes no effort to undertake such an evaluation of property valuation impacts to private property from its activities immediately above the ranching and other properties beneath the airspace, where such activities transit through the airspace of the affected properties.

VII. The DEIS Fails to Contain an Adequate Discussion of Measures to Mitigate Adverse Environmental Impacts. NP-11

An "important ingredient of an EIS is the discussion of steps that can be taken to mitigate adverse environmental consequences." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351 (1989). NEPA requires a "reasonably complete discussion" of possible mitigation measures. *Id*; *see also Citizens Advocates for Responsible*

Expansion v. Dole, 770 F.2d 423, 432 (5th Cir. 1985) (EIS must include identification of measures to mitigate "to the fullest extent possible" harmful effects to environment). "Without such discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects." *Robertson*, 490 U.S. at 352. A reasonably complete mitigation discussion helps guarantee that the decisionmaking agency has taken a "hard look" at the environmental consequences of the proposed action. *Id.*

The CEQ regulations require that an EIS address mitigation measures in evaluating the proposed action, alternatives to proposed actions, and environmental consequences. 40 C.F.R. §§ 1502.14(f), 1502.16(h), & 1508(25)(b). The Air Force must address mitigation measures in explaining its decision. 40 C.F.R. § 1505.2(c). *See also* Department of the Air Force Environmental Impact Analysis Procedure Regulations, 32 C.F.R. § 989.22. According to the CEQ, the mitigation measures discussed in an EIS "must cover the range of impacts of the proposal." CEQ's Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 46 Fed. Reg. 18026, 18031. Furthermore, "[a]ll relevant, reasonable mitigation measures that could improve the project are to be identified, even if they are outside the jurisdiction of the lead agency . . . ." *Id.*

The CEQ regulations define mitigation to include:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.

(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

40 C.F.R. § 1508.20.

The Air Force's complete failure to address mitigation measures in the DEIS is in clear violation of NEPA's "reasonably complete" discussion standard. Despite the Air Force's recognition in the DEIS of several potentially adverse affects resulting from the proposed alternatives, there is no discussion of measures to mitigate these adverse effects. *See* DEIS at I to VII. This oversight on the part of the Air Force to include any discussion of measures to mitigate adverse effects violates NEPA's underlying purpose of requiring the decisionmaking agency to "conduct an exhaustive environmental review of the impacts of the proposed action" and to "mitigate to the fullest extent possible harmful effects to the environment." *Citizens Advocates for Responsible Expansion*, 770 F.2d at 432.

B. Airspace and Aircraft Operations.

The DEIS acknowledges that the expansion of military airspace will result in an increase in sonic overflights and all training activities in the ROI. Even under the most favorable flight frequency numbers used by the Air Force, the number of sonic booms on Alternatives A and B will increase up to two times every three days. DEIS at 4-19. While the DEIS recognizes that the airspace impacted by its proposed alternatives is routinely used by civilian aircraft for travel, recreation, and ranch support purposes (including by Commenters), the Air Force has not proposed any mitigation measures to identify or avoid private airfields or aircraft, to post notices concerning when it will be using the proposed airspace, or to coordinate scheduling to avoid conflicts despite its recognition that such scheduling is necessary. Instead, the Air Force places the burden on civilians to obtain this information from non-military sources. *Id.* at 4-3. **AM-5**

Significantly, the Air Force and the FAA have improperly deferred a complete discussion of aeronautical effects until after the EIS process is completed. *See* DEIS at 2-28. This is not allowed under NEPA as civil and commercial aviation effects, and other aeronautical effects implicating environmental issues, are part of the human environment broadly defined and must be evaluated as environmental impacts in the EIS. *See DMTPHA v. FAA*, No. 02-60288, slip op. at 19 (5th Cir. Oct. 12, 2004). **AM-10**

C. Land Management and Use.

The DEIS states that noise levels resulting from its proposed alternatives will result in increases of up to 17 dB or more. DEIS at 4-15. Furthermore, the DEIS acknowledges that the increases in noise levels, especially from sonic booms, will be noticeable and intrusive. *Id.* at 4-19. Thus, it could be perceived by some people as affecting their quality of life.

Despite this, the DEIS does not include an adequate discussion of adhering to FAA avoidance rules, which include avoiding "congested areas of a city, town, settlement, or any open-air assembly of persons by 1,000 feet" and "any person, vessel, vehicle, or structure by 500 feet." The Air Force has not made any effort to identify any of the categories of sites and structures identified in the FAA rules except for the largest cities in the area. Without any prior identification of these sites and structures, it is highly unlikely that Air Force pilots flying aircraft at speeds as high as 550 knots at 500 feet AGL will be able to comply with FAA rules as well as other legal protections afforded to citizens who are subjected to such intrusive actions by the U.S. military. Even if such surveys are done prior to route approval, the failure to include this information in the DEIS defeats the purpose of the mitigation discussion requirement of allowing the public and decionmakers to gauge the true extent of anticipated effects. **NO-3**

D. Recreation.

There is no discussion of potential mitigation measures (such as flight path adjustment or increases in minimum altitudes) for recreation impacts. The DEIS analysis **NP-11**

should discuss mitigation measures based on the full scope of potential mitigation as described in the CEQ regulations. 40 C.F.R. § 1508.20.

E. Acoustic Environment.

The DEIS recognizes impacts to the acoustic environment. A variety of military literature is available which highlights a wide array of mitigation options available for mitigation of aircraft noise. These options include, reducing the number of noisy operations, altering the time of operations, using quieter aircraft, using aircraft mufflers and other noise cancellation technology, avoiding time and frequency of noisy maneuvers, avoiding water and other sound amplifying surfaces, altering the altitude of aircraft, insulating affected structures, spacing noisy events, providing advance notice of noisy events, providing noise awareness demonstrations, and publishing operation times. None of these simple and commonly practiced mitigation techniques were evaluated in the DEIS. NO-17

F. Summary.

The shortcomings in the mitigation analysis identified here and similar shortcomings in other sections of the DEIS entirely undermine the public disclosure and informed decisionmaking purposes of NEPA. These shortcomings mandate that the DEIS be re-drafted to contain the reasonably complete identification and discussion of possible mitigation measures required by NEPA. The development of these mitigation measures cannot be deferred until the final EIS or until a Record of Decision is issued. NEPA must be complied with at this DEIS stage of the proposed action if decisionmakers and the public are to carefully consider detailed information on significant environmental impacts at the time the decision on the Air Force's proposals is made. NP-11

CONCLUSION

As set out above, the Air Force and FAA have failed to comply with the full scope of their NEPA obligations here. The myriad flaws in the DEIS noted in these comments have undermined NEPA's twin goals of informed decisionmaking and informed public participation. *California v. Block*, 690 F.2d 753, 761 (9th Cir. 1982). Furthermore, the DEIS shortcomings discussed here "are not mere legal nitpicking, but go to the heart of the NEPA process." *California v. Bergland*, 483 F. Supp. 465, 493 (E.D. Cal. 1980), *aff'd in part sub nom. California v. Block*, 690 F.2d 753 (9th Cir. 1982). Because the DEIS has failed in so many crucial respects to comply with the NEPA standards for EIS preparation and analysis, the Air Force must withdraw the DEIS and prepare a new DEIS that fully responds to the issues raised in these

comments.

Respectfully submitted this 22nd day of February 2005.

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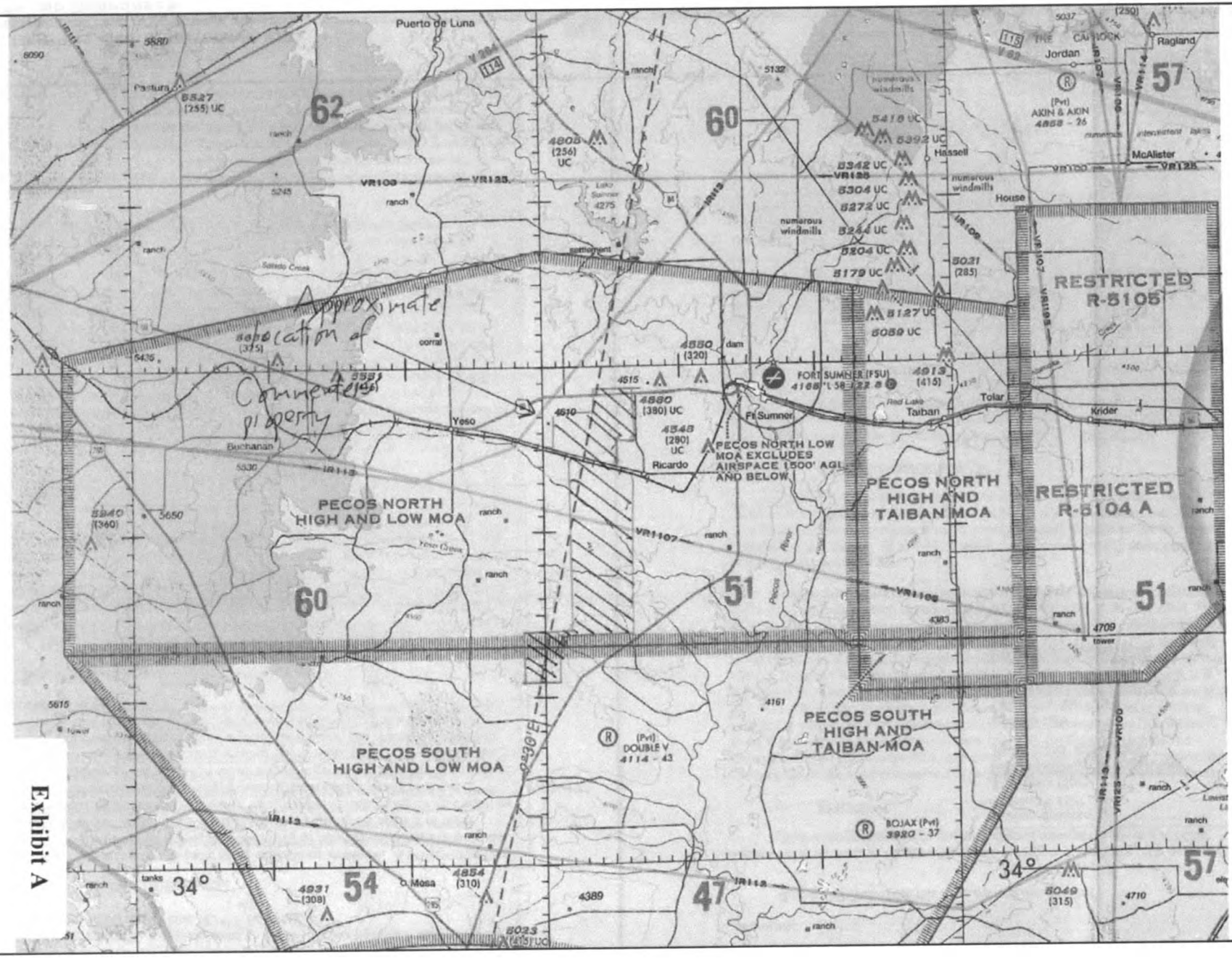

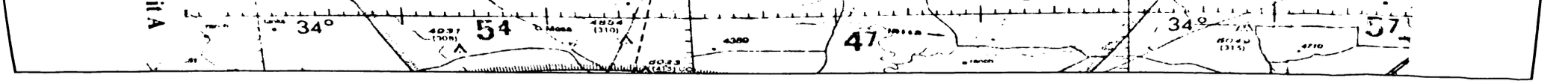

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
LUBBOCK DIVISION

DAVIS MOUNTAINS TRANS-PECOS HERITAGE ASSOCIATION; DALE and SUSAN TOONE; TIM and REXANN LEARY; EARL and SYLVIA BAKER; MARK and ANN DAUGHERTY; DICK R. HOLLAND; J. P. BRYAN; JACKSON B. "BEN" LOVE, JR.; and KAARE J. REMME,	§	CIVIL ACTION NO. 5:01-CV-289-C
Plaintiffs,	§	
v.	§	
UNITED STATES AIR FORCE; DR. JAMES G. ROCHE, Secretary, United States Air Force; UNITED STATES DEPARTMENT OF DEFENSE; and DONALD H. RUMSFELD, Secretary, Department of Defense,	§	
Defendants.	§	

SECOND DECLARATION OF RONALD O. STEARMAN, P.E.

I, RONALD O. STEARMAN, P.E., state and declare as follows:

1. I previously submitted a declaration in this case dated October 16, 2002. My qualifications and experience are set out in that earlier declaration.

2. I make the statements in this declaration based on my own personal knowledge and experience and based on the items reviewed, observations made, persons consulted, calculations performed, and explanatory Figures developed, as stated herein and in my earlier declaration.

Exhibit B

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3. I have reviewed the Declaration of Dr. Ojar Skujins and the attached materials submitted by the Air Force in this matter in its Appendix materials supporting Defendants' Cross Motion for Summary Judgment (filed Dec. 18, 2002).

4. The essential conclusion to Dr. Skujins' declaration states that there should be no significant influence of the wake turbulence of the Air Force's IR-178 high-speed low-altitude overflying aircraft on certain ranch structures in the Davis Mountain ranch areas. *See* Skujins Decl. ¶¶ 9, 11.d. (AF App. 53, 55). Two of the more critical structures that should be considered in evaluation of the potential for damage in this area are: (1) the 36- to 64-foot high windmills employed to pump water for the cattle and wildlife; and (2) the approximately 15- to 30-foot-high by 20-foot-long box-type feeders that trucks drive under when loading cattle and wildlife feed.

5. Dr. Skujins concludes that the year around wind and gust environments in the area of concern are more likely to affect these structures than the IR-178 low-altitude aircraft wake effects. However, direct landowner observations do not support this conclusion. In Mr. Robert Young's declaration he provided a video exhibit of excerpts of my interview on site with him. *See* Young Decl. ¶¶ 8, 10 (DMTPHA App. 179-80, 184, 184A). His interview statements refute this conclusion with two observations. First, his windmill maintenance records, over the last few years, reflect that the windmills in the overflight corridor near the northeast corner of his K.C. Ranch require about ten times the maintenance budget of the windmills further to the south which are well outside the IR-178 overflight corridor. Mr. Young finds that one windmill near the IR-178 overflight corridor has an average maintenance cost of up to $3000/year as compared to about $300/year for those windmills well outside the IR-178

overflight corridor. If Dr. Skujins' conclusions about the local wind and gust effects were correct, one would expect both sets of windmills subjected to the same environmental wind and gust conditions year around to average roughly the same maintenance budget, not a significant up to 10:1 difference.

6. The second observation is that Mr. Young personally saw a B-1B fly by one of his windmills about 100 to 200 feet to the east in a southeast to northwest direction. Young Decl. ¶ 5 (DMTPHA App. 178). I have illustrated by the dashed blue arc in the attached Figure 1 the flight path that Mr. Young indicated to me. It is assumed that the aircraft was at approximately the minimum 300 ft. altitude. The windmill was in an estimated wind condition of 2 to 3 mph since it was not initially turning due to having a startup speed of about 5 mph. After the fly-by, the rotor spun-up until the windmill brake came on to slow down the spinning rotor blade element, and the whole upper turbine spun about its vertical axis an estimated turn and a half. The mill tower was also vibrating in its first cantilever bending mode perpendicular to the aircraft flight path.

7. The water pumping windmills are designed to operate in the wind speed range of 18 to 20 mph.[1] To avoid damage to the windmill, its braking action is estimated to start occurring in the 25 to 30 mph wind speed range, which is a lower bound estimate of the vortex velocity at the mill. There was no disturbance from Interstate Highway 10 since it was about 100 yards away to the south. While Mr. Young did not see the top turbine of the windmill break that day, he did notice a significant wind-type disturbance to the top turbine on the tower and he noticed that the

[1] Communication with Windmill Sales and Service, South Lyon, Michigan.

aircraft flew near two other of his windmills in what appeared like a straight line since the actual aircraft was turning around a large 26-mile radius to stay close to the IR-178 corridor. Some days later (about one week), all of these windmills in the path of the observed B1-B overflight were found to be damaged in a similar manner to that shown in Figure 2. A rational explanation is given below as to how the wake of the B-1B flying closely by damaged the windmill by imposing a hurricane-level wind change and a significant time varying bending load upon the upper wind turbine disk. Responses to other points of Dr. Skujins' declaration are also discussed in the following paragraphs.

8. In paragraph 5 of Dr. Skujins' declaration (AF App. 50), a comment is made that the 1918 Prandtl finite wing lifting line theory should be adequate for modeling the wake effect behind a B-1B bomber flying in the IR-178 corridor area. It is true that moderate compressibility influences may be treated through the classical Prandtl-Glauert coordinate distortions with Mach number, and sweep back can be invoked through some additional work as indicated in references (1) and (2) noted below. It is further my understanding that only a far field picture of the wing was being considered and one reference to Prandtl was basically to describe the trailing far field wing tip vortices that most people relate to in Prandtl's model.

9. My response is still that the 1918 Prandtl finite wing theory will not model the embedded transonic flow field or the engine wake effect including engine afterburner input during maneuvers around threats, scoring sites, terrain avoidance, or at the target. Dr. Skujins basically agrees that the potential flow solution, which is the basic Biot Savart equation results presented in the RBTI Environmental Impact Statement, is not really adequate to model the vortex situation. Skujins Decl. ¶ 5 (AF

[1] Communication with Windmill Sales and Service, South Lyon, Michigan.

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Statement, is not really adequate to model the vortex situation. Skujins Decl. ¶ 5 (AF

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App. 50). So he instead relies on the full viscous flow study presented in the Air Force AFFDL Technical Report-TR-79-3060 to predict a maximum rotational velocity in the viscous portion of the vortex field. Skujins Decl. ¶ 7 (AF App. 51).

10. This July 1979 Air Force report used by Dr. Skujins is well done, and it could have been employed by the environmental impact assessment team as it has been available since July 1979. Table I, which is attached to this declaration represents a few tests I ran employing this report to spot check Dr. Skujins' maximum velocity numbers. I basically agree with his results.

11. One important feature from the 1979 Air Force report that the RBTI FEIS does not address is the "David and Goliath Syndrome." This syndrome points out the significant impact that a maneuvering load factor has on the maximum vortex wake strength. For example, in Dr. Skujins' calculations the maximum worst-case velocity for the B-1B flying at M = 0.7 at 300 ft altitude AGL was 47mph at 22 ft. above the ground level. However, if the B-1B were in a turn with a 45-degree bank angle the velocity would be 66 mph or in a 60-degree bank it would be 94 mph. The latter two maneuvering cases would be on the order of hurricane-level speeds impacting any structures 22 ft. or taller. Another maneuver described in AFFDL-TR-79-3060 is pulling up from the low altitude terrain following mission to about 2000 ft. just before encountering the target area. This is similar to a 45-degree bank from a load factor consideration. All of these maneuvers would create a highly critical wind condition for windmill type structures. I noted in my earlier declaration that aircraft on the RBTI military training routes maneuver throughout the MTR as required for aircraft interactions with scoring and threat sites situated along the training route. 1st Stearman

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Decl. ¶ 5 (DMTPHA App. 43) (citing RBTI FEIS Vol. I, p. 1-11; AR 733). Dr. Skujins does not disagree with this RBTI FEIS description in his declaration, although as noted above he does not incorporate the implications of this aircraft maneuvering into his calculations or discussion.

12. Although in paragraph 10 of Dr. Skujins' declaration the case of shock wave interactions is dismissed by considering it as a near-field phenomenon no more than a wingspan in extent, that again is not supported by observations. For example, in Figure 5 of my original declaration (DMTPHA App. 57) the F-14 is flying at 100 ft. or more above the ocean surface at a Mach number between 0.8 to 0.9. The aircraft's shock waves are kicking up waves of 6 to 10 feet. This is a significant disturbance extending out at least three wingspans (38 ft. span).

13. When considering the B-1B bomber with a sweptback wing span of 79 feet, this shock wave would extend to 237 ft. This is most likely dropping to within the tolerance band of maintaining a 300 ft. altitude at M=.85 flight in the radar terrain following mode of control over hilly country or mountainous terrain (i.e. 300 ft. ± 100 ft.). An after burner pull-up near the target or elsewhere would certainly blast the ground.

14. Further evidence that low-level flight operations can create shock waves and destroy ground targets was recently demonstrated by the Israeli Defense Force's aircraft in a raid over Lebanon. In this case, significant destruction was accomplished by the aircraft shock waves impacting the ground targets, without dropping a single bomb. *See* Reference (3) below.

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15. An explanation as to how the B-1B flyover could damage Mr. Young's windmills is now possible with the new information on maximum velocity that Dr. Skujins has obtained from AFFDL-TR-79-3060 for a low altitude 300 ft. flyover say at M = 0.7. Figure 3(a) in the attached, the base Figure of which comes from the FAA's Aeronautical Information Manual, illustrates a type of wingtip vortex shedding that is of concern to all pilots operating in and out of airports servicing large aircraft. The aircraft weight of B-52 and B-1B bombers place them in this same general class of aircraft as noted in the FAA's Manual.

16. Figure 3(a) of this sequence illustrates the case where a crosswind condition of 3 knots just nearly stops the vortex on the runway (in this case on the windmill). In Figure 3(b) the vortex velocity profile is shown just reaching the windmill from its downward descent about 24.5 seconds after being shed from the aircraft's right wing tip at 300 ft. altitude. The vortex velocity profile is shown with a peak or maximum velocity of around 47 mph as predicted by Dr. Skujins' analysis.

17. This velocity profile first faces the turbine wheel blowing upwind and the tail or sail on the turbine wheel rotates the turbine wheel facing the dominant wind as shown in Figure 3(c). Windmills are designed to always face the dominant wind direction.

18. As the vortex descends, its peak velocity impacts the top of the turbine and imposes a significant overturning force that wants to tilt the windmill face upward as shown by the nonuniform forces on the turbine face in Figure 3(c). About 2.4 seconds later, the spin axis of the vortex and turbine wheel coincide producing a

significant overturning moment in the opposite direction forcing the turbine disk to impact the tower, Figure 3(d).

19. If this occurs, gyroscopic forces will start up a whirling motion of the turbine that is not unlike the whirling of spinning propellers in a whirl flutter instability. About 1.6 seconds later, the vortex flow has switched the dominant flow by 180 degrees, Figure 3(e), and the vortex is just setting at this position. This tends to bend the turbine disk again into the tower.

20. In most cases the high speeds of the vortex velocity will be well above the turbine 5 mph startup spinning speed and an actual whirling motion will prevail with the rotor blades and sail hitting the tower producing the type damage consistent with Figures 2. Since it is well known that it is the change in fluid momentum (i.e. the change in fluid velocity) that creates the fluid forces acting on the structural bodies, one should keep in mind that within less than 2 seconds a 47 x 2 = 94 mph change in wind speed has occurred over the wind turbine disk (see Figures 3(d) and 3(e)). That is, a dynamic hurricane-level wind change has occurred over the turbine disk.

21. It is therefore not surprising that damage such as that in Figures 2a-2d can occur. It should be pointed out that dynamic hurricane-level forces would also occur even though a maximum velocity level of only 35 mph occurs. One problem with the Air Force's vortex speed interpretations is that the critical building structures are not at ground level but at elevations where the vortex speeds are a maximum. Other possible scenarios that can occur are illustrated in Figures 4 and 5. In all of these cases it is the total change in maximum velocity that gives rise to the serious dynamic loads on the wind turbine or other taller structures.

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(3). Dolling, D. Personal Comminique, Chairman, Aerospace Engineering & Engineering Mechanics Department, College of Engineering, The University of Texas at Austin. Dr. Dolling is a fellow of the American Institute of Aeronautics & Astronautics. He specializes in shock-induced turbulent separated flows and projectile aerodynamics.

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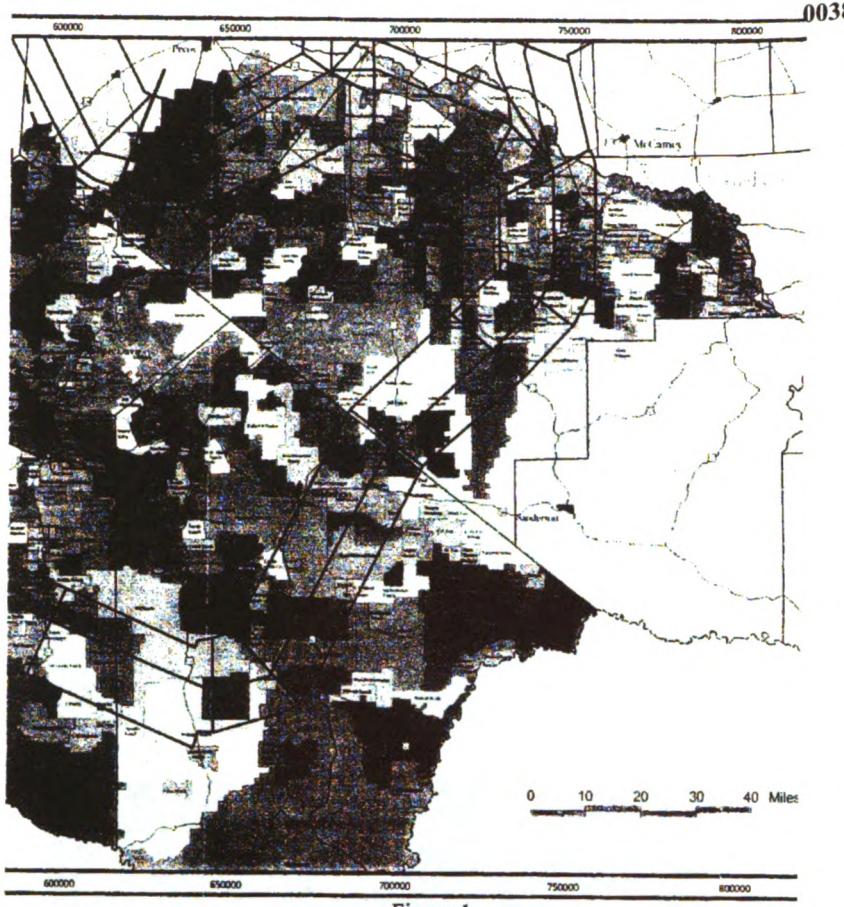

Figure 1

Figure 2a

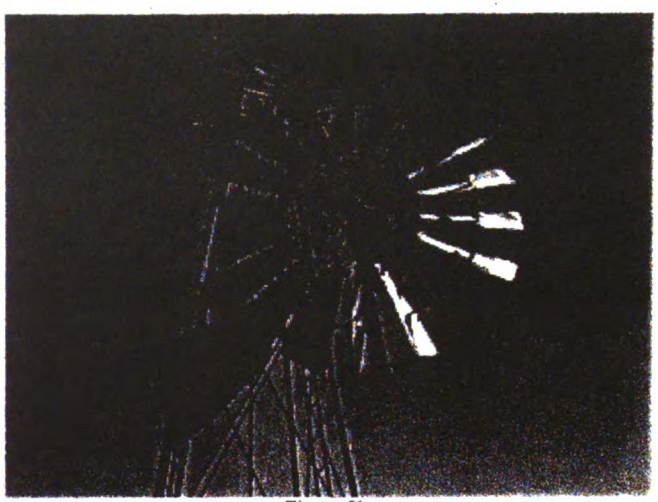

Figure 2b

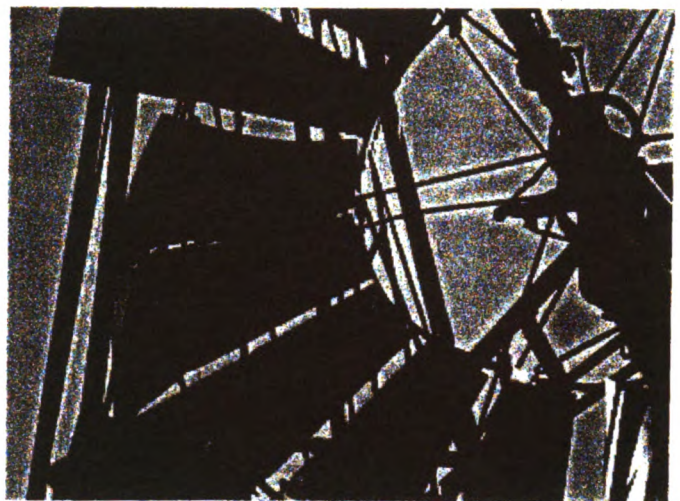

Figure 2c

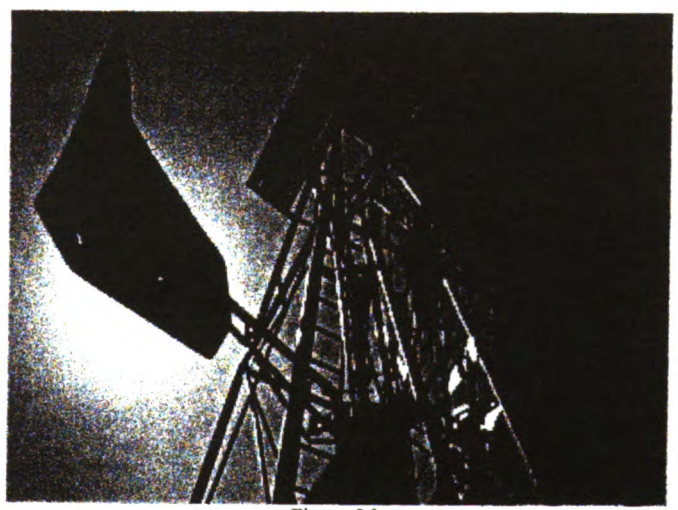

Figure 2d

Figure 2b

Figure 2d

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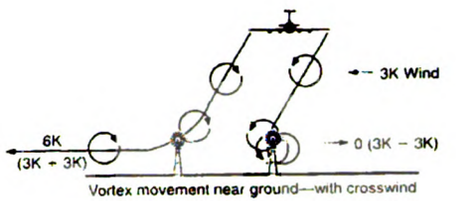
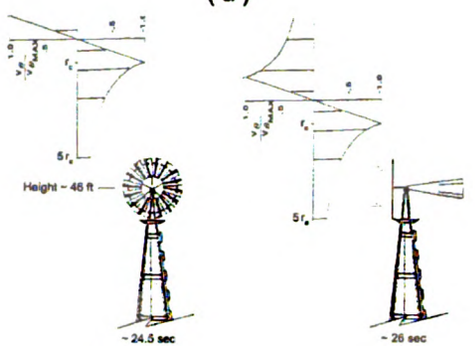
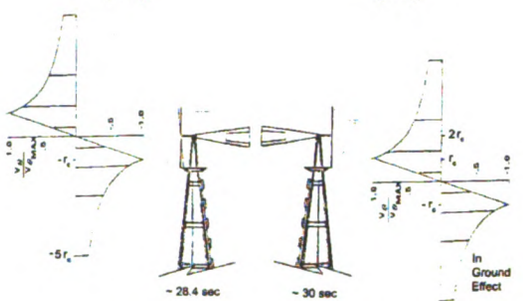


(a)



(b) (c)



(d) (e)

Figure 3

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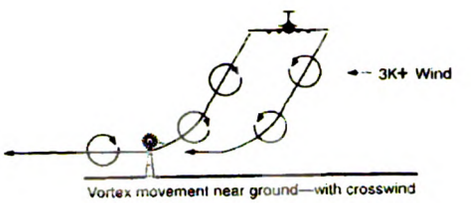
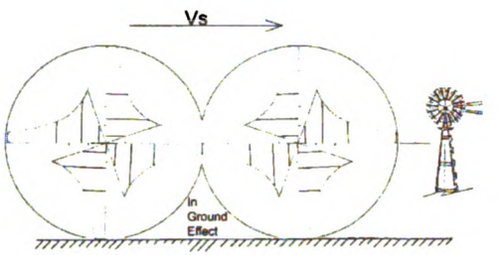


(a)



(b)

Figure 4

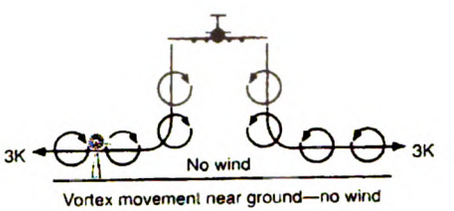


Figure 5

Air Viscosity	■	0.000173		t	rc	Vθ max	Vθ 2rc	Vθ 3rc	Vθ 4rc	Vθ 5rc
Air Density	❒	0.002112		(sec)	(ft)	(mph)	(mph)	(mph)	(mph)	(mph)
Aircraft Weight	W	350000		1	1.27	213.5	148.0	99.3	74.5	59.6
	n	1.009		2	1.80	150.9	104.7	70.2	52.7	42.1
Aircraft Velocity	Vf	773		3	2.20	123.2	85.5	57.3	43.0	34.4
Sweep angle	●	68		4	2.54	106.7	74.0	49.7	37.2	29.8
Wingspan	b	79		5	2.84	95.5	66.2	44.4	33.3	26.7
Alt. of Aircraft	Ha	300		6	3.11	87.1	60.4	40.5	30.4	24.3
Height of Tower	Ht	46		7	3.36	80.7	55.9	37.5	28.2	22.5
				8	3.59	75.5	52.3	35.1	26.3	21.1
	Vd	8.9		9	3.81	71.2	49.3	33.1	24.8	19.9
	b'	62.0		10	4.02	67.5	46.8	31.4	23.6	18.8
				11	4.21	64.4	44.6	29.9	22.5	18.0
time to tower		28.4		12	4.40	61.6	42.7	28.7	21.5	17.2
time to ground eff.		30.1		13	4.58	59.2	41.1	27.5	20.7	16.5
				14	4.75	57.0	39.6	26.5	19.9	15.9
				15	4.92	55.1	38.2	25.6	19.2	15.4
				16	5.08	53.4	37.0	24.8	18.6	14.9
				17	5.24	51.8	35.9	24.1	18.1	14.5
				18	5.39	50.3	34.9	23.4	17.6	14.0
				19	5.54	49.0	34.0	22.8	17.1	13.7
				20	5.68	47.7	33.1	22.2	16.7	13.3
				21	5.82	46.6	32.3	21.7	16.3	13.0
				22	5.96	45.5	31.6	21.2	15.9	12.7
				23	6.09	44.5	30.9	20.7	15.5	12.4
				24	6.22	43.6	30.2	20.3	15.2	12.2
				25	6.35	42.7	29.6	19.9	14.9	11.9
				26	6.48	41.9	29.0	19.5	14.6	11.7
				27	6.60	41.1	28.5	19.1	14.3	11.5
				28	6.72	40.3	28.0	18.8	14.1	11.3
				29	6.84	39.6	27.5	18.4	13.8	11.1
				30	6.96	39.0	27.0	18.1	13.6	10.9
				31	7.07	38.3	26.6	17.8	13.4	
				32	7.18	37.7	26.2	17.6	13.2	
				33	7.30	37.2	25.8	17.3	13.0	
				34	7.41	36.6	25.4	17.0	12.8	
				35	7.51	36.1	25.0	16.8	12.6	
				36	7.62	35.6	24.7	16.6	12.4	
				37	7.72	35.1	24.3	16.3	12.2	
				38	7.83	34.6	24.0	16.1		

Table 1

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NMTRI DEIS COMMENTS

Exhibit C

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Exposure-response relationships for transportation noise

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This article presents synthesis curves for the relationship between DNL and percentage highly annoyed for three transportation noise sources. The results are based on all 21 datasets examined by Schultz [J. Acoust. Soc. Am. 64, 377–405 (1978)] and Fidell *et al.* [J. Acoust. Soc. Am. 89, 221–233 (1991)] for which acceptable DNL and percentage highly annoyed measure could be derived, augmented with 34 datasets. Separate, nonidentical curves were found for aircraft, road traffic, and railway noise. A difference between sources was found using data for all studies combined and for only those studies in which respondents evaluated two sources. The latter outcome strengthens the conclusion that the differences between sources cannot be explained by differences in study methodology. © *1998 Acoustical Society of America.*
[S0001-4966(98)02012-8]

PACS numbers: 43.50.Qp, 43.50.Sr [MRS]

INTRODUCTION

Annoyance and sleep disturbance are the most important health effects of environmental noise exposures if DNL is below 70 dB. This can be concluded from two extensive overviews prepared by an international committee of the Health Council of the Netherlands (Gezondheidsraad, 1994) and by Bergtlund and Lindvall (1995). The range below 70 dB is usually considered when noise limits are established. Therefore, information about the relationships between exposure on the one hand, and annoyance and sleep disturbance, on the other hand, is very relevant for the evaluation of environmental noise.

Sleep disturbance has been quantified with various parameters, such as the number of EEG awakenings, the number of sleep stage changes, but also, for example, on the basis of the self-reported sleep disturbance. Research conducted so far does not provide sufficient evidence for quantitative statements about the relationship between noise exposure during sleep and sleep disturbance parameters. An attempt (Pearsons *et al.*, 1989) to integrate results from various studies on noise-induced awakenings has shown great variability, and also a large difference between results from laboratory and from field studies. Since then several new studies have been initiated so that future overviews may reveal more definite quantitative results.

This paper concerns *annoyance* due to environmental noise. Existing data will be reanalyzed to establish functions which summarize the relationship between annoyance experienced in and around the house and the incident noise at the most exposed facade in steady state situations.

We use the term "dataset" for the data with respect to a single noise source (aircraft, road traffic, or railway) from a single survey. In datasets derived from the same survey, the exposure and effect variables related to the noise source have different values in each dataset while others variables, e.g., characterizing the respondent or his dwelling, have identical values in each dataset. Note that more datasets are only derived from a single survey when more than one noise source is evaluated.

Table I gives an overview of the datasets that are used in the present synthesis. Each dataset is identified by its code from Fields' catalogue of noise annoyance surveys (Fields, 1994b). The datasets marked with an asterisk were also included in the synthesis of Fidell *et al.* (1991). The 55 datasets in the present synthesis encompass information for a total of 63 969 respondents (counting respondents twice if they appear in two datasets). They are derived from 45 surveys with a total of 58 065 respondents. Only respondents for whom DNL and an annoyance response are available are counted.

Results from previous analyses on a part of the dataset have been reported at the ICBEN conference in Nice by Miedema (1993). Before our synthesis is discussed, some previous syntheses will be reviewed.

I. STATE OF THE ART

Several authors (e.g., Alexandre, 1973; Finke *et al.*, 1980, pp. 248–252; Fields and Walker, 1982) have attempted to integrate results from individual exposure-response studies. However, most publications used only a limited number of studies, or did not pay much attention to the comparability of the definition of variables in different studies. Alexandre (1973) included five aircraft noise studies, Finke *et al.* (1980) included nine road traffic studies, and Fields and Walker (1982) compared six studies (one on railway, two on road traffic, and three on aircraft).

A very influential attempt that included many more studies was Schultz's synthesis (Schultz, 1978). His paper was followed by an intense discussion between Schultz and Kryter (Schultz, 1982; Kryter, 1982, 1983). In his 1978 article Schultz discussed 24 noise annoyance surveys carried out in several countries. These investigations concerned aircraft, road traffic, and railway noise. In an attempt to make the investigations comparable, Schultz used the available data to estimate a common noise measure and a common

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Exhibit D

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TABLE I. Datasets included in analyses in this paper. There are 45 surveys included with a total of 58 065 respondents. From these surveys 55 datasets are derived with a total 63 969 respondents, counting respondents twice if they appear in two datasets. Our count of surveys is based on Fields (1994b) catalogue. A study is counted as a separate survey if it is assigned there a seperate code. This leads to small differences between our counts of surveys and counts based on the grouping in Schultz (1978) or Fidell *et al.* (1991).

Fields' code	Name of the survey	Number of respondents (for this source)
	Aircraft	
AUL-210	Australian Five Airport Survey (1980)	3288
CAN-168	Canadian National Community Noise Survey (1979)	631
FRA-016	French Four-Airport Noise Study (1965)	2000
FRA-239	French Combined Aircraft/Road Traffic Survey (1984)	565
NET-240	Schiphol Combined Aircraft/Road Traffic Survey (1984)	573
NOR-311	Oslo Airport Survey (1989)	1548
NOR-328	Bodo Military Aircraft Exercise Study (1991–1992)	702
NOR-366	Vaernes Military Aircraft Exercise Study (1990–1991)	391
SWE-035	Scandinavian Nine-Airport Noise Study (1969, 1970, 71, 72, 74, 76)	1662
SWI-053	Swiss Three-City Noise Survey (1971)	3934
UKD-024	Heathrow Aircraft Noise Survey (1967)	4515
UKD-242	Heathrow Combined Aircraft/Road Traffic Survey (1982)	1993
UKD-238	Glasgow Combined Aircraft/Road Traffic Survey (1984)	598
USA-022	U.S.A. Four-Airport Survey (phase I of Tracor Survey) (1967)	3499
USA-032	U.S.A. Three-Airport Survey (phase II of Tracor Survey) (1969)	2828
USA-044	U.S.A. Small City Airports (small City Tracor Survey) (1970)	1954
USA-082	LAX Airport Noise Study (1973)	702
USA-203	Burbank Aircraft Noise Change Study (1979)	924
USA-204	John Wayne Airport Operation Study (1981)	1033
USA-338	U.S.A. 7-Air Force Base Study (1981)	874
	Total Aircraft (20 datasets)	34 214
	Road Traffic	
CAN-120	Western Ontario University Traffic Noise Survey (1975)	1149
CAN-121	Southern Ontario Community Survey (1975/1976)	1304
CAN-168	Canadian National Community Noise Survey (1979)	568
BEL-122	Antwerp Traffic Noise Survey (1975)	896
BEL-137	Brussels Traffic Noise Survey (1976)	297
FRA-092	French Ten-City Traffic Noise Survey (1973/1975)	975
FRA-239	French Combined Aircraft/Road Traffic Survey (1984)	524
FRA-364	French 18-site Time of Day Study (1993/1994)	895
GER-192	German Road/Railway Noise Comparison Study (1978/1981)	1649
GER-372	Ratingen-Dusseldorf Road Traffic/Aircraft Survey (1985/1986)	559
GER-373	Ratingen Road Traffic/Aircraft Study (1987)	440
NET-106	Dordrecht Home Sound Insulation Study (1974)	420
NET-240	Schiphol Combined Aircraft/Road Traffic Survey (1984)	473
NET-258	Amsterdam Home Sound Insulation Study (1975)	365
NET-276	Netherlands Tram and Road Traffic Noise Survey (1993)	697
NET-361	Netherlands Environmental Pollution Annoyance Survey (1983)	880
NET-362	Arnhem Road Traffic Study (1984)	293
SWE-142	Stockholm, Visby, Gothenburg Traffic Noise Study (1976)	811
SWE-165	Gothenburg Tramway Noise Survey (1976)	464
SWI-053	Swiss Three-City Noise Survey (1971)	945
SWI-173	Zurich Time-of Day Survey (1978)	1371
UKD-071	B.R.S. London Traffic Noise Survey (1972)	2903
UKD-072	English Road Traffic Survey (1972)	1043
UKD-157	London Area Panel Survey (1977/1978)	364
UKD-242	Heathrow Combined Aircraft/Road Traffic Survey (1982)	410
UKD-238	Glasgow Combined Aircraft/Road Traffic Survey (1984)	536
	Total Road Traffic (26 datasets)	21 228
	Railway	
FRA-063	Paris Area Railway Noise Survey (1972)	334
GER-192	German Road/Railway Noise Comparison Study (1978/1981)	1648
NET-153	Netherlands Railway Noise Survey (1977)	671
NET-276	Netherlands Tram and Road Traffic Noise Survey (1993)	265
NET-361	Netherlands Environmental Pollution Annoyance Survey (1993)	71
SWE-165	Gothenburg Tramway Noise Survey (1976)	464
SWE-228	Swedish Railway Study (1978–1980)	856
SWE-365	Swedish 15-site Railway Study (1992–1993)	2833
UKD-116	British National Railway Noise Survey (1975/1976)	1385
	Total Railway (9 datasets)	8527

annoyance measure, namely, DNL and the percentage of respondents who could be considered to be highly annoyed.

For each of the investigations he drew a curve showing the percentage highly annoyed persons as a function of DNL (Schultz, 1978, Figs. 1 and 2). On the basis of 11 individual "clustering" surveys he synthesized a single curve as the "best currently available estimate of public annoyance due to transportation noise of all kinds." Eight "nonclustering" surveys were not included in the synthesis. Five surveys were obtained after the analyses and discussed in an addendum. They were not included in the synthesis.

Kryter (1982) cast doubt on the adequacy of the synthesized curve. Most important are his comments with respect to the criteria used for excluding investigations when drawing up the synthesized curve, the definitions of the percentage highly annoyed persons for the different investigations, and the methods used to estimate DNL from the data.

Kryter argued that for ground traffic (i.e., road and rail traffic) and air traffic separate, nonidentical curves give a significantly better representation of the data used by Schultz (Kryter, 1982, Fig. 11). According to Kryter, for a given DNL the annoyance due to aircraft lies above the level specified by the synthesized curve, whereas the annoyance due to ground transportation noise lies below that level. The argument between Kryter and Schultz regarding the adequacy of a single curve for transportation noise did not lead to agreement between them.

Fidell *et al.* (1991) extended the original compilation of Schultz and arrived at substantially the same curve. Their curve was based on 26 datasets: the 11 datasets Schultz (1978) used as a basis for his synthesis curve, 4 of the 5 datasets which he discussed in his addendum, and 11 additional datasets. Although their additional data appear to support Kryter's point that at the same exposure level aircraft noise is more annoying than ground transportation noise, the authors ignored the discussion with Kryter in which this point was brought forward.

Fields (1994a) reviewed the abovementioned original and updated synthesis. Although his review was not conducted with the objective of identifying errors in the data, "a few major errors and a large number of minor inaccuracies have been identified" (cf. his Sec. 2.5). Fields criticizes, among others, the selection process of studies for the synthesis (cf. his Secs. 3.4 and 3.5), weaknesses in the data included in the synthesis (cf. his Sec. 3.8), the comparability of the determination of the percentage highly annoyed for different studies (cf. his Sec. 4.1), and the assignment of equal weights to datapoints that represent different numbers of cases (cf. his Sec. 4.2). The scope of the problems will be illustrated in Sec. III. The overall conclusion that can be drawn from Fields' review is that much can be improved in the process of establishing synthesis curves.

This article presents a synthesis based on all studies examined by Schultz (1978) and Fidell *et al.* (1991) for which DNL and percentage highly annoyed meeting certain minimal requirements could be derived, augmented with a number of additional studies. Consequently, the present synthesis is more comprehensive. Moreover, the kind of errors and inaccuracies Fields (1994a) found in the previous syntheses are avoided.

TABLE II. Boundary quantifications for different annoyance scales.

Number of effective categories	Boundary quantifications
3	0-33-67-100
4	0-25-50-75-100
5	0-20-40-60-80-100
6	0-17-33-50-67-83-100
7	0-14-28-43-57-72-86-100
10	0-10-20-...-80-90-100
11	0-9-18-...-82-91-100

II. DNL AND PERCENTAGE HIGHLY ANNOYED (%HA)

Following Schultz (1978) and Fidell *et al.* (1991), we use DNL as a noise exposure measure and percentage highly annoyed (%HA) as a noise annoyance measure. DNL is a measure with a night-time penalty of 10 dB calculated from L_{Aeq} for the daytime and L_{Aeq} for the night-time:

$$\mathrm{DNL} = 10\ \lg(15.10^{L_{Aeq}(7-22h)/10} + 9.10^{(L_{Aeq}(22-7h)+10)/10})/24\ .$$

The L_{Aeq}'s are measured, or calculated with noise propagation models. As much as possible we derived the L_{Aeq}'s for the incident sound at the most exposed facade of a dwelling for the one year period preceding a social survey. However, it is not a common practice to report information on these aspects of the determination of L_{Aeq}, so that often they were unknown.

%HA is the percentage of annoyance responses which exceed a certain cutoff point. To assess the percentage above a cutoff point, the response alternatives have to be quantified. This quantification is simplest when the following two assumptions can be made:

- Equal intervals: each category from a set of response alternatives occupies an equal portion of the annoyance continuum;
- Equal extremes: the extreme (lower and upper) category boundaries from different sets of annoyance response alternatives coincide.

Quantification of boundaries of annoyance categories based on the above assumptions are given in Table II. They depend only on the number of effective categories. The boundary quantifications are determined as follows:

$$\mathrm{score}_{\mathrm{boundary}\,i} = 100i/m,$$

where m is the number of effective categories and $i = 0,1,...,m$ is the rank of the boundary, starting with the lower boundary of the lowest annoyance category.

To arrive at a percentage responses above a cutoff point x, a score is assigned to each respondent in the following way. Let L and U be the quantifications of the lower and the upper boundary of the category selected by a respondent. Then the score assigned to the respondent for the calculation of the percentage is 0 if the respondent chose a category that is below the cutoff point x (i.e., $U<x$) and is 1 if the respondent chose a category that is above the cutoff point x (i.e., $x \leqslant L$). If the category chosen by the respondent encompasses the cutoff point (i.e., $L<x \leqslant U$), then it is not known whether this is a response below or above the cutoff point. The score assigned to these respondents is the probability that the annoyance score for the respondent actually is above the cutoff point, assuming that the annoyance score is uniformly distributed within a category.

The following example illustrates the above procedure for the calculation of a percentage annoyed respondents. Suppose that a ten-point scale is used and that the percentage annoyed respondents is calculated for a cutoff at 72 on the scale from 0 to 100. The respondents who chose one of the seven categories corresponding to relatively low annoyance are assigned 0 because the upper boundaries of these categories (10, 20, 30, 40, 50, 60, and 70, respectively) are below the cutoff point. Respondents who chose one of the highest two annoyance categories are assigned 1 because the lower boundaries of these category (80 and 90, respectively) are above the cutoff point. The respondents who chose the two but highest category (with boundaries 70 and 80), which encompasses the cutoff at 72, are assigned (80-72)/(80-70) = 0.8.

Schultz (1978) used a cutoff at 72 (highest two categories of seven: see Table II) in his influential synthesis, and he called the percentage obtained with this cutoff point the percentage "highly annoyed." The interpretation of a percentage does not depend on this label, but on the value chosen as the cutoff point, i.e., 72. We also use the label "highly annoyed," if the cutoff is (sufficiently close) to 72. An advantage of using a cutoff at 72 over lower cutoff values is that percentages obtained with the cutoff at 72 are less affected by differences between studies in the usage of a filter question (see Sec. IV).

III. SURVEYS EXAMINED BY SCHULTZ (1978), AND FIDELL *et al.* (1991)

Schultz (1978) and Fidell *et al.* (1991) derived DNL and percentage highly annoyed (%HA) from a number of studies. If DNL and %HA satisfy minimal requirements, possibly after improvements, then a study examined in these publications is also included in the present synthesis. The minimal requirements concerning DNL and %HA and the evaluation of studies with respect to these requirements are discussed here with the aid of Table III.

Schultz (1978) and Fidell *et al.* (1991) gave a short description of the individual studies they examined and the way they derived DNL and %HA. The pages where the reader can find these descriptions are given in the first and second column of Table III. A description is lacking for one study (USA-082). The third column gives the page in Fields (1994a) where the reader can find a critical discussion of the study concerned. The fourth column of Table III indicates for which studies we used the original dataset in our synthesis. For these studies additional information is given in the next section.

We consider the following requirements concerning DNL and %HA to be minimal requirements:

- *Source specific:* DNL and %HA pertain to one and the same source of transportation noise (aircraft, road traffic, or railway);
- *General noise annoyance question:* %HA is directly derived from the responses to a question about the general noise annoyance from the source concerned. Thus it is not based on, e.g., an index constructed from multiple questions concerning specific disturbances or a ranking of sources by respondents;
- *Consistent cutoff:* %HA is derived with a cutoff point sufficiently close to 72 on a scale from 0 (no annoyance at all) to 100 (very high annoyance).

A. Source specific

The fifth and seventh columns of Table III indicate whether DNL and %HA were source specific or not. In one study (USA-102) neither DNL nor %HA pertained to a single transportation noise source; in two other studies DNL did not pertain to a single source (SWE-142 and USA-301); and in four more studies (AUS-093, CAN-121, DEN-075, and FRA-041) %HA did not pertain to a single transportation noise source. For this reason all but one of these studies are excluded from the present synthesis. CAN-121 was not excluded because we could derive %HA specifically for the source concerned (road traffic) on the basis of an annoyance question other than the one used by Schultz (1978). Thus six studies had to be excluded on the basis of this criterion.

B. General noise annoyance question

For nine studies in the syntheses (DEN-200, FRA-041, GER-034, SWE-021, UKD-008, UKD-024, USA-022, USA-032, and USA-044) %HA is not based on a question about general noise annoyance, but on an index constructed from multiple questions concerning among others specific disturbances, or it is based on a ranking by respondents (see Table III, eight column). There is no clear relation between such a "%HA" and %HA as defined here [or by Schultz (1978) and Fidell *et al.* (1991) themselves]. Therefore these studies had to be excluded from the present synthesis unless we were able to derive %HA from a general annoyance question. This was the case for four studies (UKD-024, USA-022, USA-032, and USA-044) for which we have the original data. Thus five studies had to be excluded on the basis of this criterion.

C. Consistent cutoff

Schultz (1978) chose, in our terminology, 72 on a scale from 0 (no annoyance) to 100 (highest annoyance) as the cutoff point above which respondents are counted as highly annoyed. Following Fidell *et al.* (1991), we adopted this convention. For the studies not already excluded on the basis of the above discussed criteria, we tried to determine %HA with a cutoff point as close to 72 as possible (see Table III). If this led to another cutoff than the cutoff used in the previous syntheses, this latter point is shown between parentheses. For five studies (AUS-014, AUS-093, FRA-019, JAP-065, and USA-250) with a cutoff point very different from 72 (60, 50, 50, 50, and between 50 and 60, respectively) we could not

TABLE III. For studies examined by Schultz (1978) and/or Fidell *et al.* (1991), represented by the code assigned to that study by Fields (1994b), the pages where they are described or discussed in three publications, an indication whether we used the original individual data, aspects of the DNL and percentage highly annoyed (%HA) that determine the quality of these measures, the cutoff above which persons were counted as highly annoyed, and the inclusion or exclusion of the studies. A point '.' means that an aspect is not rated because the study is excluded (on the basis of other aspects). Ratings for DNL and %HA used by Schultz (1978) and/or Fidell *et al.* (1991) are given between parentheses if they are different.

ID Fields (1991)	Page Schultz (1978)[a]	Page Fidell *et al.* (1991)[b]	Page Fields (1994c Appendix B)[c]	Original individual data used[d]	DNL source specific[e]	DNL without relations other studies[f]	%HA source specific[g]	%HA general[h]	%HA cutoff[i]	Dataset included[j]
AUL-210		222	76	+	+	+	+		72 (80)	+
AUS-014	392		–	.	+?	–	+	+	60	–
AUS-093	400		–	.	+?	–	–	+	50	–
BEL-122,137	401		76,–7	–	+	+	+	+ [daytime]	70	+
CAN-121	402		77	+	+	+	+(–)	+	72 (60)	+
CAN-168 read & ar		222	77	+	+	+	+	+	72 (60)	+
DEN-075	400		77	.	+	.(+)	–	+	.(67)	–(+)
DEN-300		228	77	.	+	.(–)	+	–	.(?)	–(+)
FRA-016	392		78	–	+	–	+	+	72 (75)	+
FRA-019	394		80	.	+	.(–)	+	+	.(50)	–
FRA-041	395		78	.	+	.(–)	–	–	.(?)	–(+)
FRA-063	398		78	–	+	–	+	+	72	+
GER-034	396		78	.	+	.(–)	+	–	.(?)	–(+)
JAP-065	398		–	.	+	.(+)	+?	+ [worst case]	50	–
SWE-021	394		81	–	+	.(–)	+	–	.(?)	–
SWE-035	397		78	–	+	–	+	+	67–75	+
SWE-142	394		–	–	–	–	+	+	67–75	+(–)
SWE-165		225	78	–	–	.(+)	+	+	.(67–75)	+
SWE-228		226	–	–	+	–	+	+	67–75	+
SWI-053 read & ar	396,–9		78,–9	–	+	–	+	+	73	+
UKD-008	391		79	.	+	.(–)	+	–	.(?)	–(+)
UKD-024	393		79	+	+	+(–)	+	+(–)	72(?)	+
UKD-071	399		–	+	+	+	+	+	72 (67)	+
UKD-116		225	–	+	+	+	+	+	72 (5)	+
USA–022,032,044	398		81	+	+	+(–)	+	+(–)	72 (?)	+(–)
USA-082	–	–	79	+	+	+	+	+	72 (60)	+
USA-102	399		79	.	–	+	–	+	.(60)	–(+)
USA-203		223	80	+	+	+	+	+	72 (60)	+
USA-204		224	80	–	+	+	+	+	63–70 (50–60)	+
USA-250		223	80	.	+	+	+	+	.(50–60)	–(+)
USA-301		228	80	.	–	+	+	+	.(50–60)	–(+)
USA-338		227	80	–	+	+	+	+	70	+

[a]The page where the description of the study in Schultz (1978) starts.
[b]The page where the description of the study in Fidell *et al.* (1991) starts.
[c]The page where the discussion of the study in Appendix B of Fields (1994a) starts.
[d]'+' means that the original individual data are used, '–' means we do not have the original dataset.
[e]'+' means that DNL pertains to noise from the source concerned, '–' means that also other sources contributed substantially to the noise.
[f]'+' means that DNL was calculated from the L_{Aeq}'s for the day and night or estimated on the basis data about L_{Aeq}'s for other periods or data about sound events. '–' means that DNL is estimated from one or more other metrics using relations established in other studies or rules of thumb to convert these metrics into DNL.
[g]'+' means that %HA is derived from responses to an annoyance question that refers to the source concerned, '–' means that the question used was not restricted to that source.
[h]'+' means that %HA is derived from response to a question about general annoyance from the source concerned, '–' means that an index constructed from multiple questions or a ranking by respondents is used.
[i]The cutoff point above which respondents are counted as highly annoyed.
[j]'+' means that a dataset is included, '–' means that it is excluded.

derive percentages with a cutoff point closer to 72. Because 72 is by convention the cutoff to be used for determining %HA, we excluded these five studies.

As mentioned above, Fidell *et al.* (1991) based their synthesis curve on 26 datasets, and Schultz (1978) examined eight additional "nonclustering" datasets and one study in his addendum which were excluded by them. After improvements we still had to exclude 8 of the 26 datasets that were included by Fidell *et al.* (1991) because they did not meet the minimal criteria discussed, but we could include four of the

TABLE IV. Derivation of DNL and %HA from the datasets available in the TNO-archive (see text).

Fields' code	DNL	%HA
AUL-210 CAN-168 FRA-239 NET-340 NOR-311	EFN	notice filter & responses for indoor and for outdoor situation
NOR-328	general transformation rule EFN	notice filter
NOR-366	general transformation rule EFN	notice filter
UKD-034	general transformation rule average PNdB, average log duration and N for the periods 7–19h, 19–22h, and 22–7h relation between LAmax and PNdB from this study and event pattern model	
UKD-238		
UKD-242	L_{Aeq}(7–19h), L_{Aeq}(19–23h), L_{Aeq}(23–7h) L_{Aeq} pattern model	notice filter
USA-022	average PNdB and N for the periods 6–21h and 21–6h per site and N for the three hour period for aggregated over sites relations between L_{Amax} and PNdB, and between duration and PNdB from this study. event pattern model and traffic intensity model	notice filter
USA-032	see USA-022	notice filter
USA-044	see USA-022	notice filter
USA-082		
USA-203	DNL based on measurements during one week only	
CAN-120		bipolar scale
CAN-121	L_{Aeq}(7–19h), L_{Aeq}(19–23h), L_{Aeq}(23–7h) L_{Aeq} pattern model	
CAN-168 FRA-092	L_{Aeq}(8–20h), L_{Aeq}(20–24h), L_{Aeq}(24–5h), L_{Aeq}(5–8h) staircase model	
FRA-239		
FRA-364	L_{Aeq}(6–22h), L_{Aeq}(22–6h), L_{Aeq}(8–20h), L_{Aeq}(20–22h) L_{Aeq}(6–7h)=L_{Aeq}(6–8h)	
GER-192	for about half of the sites: L_{Aeq}(6–22h), L_{Aeq}(22–6h), N per hour traffic intensity pattern model for the other sites: L_{Aeq}(6–22h), L_{Aeq}(22–6h) L_{Aeq} pattern model based on above sites	
GER-372	L_{Aeq}(6–22h) linear regression model based on sites in same city L_{Aeq} pattern model based on GER-192	
GER-373	L_{Aeq}(6–22h) linear regression model based on sites in same city	
NET-340		two all annoyance labels
NET-106		two all annoyance labels
NET-258		
NET-276	L_{Aeq}'s for variable periods L_{Aeq} pattern model based on one site some study	
NET-361	L_{den} L_{Aeq} pattern model based on other studies	
NET-362	L_{Aeq}(7–19h), L_{Aeq}(19–23h), L_{Aeq}(23–7h), N per hour traffic intensity pattern model	
SWI-173		responses for daytime and for night-time situation; bipolar with only endpoint labeled
UKD-071	L_{Aeq}(8–20h), L_{Aeq}(22–6h), L_{Aeq}(6–24h), L_{Amax}(24h) staircase model	
UKD-072	average of hourly NPL and σ for the periods 6–24h, 22:30–7:30h, and 24h staircase model	
UKD-157	L_{Aeq}(6–24) L_{Aeq} pattern model based on other study	

TABLE IV. (*Continued*)

Fields' code	DNL	%HA
UKD-238		
UKD-242	$L_{Aeq}(24h)$ L_{Aeq} pattern model based on other study	notice filter
GER-192	for about half of the sites: $L_{Aeq}(6-22h)$, $L_{Aeq}(22-6h)$, N per hour traffic intensity pattern model for the other sites: $L_{Aeq}(6-22h)$, $L_{Aeq}(22-6h)$ $L_{Aeq}(6-7h) = L_{Aeq}(6-22h)$	
NET-153	$L_{Aeq}(7-19h)$, $L_{Aeq}(19-23h)$, $L_{Aeq}(23-7h)$ $L_{Aeq}(22-23h) = L_{Aeq}(19-23h)$	notice filter & bipolar scale
NET-276	$L_{Aeq}(7-19h)$, $L_{Aeq}(19-23h)$, $L_{Aeq}(23-7h)$, N per hour traffic intensity pattern model	notice filter & indoor situation evaluated
NET-361	L_{den} general transformation rule based on NET-153	
SWE-365	$L_{Aeq}(24h)$, $N(6-18h)$, $N(18-22h)$, $N(22-6h)$ traffic intensity pattern model	two nil annoyance labels
UKD-116		notice filter

rune datasets that were previously excluded. Thus we included on the basis of the above discussed criteria 22 of the 35 datasets examined by Fidell *et al.* (1991) and Schultz (1978).

IV. ORIGINAL DATASETS INCLUDED IN THE PRESENT SYNTHESIS

In the last seven years TNO in Leiden has compiled an archive of original datasets from studies about annoyance caused by environmental noise. These studies concerned different modes of transportation (aircraft, road traffic, and railway) and were carried out in Europe, North America, and Australia. As far as possible a common set of variables is derived for all studies which includes, among others, noise exposure measures and annoyance measures. Much effort has been put into a the derivation of the variables from different studies. Studies are included in the archive if and only if DNL [or $L_{Aeq}(24h)$] and %HA can be derived in such a way that they satisfy the criteria presented in the section about DNL and percentage highly annoyed. This section describes some aspects of the derivation of DNL and %HA from the information in these datasets with the aid of Table IV.

The first column in Table IV pertains to the *derivation of* DNL. If DNL or $L_{Aeq}(7-22h)$ and $L_{Aeq}(22-7h)$ were available, then a cell in this column is empty. Otherwise it indicates from what data DNL was estimated (above the broken line) and how it was estimated (below the broken line). The following types of estimation have been carried out.

For four aircraft noise datasets (UKD-024, USA-022, USA-032, and USA-044) DNL has been estimated using average maximum perceived noise level (PNL), average duration, and number of overflights (N). First, average maximum PNL was converted into average maximum A-weighted sound level using relations between these quantities established in the survey concerned, or a very similar survey. Then sound exposure level (SEL) has been estimated from average maximum A-weighted sound level and average duration of events, using an *event pattern model*. This assumes a linear increase and a linear decrease at the same rate of the A-weighted sound level during an event.

For three datasets (road traffic: FRA-364; railway: GER-192; NET-153) $L_{Aeq}(7-22h)$ and $L_{Aeq}(22-7h)$ were obtained by combining L_{Aeq}'s possibly after equating a L_{Aeq} to a L_{Aeq} for a slightly different period. For a number of datasets (aircraft: USA-022, USA-032, USA-044; road traffic: GER-192, NET-362; railway: GER-192, NET-276, SWE-365) $L_{Aeq}(7-22h)$ and $L_{Aeq}(22-7h)$ have been estimated from available or estimated L_{Aeq}'s and information about traffic intensity as a function of the time of the day. In most cases the *traffic intensity models* used were site specific, i.e., they were based on traffic intensity data per site. In three cases (road traffic: FRA-092, UKD-071, and UKD-72) a *staircase model* of the pattern of L_{Aeq} as a function of the time of the day was fitted to available L_{Aeq}'s. This model assumed a decrease of L_{Aeq} in the evening and night until about 3 to 5 a.m. with constant steps from hour to hour and an increase with constant steps in the morning. Depending on available L_{Aeq}'s, the magnitudes of the downward steps and upward steps were either equated or estimated independently. Also, the point in the evening where the decrease started, the time and width of the minimum, and the point in the morning where the pattern leveled off, varied somewhat depending on available information with respect to the pattern. Not all details of the assumed pattern affected the estimation of the target L_{Aeq}'s. It was, e.g., not really necessary to specify the pattern during daytime.

For a number of studies (aircraft: UKD-242; road traffic: CAN-121, GER-192, NET-276, UKD-157, UKD-242; railway: NET-361) an L_{Aeq} *pattern model* was used to derive the differences between available L_{Aeq}'s and target L_{Aeq}'s. An L_{Aeq} pattern model specifies differences between L_{Aeq}'s for different time periods. Derivation of DNL from another metric using a rule of thumb or a transformation rule established

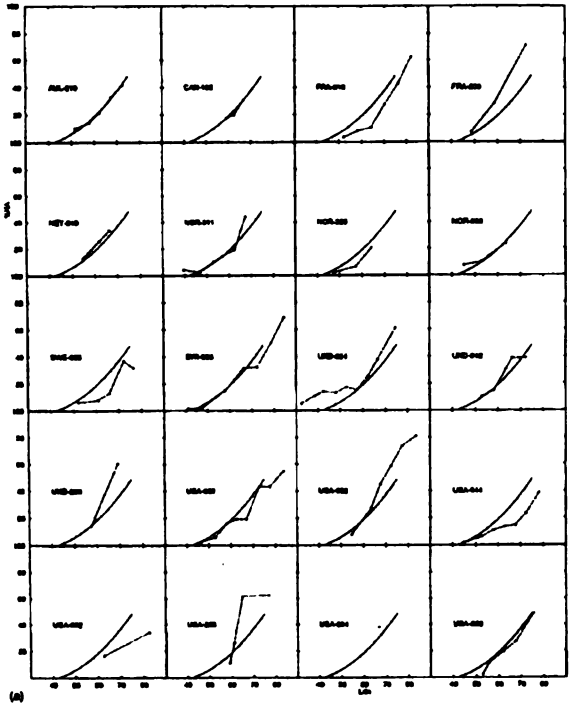

FIG. 1. Percentage highly annoyed persons (%HA) as a function of DNL for aircraft (a), road traffic (b), and railway noise (c). In addition to the curves from individual datasets, the synthesis curve for aircraft, road traffic, and railway noise, respectively, are shown.

in one or more other surveys is used for the following datasets: aircraft: NOR-311, NOR-328, NOR-366; road traffic: GER-372, GER-373; railway: NET-361.

The second column in Table IV pertains to the *derivation of %HA*. If the derivation of %HA could be carried out with the procedure described in Sec. II, then a cell in this column is empty. Otherwise the complications are indicated and are discussed below.

Verbal labels used in questionnaires may lead to violations of the "equal intervals" and "equal extremes" assumptions which underlie the derivation of %HA with different scales (see Sec. II). In general, violations are expected if labels deviate from a gradual transition from no annoyance to very high annoyance. Especially bothersome are bipolar scales with a neutral label for the middle category, scales with only the endpoints labeled and a positive label (e.g., "definitely satisfactory") instead of a no annoyance label at one end, and scales with at one end two categories whose labels express zero annoyance (e.g., "definitely not annoyed" and "not annoyed"). In order to adjust for the effect of these labels categories are combined. The categories obtained after the necessary adjustments are referred to as the effective categories.

The general rules applied for these adjustments are as follows. For bipolar scales all categories on the favourable side of the scale up to and including the neutral category are combined. For category scales with only the extremes labeled and one extreme category labeled favourably, this latter category is combined with the adjacent category. Finally,

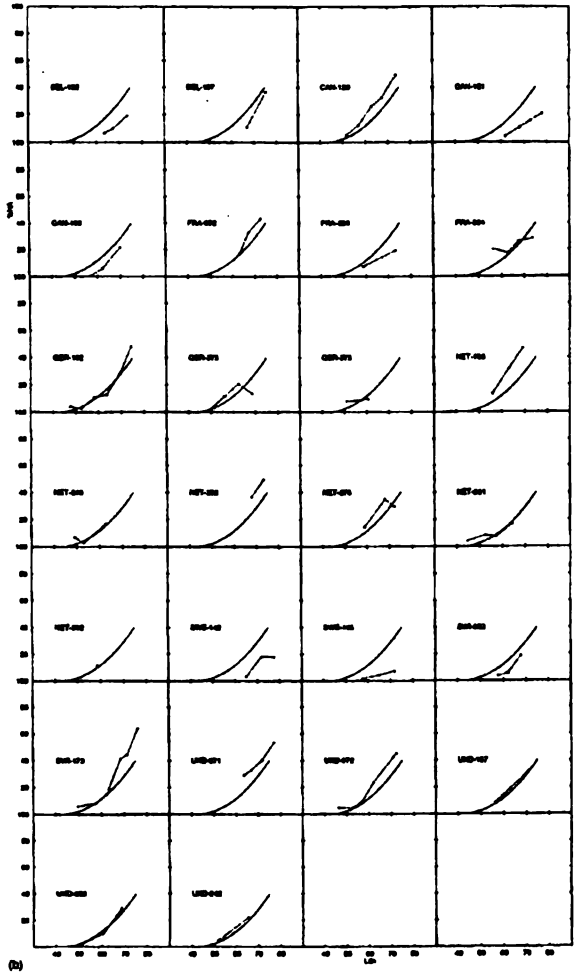

FIG. 1. (*Continued.*)

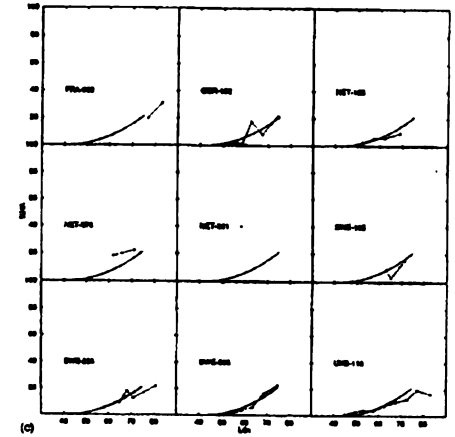

FIG. 1. (*Continued.*)

two categories with labels which both express no annoyance are combined.

In several surveys the noise annoyance question was preceded by a question about noticing the source or annoyance from the source, and respondents who did not (or seldom) notice the source or who were not annoyed skipped the (more detailed) annoyance question. We assigned the respondents who skipped the annoyance question on the basis of such a so-called filter question to the lowest category of the annoyance question. This procedure can be expected to affect %HA less than annoyance percentages obtained with a lower cutoff, because with a lower cutoff it becomes more likely that the respondents who skipped the main annoyance question would have chosen a response above the cutoff.

Some questionnaires do not contain a general annoyance question, but only questions regarding complementary parts of the situation in and around the house (e.g., questions with respect to the situation with the windows open and closed, or with respect to weekdays and weekends). If questions regarding "all" complementary situations were available, then they were combined. For some surveys only responses with respect to the daytime or the indoor situation were available.

V. EXPOSURE-RESPONSE RELATIONSHIPS

To establish curves for each dataset showing %HA as a function of DNL, DNL is divided into intervals of 5 dB. If for a dataset such an interval contains less than 100 cases, it is combined with the adjacent interval with the least observations. This step is repeated until every interval contains at least 100 cases. For each resulting interval the average DNL and %HA are determined and plotted. The curves are shown for each dataset separately (Fig. 1) and combined in one figure per mode of transportation (Fig. 2). Synthesis curves for aircraft, road traffic, and railway noise are determined in two ways: with a straight forward least squares regression analysis, and with a multilevel approach. The straight forward regression analysis is the conventional, well-known procedure. The curves determined through this approach are also shown in the Figs. 1 and 2, and they will be discussed first.

To determine the curves DNL is divided per mode of transportation into intervals of 5 dB. Then for each mode of transportation a quadratic ordinary least squares regression was carried out, weighting each point according to the number of observation on which it is based. Extreme exposure levels (<45 and >75 dB) were excluded from this analysis. It turned out that the three curves reached %HA=0 at circa DNL=42 dB. Therefore a new analysis was conducted in which the curves were forced through zero at 42 dB. Above 50 dB the (absolute) %HA difference between the curves forced through zero at 42 dB and the curves with a free intercept is smaller than 0.8 for aircraft, 1.5 for road traffic, and 0.3 for railway noise. The equations of the curves with zero annoyance at 42 dB(A) are:

Aircraft: $\%HA = 0.53(DNL-42) + 0.0285(DNL-42)^2$,
Road traffic: $\%HA = 0.03(DNL-42) + 0.0353(DNL-42)^2$,
Rail: $\%HA = 0.01(DNL-42) + 0.0193(DNL-42)^2$.

The relationship for aircraft noise has a substantial linear component while for road traffic and railway noise an equa-

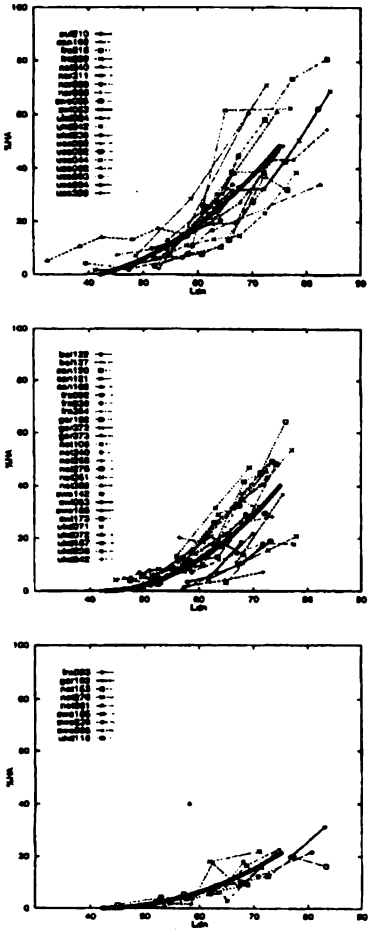

FIG. 2. The same curves as shown in Fig. 1, here combined in three subfigures for aircraft (top), road traffic (middle), and railway noise (bottom), respectively.

tion with only a quadratic term would also give an adequate description of the data.

Figure 3 shows the curves for the three modes of transportation fitted with the ordinary least squares regression procedure together with the data points. At a given exposure level aircraft noise causes the highest %HA, followed by road traffic and rail traffic, respectively.

Standard procedures for estimating confidence intervals around regression curves are based on the assumption that the cases have been drawn at random from a population. Actually, however, the cases in these analyses are not drawn at random, but can be thought of as having been drawn in clusters defined by the studies. If this study level in the sample is ignored and simple random sampling is assumed, then the width of the true confidence intervals is underestimated.

Therefore, curves were also fitted by a multilevel procedure which takes into account that the cases are selected in two stages: first the studies and then the cases within each study. In the multilevel model (Goldstein, 1995) studies are assumed to have a normally distributed effect on the parameters of the (quadratic) curves fitted. The parameters of the curves, and the mean and standard deviation of the distributions of these parameters were estimated using the software package MLn (Rasbash and Woodhouse, 1995). The curves and the confidence intervals found by this procedure are also shown in Fig. 3. The equations of the curves are:

$$\text{Aircraft:} \quad \%HA = -0.02(DNL-42)+0.0561(DNL-42)^2;$$
$$\text{Road traffic:} \quad \%HA = 0.24(DNL-42)+0.0277(DNL-42)^2;$$
$$\text{Rail:} \quad \%HA = 0.28(DNL-42)+0.0085(DNL-42)^2.$$

The curves fitted with the two different procedures are similar except for aircraft noise at high exposure levels. The curve for aircraft obtained with the multilevel procedure has a stronger quadratic component, and predicts at high exposure levels more annoyance than the other curve. The curve obtained with the multilevel approach may be preferred because this approach takes the structure of the data better into account. An important observation is that the confidence intervals are mutually exclusive at higher levels. This is a strong indication that the curves for the three modes of transportation are different.

Figure 1(a), (b), and (c) for air traffic, road traffic, and rail traffic, respectively, show a large variation between the curves from different studies for the same mode of transportation. In order to determine whether the variation between modes of transportation can be attributed to methodological or other differences, studies in which the same respondents evaluated more than one noise source were examined. Differences between modes of transportation found with these respondents cannot be attributed to study variables. The studies used in the comparison between aircraft and road traffic noise are CAN-168, UKD-238, FRA-239, NET-240, and UKD-242, and the studies used in the comparison between road traffic and railway noise are: GER-192, NET-276, and NET-361. Figure 4 shows the results.

Overall the road traffic curve in Fig. 4 lies below the aircraft curve and above the railway curve, indicating a systematic and substantial difference between these sources. Each data point contains at least 100 responses. Aircraft noise and railway noise could not be compared directly, because no studies treating both sources were available. Figure 4 supports the interpretation that the differences between modes of transportation found when analyzing all datasets are indeed related to the mode of transportation and not caused by differences between studies.

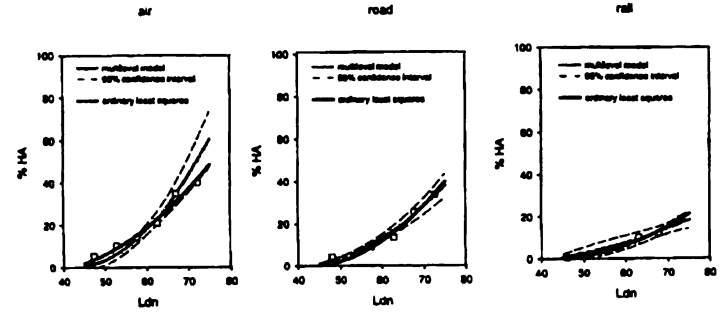

FIG. 3. Percentage highly annoyed persons (%HA) as a function of DNL. Two synthesis curves per mode of transportation, and the datapoints are shown. For the curves obtained with multilevel analysis the 95% confidence intervals are shown.

Variation between road traffic studies by type of road was also investigated. For the majority of road traffic studies we were able to distinguish three subclasses: local road traffic, expressway traffic and all other road traffic, mainly traffic on arterial and district roads. For the latter category it was determined whether the traffic was free flowing or interrupted, if possible. Sometimes this was coded as a variable in the dataset, in other cases we used maps presented in articles, reports, or readily available city maps. When there was no crossing with a same level road or regulated by traffic lights within 150 m, the traffic was assumed to be free flowing. If no specific information about the traffic type was available, the road traffic type was left "unspecified." Figure 5 shows the results for datasets with multiple road traffic types. Each data points represents at least 100 cases.

No substantial systematic difference can be found in Fig. 5, other than differences which can be explained by a difference in exposure level. Thus it is not likely that differences between road traffic studies in Fig. 1(b) are caused by a difference in road type between studies.

VI. DISCUSSION

The percentage highly annoyed persons (%HA) is zero below 40–45 dB, and increases at higher levels monotonically as a function of DNL. Different functions were found for aircraft, road traffic, and railway noise. The rate of increase is higher for aircraft noise than for road traffic noise, which in turn has a higher rate of increase than railway noise. The 95% confidence intervals around the different functions are mutually exclusive at higher exposure levels. Moreover, differences between sources were found using data for all studies combined and for only those studies in which respondents evaluated two sources. These outcomes justify the conclusion that the differences between sources cannot be explained by random factors or differences in study methodology. Consequently, above 40–45 dB the %HA at a given DNL depends on the mode of transportation that causes the noise.

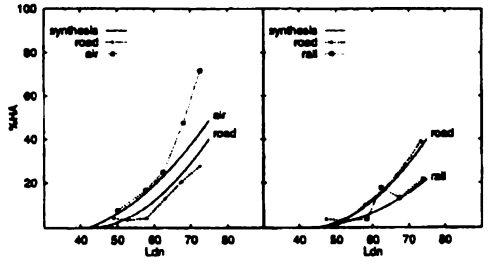

FIG. 4. Comparison of curves giving percentage highly annoyed persons (%HA) as a function of DNL. They are based on the responses of persons who evaluated both aircraft and road traffic noise (left), or both road traffic and railway noise (right).

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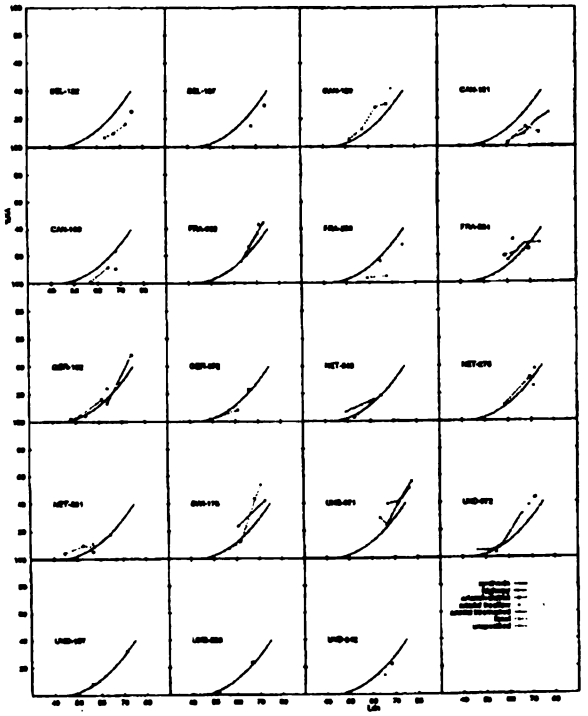

FIG. 5. Percentage of highly annoyed persons as a function of DNL. For dataset the results for different road types are shown.

There is a considerable variation between curves for %HA as a function of DNL for different studies and for the same mode of transportation. This variation is highest for road traffic noise and appears to be lowest for railway noise. The between-study variation for road traffic noise could not be explained by a difference between the types of roads causing the exposures in different studies. Although the classification of the type of road may have not always been accurate, we believe on the basis of the results in Fig. 5 that type of road is not an important variable for predicting the noise annoyance.

The differences between the curves for the three modes of transportation may be caused by acoustical as well as nonacoustical factors. The exposure of an individual at home to noise from a single source is complex and varies over time, and between places in and around the dwelling. A metric such as DNL summarizes this complex exposure of an individual by one number. Theoretically it is possible that no differences between sources would be found if this complex exposure was summarized in another way, by a metric which uses for example other weights for the time of day, or is more sensitive to quiet periods. It may be important that DNL is determined at the most exposed facade and therefore is not sensitive to differences between noise levels in and around the dwelling, notably indoor–outdoor differences and differences between the most and the least exposed side of a dwelling. In general, the latter differences, between sides of a dwelling, may be higher for road traffic than for aircraft noise. Consequently, a relatively quiet side for persons exposed to road traffic noise may cause annoyance to be lower

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while DNL at the most exposed facade is equal. In addition nonacoustical factors may contribute to the differences between sources. For example, fear of a crash may cause people to focus more on noise from aircraft than on other noise and, as a consequence, they may be more annoyed by aircraft noise.

VII. CONCLUSIONS

The synthesis curves presented in this paper can be used to obtain estimates of noise annoyance (%HA) on the basis of noise exposure (DNL at the most exposed facade). The curves apply to steady state situations. If DNL is used as a descriptor of the noise exposure, different curves have to be used for different modes of transportation. The curves presented can be used to establish noise limits, and they can be used to compare plans with respect to the noise impact on the community.

To treat different transportation sources equally with respect to the amount of noise annoyance tolerated, a *noise limit* in terms of DNL at het most exposed facade must be lower for aircraft noise than for road traffic noise, and the limit for road traffic must be lower than for railway noise. Which DNL values correspond to an equal %HA can be read from the curves presented in this paper.

The *noise impact* of alternative traffic policies or alternative realizations of an infrastructural project (extending an airport, building a new road or railway line) can be compared by calculating the noise exposures for the dwellings in the area concerned first. Then the curves presented in this paper can be used to estimate the expected number of highly annoyed persons in the area (after the changed situation has become the new steady state). By doing this for each alternative the noise impacts of the alternatives on the community can be compared.

ACKNOWLEDGMENTS

This publication depends on the research effort of many investigators whose surveys we included in our archive. We thank especially Dr. James M. Fields for providing us the datasets he already collected at NASA together with his valuable information on those datasets. Building of the data archive was and is still made possible through the financial support of the Netherlands Ministry of Housing, Spatial Planning, and the Environment. This ministry also supported the analyses and the present publication based on them.

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Exhibit E

Annoyance from Transportation Noise: Relationships with Exposure Metrics DNL and DENL and Their Confidence Intervals

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We present a model of the distribution of noise annoyance with the mean varying as a function of the noise exposure. Day–night level (DNL) and day–evening–night level (DENL) were used as noise descriptors. Because the entire annoyance distribution has been modeled, any annoyance measure that summarizes this distribution can be calculated from the model. We fitted the model to data from noise annoyance studies for aircraft, road traffic, and railways separately. Polynomial approximations of relationships implied by the model for the combinations of the following exposure and annoyance measures are presented: DNL or DENL, and percentage "highly annoyed" (cutoff at 72 on a scale of 0–100), percentage "annoyed" (cutoff at 50 on a scale of 0–100), or percentage (at least) "a little annoyed" (cutoff at 28 on a scale of 0–100). These approximations are very good, and they are easier to use for practical calculations than the model itself, because the model involves a normal distribution. Our results are based on the same data set that was used earlier to establish relationships between DNL and percentage highly annoyed. In this paper we provide better estimates of the confidence intervals due to the improved model of the relationship between annoyance and noise exposure. Moreover, relationships using descriptors other than DNL and percentage highly annoyed, which are presented here, have not been established earlier on the basis of a large dataset. *Key words*: day–evening–night level, day–night level, DENL, DNL, noise annoyance, noise pollution, transportation noise. *Environ Health Perspect* 109:409–416 (2001). [Online 29 March 2001] *http://ehpnet1.niehs.nih.gov/docs/2001/109p409-416miedema/abstract.html*

Lambert et al. (*1*) estimated that in the European Union (EU) approximately 77 million people (i.e., 22% of the total population of the EU in 1994) are exposed to a transportation noise level (L_{Aeq}) exceeding 65 dB during the day, which many countries consider to be unacceptable. In 1994, almost 170 million Europeans (49%) lived in "gray zones," areas that do not ensure acoustic comfort to residents (*1*). Depending on the country, road traffic noise annoyed between 20% and 25% of the population (*1*). Even though the uncertainty of these estimates is very large, there is no doubt about the high prevalence of noise annoyance in the EU.

A recent survey in Muscat City, Oman, illustrates that noise and noise annoyance are not confined to the industrialized societies, but are quickly increasing in cities in the developing countries (*2*). The length of the paved roads in Muscat City increased from ≤ 50 km in 1975 to 156 km in the old part of the city and 1,213 km in the entire city in 1995. This explains the finding that in 1995 lack of quietness caused the highest dissatisfaction in a sample of 452 inhabitants. It was higher than the dissatisfaction with the 12 other aspects of the environment that were rated, such as public facilities and safety.

These figures illustrate that noise annoyance is widespread in the industrialized countries, as well as in urban areas in the developing countries. The growing transportation network with increasing traffic densities is a primary cause of the high prevalence of noise annoyance.

For making policy to control environmental noise, it is important to have a set of relationships that show how annoyance levels are associated with given noise exposure levels. Many studies have been conducted to establish such relationships. However, doubt regarding the predictability of noise annoyance has impeded the acceptance of the exposure–response relationships that have been proposed.

One cause of this doubt is that the studies show a large variation in individual annoyance reactions to the same noise exposure level. The other cause of doubt regarding the predictability of noise annoyance is that attempts to integrate the results from different studies (*3–5*) show that there is a large variation in the relationships found in different studies. The large individual variation and the large study variation suggest that it is impossible to predict annoyance with sufficient accuracy.

Indeed, the annoyance response of a particular individual or a group of individuals can be predicted on the basis of the exposure only with a large amount of uncertainty. This uncertainty can be described by the prediction interval for individuals or groups around the exposure–response curves. However, in most cases the uncertainty regarding individual or group reactions is not what matters for noise policy. Most policy is made with a view to the overall reaction to exposures in a population. This means that it is not the uncertainty with respect to the prediction of an individual or group reaction that is important, but it is the uncertainty regarding the exact relationship between exposure and response in the population. The accuracy of the estimation of this relationship is described by the confidence interval around the curve. If properly established, the confidence interval takes into account the variation between individuals as well as the variation between studies.

The distinction between the types of uncertainty (regarding an individual or group reaction or regarding the location of the curve) and their relevance to policy making is as important as it is subtle. In this paper we present a type of exposure–response curve that was established earlier (*3–5*) as well as curves with other descriptors of the exposure and the annoyance, together with the confidence intervals of these curves.

Miedema and Vos (*3*) presented synthesis curves for aircraft, road traffic, and railway noise. An attempt was made to find the 95% confidence intervals around the exposure–response curves, taking into account the variation between individuals and studies. These curves were based on all studies examined by Schultz (*3*) and Fidell et al. (*4*) for which day–night level (DNL) of noise and percentage of "highly annoyed" persons (%HA) meeting certain minimal requirements could be derived, augmented by a number of additional studies. Consequently, that synthesis was more comprehensive than the previous ones. Moreover, the kind of errors and inaccuracies found in the previous syntheses were avoided (*6*).

Here we improve upon the method used to establish the confidence intervals. We analyzed the same data, but the model of the relationship between exposure and annoyance is more sophisticated and better suited for the data. Using the more appropriate model gives the relationships and their confidence intervals a firmer basis. The resulting relationships and their 95% confidence intervals do not differ much from the ones published previously (*3*). The confidence intervals indicate that, even though there is considerable variation between individuals and between studies, the uncertainty regarding the location of the

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relationships between noise exposure and annoyance is rather limited.

In the approach taken in this paper, the entire distribution of annoyance reactions is modeled as a function of the noise exposure. Consequently, any annoyance measure that summarizes this distribution (i.e., %HA or another measure) can be calculated as a function of the exposure level. In addition to the relationships between DNL and annoyance, relationships that use another noise metric, day–evening–night level (DENL) of noise, are presented. DENL has been proposed as the noise exposure metric for the European Union (*7*). This is the first analysis of relationships using descriptors other than DNL and %HA, based on a large data set.

Noise Metrics and Annoyance Measures

Previous synthesis studies used DNL as the descriptor of noise exposure. This noise descriptor is defined in terms of the L_{Aeq} (average levels) during daytime and nighttime, and applies a 10-dB penalty to noise in the night:

$$\mathrm{DNL} = 10 \log[(15/24) \times 10^{LD/10} + (9/24) \times 10^{(LN+10)/10}]$$

Here *LD* and *LN* are the long-term L_{Aeq} as defined by the International Standards Organization (*8*) for the day 0700–2200 hr and the night 2200–0700 hr, respectively. DNL is used in the United States.

A noise metric related to DNL is DENL. It is defined in terms of the average levels during daytime, evening, and nighttime, and applies a 5-dB penalty to noise in the evening and a 10-dB penalty to noise in the night:

$$\mathrm{DENL} = 10 \log[(12/24) \times 10^{LD/10} + (4/24) \times 10^{(LE+5)/10} + (8/24) \times 10^{(LN+10)/10}]$$

Here *LD*, *LE*, and *LN* are the A-weighted long-term L_{Aeq} (*8*) for the day (0700–1900 hr), evening (1900–2300 hr), and night (2300–0700 hr) determined over the year at the most exposed facade. DENL has been proposed as the new uniform noise metric for the European Union (*7*).

The use of DNL or DENL is supported by a recent study that investigated which noise metrics best predict annoyance from aircraft noise (*9*). The authors concluded that the outcome of their analyses of available data sets supports the use of metrics based on L_{Aeq} and the application of a 10-dB penalty to nighttime noise. The available data were not a suitable basis for a conclusion regarding a penalty for noise in the evening. Results are presented here for both DNL (used in previous synthesis studies and being used in the United States) and DENL (new metric for the European Union) because both measures are relevant.

Annoyance questions in different studies do not use the same number of response categories. Some questions have only 3 response categories, whereas others use as many as 11 categories. The translation of such scales into comparable annoyance measures for different studies is not trivial. Here all sets of response categories were translated into a scale from 0 to 100. The translation is based on the assumption that a set of annoyance categories divides the range from 0 to 100 in equally spaced intervals. The general rule used to determine the position of a category boundary on a scale from 0 to 100 is $\mathrm{score}_{\mathrm{boundary}, i} = 100 i/m$ (Table 1). Here *i* is the rank number of the category boundary, starting with 0 for the lower boundary of the lowest annoyance category, and *m* is the number of categories.

The distribution of the annoyance scores at a given noise exposure level can be summarized in various ways. Often a cutoff point is chosen on the scale, and the percentage of the responses exceeding the cutoff is reported (*3–5*). If the cutoff is 72 on a 0–100 scale, then the result is called the percentage of highly annoyed persons (%HA); with a cutoff at 50 it is the percentage "annoyed" (%A), and with a cutoff at 28 it is the percentage "(at least) a little annoyed" (%LA). An alternative to these types of measures is the average annoyance score.

Data

In the last 7 years, TNO in Leiden, The Netherlands, has compiled an archive of original data sets from studies on annoyance caused by environmental noise. These studies concerned different modes of transportation (aircraft, road traffic, and railway) and were carried out in Europe, North America, and Australia. As far as possible, a common set of variables is derived for all studies which includes, among others, noise exposure measures and annoyance measures. Table 2 gives an overview of the studies for which it was possible to derive DNL and %HA in such a way that they satisfy established criteria (*5*). Extreme exposure levels (DNL < 45 or > 75 dB) were excluded from the analyses because there is no practical need for information concerning the annoyance at these extreme levels, and the risk of unreliable data is high at these extremes. (The risk of unreliable noise data is high at very low levels, whereas the risk of selection of "survivors" is high at very high levels). The derivation of DNL and %HA has been discussed elsewhere (*5*). Here that report is supplemented with a discussion of the derivation of the additional measures that are used in this paper.

We also use DENL as a descriptor of the noise exposure, as a possible alternative for DNL. For most studies in Table 2 the L_{Aeq}s that are needed for calculating DENL could be derived in the same way as the L_{Aeq}s that are needed for calculating DNL (*5*). However, DNL was given or estimated directly for various studies, indicated in Table 2, and no information regarding the time pattern of the L_{Aeq} was available for these studies. For these studies DENL is estimated from DNL on the basis of the general rules that are derived in the Appendix. An exception to these rules was made for three airports in the Australian Five Airport Survey (AUL-210) because some information was available, in particular regarding the existence of a nighttime curfew. For Sydney and Adelaide, such a curfew existed so that the hourly L_{Aeq} was expected to drop sharply after 2200 hr. Consequently, the difference, DENL – DNL, was expected to be larger than for most other airports (~ 0.6 dB) but still smaller than the value obtained when the level drops to zero between 2200 and 2300 hr (1.56 dB; Appendix). Thus, a better rule for these airports is DENL = DNL + 1.2. For Melbourne the time pattern resembled that of road traffic more than the usual time pattern of aircraft noise, so that the difference, DENL – DNL, was expected to be smaller than for most other airports (~ 0.6 dB), but still larger than for road traffic (~ 0.2 dB; Appendix). Thus, a better rule in this case is DENL = DNL + 0.3.

Here we model the distribution of annoyance responses as a function of the noise exposure. The input needed for estimating the parameters of the annoyance distribution is either the individual annoyance responses combined with the individual exposure levels, or the distribution of the annoyance responses per noise exposure class. This information was available (*5*) for most studies in Table 2. For some studies, the distribution of the response over the original annoyance categories was not known, but only %HA (and the percentage not highly annoyed). Because the more detailed distribution was not available for these studies, the distributions of responses over the two categories (not highly annoyed, highly annoyed) were used as input.

Table 1. Boundary quantifications for different annoyance scales.

No. of effective categories	Boundary quantifications
3	0-33-67-100
4	0-25-50-75-100
5	0-20-40-60-80-100
6	0-17-33-50-67-83-100
7	0-14-29-43-57-72-86-100
10	0-10-20-_-80-90-100
11	0-9-18-_-82-91-100

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We applied a specific procedure to the distribution of annoyance responses if the annoyance question was preceded by a "filter" question (e.g., Do you hear the noise from road traffic? never, sometimes, often, always) on the basis of which the annoyance question was skipped for some respondents (e.g., those who answered "never"). The respondents who skipped the annoyance question can be assumed to have low annoyance. The present analyses are more sensitive to the form of the entire distribution than the previous procedure (*5*), where only the relationship of %HA with the noise exposure was modeled. For establishing that relationship, it was sufficient to assume that respondents who skipped the annoyance question were not highly annoyed (this could technically be done by assigning them to the lowest annoyance category). Here, because of the uncertainty regarding their exact annoyance level, the two lowest annoyance categories were combined if a filter was used, and the respondents who skipped the annoyance question were assigned to this category. This minimized the risk that annoyance was underestimated due to the use of a filter question.

Table 2. Data sets used to establish the relationships between noise exposure and annoyance.

Fields' code (*8*)	Name of survey (year)	Determination of DENL
Aircraft		
AUL-210	Australian Five Airport Survey (1980)	
	Richmond & Perth	•
	Sydney & Adelaide	DNL + 1.2
	Melbourne	DNL + 0.3
CAN-188	Canadian National Community Noise Survey (1979)	•
FRA-018	French Four-Airport Noise Study (1965)	•
FRA-239	French Combined Aircraft/Road Traffic Survey (1984)	
NET-240	Schiphol Combined Aircraft/Road Traffic Survey (1984)	
NOR-311	Oslo Airport Survey (1989)	•
NOR-328	Bodo Military Aircraft Exercise Study (1991–1992)	•
NOR-368	Vaernes Military Aircraft Exercise Study (1990–1991)	•
SWE-035	Scandinavian Nine-Airport Noise Study (1969, 1970, 1971, 1972, 1974, 1978)	•
SWI-053	Swiss Three-City Noise Survey (1971)	•
UKD-024	Heathrow Aircraft Noise Survey (1967)	
UKD-242	Heathrow Combined Aircraft/Road Traffic Survey (1982)	
UKD-238	Glasgow Combined Aircraft/Road Traffic Survey (1984)	
USA-022	U.S. Four-Airport Survey (phase I of Tracor Survey) (1967)	
USA-032	U.S. Three-Airport Survey (phase II of Tracor Survey) (1969)	
USA-044	U.S. Small City Airports (Small City Tracor Survey) (1970)	
USA-082	LAX Airport Noise Study (1973)	•
USA-203	Burbank Aircraft Noise Change Study (1979)	•
USA-204	John Wayne Airport Operation Study (1981)	•
USA-338	U.S.A. 7-Air Force Base Study (1981)	•
Road traffic		
BEL-122	Antwerp Traffic Noise Survey (1975)	•
BEL-137	Brussels Traffic Noise Survey (1976)	•
CAN-120	Western Ontario University Traffic Noise Survey (1975)	
CAN-121	Southern Ontario Community Survey (1975/1976)	•
CAN-198	Canadian National Community Noise Survey (1979)	
FRA-082	French Ten-City Traffic	
NET-278	Netherlands Tram and Road Traffic Noise Survey (1993)	
NET-361	Netherlands Environmental Pollution Annoyance Survey (1983)	•
NET-362	Arnhem Road Traffic Study (1984)	•
SWE-142	Stockholm, Visby, Gothenburg Traffic Noise Study (1976)	•
SWE-165	Gothenburg Tramway Noise Survey (1976)	
SWI-053	Swiss Three-City Noise Survey (1971)	
SWI-173	Zurich Time-of-Day Survey (1978)	
UKD-071	B.R.S. London Traffic Noise Survey (1972)	
UKD-072	English Road Traffic Survey (1972)	
UKD-157	London Area Panel Survey (1977/1978)	
UKD-242	Heathrow Combined Aircraft/Road Traffic Survey (1982)	
UKD-238	Glasgow Combined Aircraft/Road Traffic Survey (1984)	
Railway		
FRA-063	Paris Area Railway Noise Survey (1972)	•
GER-192	German Road/Railway Noise Comparison Study (1978/1981)	
NET-153	Netherlands Railway Noise Survey (1977)	
NET-278	Netherlands Tram and Road Traffic Noise Survey (1993)	
NET-361	Netherlands Environmental Pollution Annoyance Survey (1983)	NA
SWE-165	Gothenburg Tramway Noise Survey (1976)	•
SWE-228	Swedish Railway Study (1978–1980)	•
SWE-365	Swedish 15-site Railway Study (1992–1993)	
UKD-116	British National Railway Noise Survey (1975/1976)	

Data sets as in Miedema and Vos (*5*), except for NET-361, which was not used here (NA) because the number of cases was too small for the analyses in this paper; some minor corrections have been applied (*5*). For each data set, it is indicated how DENL is established. If this was done directly from the basic L_{Aeq} data, there is a blank in the determination column. *Indicates that the rules from the Appendix have been used. For three airports in AUL-210, the specific rules used are given (see text).

Exposure–Response Model

Basic model. The noise annoyance of an individual on a scale from 0 to 100 is denoted by A^*. Instead of observing A^* precisely, we only know the interval in which A^* comes on the scale for an individual. The locations of the boundaries of the intervals depend on the set of annoyance response categories used in a study.

On the basis of Miedema (*10*), where a linear relationship between DNL and A^* was found, A^* is assumed to be the sum of two components—namely, a component that is a linear function of DNL (or DENL) and a random component. Thus:

$$A^* = \beta_0 + \beta_1 \mathrm{DNL} + \varepsilon^* \qquad [1]$$

Here β_0 is the intercept, β_1 is the slope coefficient of DNL, and ε^* is the random component. The random component, ε^*, and hence A^*, is assumed to have a censored normal distribution. {A random variable *X* with bounded support $[\tau_L, \tau_R]$ has a censored normal distribution with parameters μ, σ, τ_L, and τ_R (the left and right censoring points) if its density equals $\phi[(x-\mu)/\sigma]$ for $x \in]\tau_L, \tau_R[$ and if at the censoring points $P(X = \tau_L) = \Phi[(\tau_L - \mu)/\sigma]$ and $P(X = \tau_R) = 1 - \Phi[(\tau_R - \mu)/\sigma]$. $\Phi(x)$ represents the cumulative standard normal distribution and $\phi(x)$ the standard normal density.} This means that there is a normally distributed variable *A* such that A^* equals *A* if $A \in [0,100]$, $A^* = 0$ if $A < 0$, and $A^* = 100$ if $A > 100$. The reason for assuming a censored normal distribution is as elaborated below.

A^* has values in the interval [0,100] so that its distribution has bounded support. The dispersion of A^* varies with the noise exposure: for low DNL levels (just above 45 dB) and high levels of DNL (just below 75 dB), the annoyance varies less among people than at intermediate values of DNL. A distribution that has both characteristics (bounded support on [0,100] and a variation related to DNL as described) is a censored normal distribution with the mean increasing as a function of DNL. Therefore the distribution of ε^*, and hence A^*, is assumed to be censored normal.

Instead of considering A^*, it is more convenient to model the corresponding, normally distributed variable A. Then the model is

$$A = \beta_0 + \beta_1 \mathrm{DNL} + \varepsilon. \qquad [2]$$

where ε is normally distributed with zero mean and constant variance σ^2, that is, $\varepsilon \sim N(0, \sigma^2)$. The parameters of Equation 2 can be estimated with grouped regression analysis (*11*) if only the interval in which A comes is observed.

A common type of measure of annoyance is the percentage of people whose annoyance exceeds a certain annoyance level C. This is the main descriptor of the annoyance distribution of interest. The probability, p_C(DNL), that someone with exposure DNL has an annoyance level that exceeds C is

$$\begin{aligned} p_C(\mathrm{DNL}) &= Prob\,(A \geq C) \\ &= Prob\,(\beta_0 + \beta_1 \mathrm{DNL} + \varepsilon \geq C) \\ &= Prob\,(\varepsilon \geq C - \beta_0 - \beta_1 \mathrm{DNL}) \\ &= 1 - \Phi\,[(C - \beta_0 - \beta_1 \mathrm{DNL})/\sigma], \end{aligned} \quad [3]$$

where Φ represents the cumulative standard normal distribution. [The standard normal distribution $\Phi(x)$ equals $(2\pi)^{-1/2} \int \exp(-0.5 \times t^2)\, dt$, with integration over the interval minus infinity to x.]

The annoyance distribution can be fully described by varying C and calculating p_C(DNL) for each C. Given estimates b_0, b_1 of the intercept β_0 and the slope β_1, and estimate s of the standard error σ, respectively, then

$$\hat{p}_C(DNL) = 1 - \Phi\left(\frac{C - b_0 - b_1 DNL}{s}\right)$$

is an estimate of p_C(DNL). Then $100 \times \hat{p}_C$(DNL) is an estimate of the percentage of persons with noise exposure DNL whose annoyance exceeds C. In the "Results" section, results will be presented for three different values for C: 28 (little annoyed), 50 (annoyed), and 72 (highly annoyed). In addition, the estimates of the parameters will be presented so that the percentage of persons with a certain DNL whose annoyance exceeds C can be calculated for any C.

Extended model. In standard regression models it is assumed that individuals have been drawn at random from a population and that the random components, ε, for the individuals are independent. However, the individuals in the present multistudy data set are not drawn at random, but can be thought of as having been drawn in clusters defined by the studies. If there is a study effect and the study level in the sample is ignored, then estimates of standard errors are biased (too low). Underestimated standard errors result in too-narrow confidence intervals. The underestimation depends on the size of the study effect. Because there is a large study effect in noise annoyance investigations, it is important to take this aspect of the data set into account. An accepted method of incorporating study effects is formulating a multilevel model (*12*). A multilevel version of models such as Equation 2, of which the parameters can be estimated by grouped regression, has been studied by Keen and Engel (*13*).

Including a study effect on the intercept of the relationship specified in Equation 2 gives (using individual index i and study index j)

$$A_{ij} = \beta_0 + \beta_1 DNL_{ij} + u_{0j} + \varepsilon_{ij}. \quad [4]$$

where u_{0j} is a random study factor, normally distributed with zero mean and variance σ_δ^2. According to this model the relation between DNL and annoyance can have a different intercept in each study. The average intercept is equal to β_0. The total random component in Equation 4 is equal to $u_{0j} + \varepsilon_{ij}$. This means that the observations within one study are not independent.

Using Equation 4, the probability that a randomly selected person from a randomly selected study, with exposure level DNL, has an annoyance level that exceeds C [i.e., p_C(DNL)], can be estimated as follows.

The probability conditional on the random study factor u_0 is

$$\begin{aligned} p_C(\mathrm{DNL}|u_0) &= Prob(A \geq C|u_0) \\ &= Prob(\varepsilon \geq C - \beta_0 - \beta_1 \mathrm{DNL} - u_0|u_0). \end{aligned}$$

Using this and the assumption that u_0 is normally distributed with mean zero and variance σ_δ^2, the following result can be obtained:

$$\begin{aligned} p_C(DNL) &= Prob\left(\beta_0 + \beta_1 DNL + u_{0j} + \varepsilon \geq C\right) \\ &= 1 - \Phi\left(\frac{C - \beta_0 - \beta_1 DNL}{\sqrt{\sigma^2 + \sigma_\delta^2}}\right) \end{aligned} \quad [5]$$

The term $\sigma^2 + \sigma_\delta^2$ in Equation 5 has the same role as σ^2 in Equation 3.

To estimate the probability that the annoyance level of a randomly selected person from a randomly selected study exceeds C, the four parameters β_0, β_1, σ_δ^2, and σ^2 must be estimated. Standard grouped regression analysis could not be used because this assumes independence of the random components. We used SAS PROC NLMIXED (SAS version 8, SAS Institute, Cary, NC, USA) to obtain the estimates, because with this procedure the study effect could be properly taken into account.

Given the estimates b_0, b_1, s_δ^2, and s^2 of β_0, β_1, σ_δ^2 and σ^2, respectively, the expected percentage of persons with noise exposure DNL whose annoyance exceeds C can be estimated as follows:

$$100 \times \hat{p}_C(DNL) = 100\left[1 - \Phi\left(\frac{C - b_0 - b_1 DNL}{\sqrt{s^2 + s_\delta^2}}\right)\right] \quad [6]$$

Confidence intervals. This subsection explains how the confidence intervals are calculated. The reader who is not mathematically trained may want to skip this subsection.

Let x be the transpose of the vector $(1, \mathrm{DNL})$ [i.e., $(1, \mathrm{DNL})^t$] with DNL a certain noise level. Let Σ_β denote the covariance matrix of the coefficients β_0 and β_1. Furthermore, b is the vector of estimates $(b_0, b_1)^t$. Then the 95% lower and upper confidence limits of the expected annoyance at exposure level DNL are

$$C_{L,U} = x'b \pm 1.96\sqrt{(x'S_\beta x)} \quad [7]$$

The confidence limits for p_C(DNL) are

$$1 - \Phi\left(\frac{C - C_{L,U}}{\sqrt{s^2 + s_\delta^2}}\right).$$

where s is an estimate of σ, s_δ is an estimate of σ_δ, and $C_{L,U}$ is given by Equation 7.

Results

The Model in Equation 4 was fitted separately for aircraft, road traffic, and railways because earlier analyses demonstrated significant differences between the relationships for these types of sources (*5*). Figure 1 (for DNL) and Figure 2 (for DENL) show the percentage of persons who are (at least) a little annoyed (annoyance ≥ 28), annoyed (annoyance ≥ 50), and highly annoyed (annoyance ≥ 72). In addition to the curves, the corresponding confidence intervals are also shown. The estimates of the coefficients β_0, β_1, σ_δ^2, and σ^2 for aircraft, road traffic, and railways are presented in Table 3 (for DNL) and Table 4 (for DENL) with their estimated standard errors and significance levels. Comparing the estimates of σ_δ^2 and σ^2 shows that there is a significant between-study variation for aircraft and road traffic, but the within-study variation is much larger. The order of magnitude of the within-study variation, and hence of the total variation, is equal for aircraft, road traffic, and railways.

The obtained curves can be approximated accurately with third-order polynomials using source-independent exposure values for zero %LA (namely, 32 dB), %A (namely, 37 dB), and for %HA (namely, 42 dB). Approximations for DNL are presented in Table 5.

Figures 3 (DNL) and 4 (DENL) show that the approximations are almost equal to the estimated curves. Curves for other annoyance cutoff points, C, can be obtained by substituting the chosen C and the estimates of the coefficients (Tables 3 and 4) in Equation 6.

An alternative to measures such as %LA, %A, and %HA is the mean annoyance. For establishing the mean annoyance as a function of DNL or DENL, it is important to note that the estimated annoyance distribution is non-zero outside the interval [0,100], whereas the actual annoyance scores are restricted to that interval. Consequently, it is not the mean of the estimated normal annoyance distribution, but the mean of the corresponding censored normal distribution, that is an estimate of the mean annoyance observed with a scale from 0 to 100.

Discussion and Conclusion

We presented a model of the distribution of noise annoyance with the mean varying as a function of the noise exposure: DNL and DENL were used as noise descriptors.

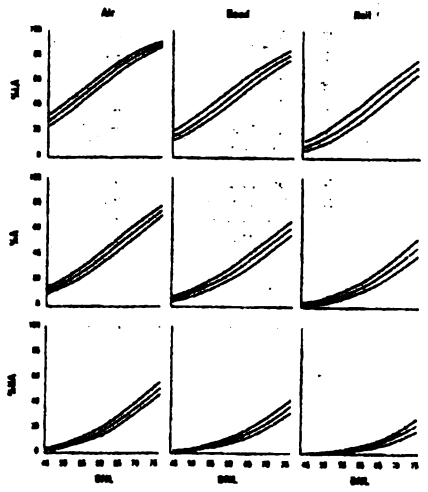

Figure 1. The %LA (top row), %A (middle row), and %HA (bottom row) for aircraft, road traffic, and railways as a function of DNL, together with 95% confidence intervals. The curves were found by fitting Equation 4 to the data from field surveys (see Table 2). The estimates of the parameters are given in Table 3.

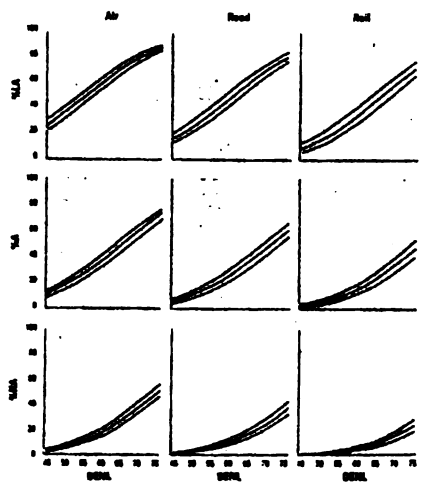

Figure 2. The %LA (top row), %A (middle row), and %HA (bottom row) for aircraft, road traffic, and railways as a function of DENL, together with the 95% confidence intervals. The curves were found by fitting Equation 4 to the data from field surveys (see Table 2). The estimates of the parameters are given in Table 4.

Table 3. The estimated coefficients of Equation 5 using DNL as noise exposure metric for aircraft, road traffic, and railways separately.

Parameter	Estimate	SE	p-Value
Aircraft (27,081 observations; 19 studies)			
β_0	−88.67	3.30	< 0.0001
β_1	2.16	0.0408	< 0.0001
σ_δ^2	81.05	28.93	0.0075
σ^2	1165.90	28.11	< 0.0001
Road traffic (18,172 observations; 28 studies)			
β_0	−105.72	3.89	< 0.0001
β_1	2.21	0.0473	< 0.0001
σ_δ^2	150.32	42.93	0.0018
σ^2	1198.08	18.65	< 0.0001
Railways (7,832 observations; 8 studies)			
β_0	−107.46	6.18	< 0.0001
β_1	2.06	0.0819	< 0.0001
σ_δ^2	51.01	28.99	0.0998
σ^2	1943.43	44.32	< 0.0001

Table 4. The estimated coefficients of Equation 5 using DENL as noise exposure metric for aircraft, road traffic, and railways separately.

Parameter	Estimate	SE	p-Value
Aircraft (27,081 observations; 19 studies)			
β_0	−91.42	3.30	< 0.0001
β_1	2.17	0.0407	< 0.0001
σ_δ^2	77.84	25.83	0.0076
σ^2	1167.11	28.13	< 0.0001
Road traffic (18,172 observations; 28 studies)			
β_0	−108.97	3.91	< 0.0001
β_1	2.22	0.0476	< 0.0001
σ_δ^2	150.54	42.98	0.0018
σ^2	1150.71	18.66	< 0.0001
Railways (7,832 observations; 8 studies)			
β_0	−110.09	6.33	< 0.0001
β_1	2.10	0.0840	< 0.0001
σ_δ^2	53.86	28.95	0.1013
σ^2	1078.73	47.21	< 0.0001

Because the entire annoyance distribution has been modeled, any annoyance measure that summarizes this distribution can be calculated from the model. The model has been fitted to data from noise annoyance studies for aircraft, road traffic, and railways separately. Polynomial approximations of relationships implied by the model for combinations of exposure and annoyance measures were presented. These approximations are easier to use for practical calculations than the model itself because the model involves a normal distribution.

The present results are based on the same data set that was previously used to establish relationships between DNL and %HA (*5*). In this paper we provide better estimates of the confidence intervals due to the improved model of the relationship between annoyance and noise exposure. Moreover, relationships using descriptors other than DNL and %HA, which are presented here, have not been established earlier on the basis of a large data set. The predictability of the annoyance of the general population exposed to a certain noise level (DNL or DENL) is quantified by the width of the confidence interval at that noise level for the noise and annoyance measure concerned.

The exposure–response functions and their curves presented here are only to be used for aircraft, road traffic, and railway noise. The curves are not necessarily valid for specific sources such as helicopters, low-flying military aircraft, train sounding noise, shipping noise, or aircraft noise on the ground. The curves were derived for adults on the basis of surveys distributed over countries as shown in Table 2. On the basis of inspection of the curves presented earlier (*5*), we hypothesize that there are no important differences between countries in the reaction of the population to similar noise exposures, but this needs to be investigated further.

The validity of the presented curves depends to a large extent on the validity of the data used. The model of annoyance as a function of noise exposure (described by DNL or DENL) was fitted to the data from a large set of field studies in which noise exposure and noise annoyance were determined. For most other environmental pollutants, the situation is less favorable because only data from animal studies are available, which must be extrapolated to humans. This extrapolation involves strong assumptions regarding the relation between effects in animals and effects in humans and strong assumptions regarding the relation between effects of high exposures in a relatively short time interval in the laboratory and effects of long-term low exposures in real life. Such assumptions were not necessary here because noise annoyance was studied extensively, directly with humans in the relevant exposure situations. There are few environmental pollutants, if any, for which there is such an extensive set of valid data for deriving exposure–response relationships or thresholds.

The noise annoyance curves that have been found have rather narrow confidence intervals. This means that the location of these curves in the population is known rather accurately. Nevertheless, substantial deviations from the predicted distribution of annoyance responses for limited groups at individual sites must be expected because random factors, individual and local circumstances, and study characteristics affect the noise annoyance.

However, in many cases the prediction on the basis of a norm curve that is valid for the entire population is a more suitable basis for policy than the actual annoyance of a particular individual or group. For example, a norm curve is useful when exposure limits for dwellings and noise abatement measures are discussed. Equity and consistency require that limits and abatement measures do not depend on the particularities of the persons and their actual circumstances. For similar reasons, a norm curve also can be used to estimate the number of highly annoyed persons in the vicinity of an airport, road, or railway when different scenarios concerning extension of these activities or emission reductions, for example, are to be compared. That the norm curve does not take local circumstances or reactions to a change in exposure itself into account is considered advantageous for many purposes. Equity and consistency of policy would not be served if in each case the actual annoyance is taken as the only basis for these evaluations.

The above concept of equity stresses the acceptance of equal exposures for all individuals. This kind of equity is generally strived for in environmental protection. After limits have been established on the basis of studies among the general population or a sensitive group, they are applied to any specific population irrespective of the match between that specific population and the study population. Nonetheless, another form of equity that stresses equal tolerance with respect to the individual effect may be useful in certain circumstances. At the local level measures may be taken on the basis of the actual, individual response to the noise exposures. A survey is needed to obtain insight in such place- and time-bound responses.

To put it in another way, the exposure–response functions and their curves can be used for strategic assessment. They can be

Table 5. Approximations for DNL and DENL.

Measure/source	DNL	DENL
%LA		
Aircraft	$-5.741 \times 10^{-4}(DNL - 32)^3 + 2.893 \times 10^{-2}(DNL - 32)^2 + 1.912(DNL-32)$	$-6.198 \times 10^{-4}(DENL - 32)^3 + 3.410 \times 10^{-2}(DENL - 32)^2 + 1.738(DENL - 32)$
Road traffic	$-8.188 \times 10^{-4}(DNL - 32)^3 + 5.379 \times 10^{-4}(DNL - 32)^2 + 0.723(DNL-32)$	$-8.235 \times 10^{-4}(DENL - 32)^3 + 5.508 \times 10^{-2}(DENL - 32)^2 + 0.6603(DENL - 32)$
Railways	$-3.343 \times 10^{-4}(DNL - 32)^3 + 4.918 \times 10^{-2}(DNL - 32)^2 + 0.175(DNL-32)$	$-3.229 \times 10^{-4}(DENL - 32)^3 + 4.871 \times 10^{-2}(DENL-32)^2 + 0.1673(DENL - 32)$
%A		
Aircraft	$1.480 \times 10^{-4}(DNL - 37)^3 + 1.511 \times 10^{-2}(DNL - 37)^2 + 1.348(DNL-37)$	$8.598 \times 10^{-4}(DENL - 37)^3 + 1.777 \times 10^{-2}(DENL-37)^2 + 1.221(DENL - 37)$
Road traffic	$1.732 \times 10^{-4}(DNL - 37)^3 + 2.079 \times 10^{-2}(DNL - 37)^2 + 0.588(DNL-37)$	$1.706 \times 10^{-4}(DENL - 37)^3 + 2.110 \times 10^{-2}(DENL-37)^2 + 0.5353(DENL - 37)$
Railways	$4.552 \times 10^{-4}(DNL - 37)^3 + 9.400 \times 10^{-2}(DNL - 37)^2 + 0.212(DNL-37)$	$4.538 \times 10^{-4}(DENL - 37)^3 + 9.482 \times 10^{-2}(DENL-37)^2 + 0.2129(DENL - 37)$
%HA		
Aircraft	$-1.385 \times 10^{-4}(DNL - 42)^3 + 4.081 \times 10^{-2}(DNL - 42)^2 + 0.342(DNL-42)$	$-8.199 \times 10^{-4}(DENL - 42)^3 + 3.932 \times 10^{-2}(DENL-42)^2 + 0.2930(DENL - 42)$
Road traffic	$9.884 \times 10^{-4}(DNL - 42)^3 - 1.523 \times 10^{-4}(DNL - 42)^2 + 0.538(DNL-42)$	$9.888 \times 10^{-4}(DENL - 42)^3 - 1.436 \times 10^{-2}(DENL-42)^2 + 0.5119(DENL - 42)$
Railways	$7.188 \times 10^{-4}(DNL - 42)^3 - 7.774 \times 10^{-3}(DNL - 42)^2 + 0.183(DNL-42)$	$7.239 \times 10^{-4}(DENL - 42)^3 - 7.851 \times 10^{-3}(DENL-42)^2 + 0.1885(DENL - 42)$

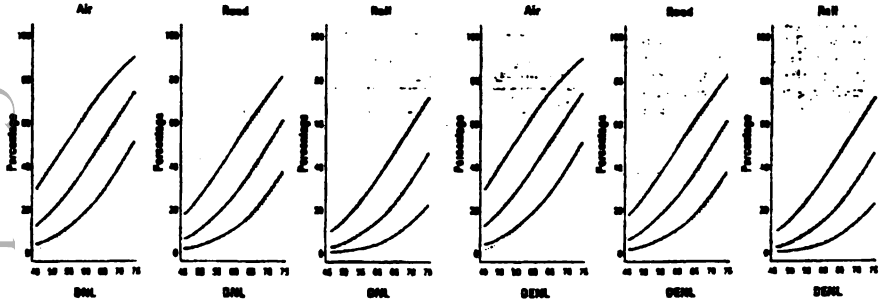

Figure 3. The estimated curves (solid lines) and their polynomial approximations (dashed lines) for DNL.

Figure 4. The estimated curves (solid lines) and their polynomial approximations (dashed lines) for DENL.

Appendix

Relation between DENL and DNL

Expectations regarding DENL – DNL on the basis of time patterns. DNL has been used as the noise metric (*5*). Here general rules are derived for translating DNL into DENL. These general rules are used in the analyses in this paper only if DENL could not be determined on the basis of (estimates of) the L_{Aeq} in terms of which DENL is defined.

There is no consistent relation between DNL and DENL. The difference between the two metrics depends on the time pattern of the noise exposure. The possible differences are restricted if it is assumed that the noise level does not increase during the evening and the night; more specifically, if $L_{Aeq}(0700–1900\ hr) \geq L_{Aeq}(1900–2200\ hr) \geq L_{Aeq}(2200–2300\ hr) \geq L_{Aeq}(2300–0700\ hr)$. This assumption will hold for the vast majority of situations.

Assuming a decreasing pattern of L_{Aeq} as described above, the lowest value of DENL – DNL is equal to –0.06 dB. This means that it can be stated without significant error that DENL – DNL ≥ 0. The highest value of DENL – DNL occurs if the (hourly) L_{Aeq} remains constant until 2200 hr and drops sharply at 2200–2300 hr (and thereafter). Assuming the above described decreasing pattern of L_{Aeq}, the maximum value DENL – DNL is equal to 1.56 dB. On the basis of these findings it can be roughly stated that the range of the difference DENL – DNL is 0–1.5 dB. To get a more detailed insight, the difference DENL – DNL has been calculated for various combinations of positive differences between the L_{Aeq} for the successive time intervals: $L_{Aeq}(0700–1900\ hr) - L_{Aeq}(1900–2200)$, $L_{Aeq}(1900–2200\ hr) - L_{Aeq}(2200–2300\ hr)$, and $L_{Aeq}(2200–2300) - L_{Aeq}(2300–0700\ hr)$. The calculations indicated that both a constant (hourly) L_{Aeq} until 2200 hr and a sharp decrease at 2200–2300 hr are necessary conditions for a value of DENL – DNL that is substantially larger than 0.

Because different noise sources have to some extent a typical time pattern, the range 0–1.5 dB can be further restricted for a specific type of noise source. In general, the (hourly) L_{Aeq} caused by trains will not change much until after 2300 hr. For trains there may be a decrease in the evening, but in general there is no sharp decrease between 2200 and 2300 hr. This means that railway noise generally does not fulfill the two requirements for a significant value of DENL – DNL (stability of the (hourly) L_{Aeq} until 2200 hr and a sharp decrease at 2200–2300 hr). Therefore, this difference will be close to zero for railway noise.

In general, the road traffic noise level gradually decreases during the evening, and this decrease often is accelerated in the period 2100–2400 hr. The decrease in the noise level at 2200–2300 hr will in general be smaller than 3 dB. The larger this decrease at 2200–2300 hr, the larger the decrease of the level in the preceding period of the evening will be. Assuming this, the above-mentioned calculations indicate that for road traffic noise DENL – DNL will generally be < 0.5.

For aircraft noise there may be a sharp decrease of the noise level, depending on the operation of the airport. Little can be said about the consequence for the value of DENL – DNL. If a sharp decrease occurs at 2200–2300 hr, then this difference may be 1 dB, but the conditions needed for a value of the difference up to 1.5 dB are not generally expected.

Empirical data regarding DENL – DNL. The table below gives an overview of the studies in the TNO archive of noise annoyance studies that contain estimates of (the L_{Aeq} needed to determine) both DENL and DNL. Inspection of scatter plots with DENL and DNL on the axes showed that the data points lie close to the line DENL = DNL and that the small deviations from that line are not level dependent. Therefore, the relation between DENL and DNL is summarized in Table A1 by the average value per data set for the difference DENL – DNL. The values for the average in Table A1 confirm the previous analysis on the basis of the time pattern: that is, the average for railways nearly equals zero, the averages for road traffic are slightly larger but also close to zero, while the averages for aircraft noise are larger and vary.

Conclusion. On the basis of the expectations derived from the time patterns of the noise level and the available relevant empirical evidence, we conclude that the following equations can be used to transform the DNL of a noise exposure into DENL:

Aircraft DENL = DNL + 0.6

Road traffic DENL = DNL + 0.2

Railway DENL = DNL

These are general rules that do not necessarily give the precise relationship between the two noise metrics for an individual case. However, the analysis of the time pattern of the noise level indicates that values of the difference DENL – DNL outside the range 0–1.5 dB will be rare.

Table A1. Difference between DENL and DNL found for various studies.

Fields' code (d)	DENL – DNL	n
Aircraft		
FRA-238	1.5	595
NET-240	0.8	573
NET-371	0.6	11,211
UKD-238	0.5	888
Road traffic		
FRA-238	0.2	324
GER-192	0.1	883
JPN-388	0.1	823
NET-108	0.1	420
NET-240	0.2	473
NET-238	0.1	385
NET-382	0.2	283
SWI-173	0.2	1,371
TRK-387	0.2	154
UKD-238	0.3	538
Railway		
GER-192	–0.1	888

used in target setting, in translating noise maps into overviews of numbers of persons annoyed, in cost–benefit analyses, and in environmental health impact assessments. When used in environmental health impact assessments, they give insight to the situation that is expected in the long term. They are not applicable to local, complaint-type situations or to the assessment of the short-term effects of a change of noise climate. With the present state of the art, the annoyance in those cases can be assessed only by conducting a noise annoyance survey in the situation concerned.

In principle, the estimation of the curves and their confidence intervals can be further elaborated by incorporating study site as an extra level in the analysis. In most studies, a limited number of study sites were selected first, and then respondents were selected at random at each site. Because it is likely that site characteristics other than the noise exposure levels at the site affect the annoyance, incorporating the sites as an extra level in the analysis would be an improvement. A site level was not included in the present analyses because the available data sets do not contain comparable definitions of sites.

Another, more important elaboration of the present model would be the inclusion of more (exposure) variables as predictors of annoyance, in addition to DNL or DENL (at the most exposed side of a dwelling). Most interesting are factors that can be influenced by policy. Examples of such factors are the sound insulation of the dwelling and the presence of a relatively quiet side of the dwelling. The latter factor depends on the configuration and orientation of the building relative to the noise source. The purpose then would be to establish a model of the annoyance reactions in the population as a function of DNL or DENL, the sound insulation of the dwelling, and the level at the most quiet side of the dwelling.

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0038

U.S. Air Force
Human Systems Center,
Environmental Planning Directorate
Brooks AFB, TX

FINAL REPORT

Requirements Analysis for Noise

Dated 31 October 1996

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HUMAN SYSTEMS CENTER, ENVIRONMENTAL PLANNING DIRECTORATE

TECHNOLOGY ASSESSMENT (Part 1)

REQUIREMENTS ANALYSIS FOR

NOISE

EXECUTIVE SUMMARY

OBJECTIVE

The objective of this Requirements Analysis (RA) is to provide to Air Force Major Commands (MAJCOMs) information that can be used to identify solutions to technology needs related to developing noise models and reducing noise generated by aircraft and space launch vehicles and the associated impacts on affected populations. The RA is intended to assist the MAJCOMs in deciding whether to pursue commercial off-the-shelf (COTS) technology solutions or research and development (R&D) options.

SUMMARY

The following technology needs addressed in this report are identified in the *FY96 United States Air Force Environment, Safety and Occupational Health Technology Needs Survey:*

Need ID	Title
1411	A Quantitative Dosage-Response Relationship for Predicting the Effects of Noise Is Required.
1410	A New Method Is Needed to Gather Defensible Aircraft Operational Data for Use in Determining Noise Levels for Aircraft Beddowns/Realignments; and the Air Installation Compatible-Use-Zone Program.
450	Need Analytical Methods to Determine Environmental Impacts of Sonic Boom from Launch Vehicles and Sonic/Supersonic Airplanes through Air Propagation and Underwater Propagation.
1413	Model Updates to the Assessment System for Aircraft Noise (ASAN) for Prediction of Noise Exposure from Military Aircraft Operations and the Resulting Impact to Humans, Animals, and Structures.
252	The AF, in Many Cases, Must Reduce Mission Rates Because of Community Noise Concerns.
411	Modeling is Needed of Environmental Impacts of the Noise and Sonic Boom Generated by Launching Large Space-Launch Vehicles.
1412	Methods Are Needed to Assess the Annoyance of Sporadic Exposure to Sonic Booms and the Combined Annoyance of Noise Exposure of Subsonic and Supersonic Operations.

The needs in this Noise technology group result from requirements of the National Environmental Policy Act (NEPA), the Noise Control Act (NCA), and other Federal, State, and local laws, as implemented through Air Force Policy Directive (AFPD) 32-70, *Environmental Quality*, and Air Force Instructions (AFI) 32-7061 and 32-7063, to perform noise analyses. NEPA requires the Air Force to give appropriate consideration to environmental concerns, including noise-related issues, prior to beginning any action that may affect significant changes in prior levels.

Potential solutions to these needs must meet the following criteria: (1) ensure that regulatory

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requirements are met without prolonged controversy; (2) be consistent with mission requirements; and (3) ensure that Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art methods. Meeting these criteria, however, requires the deployment of technologies that fulfill not only scientific and technical requirements of reproducibility, accuracy, and validity but also social and legal tests of credibility and defensibility. Supporting a decision with state-of-the-art models, data, and analyses is insufficient to ensure that the information will be accepted by interested and affected parties as credible or will meet the legal requirements of defensibility. EPA and DOE experiences have both shown that establishing credibility involves developing a trust relationship with regulators and other interested and affected parties by involving them early in the development process so that they can understand and accept the outcomes. Legal defensibility requires extensive documentation to establish the integrity and ensure acceptance of data collection and analysis activities.

An extensive domestic and international search covering the major databases in which information on technologies addressing noise pollution was conducted. Additionally, a number of individuals involved in noise research, policy, and litigation were contacted. Findings were analyzed, and the following conclusions were drawn:

CONCLUSIONS

1. There are no COTS integrated sets of data and models available for the high priority needs in this group (Needs 1411, 1410, 450, 1413, and 252).

2. Noise-related regulatory areas are changing; hence, legal defensibility and credibility are critical to interested and affected parties accepting proposed solutions.

3. The Air Force, NASA, and the Federal Aviation Administration (FAA) are all involved in developing and/or using models and collecting data to develop better solutions to noise-related issues concerning aircraft operations.

4. Currently, it is Armstrong Laboratory's Noise Effects Branch (AL/OEBN) whose research program is most likely to provide the scientific and technical solutions to the needs in this technology group. The Air Force Armstrong Laboratory and NASA's Langley Research Center are the major organizations that have ongoing scientific and technical work at development stages 6.2 and 6.3, related to noise measurement and the effect of noise on the environment. However, several of the needs (1411, 450, 1413, and 252) are likely to be only partially met by the currently planned AL/OEBN program. Only Need 1410 appears to be fully met.

RECOMMENDED OPTIONS

The Air Force should continue to support the R&D option through programs at AL/OEBN, to find a solution to noise generated by aircraft and space launch vehicles. The supporting strategy is as follows:

- Critically evaluate the scope of these programs in relation to the top priority needs and refocus or expand where necessary to ensure that success criteria are met.
- Develop and implement strategies for producing technically peer-reviewed publications from all stages of the R&D process.
- Implement highly visible, independent peer review processes that include technical representatives from interested and affected parties.
- Ensure defensibility of the data through development and pilot testing of QA/QC processes, documentation, training programs, and SOPs for data acquisition and analysis, chain of custody tracking, and instrument use.
- Develop training and certification processes which can be applied to all users of the technologies, particularly in support of litigation and regulatory procedures.

2. The AL/OEBN program for Mitigation of Environmental Noise includes several projects to develop communication tools that should be broadly deployed in advance of the widespread use of other research products.

3. The Air Force should fully evaluate the AL/OEBN program through cross-mapping the numerous milestones to the needs of the MAJCOMs and their contributions toward achieving the three success criteria. The evaluation would include a detailed examination of (1) the problems associated with noise analyses, (2) the time spans for required solutions, (3) the acceptance level of current data and models, (4) the factors that impair achievement of the user's three success criteria, and (5) potential modifications to the R&D process.

HUMAN SYSTEMS CENTER, ENVIRONMENTAL PLANNING DIRECTORATE

TECHNOLOGY ASSESSMENT (Part 1)

REQUIREMENTS ANALYSIS FOR

NOISE

1.0 BACKGROUND/PURPOSE

Background: The Human Systems Center, Environmental Planning Directorate (HSC/XRE) Technology Assessment (TA) analyzes the environmental, safety, and occupational health technology needs identified in the Air Force Technology Needs Surveys, identifies the technologies available to satisfy those needs, and presents both the most feasible methods for implementing the solutions and the risks associated with those solutions. Finding the most effective technology solution entails conducting two of the three parts of the TA: the Requirements Analysis (RA), and the Technology Evaluation (TE). The third part, the Systems Implementation Review (SIR), is conducted to evaluate the utility of the technology solution(s) actually implemented.

The RA provides preliminary information that can be used to select one of the following options: (1) to pursue potential commercial off-the-shelf (COTS) technologies, if appropriate and readily available; (2) to pursue research and development (R&D) activities that can lead to potential solutions for the technology needs; (3) to maintain the status quo and the ongoing course of action; or (4) to formulate policy or administrative changes. The TE, on the other hand, provides more detailed information to (1) implement COTS solutions for individual needs at site-specific locations; (2) select supporting R&D programs to develop products for satisfying the needs; or (3) support policy changes or administrative courses of action. The TE is conducted only if the cognizant Major Command decides to pursue an option outlined in the RA and desires assistance in doing so.

Purpose: This document is an RA, conducted to provide preliminary information on Noise technology needs to Air Force Major Commands (MAJCOMs) who may be affected by the implementation of solutions to those needs. The information presented, which is based on current technology, can be used to determine whether further investment in finding solution sets for noise-related environmental and safety technology needs may be warranted.

2.0 INTRODUCTION TO THE TECHNOLOGY GROUP

A Requirements Analysis (RA) addresses a family of related needs, called a technology group, so that the information searches and analyses conducted in the RA will be applied to those needs collectively. The technology group addressed in this RA pertains to needs that require the development of noise models to estimate the impact on humans and animal populations of noise generated by aircraft and space launch vehicles and transmitted through air and water.

2.1 Needs Commonality

The needs in this technology group stem from a common finding--that noise from aircraft is a significant source of annoyance» (and potentially a source of other adverse impacts) to people residing under flight paths or near air base facilities. In addition, the needs in this technology group are all affected by the following regulatory "drivers": (1) the National Environmental Policy Act (NEPA), (2) the Noise Control Act (NCA), (3) National Parks Overflight Act (NPOA), and (4) State and local laws, all of which are implemented through Air Force Policy Directive (AFPD) 32-70. These "drivers" require the Air Force to provide up-to-date assessments of the impact of its aircraft activities on affected populations and structures. Under NEPA and the Noise Control Act, the Air Force is required to conduct noise analyses for all activities that relate to the movement of aircraft. NPOA of 1987 requires the Air Force to conduct similar assessments for flight paths over National Forest System wilderness areas.

Under NEPA, as implemented through AFPD 32-70 and Air Force Instruction (AFI) 32-7061, which describes specific tasks and procedures for the Air Force's Environmental Impact Analysis Process (EIAP), a new environmental analysis must be conducted to support any decision that results in changes in the quality or the quantity of aircraft movement in and around an air facility. Decisions to make minor changes (e.g., replacing the old, noisier C-5s with the same number of new C-5s, which are fitted with quieter engines) can be supported with the NEPA categorical exclusion (CATEX) document. Making more dramatic changes (e.g., exchanging a fighter squadron for a transport squadron) entails following a detailed NEPA process that requires preparing an Environmental Assessment (EA) and, possibly, an Environmental Impact Statement (EIS) that would include a thorough noise analysis to evaluate potential impact changes. NEPA, implemented through EIAP, requires that the Air Force understand and disclose the impacts of noise exposures on human and animal populations populations and their environment in general. This understanding and disclosure must include information on impacts as diverse as noise nuisance to outdoor recreationists; glass shattering due to sonic booms; and noise-induced disturbances in mating habits, migratory patterns, and young-rearing behavior of animal populations and agriculturally important species. In addition, documents prepared under the EIAP must be based on the best scientific information and methods available and must support any decision that results in changes in the quality or the quantity of aircraft movement in and around an air facility or operational changes within special use training airspace.

The Noise Control Act is implemented through AFPD 32-70 and Air Force Instruction (AFI) 32-7063, which provides development, implementation, and maintenance instructions for the Air Installation Compatible Use Zone (AICUZ) program. AFI 32-7063 requires all air facilities to perform a noise analysis every two years, focusing the analysis on documenting the change in noise contours around the facilities over the two-year period, to gather information that can be used for current and future land-use planning activities. Base commanders working with local communities use AICUZ data to determine where high, moderate, and low noise areas are located around their facility, so that noise-sensitive and non-noise-sensitive activities can be appropriately sited (e.g., a high noise area might be zoned for agricultural activities, while low noise areas might be reserved for hospital or school siting).

The circumstances that mandate noise analyses to satisfy NEPA, NCA, and NPOA requirements continually change, influenced by (1) improvements in state-of-the-art methods for assessing noise impacts; (2) an ever-increasing number of animal species of concern; (3) variability in community noise tolerance; and (4) modifications in MAJCOM requirements to realign aircraft and operations to meet flying mission needs. This means that any of the noise analyses can be challenged by interested parties whose interpretation of what constitutes the best scientific information and methods differs from that of the Air Force. To mitigate such challenges, the solutions to the needs in this technology group must fulfill the following requirements:

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- Provide adequate data to credibly demonstrate compliance with regulatory requirements (NEPA, NCA, NPOA, and State and local ordinances) as well as adequately validate models used for planning and compliance assessment.
- Develop technical methods for defining and modeling the impacts of noise that are state-of-the-art, legally defensible, and accepted as credible by interested and affected parties.
- Increase credibility of the analyses conducted by demonstrating that the solutions proposed have been thoroughly researched and alternatives have been properly considered.

2.2 List of Needs

The technology group for noise-related needs is comprised of the following seven needs, listed in priority order. The point-of-contact (POC), Command, and telephone number are included in the description of each need. These needs are identified in the FY96 United States Air Force Environment, Safety, and Occupational Health (ESOH) Technology Needs Survey (TNS) of December 1995, which is also the source of ID numbers and priorities.

Need ID: 1411 - Top 1%
Title: **A Quantitative Dosage-Response Relationship for Predicting the Effects of Noise Is Required.**
Description: Because training operations may overfly lands used for outdoor recreation, the Air Force requires the ability to predict the effects of aircraft noise on the outdoor recreationist. Much of the special use airspace established and utilized by the Air Force is away from populated areas; as a result the outdoor recreationist is subjected to the aircraft overflight and noise exposure. Federal and State agencies which control the areas largely utilized by the outdoor recreationist have recently made the attempt to exert greater control over the airspace above the resources for which they are responsible, including that utilized by military aircraft. Today, no quantitative dosage-response relationship has been developed for predicting annoyance in these circumstances, and information on which such a relationship could be based is in short supply. Apart from a social survey of wilderness visitors sponsored by the Forest Service, and a study of park visitors' reactions to tour aircraft sponsored by the National Park Service, no useful quantitative information of any kind exists.

Considering the great value of reliable information about recreationists' reaction to aircraft overflights, it is worthwhile to the Air Force to undertake a study in an outdoor recreational setting.

Overall, new and refined methods of analysis are needed 1) to ensure environmental law requirements can be met without prolonged controversy, 2) to be consistent with and avoid impact to mission requirements, and 3) to ensure Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art description and analysis methods.
POC: Ms. Brenda Cook, HQ ACC/CEVA, DSN 574-3056

Need ID: 1410 Top 2 %
Title: **A New Method Is Needed to Gather Defensible Aircraft Operational Data for Use in Determining Noise Levels for Aircraft Beddowns/Realignments and the Air Installation Compatible-Use-Zone Program.**
Description: The Air Force in constantly realigning aircraft to meet the needs of the flying mission. A noise analysis is required for all actions involving the movement of aircraft during the National Environmental Policy Act (NEPA) process and every two years for the Air Installation Compatible Use Zone Program, in accordance with Noise Control Act and AFI 32-7063. The computer program used to calculate these noise levels (NOISEMAP) has been refined over the years and is highly defensible against outside challenges. Unfortunately, the methods used to gather the information required is extremely

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vulnerable to litigation.

The current data collection methods do not provide indisputable data. In fact, the accuracy of the data is totally dependent upon human interpretation and, therefore, extremely vulnerable to human error. The Air Force needs to develop a data acquisition system that will record and store actual aircraft flight information and convert it into data that can then be read directly into BASEOPS (the computerized input program for NOISEMAP). The data acquisition should also include ground maintenance activities which also contribute to the noise environment.

Additional benefits include actual historical information for air quality, determining the source of noise for complaints and lawsuits, assistance during accident investigations, and designing terminal instrument procedures.
POC: Ms. Linda Merritt, HQ ACC/CEV, (804) 764-3056 DSN 574-3056

Need ID: 450 - Top 6%
Title: **Need Analytical Methods to Determine Environmental Impacts of Sonic Boom from Launch Vehicles and Sonic/Supersonic Airplanes through Air Propagation and Underwater Propagation.**
Description: The AF creates numerous sonic boom impacts from both space launches and super/hypersonic airplanes on populated areas and native habit that are not well understood. The National Environmental Policy Act (NEPA) requires that the AF predict impacts of programs and report them to the public. Recent developments in sonic boom studies have made evident the need for amending the near-field analysis with nonlinear calculations and a need for an unambiguous matching procedure to improve waveform-prediction techniques. In addition, there is a renewed issue with "transition focus booms," particularly the "superboom," which occurs during a speed change through a threshold Mach number and gives rise to strong work-focusing effects; however, the intensity and extent of impact area cannot be established from existing methods. Another concern is the potential sonic boom impacts on pelagic and coastal environmental of which the Methodology for defining the impacts is not adequately developed. The AF is currently required by environmental agencies to monitor the impact of rocket sonic booms on animals downrange of launch sites at Vandenberg AFB.
POC: Mr. Pete Campell, HQ SMSC/CEV, (310) 363-0923 DSN 833-0923

Need ID: 1413 - Top 6%
Title: Model Updates to the Assessment System for Aircraft Noise (ASAN) for Prediction of Noise Exposure from Military Aircraft Operations and the Resulting Impact to Humans, Animals, and Structures.
Description: USAF requires the ability to conduct flight operations at its airfields, weapons ranges, and in designated airspace. This requirement is met by aircraft/mission realignments, acquiring and maintaining airspace, preventing or controlling encroachment of airfields and weapons ranges. Performance of this mission is dependent upon the ability to describe and assess, in a timely and defensible manner, the magnitude and impact of subsonic and supersonic noise, particularly noise impacts associated with MTSs and MOAs. New and refined methods of analysis are needed 1) to ensure Environmental Law requirements can be met without prolonged controversy, 2) to be consistent with mission requirements, and 3) to ensure Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art description and analysis methods.

The National Environmental Policy Act (NEPA) of 1969 requires federal agencies to analyze the potential environmental impacts of proposed actions and alternatives and to use those analyses in their decision-making process. The USAF Environmental Impact Analysis Process (EIAP) provides an understanding of the potential environmental

consequences of proposed actions and alternatives.

A major part of the USAF-EIAP effort involves the prediction of aircraft noise effects around air bases in over 350 Military Operating Areas (MOAs), in restricted areas and along more than 600 Military Training Routes (MTRs), encompassing approximately one half million square miles of domestic airspace. The USAF must be able to predict aircraft noise levels in exposed areas, the effects of both subsonic aircraft noise and sonic booms on the populations, the dynamics of animal wildlife, health, and welfare of domestic animals, and damage to conventional and nonconventional structures.

Updates and additions to Version 1.0 of ASAN (scheduled for release FY95) will be required, including but not limited to Models for Predicting Effects of Aircraft Noise and Sonic Boom on Structure, Model to Assess Noise Impacts for Training Routes and Military Operating Areas, and Models for Predicting Effects of Aircraft Noise and Sonic Boom on Humans.

POC: Mr. Ron DiBenedetto, HQ AFCEE/ECP, DSN 240-2\3183
POC: Ms. Brenda Cook, HQ ACC/CEVA, DSN 574-3056

Need ID: 252 - Top 10%
Title: The AF, in Many Cases, Must Reduce Mission Rates Because of Community Noise Concerns.
Description: The AF needs to reduce the impact of noise on communities from flying missions. Local ordinances restrict the level of noise that is allowed to impact local communities. These restrictions directly impact the number of missions that we are allowed to conduct near these communities. A means to mitigate or reduce the noise levels impacting local communities, while allowing the Air Force to conduct the number of missions necessary for readiness operations is required.
POC: Lt. Col. Al Badeau, 75 MDG/SGPB, (801) 777-1181 DSN 777-1181

Need ID: 411 - Top 67%
Title: **Modeling is Needed of Environmental Impacts of the Noise and Sonic Boom Generated by Launching Large Space-Launch Vehicles.**
Description: Space and Missile Systems Center launch vehicles produce high levels of noise and sonic boom energy which are known to be harmful to humans (requiring evacuation) and suspected of being harmful to animal species in the vicinity. At Vandenberg AFB and Cape Canaveral Air Station, endangered/threatened species such as the least tern, snowy plover, and West Indian manatee are subjected to this environment during launches. Damage to hearing from launch vehicle noise and sonic boom is suspected to cause reproductive and feeding failure, resulting in further decline of protected species. To properly protect them and meet the requirements of the Endangered Species Act, a better understanding of the effects is needed.
POC: Capt. Brian Laine, SMSC/CLNE, (310) 363-1095 DSN 833-1095

Need ID: 1412 - Top 67%
Title: **Methods Are Needed to Assess the Annoyance of Sporadic Exposure to Sonic Booms and the Combined Annoyance of Noise Exposure of Subsonic and Supersonic Operations.**
Description: USAF requires the ability to conduct supersonic flight operations in approved airspace. Past combat experience has demonstrated that the effectiveness and survival of aircrews exposed to sophisticated aircraft and advanced antiaircraft weapons systems are directly affected by the type, quality, and amount of training they receive. As a result of the AF training mission, there is public concern over the impacts of noise and sonic booms. Performance of the AF mission is dependent upon the ability to describe and assess, in a timely and defensible manner, the magnitude and impact of subsonic

and supersonic noise. New and refined methods of analysis are needed 1) to ensure Environmental Law requirements can be met without prolonged controversy, 2) to be consistent with mission requirements, and 3) to ensure Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art description and analysis methods.

The dosage-response relationship on which the Air Force currently relies for predicting the annoyance of exposure to sonic booms was produced by the 1981 CHABA Working Group 84 on the basis of modest amounts of information about repetitive and expected noise exposures in residential communities. The applicability of this relationship to many settings of practical interest to the Air Force has never been demonstrated. Both physical and psychoacoustic issues must be resolved to increase confidence in the Air Force's method for assessing impacts of sporadic sonic booms over largely dispersed populations.

Additionally, the Air Force predicts the annoyance due to noise exposure from subsonic operations and that due to supersonic operations separately, by means of two different dosage-response relationships. An accurate combined annoyance prediction from both types of operations is not currently available. ACC must be able to predict community response in settings subject to both subsonic and supersonic flight operations.
POC: Ms. Brenda Cook, HQ ACC/CEVA, DSN 574-3056

Subsequent discussion focuses on the five top priority needs, Needs 1411, 1410, 450, 1413, and 252. Needs 411 and 1412 are low-priority (67%) needs and have not been specifically addressed in this report. However, these needs have requirements in common with the top priority needs and may also have solutions in common; however, they are not discussed in detail in this RA.

2.3 Clarifying Needs and Establishing Subgroups

To ensure the utility of this document for assisting the MAJCOMs in making defensible decisions, each need was discussed with the respective point-of-contact (POC) and in the context of current related technology. The following criteria for satisfying the needs were established:

1. Ensure that regulatory requirements are met without prolonged controversy.
2. Be consistent with mission requirements.
3. Ensure that Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art methods.

In addition, the needs were deemed similar enough to be considered as a single group. The descriptions of four of the top five priority needs indicate an imperative for two outcomes: (1) a better understanding of the environmental impacts of noise on humans, animals, and/or structures and (2) a better ability to model and predict, accurately and defensibly, the potential changes in noise impacts from changes in aircraft movement. The description of the fifth top priority need, Need 252, though not explicitly stating so, indicates that achieving such outcomes will be necessary if new approaches to mitigating or reducing the noise levels that affect local communities are to be developed. This RA therefore addresses Need 252 in the context of modeling but does not address technical approaches to reducing the noise levels described. Those approaches will need to be addressed in a separate document. Based on the comments of the Need's Point-of-Contact, Need 1410 was modified to include noise modelling of ground maintainenace activities. This aspect will be addressed by Armstrong Laboratory's noise programs.

The top priority needs have in common a strong rationale for finding effective technology solutions: the MAJCOMs want to achieve their mission requirements involving aircraft operations and space launches. Concerns on the part of regulators, communities, and other interested and affected parties, particularly when expressed as legal actions under the provisions of NEPA and other laws, can result

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in delays in meeting mission requirements and/or increases in costs, which may also impede achieving mission requirements. Because the needs addressed in this technology group are driven by the same requirements, they are treated in aggregate in this Requirements Analysis.

3.0 ANALYSIS AND RECOMMENDED OPTIONS FOR THE TECHNOLOGY GROUP

Research on information pertaining to COTS and R&D solutions for the Noise technology group focused initially on the Air Force and then expanded into the wider international arena. The major science/technology, environmental, chemical, and medical databases were searched to gather pertinent technological data from a time frame spanning the early 1970s to the present. Twelve databases were examined:

1. Defense Technical Information Center (DTIC)
2. Aerospace Database
3. SciSearch
4. Conference Papers Index
5. CA Search
6. Transportation Research Information Service
7. Enviroline
8. Environmental Bibliograph
9. Pollution Abstracts
10. Energy Science and Technology
11. Federal Research In Progress
12. Toxline

Other databases identified as appropriate to the technology area were searched when deemed necessary to ensure a comprehensive search. The Internet was also searched, using such search engines as Metacrawler, Alta Vista, and Lycos. The following discussion and analysis presents pertinent information gained from these searches.

Several issues are under discussion within the scientific community: (1) the best metrics for a particular impact; (2) how best to capture the differences in response to impulsive and non-impulsive noise; (3) the importance of self-noise generated by the listener; and (4) the definition of ambient quiet. These issues continue to generate on-going research projects with regard to the appropriate dose-response curves and noise metrics used to estimate the likelihood that different populations (e.g., adults, children, raptors, structures) under differing exposure regimens (e.g., sonic vs. subsonic, continuous vs. intermittent exposures) will experience different end points (e.g., annoyance, hearing loss, and impaired reproductive function).

Numerous national and international efforts to measure, understand, and predict the impacts of military aircraft noise are on-going. The results of research programs in Sweden, Germany, Norway, and the Netherlands are representative of the kind of information member nations of the European Community are developing with regard to assessing and managing noise from military aircraft operations. However, to date, these research and development efforts have not resulted in commercially available products. Our review indicates that for the Air Force's specific requirements, research and development ongoing in the United States is the most advanced. Thus, the following discussion focuses on work conducted within the United States and, specifically, within the U.S. Department of Defense.

Satisfying the requirements of the needs in this technology group necessitates that noise analyses be conducted under the EIAP and the AICUZ program, which use different models and data. The EIAP's focus is on identifying and evaluating potential impacts of military aircraft training/operations around Air Force installations and within/beneath special use airspace, (e.g., military training routes (MTR) and military operating areas (MOA)). In contrast, the AICUZ

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program is designed to provide the air facilities and nearby communities information about noise level contours for incorporation in land-use planning decisions (e.g., high noise areas for cropland and low noise areas for special facilities, such as hospitals or schools). Over time, conducting noise analyses for either the EIAP or AICUZ program have become very complex. For example, developing noise contours required by the AICUZ program involves consideration of the appropriate noise metrics; accurate, consistent, and reliable methods for capturing operational data; and an in-depth knowledge of the physics of acoustics and the ways in which changes in weather parameters can modify sound quality and transfer through the environment.

The appropriate noise metric may be highly variable, depending on the receptor. The human ear, for example, does not perceive all sound frequencies equally. It is less sensitive to low frequencies than to mid-range frequencies. Thus, derivation of the appropriate dose metric requires application of a frequency weighting system which, similar to the action spectrum used in assessing the impacts of ultraviolet radiation on humans, gives more weight to the effective (e.g., higher impact) frequencies. The effective dose metric is also related to the outcome of interest. For example, the appropriate dose metric for human annoyance appears best captured by the A-weighted sound level which assesses the instantaneous level of effective sound, and varies with the changing level of the sound environment. Different metrics may be more appropriate for the reaction of other species to noise, however, or even for different human impacts.

According to the EPA, the best metrics to describe the effects of environmental noise are:

1. The Long-Term Equivalent A-Weighted Sound Level (Leq)
2. The Day-Night Average Sound Level (DNL), which may be symbolized as Ldn.

A-weighting de-emphasizes the low- and high-frequency range of the sound spectrum in order to provide a good approximation of the response of the average human ear and correlates well with a person's judgment of the relative loudness of a noise event. Leq is the average of the A-weighted sound levels over a period of time. The absence of a standardized averaging period makes it difficult to use this metric to compare data for events of different durations. The DNL is the Leq measured over a period of 24 hrs, with a 10dB penalty applied to nighttime (10 p.m. to 7 a.m.) sound levels to account for increased annoyance by sound during night hours. The annual average DNL provide the basis for the Air Force's AICUZ program. Supplemental metrics used to characterize specific effects on a case-by-case basis include, Leq for varying representative time periods, Sound Exposure Levels (SEL), Third Octave Band Sound Pressure Level (SPL), Lmax (A-weighted maximum sound level), and TA (time above-expressed in minutes for which aircraft-related noise exceeds specified A-weighted sound levels).

Operational data quality is also critical for noise analyses. The Air Force flight facilities routinely record information on the frequency, duration, and routes of flight activities and on the number and types of aircraft flown. However, detailed information as to flight speed and altitude changes over time, which are needed to assess the noise levels accurately, has generally been gathered on a more ad hoc basis. Surveys of pilots and air traffic control tower occupants, rather than automated data collection through instrumentation, have frequently been used to develop these assessments. The noise contour estimates have, as a consequence, not been particularly reliable and may result in inappropriate predictions.

The noise analyses required under the AICUZ program are based on a pair of integrated models. BASEOPS is the operational data input model, and NOISEMAP is the noise contour calculation model. NOISEMAP can be integrated with one or more dose-response models to estimate potential risks. However, dose-response models are generally specific to the outcome and animal of concern, so that each time a new outcome or animal of concern is identified, a new dose-response model must be developed.

As used for the AICUZ program, NOISEMAP considers all aircraft operations at an installation and

uses the DNL metric to produce noise level estimates with 5 decibel (dB) contour gradations. These contours are then used to develop predicted noise exposure levels for various installation locations under the operational change scenarios of interest. These predicted levels are then compared to the noise baseline for the facility, which is based on similar contours derived from noise levels associated with current operations. Another program, ROUTEMAP, is used to obtain a total noise level estimate across a Military Training Route (MTR) by summing the individual noise levels for MTR segments.

The Air Force has recently completed the development of a suite of computer programs for evaluating noise impacts under military airspaces. The suite consists of; MR_NMAP (MOA Range NOISEMAP), a general purpose program that calculates noise contours under MOAs and MTRs; MR_OPS , a companion interface program that facilitates defining the airspace, specifying aircraft types and operations and controlling the computational features of MR_NMAP; and NMPLOT, the Air Force's standard noise contour plotting program.

The U.S. Department of Defense (DOD) has an extensive ongoing program related to noise modeling. However, that program does not provide the Air Force with the full set of noise models currently needed, nor does it ensure the full acceptance of the Air Force program by the affected parties. The reason is that conducting a noise analysis is often a complex process involving the measurement, interpretation, and estimation of a large number of parameters for which there is considerable uncertainty and limited consensus on methods. The following subsections detail the options and rationale for the recommendations made concerning the noise technology group.

3.1 Commercial Off-the-Shelf (COTS) Technologies

There are no COTS available for the top priority needs (Needs 1411, 1410, 450, 1413, and 252) in this technology group. The state-of-the-art in these areas is changing, and no evidence was found of a commercially-available, integrated set of models directly linked to data collection instrumentation that addresses the principal requirements of the needs. Most of the solutions to these needs require improvements to existing software and hardware currently being used by MAJCOMs to meet the regulatory requirements of NEPA and other statutes. Indeed, the results of this RA indicate that in addition to the Air Force's products being representative of state-of-the-art technology, the Air Force requirement to perform increasingly sophisticated noise analyses is the major impetus for improvements in those state-of-the-art technologies.

Need 1410 also identifies a requirement for better operational data collection methods. These methods should, preferably, not be dependent on human interpretation and should have the capacity to collect and directly convert the data to a format compatible with the programs used for the noise analyses required by the EIAP or AICUZ program. No evidence that a technology that meets the requirement in Need 1410 is currently available commercially was found.

3.2 Research and Development Activities

Research and development efforts in the U.S. that are similar to the international programs mentioned earlier (see page 9, section 3.0) are principally addressed by the Air Force and the National Aeronautics and Space Agency (NASA). These organizations have research activities in progress that should satisfy the requirements associated with the top five priority needs in this technology group (Needs 1411, 1410, 450, 1413, and 252) and may, in addition, provide complete or partial solutions to Needs 411 and 1412.

3.2.1 Key Organizations The Noise Effects Branch of Armstrong Labs (AL/OEBN) is the U.S. Air Force's lead laboratory for addressing noise issues related to data collection, analytic methods, model development and validation, and noise mitigation. Contractors important to this area include BBN Systems and Technologies and Wyle Laboratories. In addition, several NASA facilities, particularly the Langley Research Center, are heavily involved in noise research issues, particularly those related to sonic booms. Addresses and key contacts for each of these organizations are as follows:

1. Armstrong Labs
AL/OEBN
Dr. Robert Lee
(513) 255-3605

2. NASA, Langley Research Center
Hampton, Va
Mr. Kevin Shepherd
(804) 864-3583

3. BBN Systems and Technologies
Canoga Park, CA
Dr. Sanford Fidell
(818) 347-8360

4. Wyle Laboratories
Arlington, VA
Dr. Kenneth Plotkin
(703) 415-4550

3.2.2 Stage of Development The Air Force, NASA and the Federal Aviation Administration (FAA) are all involved in developing and/or using models and collecting data to develop better solutions to the problems identified in this technology group (although the FAA principally focuses on issues related to commercial aircraft). The research has been on-going for many decades. However, with the possible exception of the work conducted by AL/OEBN, no evidence was found of an integrated, systems-based approach for solving issues posed by noise exposures connected with peacetime military missions. Such a systems approach would provide a general framework for assessing noise impacts at any airfield and incorporate and integrate the best features of all the available models and databases.

The AL/OEBN has four principal programs that directly or indirectly address the needs in this technology group. Given below are the titles, numerical designations, and development stages (DS) of these programs and a table that indicates AL/OEBN's assessment of how completely these programs address the priority needs of this technical group.

1. Environmental Noise Modeling and Measurements, S-96-OEBN-1, DS:6.2
2. Assessment System for Aircraft Noise (ASAN), OEBN-2, DS:6.3
3. Impacts of Environmental Noise on Humans, Animals and Structures, OEBN-3, DS:6.2
4. Mitigation of Environmental Noise, OEBN-4, DS:6.3

AL/OEBN Assessment of Program's Ability to Satisfy Need

	OEBN-1	OEBN-2	OEBN-3	OEBN-4
Need 1411	N/A	N/A	+++	+/-
Need 1410	+++	N/A	N/A	N/A
Need 450	+++	N/A	N/A	N/A
Need 1413	N/A	++	++	N/A
Need 252	+++	+	++	+++

+++ = fully meets need
++ = partial solution
+ = will likely lead to a solution
+/- = may indirectly meet need

The information presented indicates that the AL/OEBN research program will partially meet Needs 1410, 1411 and 450. Needs 1413 and 252 may be fully met if the partial solutions derived from the multiple programs that address them comprise a complete solution. The AL/OEBN program does not fully address all of the needs in this technology group, however. A more thorough exploration of the AL/OEBN program would be required to determine the specific gaps exist that exist and their importance in addressing the top priority needs adequately.

One of the issues that still needs to be addressed is the appropriate metric for modeling sound levels

of flights resulting in sonic booms. The DNL metric used in NOISEMAP was found to be inappropriate. The Air Force subsequently developed PCBOOM3, a general purpose, single-event sonic boom prediction model that supports building input cases, running boom calculations, displaying contours and signatures, and managing associated data. Together with prior versions of similar programs such as BOOMAP2, MOAOPS, TACTS/ACMI, and a library of aircraft sorties from Military Operating Areas, PCBOOM3 provides a method that predicts and characterizes sonic booms with reasonable accuracy. PCBOOM3 is being upgraded by AL/OEBN to include launch vehicle boom capability, high altitudes associated with launch vehicles, inclusion of rocket plume effects, and the capability of importing trajectory/maneuver data from external sources. This effort will contribute to solutions for technology needs in this group.

Appropriate dose-response relationships for the chronic impacts of high intensity exposures need to be developed, however. Recent NASA Langley studies conducted on the impacts of long-term exposure of human communities to sonic booms have found that annoyance response to sonic booms appears to be greater than would have been predicted from the results of a well-designed matched aircraft noise survey and several widely-accepted summaries of dose-response relationships.

This RA provides preliminary information that can lead to potential solutions. The preliminary information obtained about the AL/OEBN programs indicates that the program is technically sound, but although the AL/OEBN program for Mitigation of Environmental Noise includes several projects to develop communication tools, there is not strong evidence that the program adequately addresses the critical requirements for ensuring legal defensibility and stakeholder acceptance. A basis for this conclusion is the U.S. Department of Energy's (DOE) experience in developing community acceptance of its actions, the intentions of which were to remediate its sites around the United States and to transport nuclear material across the country. Over a lengthy period, DOE determined that the following factors are important to legal defensibility and stakeholder acceptance:

- Development and implementation of technical peer review of documents published from all stages of the R&D program.
- Development, testing, and validation of QA/QC processes to ensure defensibility of data.
- Development of training and certification processes for all users of the technology.
- Development of communication tools for outreach.

These same factors appear to require greater Air Force support for effective inclusion in the AL/OEBN program. A follow-on TE would result in closer collaboration with the laboratory and the Air Force users and would more closely assess these factors in the program.

Two noise-related projects are funded under the Strategic Environmental Research and Development Program (SERDP): an Air Force project included in the OBEN-3 program and a related Army project. The two SERDP-funded projects are as follows:

1. The Effects of Aircraft Overflights on Birds of Prey
Major Robert C. Kull, Jr.
AL/OEBN
(513) 255-3675

2. Controlling, Assessing, Managing, and Monitoring the Noise Impact from Weapons, Helicopters, and Aircraft on Training and Readiness.
Dr. Paul Schomer
U.S. Army CERL
(217) 352-7229

The Armstrong Labs project started in 1994 and is expected to be completed in 1997. The major objective of this project addresses concerns raised by the U.S. Fish and Wildlife Service. The project will develop an additional dose-response model for integration in ASAN. The CERL project

addresses DOD-wide noise problems, and covers the noise effects of helicopters, fixed-wing aircraft, artillery, night-time training, and the meteorological effects on noise propagation.

3.2.3 Order of Magnitude Cost Estimates

Based on AL/OEBN submissions to the USAF Environment, Safety, and Occupational Health strategic plan, rough order of magnitude costs for the current programs are baselined at $860K (FY96) and are growing to $1.1M by FY03. Additional funding on an annual basis may be added from competitively-awarded funds (SERDP, Small Business Innovative Research, etc.). Currently (through FY96), AL/OEBN operates with a total budget of about $4 million. Significant portions of AL/OEBN's proposed program have been unfunded or under-funded, with the shortfall across the four programs between FY96 and FY03 estimated at $13 million.

3.2.4 Qualitative Risk Assessment

The risks associated with the R&D option and existing program at AL/OEBN are as follows:

- The total set of requirements under this technology group may not be met as indicated in the previous table, "AL/OEBN Assessment of Program's Ability to Satisfy Need." Only Need 1410 is currently judged, on the basis of the information available, as being fully-satisfied under the scope of the programs.
- Research products may not be available when needed. These programs are only in stages 6.2 to 6.3; therefore, several years may be required to develop the data, models, and tools to the degree of complexity needed to affect immediate high priority needs.
- Noise analyses developed by Air Force research products may be technically adequate but not acceptable to interested and affected parties outside the Air Force because the efforts are not viewed as credible. If products are not acceptable, then the Air Force is open to further delays, litigation, or prolonged controversy.
- Research focused only on improved data collection and model development may be viewed by interested and affected parties as not directly addressing the real problem of reducing noise and its impacts. Public outreach and education programs must adequately demonstrate that engine and airframe designs are already in an advanced stage of development and that further efforts in those areas are unlikely to produce a significant decreases in noise levels.
- In order to ensure that the above risks are minimized, the following actions should be considered:
- Reviewing the AL/OEBN program to determine what special gaps exist in program scope and their implications in adequately addressing top priority needs.
- Ensuring that documentation of research and development is comprehensive and made available to regulators and interested and affected parties.
- Including regulators and other interested and affected parties in the development process.
- Verifying that research products are state-of-the-art, thereby enhancing credibility and value.
- Ensuring that data and conclusions meet appropriate tests for legal defensibility, [e.g., chain of custody, adherence to Good Laboratory Practices (GLP) or its equivalent, accreditation of laboratories, etc.].
- Ensuring acceptance by all appropriate regulators and interested parties.
- Including independent external technical peer reviews and evaluations to facilitate certification that may eventually be required of any model or process used in regulatory or legal proceedings.
- Ensuring model validation that compares model estimates against real-time data.
- Ensuring bench-marking with checks that the model under development produces similar results to other, previously validated models used elsewhere.
- Providing for implementation by ensuring that there are adequate models, data acquisition and analysis processes, and hardware and associated software [with sufficiently detailed and understandable documentation/standard operating procedures (SOPs), training programs, and

QA/QC processes to ensure correct use by individuals other than their creators], and that the resulting products are credible and defensible.
Including representatives from local colleges and universities, outside experts in support of the local community, and appropriate regulators and professionals from the public and occupational health communities, which could result in faster acceptance of regulatory documents and fewer litigations in those geographic locations/MAJCOMs where disruptions may have previously occurred.

3.3 Other Considerations

As discussed previously, there are several models under development that are being refined with improved data for specific situations. Models in and of themselves are non-goal oriented, in that they do not reduce noise levels in any way but can only aide in the understanding of impacts. Models can consist of computer programs, databases, or, simply, relationships that explain cause and effect relationships. The added advancement from recent modeling efforts tends to be only marginal because the models are already well-developed. Similarly, the advancements in aircraft technologies relating to lightweight, low-sound profile air frames and quiet engines have been considerable, such that further significant improvements to reduce noise are viewed as marginal. A large amount of effort is required to improve either the models or aircraft technologies beyond current standards. No significant breakthroughs are expected. For this reason, the major thrust is to work with the affected communities to improve their understanding and confidence in the Air Force's abilities to monitor and determine impacts of the noise generated on the environment and communities. The ability to conduct these assessments is important.

Most of the needs in this technology group have been described in a fashion that makes it clear that users are expecting technical solutions that are "legally defensible. state-of-the-art". Unfortunately, with regard to environmental decisions, a variety of Federal agencies have found that technical improvements may have little or no effect on the acceptance of information by interested and affected parties. In many such instances, the past practices of a particular Agency or Department has resulted in a lack of credibility to the point that none of the information generated by the government or its contractors is believed. Subsequent disputes may lead to litigation. Legally defensible technical input may allow the government to win these disputes, but only after a considerable investment of time. The MAJCOM can ill afford this situation, given its need to fulfill a mission. Lack of credibility is likely to make it difficult to fulfill another requirement of these needs: "Ensure environmental law [regulatory] requirements can be met without prolonged controversy17". Needs 1411 and 1413 cannot be achieved strictly by improvements in the technical aspects of these analyses.

If there is a lack of credibility in the community of interested and affected parties associated with noise analyses, then it is unlikely that any technical improvements achieved without the full involvement of regulators and other interested and affected parties (and/or their technical representatives) will lead to complete needs resolution. To develop complete solutions, the Air Force must work with interested and affected parties to identify those characteristics that confer credibility on an R&D program and must use this information to direct its noise R&D program. The effort would need to be a joint one between the Air Force and its interested and affected parties and would likely require either the use of local implementation mechanisms that are viewed as quasi-independent of the Air Force (e.g., cooperative agreements with local universities) or a research program managed by another agency such as the National Science Foundation or National Institute of Health.

Finally, despite the fact that the Air Force routinely has about $10 million in claims pending relating to aircraft overflight issues, these claims have never been found to be related to non-compliance situations. Nevertheless, the claims typically result in disbursements of about $3.3 million each year. Development of improved credibility and improved relations with the interested and affected parties could potentially lessen the number of claims and the amounts of the disbursements.

3.4 Recommended Options

Recommended Option 1: **That the Air Force continue to support the R&D option through programs at AL/OEBN, to find a solution to noise generated by aircraft and space launch vehicles.**

The supporting strategy is as follows:

1. Continue with the on-going noise-related R&D programs through AL/OEBN.
2. Critically evaluate the scope of these programs in relation to the top priority needs, and refocus or expand where necessary to ensure that success criteria are met.
3. Develop and implement strategies for producing peer-reviewed publications from all stages of the R&D process.
4. Implement highly-visible, independent peer review processes that include technical representatives from interested and affected parties, that cover all components of the process used to generate documents addressing noise measurement, and that affect assessments that can be used in litigation or regulatory proceedings.
5. Ensure defensibility of the data through development and pilot testing of QA/QC processes, documentation, training programs, and SOPs for data acquisition and analysis, chain of custody tracking, and instrument use.
6. Develop training and certification processes that can be applied to all users of the technologies, particularly in support of litigation and regulatory procedures.

Recommended Option 1 is based on the conclusions that:

- There are no applicable COTS integrated set of models available for the high priority needs in this group.
- Regulatory areas related to noise are changing; therefore, credibility and legal defensibility are critical to the acceptance of proposed solutions by interested and affected parties.
- Credibility and legal defensibility are critical to the acceptance of proposed solutions by interested and affected parties.
- There is only marginal gain to be made in the reduction of noise from aircraft, due to the advanced state of aircraft design.
- The following recommendations further amplify parts of this strategy.

Recommended Option 2: **That communication tools under development be used for outreach and that the testing of these tools for this activity be included either in the 6.3 or early 6.4 stages of the R&D process.**

The AL/OEBN program for Mitigation of Environmental Noise includes several projects to develop communication tools that should be broadly deployed in advance of the widespread use of the other research products.

Recommended Option 2 is based on the conclusions that:

- The Air Force, NASA and the Federal Aviation Administration (FAA) are all involved in developing and/or using models and collecting data to develop better solutions to noise-related issues concerning aircraft operations (though the FAA principally focuses on issues related to commercial aircraft), and communities should be made aware of this work.
- Currently, it is Armstrong Laboratory's Noise Effects Branch (AL/OEBN) whose research program is the most likely to provide the scientific and technical solutions to the needs in this technology group.
- The Air Force Armstrong Laboratory and NASA's Langley Research Center are the major

situations. Nevertheless, the claims typically result in disbursements of about $3.3 million each year. Development of improved credibility and improved relations with the interested and affected parties could potentially lessen the number of claims and the amounts of the disbursements.

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- The Air Force Armstrong Laboratory and NASA's Langley Research Center are the major

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organizations that have ongoing scientific and technical work at development stages 6.2 and 6.3, related to noise measurement and the effect of noise on the environment.

Recommended Option 3: **That an evaluation be performed that more fully explores how the numerous milestones contained in the AL/OEBN program map to the needs of the MAJCOM and contribute to the successful achievement of the three criteria for success.**

The evaluation would include a detailed examination of (1) the problems associated with noise analyses; (2) the time spans for required solutions; (3) the acceptance level of current data and models; (4) the factors that impair achievement of the users' three success criteria; and (5) potential modifications to the R&D process.

Recommended Option 3 is based on the conclusions that:

- Several of the needs (1411, 450, 1413, and 252) are likely to be only partially met by the currently planned AL/OEBN program. Only Need 1410 appears to be fully met.
- Funding is a mixture of both Air Force and non-Air Force funds.

HSC/XRE follow-on assistance:

If the Major Command desires assistance from HSC/XRE for more detailed analysis, HSC/XRE can perform Part 2 of a Technology Assessment, which is called a Technology Evaluation (TE). The TE will determine need- and site-specific solution sets to the defined needs. A clear definition of the objective for and desired assistance from a TE will be developed in close coordination with each MAJCOM involved or with other designated points of contact. It is estimated this TE could be accomplished within the range of four to ten weeks, once defined and funded.

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0038

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 27TH FIGHTER WING(ACC)
CANNON AIR FORCE BASE, NEW MEXICO

18 June 96

27 FW/PA
100 S DL Ingram Blvd Suite 102
Cannon AFB NM 88103-6216

Mr. A. S. "Tex" Elliott
[redacted]
Ft. Sumner NM [redacted]

Dear Mr Elliott

I am writing to you in response to your low-level noise complaint dated 3 June.

After receiving your complaint, our office forwarded the information you provided us with to Cannon's Airspace Management Division.

Based on documentation from scheduling records, we were able to ascertain that there was a Cannon F-16 booked in the Pecos MOA around the time of the incident. Additionally, we have confirmed that there was an inadvertent penetration of your Noise Sensitive Area since the crew reported flying in the airspace near your home between 1000' and 1500' AGL at about 1:12 p.m.

The crewmembers would like to extend their sincere apologies as they try very dilligently to respect all established NSAs.

As always, we will continue to place special emphasis on your NSA during squadron preflight briefings when training space issues are generally discussed.

If there are incidents in the future and you feel the aircraft breech the NSA, please let us know. We will investigate and provide you with a response as soon as the information becomes available.

Sincerely,

James R. Wilson

JAMES R.WILSON, 1Lt, USAF
Deputy Chief, Public Affairs

Exhibit G

0038

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 27TH FIGHTER WING(ACC)
CANNON AIR FORCE BASE, NEW MEXICO

29 May 96

27 FW/PA
100 S DL Ingram Blvd Suite 102
Cannon AFB NM 88103-6216

Mr. A. S. "Tex" Elliott
[redacted]
Ft. Sumner NM [redacted]

Dear Mr Elliott

I am writing to you in response to your low-level noise complaints dated 14 and 21 May.

I understand your concerns over noise generated by military training in your area, however the airspace available to us to conduct training operations is very limited and very valuable.

As for the two noise complaints on 14 and 21 May, both were investigated by the Airspace Management Office. The first complaint was coordinated with the 524th Fighter Squadron who said they may have penetrated your noise sensitive area while flying between 500' and 1,000' AGL. Regarding the second complaint, even though all NSAs applicable to the airspace in use were pre-briefed and the majority of training occurred at 1,500' AGL, there were a few excursions down to 700' AGL. The aircrews involved extend their regrets for this inadvertent penetration of your noise sensitive area.

The aircrews are professionals who train for the protection of America's freedom while at the same time try to respect our New Mexico neighbors.

The 27th Fighter Wing takes complaints of the noise sensitive areas very seriously. If there are incidents in the future and you feel the aircraft breech the NSA, please let us know. We will investigate and provide you with a response as soon as the information becomes available.

Sincerely,

James R. Wilson
JAMES R.WILSON, 2Lt, USAF
Deputy Chief, Public Affairs

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008 EXPIRES 4-30-88

0038

1. Submit To Appropriate Federal Agency:

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)
A. S. Elliott
dba El Bigote Cattle Co.
[redacted]
Fort Sumner, NM [redacted]

3. TYPE OF EMPLOYMENT	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
☐ MILITARY ☒ CIVILIAN	21JUN46	M	22-25 DEC 93	UNKNOWN

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.)
I weaned our 1993 calf crop on or about 21DEC93 and they were in the herd trap just east of my house. The next day, and for the next three days, I had to patch a five strand 12½ga domestic barbwire fence on the south and west sides of said trap and recover calves that had escaped and remove cows that had entered the trap. We've never experienced such "break-outs" before even with foreign imported calves. I had tickets to attend the John Hancock Bowl on CHRISTmas eve with my family andmy wife's family. I was unable to leave the ranch because I had to patch the fence and recover the calves daily. After trying to ascertain just why I was having to patch fence this year and never before, I remembered the F-111's flying over that corner ~~below 100'AGL both day and night; North to South, and East to west over that corner.~~

9. PROPERTY DAMAGE
NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code)

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.) Five 5½' steel T posts were bent over and broken, 6-7 different (I qu counting)locations were wire stretched and wire replaced along with clips and tie wire. Saddled horses, time spent gathering cattle, unable to attend game. Jim Bryant, CAFB, inspected

10. PERSONAL INJURY/WRONGFUL DEATH
STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT.
SW cor SEC1,T1N, R24E,NMPM
NOTE: I have complained before about low flying F-111 aircraft over my house corrals, and ranch personnel. I've made several personal trips to OPERATIONS CENTER on Cannon AFB,to show numerous officers where my house is located. AF personnel continue to abuse flight restrictions and FAR's. NOTE ENCLOSED

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
Jan Elliott (Wife)	[redacted] Uvalde, TX [redacted]
Benjamin Elliott	Same
Stephen Elliott	Same These family members all participated
Erin Elliott	Same in patching fence
Rebecca Elliott	Same

12. (See instructions on reverse) AMOUNT OF CLAIM (In dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
Material: $ 25.00 Labor 400.00	Unable to attend game: $500.00	Calves were cut but, did not die	$925.00

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
A. S. Elliott 28FEB94	[redacted]	22-25DEC93

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM
The claimant shall forfeit and pay to the United States the sum of $2,000, plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS
Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001.)

95-107 NSN 7540-00-634-4046 Previous editions not usable. STANDARD FORM 95 (Rev. 7-85) Prescribed by GSA, FPMR (41 CFR) 101-32.9 28 CFR 14.2

ENCLOSED: 13FEB87 LETTER DESCRIBING ROUTE RESTRICTIONS USAF WIDE IN & MAP OF RANG

Exhibit H

0038

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008 EXPIRES 4-30-88

1. Submit To Appropriate Federal Agency:

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)

A. S. Elliott
dba El Bigote Cattle Co.
[redacted]
Fort Sumner, NM [redacted]

3. TYPE OF EMPLOYMENT	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
☐ MILITARY ☒ CIVILIAN	21JUN46	Married	4-9NOV94, Friday-Wednesda	Day/Night

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.)

I weaned 141 calves on Sunday, 30OCT94, and left in pens overnight. I released the calves the next morning onto feed and water here at HQTRS. I called Cannon AFB, Public Affairs, same day, 31OCT94, to advise them of my operation and to ask/advise them not to overfly like last year causing excitement of animals & damage to fence and injury to livestock. Since it was a "Gold Day", I was told, no military personnel were on duty; off trick or treating, I presume. I spoke with a civilian personnel. He assured me he would pass on the call. I fed and counted all 141 head until I left ranch on PM of 4NOV94. Upon my return, I discovered 4 head missing & fence damaged; 2 wires broken, 2 steel "T"posts broken, and remaining wires (3)had to be re-stretched. Fixed fence & gathered 3 head: 1 on 10NOV94, 2 on 25NOV94, 1 found dead. 137 remained in trap. I took pictures.

9. PROPERTY DAMAGE

NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code)

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.) Same as last year! S fence, Sec1,T1N,R24E,NMPM, DeBaca Co NM. Spliced -12½ga domestic barb wires, re-stretched all five, and will have to replace 2 steel "T" posts. Two cowboys gathered calves from adjacent pasture.

10. PERSONAL INJURY/WRONGFUL DEATH

STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT. NOTE: See claim of 22-25DEC93, submitted 28FEB94
B1 Bomber aircraft were seen and felt flying at extremely low altitudes over my pickup truck while feeding my livestock both before and after this damage claim They wre flying some DOD certification out of HIAC (nee Walker AFB), Roswell, NM I have pictures and witnesses. While I was feeding, I saw no F-111's, nor F-16

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
George Franklin	[redacted] Uvalde, TX [redacted]
Pat Morris	Crystal City, TX
Cowboys:	
Benjamin Elliott	[redacted] Uvalde, TX [redacted]
Stephan Elliott	Uvalde, Tx

12. (See instructions on reverse) AMOUNT OF CLAIM (in dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
Material: $ 5.00 Labor: 300.00	Inconvenience	1 Steer Cf:$475.00	$780.00

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
A. S. Elliott	[redacted]	27NOV94

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM
The claimant shall forfeit and pay to the United States the sum of $2,000. plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS
Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001.)

95-107 NSN 7540-00-634-4046 Previous editions not usable.

Exhibit I

28 CFR 14.2

0038

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008 EXPIRES 4-30-88

1. Submit To Appropriate Federal Agency:

27 FW JAD
101 S DL Ingram Blvd
Cannon AFB, NM 88103-5219

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)

A S Elliott
dba El Bigote Cattle Co
[redacted]
Ft Sumner, NM [redacted]

3. TYPE OF EMPLOYMENT	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
☐ MILITARY ☒ CIVILIAN	21JUN46	M	14MAR96, Thursday	1455

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.)

I was in my house(Cannon AFB NSA, DEC88) and heard aircraft approaching at low close range as they too often do. I ran outside and viewed a B-1B pass directly over my house at about 200'AGL. I looked up and right above me was the left engines pod and left wing attachment to the fuselage. I immediately called Cannon AFB Public Affairs and reported the violation of FAR and NSA. I also called Mr. Jerry Yuduas, Langly, VA, and as I was speaking with him, the aircraft (same or second) made a second extremely low pass just south of my ranch HQTRS. I later discovered a yearling filly was out from running into barbed wire fence, several posts and barbwire broken from excited livestock running over it, and 1 yearling heifer with severed hooves from barbed wire.

9. PROPERTY DAMAGE

NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code)

Heifer is owned by partnership, GOTTOMITEE, affadavit attached. POB 58 PT SUMNER, NM 88119

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.) 1 horse, cut on left hip, trsp fence west of HQ, yearling heifer in corral @HQTRS, Sec 2, T1N, R24E, NMPM. three fence posts were replaced and wire patched.

10. PERSONAL INJURY/WRONGFUL DEATH

STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT. Horse was cut on fence, not sutured, but scarred. Heifers hooves(front, both feet) were severed typical with cattle getting caught in barbed wire and trying to reverse themselves to escape. From the evidence of the broken/laid over fence, the cattle were excited over the fence and one heifer was caught within the wires severing the hooves while escaping Heifer was penned, doctored, and fed until released on 1JUL96.

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
None other than Jerry Yuduas heard second pass over phone.	Airspace Person address unknown other then phone number in Langley, VA

*Note: Pictures taken by JAD personnel 10-14days after, maybe longer.

12. (See instructions on reverse) AMOUNT OF CLAIM (in dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
Fence:Lbr&Mtl=112. Hfr:Vet&feed:102d>vs@$10/drv=$1020. Total=$1132.			$1132.00 US

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
A S Elliott	[redacted]	16JUL96

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM
The claimant shall forfeit and pay to the United States the sum of $2,000 plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS
Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001.)

95-107 NSN 7540-00-634-4046 Previous editions not usable.

***NCIS: 1)Further affadavit
2)Letter confirming violation of

Exhibit J

0038

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008

1. Submit To Appropriate Federal Agency:
27FW JAD
101 S DL INGRAM BLVD
CANNON AFB, NM 88103-5219

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)
A S ELLIOTT
DBA EL BIGOTE CATTLE CO
[redacted]
FORT SUMNER, NM [redacted]

3. TYPE OF EMPLOYMENT	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
☐ MILITARY ☒ CIVILIAN	21JUN46	YES	23DEC99 THURSDAY,+-07:00	+- 07:00AM

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.) I weaned ranch calves 21DEC99 and put them in HERD TRAP east of HQTRS within NSA (est DEC88, expanded JAN96). From prior experience and past claims, I called CANNON AFB PUBLIC AFFAIRS to tell them of my plans on my private property the next day, 22DEC99 AM. Sure enough, the very next morning, 23DEC99, about 7:00, here came the various F-16 aircraft from CANNON AFB! Again...just weaned livestock are extremely excitable and low flying aircraft excite them to bolt and run, sometimes over fences if they are adjacent to weaned calves. Consequently about 80+ calves busted about 100' of fence and mixed back with their mothers in the adjacent pasture. We then had to catch horses, gather entire herd (220 cows +80 calves) drive them back to corrals and re-sort calves. Then we fixed fence

9am CHRISTMAS EVE EVE and on PROPERTY DAMAGE CHRISTMAS EVE!

NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code)
A S and JAN ELLIOTT, DBA EL BIGOTE CATTLE CO, PO BOX 58, FORT SUMNER, NM 88119-0058

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.) Damaged fence was between Horse Trap and Herd Trap water lot, about 250 yards east of my house. 100'of fence was knocked down, replaced wire on 30-75'of fence, replaced 7 cedar posts and 7 steel posts, replaced brace and wire w/ te.

10. Later, found dead calf. PERSONAL INJURY/WRONGFUL DEATH

STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT. Personal property (fence) was damaged by excited livestock. CANNON AFB personnel inspected fence repaired 11:15 TUESDAY, 28DEC00. After many attempts to correctly count for missing or dead livestock, we gathered entire herd to corrals and recounted. I was short 1 steer calf. After riding the entire pasture, we found remains of deceased calf, pic encl.

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
Benjamin G Elliott	[redacted] Lubbock, TX
Stephen M Elliott	Lubbock, TX [redacted]
A S Elliott	Fort Sumner, NM [redacted]

12. (See instructions on reverse) AMOUNT OF CLAIM (In dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
Fence Matls 84.43 Labor 2days 500.00		500#St Cf @$1.00/# $500.00	$1084.43 (encls)

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
A. S. Elliott	[redacted]	16OCT00

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM
The claimant shall forfeit and pay to the United States the sum of $2,000. plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS
Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001.)

95-109 NSN 7540-00-634-4046 Previous editions not usable.

STANDA... PRESCR... 28 CFR 14.9

Exhibit K

Rcvd 16 OCT 00 27 FW/JAD/JMC

0038

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008 EXPIRES 4-30-88

1. Submit To Appropriate Federal Agency:
27thFW/JAD
101 S DL INGRAM BLVD
CANNON AFB, NM 88103-5219

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)
EL BIGOTE CATTLE CO., L.L.C.
A S ELLIOTT, MANAGING PARTNER
[redacted]
UVALDE, TX [redacted]

3. TYPE OF EMPLOYMENT	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
☐ MILITARY ☒ CIVILIAN	21JUN46	YES	2FEB01, TUESDAY PM	14:18

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.) 6TH DAMAGE CLAIM.
I was moving large hay bales with tractor into my barn at ranch headquarters under established NSA. I was startled by low flying F-16 w/ yellow horizontal strip on vert. stabalizer. As I look up, my tractor hit a parked molasses trailer near my work. A second F-16 passed south of me, the first north less than 1qtr of mile, the second about ½mile away. Both were about 500'AGL and moving west to east, both well below the NSA. I called Cannon AFB PA and it was later disclosed that it was the "Tacos", 150FG, NMANG. Their commander was to call me, but I had to call him about a month later. He just couldn't find the time to acknowledge their latest infraction. Both the fuel tank and intake manifold were broken in the violation. The motor is a 3½hp Briggs.

9. PROPERTY DAMAGE

NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code)

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.) Liquid feed trailer is located at ranch HQ, DeBaca County, NM, USA 3½ horsepower Briggs & Stratton molasses pump engine. Replaced fuel tank and intake manifold. Downtime was two days and 18 mile(1 way) trip to town.

10. PERSONAL INJURY/WRONGFUL DEATH

STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT.

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
A. S. ELLIOTT	[redacted] UVALDE, TX [redacted]

12. (See instructions on reverse) AMOUNT OF CLAIM (In dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
Parts,labor 50.26 Downtime 200.00 & Travel			$ 250.26

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
A.S. Elliott MANAGING PARTNER El Bigote Cattle Co, LLC	[redacted]	31OCT02

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM
The claimant shall forfeit and pay to the United States the sum of $2,000. plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS
Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001.)

95-107 NSN 7540-00-634-4046 Previous editions not usable.

Exhibit L

0038

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008 EXPIRES 4-30-88

1. Submit To Appropriate Federal Agency:

27thFW/JAD
101 S DL INGRAM BLVD
CANNON AFB, NM 88103-5219

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)

A S ELLIOTT
[redacted]
FORT SUMNER, NM [redacted]

3. TYPE OF EMPLOYMENT	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
☐ MILITARY ☒ CIVILIAN	21JUN46	YES	17SEP01 13:17, MONDAY	13:17

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.)

7th Damage claim within established NSA. I was sitting at living room window inside house at ranch headquarters when sonic boom sounded. The house shuddered and the window beside exploded inward. I noted the time and called 27thFW/PA to notify the incident. I spoke with Ms. Vaita G Pena with JAD; she would send claim forms. I had to drive 18 miles (one way) into town to advertise for carpenter to replace window glass. I placed ad in the newspaper and waited. A carpenter called several weeks later and after a prolonged wait, I repaired my window in FEB02. One-half of newspaper ad was $5.55, carpenter and materials was $136.62, my labor and inconvience to go to town and supervise was $200.00 @ $100.00/day.

9. PROPERTY DAMAGE

NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code)

GOTTOMITEE, LTD., A S ELLIOTT, MANAGING GEN PARTNER, [redacted] UVALDE, TX [redacted]

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.)

East side of house @ ranch hqtrs, DeBaca County, NM, USA Ms Pena said "fix it"

10. PERSONAL INJURY/WRONGFUL DEATH

STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT.

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
A S ELLIOTT	[redacted] FORT SUMNER, NM [redacted] UVALDE, TX [redacted]

12. (See instructions on reverse) AMOUNT OF CLAIM (in dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
Repairs 136.62 Newspaper ad 5.55	Labor and inconvience 200.00		$ 342.17

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
A.S. Elliott MANAGING PART Gottomitee, Ltd	[redacted]	31OCT02

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM
The claimant shall forfeit and pay to the United States the sum of $2,000. plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS
Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001

95-107 NSN 7540-00-634-4046 PRESCRIBED BY DEPT. OF JUSTICE

Exhibit M

0038

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008 EXPIRES 4-30-88

1. Submit To Appropriate Federal Agency:

27thFW/JAD
101 S DL INGRAM BLVD
CANNON AFB, NM 88103-5219

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)

GOTTOMITEE, LTD.
A. S. Elliott, Managing Partner
[redacted]
UVALDE, TX [redacted]

3. TYPE OF EMPLOYMENT	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
☐ MILITARY ☒ CIVILIAN	21 JUN 46		MONDAY, 9 SEP 02	20:33

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.)

SEE ATTACHED LIST AND ENCLOSURES

9. PROPERTY DAMAGE

NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code)

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.)

RANCH PROPERTY, CRASH AND DEBRIS, DEBACA COUNTY NEW MEXICO

10. PERSONAL INJURY/WRONGFUL DEATH

STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT.

PROPERTY DAMAGE, LIBEL AND SLANDER

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
A S ELLIOTT STEPHEN M ELLIOTT CALEB G ELLIOTT	[redacted] UVALDE, TX [redacted] BERTRAM, TX [redacted] [redacted]., LUBBOCK, TX [redacted]

12. (See instructions on reverse) AMOUNT OF CLAIM (in dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
$100,000.00	Libel and slander $10,000,000.00	NOT YET	$10,100,000.00

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
	[redacted]	8 SEP 04

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM
The claimant shall forfeit and pay to the United States the sum of $2,000. plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS
Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001.)

95-107 NSN 7540-00-634-4046 Previous editions not usable. STAN PRES 28 C...

Exhibit N

0038

**********NOTICE** THIS CLAIM IS FOR CATTLE OPERATION ONLY**********

CLAIM FOR DAMAGE, INJURY, OR DEATH

INSTRUCTIONS: Please read carefully the instructions on the reverse side and supply information requested on both sides of this form. Use additional sheet(s) if necessary. See reverse side for additional instructions.

FORM APPROVED OMB NO. 1105-0008 EXPIRES 4-30-88

1. Submit To Appropriate Federal Agency:

27thFW/JAD
101 S DL INGRAM BLVD
CANNON AFB, NM 88103-5219

2. Name, Address of claimant and claimant's personal representative, if any. (See instructions on reverse.) (Number, street, city, State and Zip Code)

EL BIGOTE CATTLE CO., L.L.C.
A S ELLIOTT, MANAGING PARTNER
[redacted]
UVALDE, TX [redacted]

3. TYPE OF EMPLOYMENT ☐ MILITARY ☒ CIVILIAN	4. DATE OF BIRTH	5. MARITAL STATUS	6. DATE AND DAY OF ACCIDENT	7. TIME (A.M. OR P.M.)
	21JUN46	YES	9SEP02, MONDAY NIGHT	20:33

8. Basis of Claim (State in detail the known facts and circumstances attending the damage, injury, or death, identifying persons and property involved, the place of occurence and the cause thereof) (Use additional pages if necessary.)

We had weaned our calves early this year because of drouth on the weekend of 24,25AUG02. The next day, Monday, 26AUG02, I called Cannon AFB Public Affairs office to notify them once again, as I have to do each year to attempt to reduce damages from USAF/NMANG aircraft, at about 11:00 hours. I spoke with the new PA Officer, CAPT SANDROCK, and notified him of our ranch operations and asked them not to overfly just weaned calves that would be, as each year, located east of our HQ well within the infamous NSA. My son, Stephen was at ranch watching Monday Night Football. He had observed many aircraft flying that PM and into night, some using afterburners. At about 20:33, the house shuddered and the explosion lit up the room. He called me @ Uvalde, Texas, and I called Cannon AFB to report their crash, 20:36, Sgt Thompso

9. PROPERTY DAMAGE

NAME AND ADDRESS OF OWNER, IF OTHER THAN CLAIMANT (Number, street, city, State, and Zip Code) took the call @ Command and Control and called Melrose Range and later confirmed crash. F-16, #316 was found on ranch.

BRIEFLY DESCRIBE THE PROPERTY, NATURE AND EXTENT OF DAMAGE AND THE LOCATION WHERE PROPERTY MAY BE INSPECTED. (See instructions on reverse side.) Cattle were observed within crash site pasture by various Cannon AFB personnel, Col Showers, Site Commander, LtCol Doran, LtCol Bower. On 10SEP02, Col Showers said yes, we need to remove livestock from crash area

10. PERSONAL INJURY/WRONGFUL DEATH

STATE NATURE AND EXTENT OF EACH INJURY OR CAUSE OF DEATH, WHICH FORMS THE BASIS OF THE CLAIM. IF OTHER THAN CLAIMANT, STATE NAME OF INJURED PERSON OR DECEDENT.

CONTINUATION OF #9 above: I and my two sons had to gather horses, gather the 184 weaning calves and move them into a much larger pasture, all in the rain. This was a month too early to remove them into a larger pasture which is more difficult to find sick weaned calves. This caused death of 1 steer.

11. WITNESSES

NAME	ADDRESS (Number, street, city, State, and Zip Code)
A S ELLIOTT	[redacted] UVALDE, TX [redacted]
CALEB G ELLIOTT	LUBBOCK, TX
STEPHEN M ELLIOTT	FORT SUMNER, NM

12. (See instructions on reverse) AMOUNT OF CLAIM (In dollars)

12a. PROPERTY DAMAGE	12b. PERSONAL INJURY	12c. WRONGFUL DEATH	12d. TOTAL (Failure to specify may cause forfeiture of your rights.)
Loss of weaning trap use 1000.	Labor to move cows and calves 500.	1 Steer @425# @ $1.00/# 425.	$1925.00

I CERTIFY THAT THE AMOUNT OF CLAIM COVERS ONLY DAMAGES AND INJURIES CAUSED BY THE ACCIDENT ABOVE AND AGREE TO ACCEPT SAID AMOUNT IN FULL SATISFACTION AND FINAL SETTLEMENT OF THIS CLAIM ***THIS IS FOR CATTLE OPERATION ONLY***

13a. SIGNATURE OF CLAIMANT (See instructions on reverse side.)	13b. Phone number of signatory	14. DATE OF CLAIM
A.S. Elliott Managing Partner El Bigote Cattle Co. LLC	[redacted]	31OCT02

CIVIL PENALTY FOR PRESENTING FRAUDULENT CLAIM

The claimant shall forfeit and pay to the United States the sum of $2,000. plus double the amount of damages sustained by the United States. (See 31 U.S.C. 3729.)

CRIMINAL PENALTY FOR PRESENTING FRAUDULENT CLAIM OR MAKING FALSE STATEMENTS

Fine of not more than $10,000 or imprisonment for not more than 5 years or both. (See 18 U.S.C. 287, 1001.)

95-107 NSN 7540-00-634-4046 STANDAF ...RE (Rev. 7-85)
Previous editions not usable. PRESCRI
28 CFR

Exhibit O

0038

USAF FY96/97 ESOH Strategic Plan

[redacted]

EXECUTIVE SUMMARY

Table of Contents for non-frame users

This is the fifth edition of the USAF Environment, Safety and Occupational Health (ESOH) Research, Development, and Acquisition Strategic Plan (Strategic Plan). The Air Force is the only Service that continues to develop an environmental research and development (R&D) strategic plan that independently documents a set of validated environmental quality technology R&D requirements. This set of validated requirements serves as the information foundation on which research, development and acquisition programs are built. The goal for the continuing development of the Strategic Plan is one of constant improvement.

The Strategic Plan originated from the Department of Defense's Joint Engineering Management Panel: "Project Reliance". Project Reliance issued a request in 1991 for all the military service laboratories to provide information on "planned" environmental research, development, and acquisition programs. Due to a lack of clear instruction and guidance on reporting requirements, a set of fragmented and incomplete Air Force environmental quality programs was published in the first edition of the Strategic Plan in fiscal year 1992.

The original goal for the Strategic Plan was to maximize the research and development potential of Department of Defense laboratories. The focus of the planning process was documenting environmental research and development efforts in a format common to the Services. The original goal is currently satisfied, thus the plan now serves several additional purposes.

The Strategic Plan is used to satisfy the reporting requirements of three government entities:

- Joint Engineering Management Panel's Project Reliance,
- Deputy Undersecretary for Defense Environmental Security, DoD Environmental Requirements, and the
- Strategic Environmental Research and Development Program.

The 1995 Strategic Plan was the first to include and link ESOH need requirements to programs and projects of Air Force laboratories.. The 1996 Strategic Plan builds on the foundation established in the previous year's plan and focuses on the "products" of the Air Force laboratories' programs and projects. This emphasis directly reflects ESOH customers keen interest in getting their needs satisfied with stakeholders and decision makers sharing in the ESOH planning process.

In reality, this document is representative of strategic programming, and is still evolving toward a complete strategic plan. Strategic planning connotes developing a vision, goals, and then deployment plans to meet the vision and goals. The Strategic Plan documents the products of laboratories' programs and projects meeting ESOH needs. It also begins linking needs and associated products with other strategic planning documents such as the Air Force Installations Mission Support Plan (DRAFT), dated 15 April 1996, and Air Force Material Command and Human System Center goals and objectives; more details about these links are included in section 2. This linkage is a major step in establishing the Strategic Plan as a true strategic planning vehicle.

Laboratory programs are influenced by complex and often competing goals and interests from the Department of Defense, Air Force Staff, Air Force Materiel Command Science and Technology, and the other services. This report advocates the customers' position to influence the principal investigator, laboratory directors, and science and technology managers to satisfy specific

Exhibit P

[redacted]

requirements. This report does not determine funding of programs, but can influence it. Funding is at the discretion of laboratory directors within the program elements. Science and Technology management requires customer approval of laboratory programs, as a result of previous editions of this publication. This year the incorporation of products begins to afford the customer the opportunity to fund research directed at specific solutions.

OVERVIEW OF THIS DOCUMENT

This publication again specifically cites the *FY96 United States Air Force Environment, Safety and Occupational Health Technology Needs Survey* (ESOH TNS). Citations in this document refer to the most recent survey, published in December 1995, and approved with modifications by the Environmental Technology Review Board in December, 1995.

Several significant changes have been made in both the content and format of this Strategic Plan from the previous version. This edition contains expanded information about the products of laboratories' programs and projects.

This Strategic Plan has been reduced to two volumes. Volume I, titled *USAF Environment, Safety, and Occupational Health, Research, Development and Acquisition Strategic Plan*, summarizes the process used and how ESOH needs are being addressed by the laboratories' products, programs and projects. Key sections of Volume I include Section 5 and Section 6, Appendix C and Appendix D. Section 5 presents an overview of how ESOH technology needs, principally those needs ranked high priority in the FY96 ESOH TNS, are being addressed by the products of the programs developed by Air Force laboratories to address these needs. The information used in Section 5 has been provided by Air Force laboratories. Section 6 is a summary of Technology Assessments or independent analyses of ESOH needs and the supporting laboratory programs. This section provides preliminary conclusions about the ability of those products to address the needs and also provides some insight into potential commercial-off-the-shelf (COTS) and other laboratory solutions for ESOH needs. Appendix C contains a series of tables that enable the reader to cross reference ESOH technology needs to specific products of R&D programs addressing those needs.

Volume II includes detailed information about USAF Laboratory Products and Associated Programs and Projects. Volume II is the supporting documentation to Appendix C of Volume I. This volume includes a complete description of the laboratory products matched to ESOH needs and identifies the laboratory programs and projects contributing to those products. The reader is also provide detailed descriptions about those contributing programs and projects.

The remainder of this Executive Summary provides a synopsis (including Graphical depictions of funding by Pillar) of Section 5 and Appendix C of Volume I, or how well ESOH needs are being addressed by Air Force Laboratory products, programs and projects.

SUMMARY OF THE SUPPORT OF ESOH NEEDS

A summary of ESOH needs with associated laboratory products is presented below. More statistics are included in Appendix C in the cross reference tables of needs to products. These statistics, like Appendix C and Volume II, do not include potential COTS or other solutions to the ESOH Needs discussed in Sections 5, 6 and other Appendices.

- 55 percent of the FY96 ESOH High priority and High plus Medium priority ranked needs have associated USAF laboratory products; however, only 47 percent of these products are fully funded (i.e., all projects associated with the product/program have projected funding in the outyears).
- 48 percent of the total FY96 ESOH needs have associated USAF laboratory products; only 43 percent of these products are fully funded.
- 67 percent of the FY96 ESOH High priority ranked and 60 percent of the total Compliance

1. ID Number: 1410

2. Title: A New Method Is Needed to Gather Defensible Aircraft Operational Data for Use in Determining Noise Levels for Aircraft Beddowns/Realignments; and the Air Installation Compatible-Use-Zone Program

3. Pillar Supported: Undefined

4. Priority: High

5. Media: Noise, especially during the NEPA process.

6. Contaminant(s):

7. Key Policy or Regulatory Driver:

- National Environmental Policy Act (NEPA)
- Noise Control Act (NCA) of 1972
- 4165.57, Air Installations Compatible Use Zones
- AFI 32-7063, Air Installation Compatible Use Zone Program
- AFI 32-7062, Base Comprehensive Planning
- AFI 32-7060, Interagency and Intergovernmental Coordination for Environmental Planning

8. Need Description: The Air Force is constantly realigning aircraft to meet the needs of the flying mission. A noise analysis is required for all actions involving the movement of aircraft during the National Environmental Policy Act (NEPA) process and every two years for the Air Installation Compatible Use Zone Program in accordance with Noise Control Act and DODI 32-7063. The computer program used to calculate these noise levels (NOISEMAP) has been refined over the years and is highly defensible against outside challenges. Unfortunately, the methods used to gather the information required is extremely vulnerable to litigation. The current data collection methods do not provide indisputable data. In fact, the accuracy of the data is totally dependent upon human interpretation and therefore, extremely vulnerable to human error. The Air Force needs to develop a data acquisition system that will record and store actual aircraft flight information and convert it into data that can then be read directly into BASEOPS (the computerized input program for NOISEMAP). Additional benefits include actual historical information for air quality; determining the source of noise for compliants and lawsuits, assistance during accident investigations, and designing terminal instrument procedures.
Current System Description: N/A
Waste/Volume/Other Environmental Concerns: Noise is consistently a high-visibility environmental issue during the NEPA process. Over the past 20 years, the Air Force has worked to refine the computer models used to calculate noise levels generated by aircraft operations. These noise simulation models are now highly defensible against outside challenges; however, a chronic shortcoming exists in the noise analysis process; difficulty in obtaining accurate data on aircraft activity, flight geometry, and performance for modeling inputs. This can lead to costly delays in implementing aircraft beddowns when legally challenged. In addition, obtaining aircraft flight information to accomplish calculations for air quality conformity is a best-guess at the most due to the uncertainty in operational data. The current system is inaccurate in that it does not take into account all aircraft flying in the vicinity of installations.
Current Cost of Process: Undefined
Standards/Specifications Impacted: None
Known R&D Efforts: Robert Lee AL/OEBN 513-255-3664 DSN 523-3664
Outside Needs: Mr Alan Zusman NAVFACENGCOM DSN 221-0090

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9. **Urgency:** 1995

10. **Alternative Options:**

Current Method of Reducing the Problem: Noise data is collected by teams of trained individuals traveling to installations and interviewing pilots, schedules, maintenance personnel, air traffic controllers and transient alert personnel.

Potential Solutions: Programmable Indicator Data Processor (PIDP) and Automated Radar Terminal Systems (ARTS) are terminal radar systems used to control air traffic around military (PIDP) and civilian (ARTS) runways. These radar systems continuously update information on the aircraft type, altitude, airspeed, and location of all aircraft within the air traffic controller's airspace; however the PIDP is in real-time mode only with no means of capturing the information for use at a later date. The Federal Aviation Administration currently records Automated Radar Terminal Systems (ARTS) data and manipulates it for use with the Integrated Noise Model (Civilian noise models). The Air Force needs a modified and expanded version of this capability using the Air Force's Programmable Indicator Data Processor (PIDP) being installed at all Air Force Installations.

Minimal Success Criteria: The recording media must not interfere with the PIDP radar systems; the system must be capable of functioning on a daily basis in a hands-off mode with dial-in capability for downloading of information. Software must be designed to allow manipulation of the data in a hands-on and hands-off mode. Output files must be in a format to allow direct input to the BASEOPS program and contain detailed data for all aircraft utilizing the installation's runway. This level of detail must include, but not necessarily be limited to, number of aircraft utilizing the runway by aircraft type and time of day; flight path used by each aircraft, altitude and airspeeds along the flight path for each aircraft. System must be able to determine multiple approaches and landings/takeoff configurations.

Additional information may be found in the Needs-to-Products cross-reference table in the FY96/97 Strategic Plan

1. **ID Number:** 1411

2. **Title:** A Quantitative Dosage-Response Relationship for Predicting the Effects of Noise Is Required

3. **Pillar Supported:** Undefined

4. **Priority:** High

5. **Media:** Noise/Sonic Boom

6. **Contaminant(s):**

7. **Key Policy or Regulatory Driver:**

- National Environmental Policy Act (NEPA)
- AFI 32-7061, Environmental Impact Analysis Process
- AFR 55-34
- Council of Environmental Quality (CEQ) Regulations
- USAF SON 1-81
- AFI 13-201

8. **Need Description:** Because training operations may overfly lands used for outdoor recreation, the Air Force requires the ability to predict the effects of aircraft noise on outdoor recreationist. Much of the special use airspace established and utilized by the Air Force is away from populated areas, as a result the outdoor recreationist is subjected to the aircraft overflight and noise exposure. Federal and state agencies which control the areas largely utilized by the outdoor recreationist have recently made the attempt to exert greater control over the airspace above the resources for which they are responsible, including that utilized by military aircraft. Today, no quantitative dosage-response relationship has been developed for predicting annoyance in these circumstances, and information which such a relationship could be based is in short supply. Apart from a social survey of wilderness visitors sponsored by the Forest Service, and a study of park visitors' reactions to tour aircraft sponsored by the National Park Service, no useful quantitative information of any kind exists. Considering the great value of reliable information about recreationists' reaction to aircraft overflights, it is worthwhile to the Air Force to undertake a study in an outdoor recreational setting. Overall, new and refined methods of analysis are needed to 1) ensure environmental law requirements can be met without prolonged controversy, 2) to be consistent with and avoid impact to mission requirements and 3) ensure Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art description and analysis methods.

Current System Description: None

Waste/Volume/Other Environmental Concerns: None.

Current Cost of Process: Cost of current process is not monetary but rather cost is the potential risk to the continuation of military training operations over non-populated areas and the accomplishment of legally defensible noise analysis for the purposes of establishing, maintaining or modifying airspace.

Extent of the Problem: All DoD services with a flying mission and established airspace, have the potential to be affected by the potential impact of military operations on outdoor recreationists.

Standards/Specifications Impacted: N/A

Outside Needs: Other services such as the Navy and Army.

9. **Urgency:** 1997

Non-Compliance: Noncompliance with the National Environmental Policy Act can result in adverse impact to the flying mission due to procedural violations wherein the potential impacts of proposed

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actions and alternatives have not been analyzed and utilized for decision-making purposes. In addition, adverse impacts due to legal injunction and/or public and political concern has the potential to occur thereby impacting the training mission and ability of the USAF to establish and maintain its airspace assets. The Air Force must begin to resolve psychoacoustical issues to increase confidence in the Air Force's methods for assessing impacts of its operation.

10. Alternative Options:
Current Method of Reducing the Problem: None. This issue has not been extensively addressed in the past, however the shift in the overall airspace question indicates emphasis should be placed in this area to maintain current and future airspace requirements.
Potential Solutions: N/A
Minimal Success Criteria: The successful solution would result in development of a dosage-response relationship to predict annoyance in the case of noise exposure of outdoor recreationists. Partial success would be to study results providing: 1) an indication of the relative exposure of outdoor recreationists to aircraft, ambient, self, and other noises throughout their recreational experiences; 2) documentation of spontaneous reactions to such noise exposure and the number of overflights actually noticed; and 3) a set of timed or exit interviews dealing with recreationists' overall satisfaction and other reactions of their visits. Because little or no quantitative information of any kind exists, specifically for military operations, even limited study in this area would be beneficial.

Additional information may be found in the Needs-to-Products cross-reference table in the FY96/97 Strategic Plan

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1. ID Number: 1412

2. Title: Methods Are Needed to Assess the Annoyance of Sporadic Exposure to Sonic Booms and the Combined Annoyance of Noise Exposure of Subsonic and Supersonic Operations

3. Pillar Supported: Undefined

4. Priority: Low

5. Media: Noise/Sonic Boom

6. Contaminant(s):

7. Key Policy or Regulatory Driver:

- National Environmental Policy Act (NEPA)
- AFI 32-7061, Environmental Impact Analysis Process
- AFR 55-34
- Council of Environmental Quality (CEQ) Regulations
- USAF SON 1-81

8. Need Description: USAF requires the ability to conduct supersonic flight operations in approved airspace. Past combat experience has demonstrated that the effectiveness and survival of aircrews exposed to sophisticated aircraft and advanced antiaircraft weapons systems are directly affected by the type, quality and amount of training they receive. As a result of the AF training mission, there is public concern over the impacts of noise and sonic booms. Performance of the AF mission is dependent upon the ability to describe and assess in a timely and defensible manner, the magnitude and impact of subsonic and supersonic noise. New and refined methods of analysis are needed to 1) ensure Environmental Law requirements can be met without prolonged controversy, 2) to be consistent with mission requirements and 3) ensure Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art description and analysis methods. The dosage-response relationship on which the Air Force currently relies for predicting the annoyance of exposure to sonic booms was produced in 1981 by CHABA Working Group 84 on the basis of modest amounts of information about repetitive and expected noise exposures in residential communities. The applicability of this relationship to many settings of practical interest to the Air Force has never been demonstrated. Both physical and psychoacoustic issues must be resolved to increase confidence in the Air Force's method for assessing impacts of sporadic sonic booms over largely dispersed populations. Additionally, the Air Force predicts the annoyance due to noise exposure from subsonic operations and that due to supersonic operations separately, by means of two different dosage-response relationships. An accurate combined annoyance prediction from both types of operations is not currently available. ACC must be able to predict community response in settings subject to both subsonic and supersonic flight operations.
Current System Description: The dosage-response relationship on which the Air Force currently relies for predicting the annoyance of exposure to sonic booms was produced in 1981 by CHABA Working Group 84 on the basis of modest amounts of information about repetitive and expected noise exposures in residential communities. The applicability of this relationship to many settings of practical interest to the Air Force has never been demonstrated. The Air Force predicts the annoyance due to noise exposure from subsonic operations and that due to supersonic operations separately, by means of two different dosage-response relationships.
Waste/Volume/Other Environmental Concerns: See XIV.
Current Cost of Process: Cost of current process is not monetary but rather cost is the potential risk to the continuation of supersonic training operations and the accomplishment of legally defensible noise and sonic boom analysis for the purposes of establishing supersonic airspace or modifying

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airspace or operational parameters of supersonic training.
Extent of the Problem: An important part of the USAF EIAP effort involves the prediction of aircraft noise and resulting impact due to subsonic noise and sonic boom. An improved model to determine the annoyance of noise exposure due to supersonic operations is needed with focus on the sporadic exposure to sparsely populated areas over which AF supersonic operations typically occur. Other services have similar needs.
Standards/Specifications Impacted: N/A
Known R&D Efforts: None
Outside Needs: Other services such as the Navy and Army.

9. Urgency: 1996
Non-Compliance: **Noncompliance with the National Environmental Policy Act can result in adverse impact to the flying mission due to procedural violations wherein the potential impacts of proposed actions and alternatives have not been analyzed and utilized for decision-making purposes. In addition, adverse impacts due to legal injunction and/or public and political concern has the potential to occur and impact the training mission. The Air Force must resolve physical and psychoacoustical issues to increase confidence in the Air Force's methods for assessing impacts of sporadic sonic booms over largely dispersed populations.**

10. Alternative Options:
Current Method of Reducing the Problem: The dosage-response relationship on which the Air Force currently relies for predicting the annoyance of exposure to sonic booms was produced in 1981 by CHABA Working Group 84 on the basis of modest amounts of information about repetitive and expected noise exposures in residential communities. The applicability of this relationship to many settings of practical interest to the Air Force has never been demonstrated. Also, because both subsonic and sonic boom impacts are identified as a major public concern, the methodology of addressing combined annoyance due to noise exposure from subsonic operations and that due to supersonic operations separately, is based on two different dosage-response relationship. An accurate combined annoyance prediction from both types of operations is not currently available.
Potential Solutions: N/A
Minimal Success Criteria: Increased confidence in the prediction of annoyance of sonic boom and the combined subsonic/sonic boom component of the AF noise analysis of aircraft operations. Real-time field measurements of personal noise exposure (in addition to or instead of place oriented), coupled with measurements of individual reactions to such exposure to verify the adequacy of the equal energy hypothesis (on which the use of CDNI, as a predictor variable rests) are required.

Additional information may be found in the Needs-to-Products cross-reference table in the FY96/97 Strategic Plan

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1. ID Number: 1413

2. Title: Model Updates to the Assessment System for Aircraft Noise (ASAN) for Prediction of Noise Exposure from Military Aircraft Operations and the Resulting Impact to Humans, Animals and Structures

3. Pillar Supported: Undefined

4. Priority: High

5. Media: Noise

6. Contaminant(s):

7. Key Policy or Regulatory Driver:

- **National Environmental Policy Act (NEPA)**
- **AFI 32-7061, Environmental Impact Analysis Process**
- **Council of Environmental Quality (CEQ) Regulations**
- **USAF SON 1-81**
- **Program Management Directive (PMD) 4093 (7)/Pe 0603723F for Noise and Sonic Boom Impact Technology (NSBIT)**

8. Need Description: USAF requires the ability to conduct flight operations at its airfields, weapons ranges, and in designated airspace. This requirement is met by aircraft/mission realignments, acquiring and maintaining airspace, preventing or controlling encroachment of airfields and weapons ranges. Performance of this mission is dependent upon the ability to describe and assess in a timely and defensible manner, the magnitude and impact of subsonic and supersonic noise, particularly noise impacts associated with MTSs and MOAs. New and refined methods of analysis are needed to 1) ensure Environmental Law requirements can be met without prolonged controversy, 2) to be consistent with mission requirements and 3) ensure Air Force actions in response to environmental issues are based on legally defensible, state-of-the-art description and analysis methods. The National Environmental Policy Act (NEPA) of 1969 requires federal agencies to analyze the potential environmental impacts of proposed actions and alternatives and to use those analyses in their decision-making process. The USAF Environmental Impact Analysis Process (EIAP) understanding of the potential environmental consequences of proposed actions and alternatives. A major part of the USAF EIAP effort involves the prediction of aircraft noise effects around air bases, in over 350 Military Operating Areas (MOAs), in restricted areas and along more than 600 Military Training Routes (MTRs), encompassing approximately one half million square miles of domestic airspace. The USAF must be able to predict aircraft noise levels in exposed areas, the effects of both subsonic aircraft noise and sonic booms on the populations, the dynamic of animal wildlife, health and welfare of domestic animals and damage to conventional and nonconventional structures. Updates and additions to Version 1.0 of ASAN (scheduled for release FY95) will be required including, but not limited to, Models for Predicting Effects of Aircraft Noise and Sonic Boom on Structure, Model to Assess Noise Impacts for Training Routes and Military Operating Areas and Models for Predicting Effects of Aircraft Noise and Sonic Boom on Humans.
Current System Description: ASAN involves development, DT&E/OT&E, technology transition and maintenance of the system. ASAN is a computer-based planning and decision support system for predicting and analyzing the effects of subsonic noise and sonic booms on humans, animals and structures in Military Training Routes (MTRs), Military Operating Areas (MOAs), and Ranges. It will be used by the USAF operational and environmental planning communities to plan operational changes and assess the predicted environmental noise impacts of new/modified operations. ASAN involves mating existing Geographical Information System (GIS) technology with available

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planning and decision support systems for addressing aircraft related environmental noise issues. The system will incorporate the results of 6.2 and 6.3 R&D projects in noise generation and propagation modeling and the effects of noise. It will allow the planners to develop in a timely manner, technically sound and legally defensible noise elements in environmental documents prepared to assess existing and proposed flight activities in MTR's.
Waste/Volume/Other Environmental Concerns: See Minimal Success Criteria.
Current Cost of Process: Current cost of noise analysis component of EIAP documentation varies extensively and is dependent upon the type of action and its complexity (5 to 50 K).
Extent of the Problem: A major part of the USAF EIAP effort involves the prediction of aircraft noise effects around air bases, in over 350 Military Operating Areas (MOAs), in restricted areas and along more than 600 Military Training Routes (MTRs), encompassing approximately one half million square miles of domestic airspace. Other services have similar needs.
Standards/Specifications Impacted: N/A
Known R&D Efforts: Maj Jeff Fordon AL/OEBN (513) 255-3376 DSN 785-3376
Outside Needs: ACC/DO/XP/JA/PA, other USAF Operational MAJCOMs, Navy and Army.

9. Urgency: 1996
Non-Compliance: Noncompliance with the National Environmental Policy Act can result in adverse impact to the flying mission due to procedural violations wherein the potential impacts of proposed actions and alternatives have not been analyzed and utilized for decision-making purposes. In addition, adverse impacts due to legal injunction and/or public and political concern has the potential to occur.

10. Alternative Options:
Current Method of Reducing the Problem: Prior to the initial release of the ASAN, there exists no systematic methodology for assessing the impacts of aircraft noise an sonic booms to humans, animals and structures. Environmental Impact Analysis Process (EIAP) documents presently use a variety of noise description and assessment models/databases, often being of questionable scientific value. Noise analyses are accomplished by using a series of individual models to address potential impacts to humans, animals and structures beneath various airspace parcels. ACC is currently developing GIS data for use with ASAN and will field the system at all ACC bases over during the FY 95-96 timeframe. Current effort comprises a 2.5M commitment.
Minimal Success Criteria: The noise analysis component of EIAP document would accurately predict the noise exposure and resulting impacts of subsonic and supersonic aircraft operations on humans, animals and structures in a consistent, legally defensible manner using scientific, state-of-the-art technology and methodology. Anything less has the potential to impact the USAF flying mission.

Additional information may be found in the Needs-to-Products cross-reference table in the FY96/97 Strategic Plan

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DEPARTMENT OF THE AIR FORCE
AIR FORCE LEGAL SERVICES AGENCY (AFLSA)

27 APR 2004

AFLSA/JACT
1501 Wilson Boulevard, Room 835
Arlington, VA 22209-2403

Mr. A.S. Elliott
General Partner of Gottomitee, Ltd.
[redacted]
Fort Sumner, NM [redacted]

Re: Appeal of Denial of Claim for Property Damage (Air Force Claim No. Cannon AFB 03-31)

Dear Mr. Elliott

In letters dated 30 June 2003 and 31 December 2003, our office offered to settle your property damage claim for the amount of $142.17. Since your response, dated 15 January 2004, did not indicate acceptance of our offer, we are treating the non-acceptance as an appeal of our original determination of your claim under the provisions of the Military Claims Act (MCA), which is Title 10 of the United States Code, Section 2733. After carefully reviewing the facts and the applicable law, including the information in your response, I have denied the appeal.

The reason for denying the claim is that you have not submitted any documentation to substantiate an additional $200.00 for your labor and inconvenience.

This is the final denial of your appeal under the MCA. Although I do not find its provisions applicable, this denial also satisfies the administrative filing requirements of the Federal Tort Claims Act, which is Title 28 of the United States Code, Sections 1346(b), 2671-2680. As such, suit may be brought against the United States in an appropriate United States District Court not later than six months from the date of mailing this letter.

Sincerely

R. ERIC RISSLING, Colonel, USAF
Chief, Tort Claims and Litigation Division

Exhibit Q

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Fence Trampled by Livestock

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

Exhibit R

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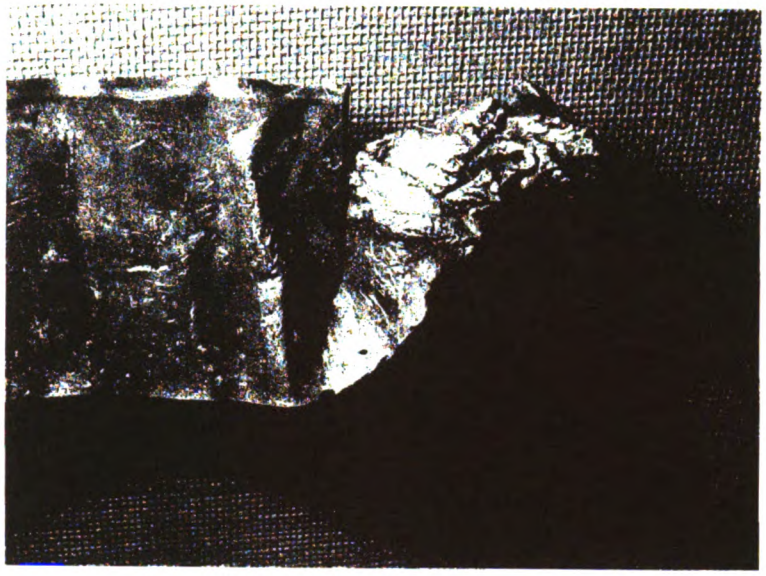

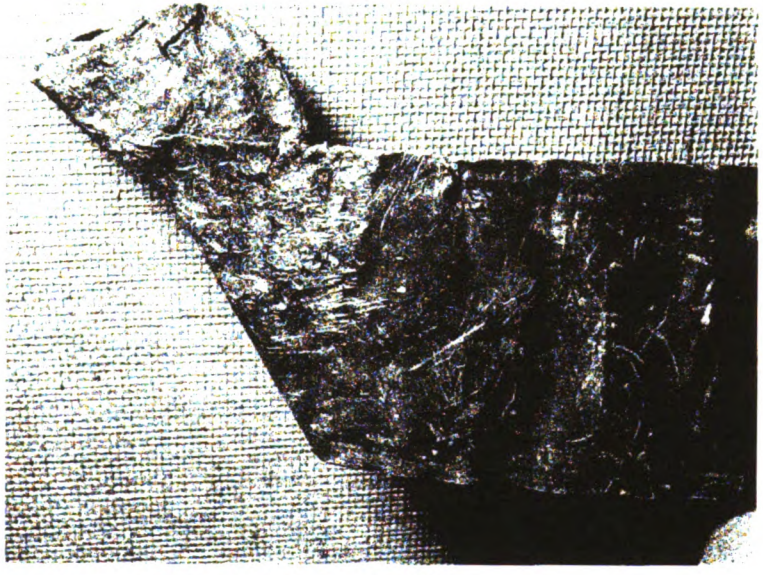

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

Exhibit S

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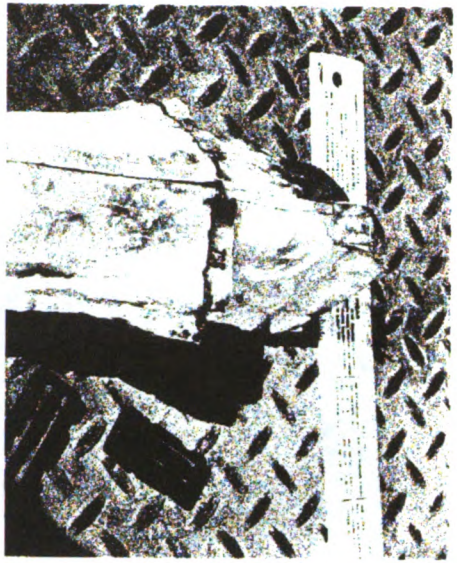

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

Exhibit T

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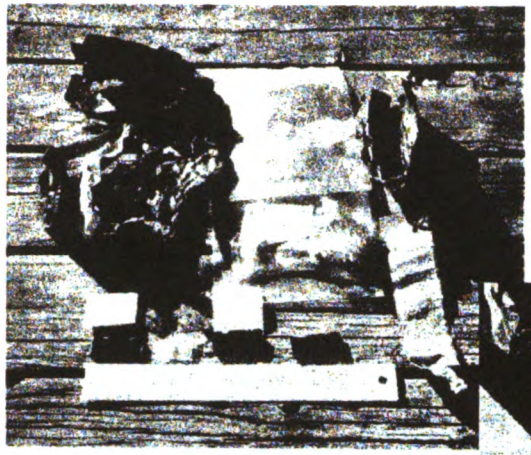

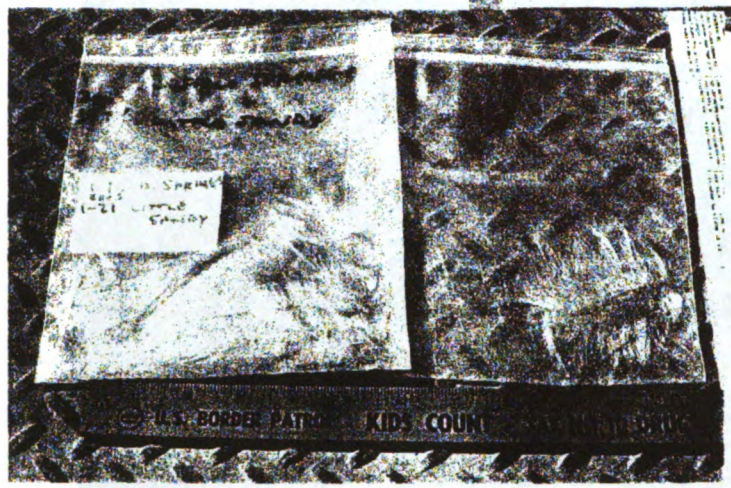

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

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El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

Exhibit U

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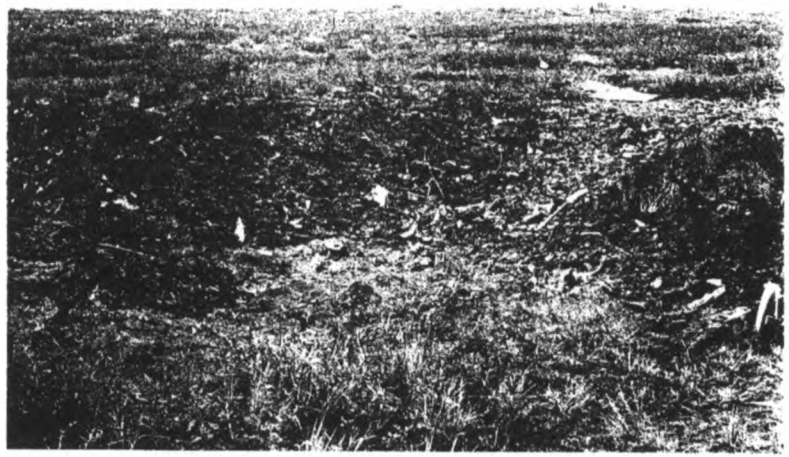

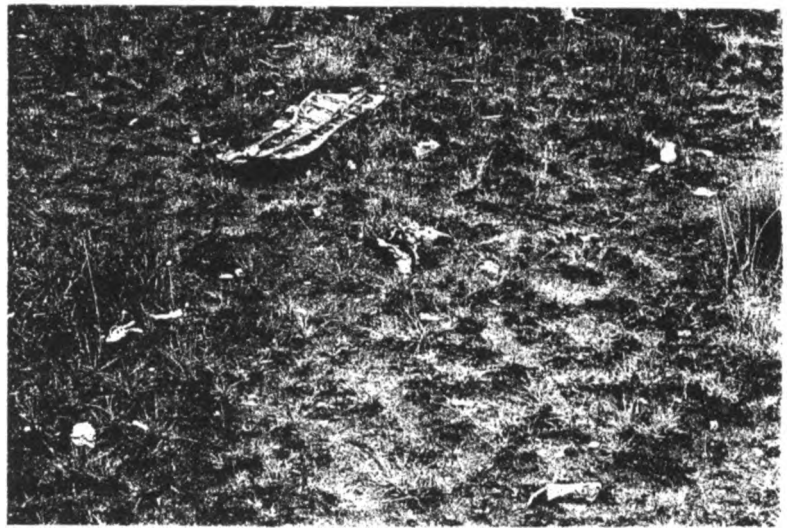

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

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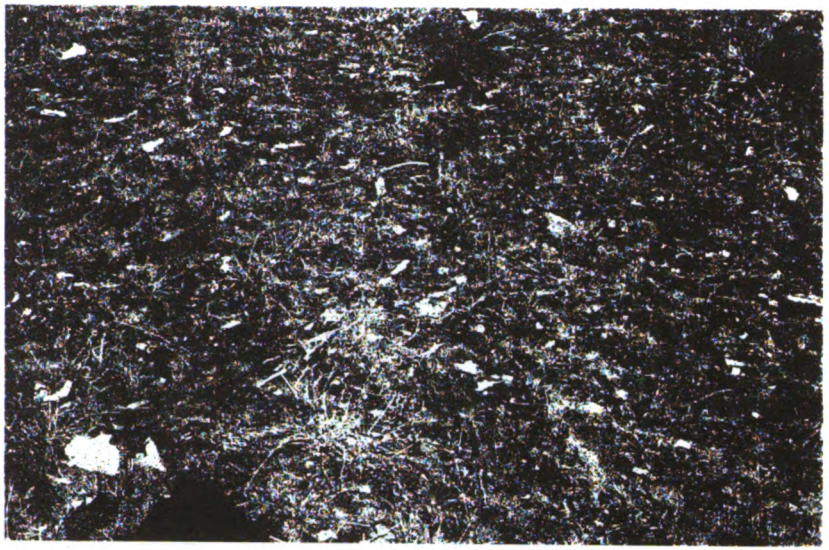

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

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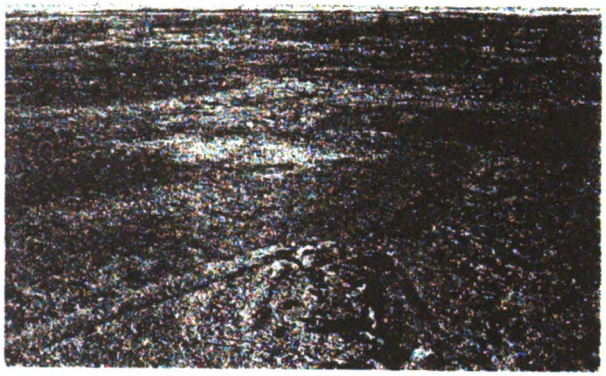
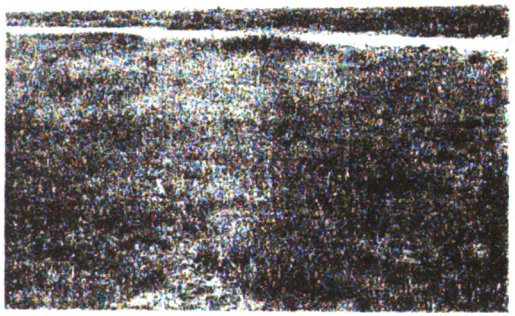
El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS





Post F-16 Crash Photos
El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

Exhibit V

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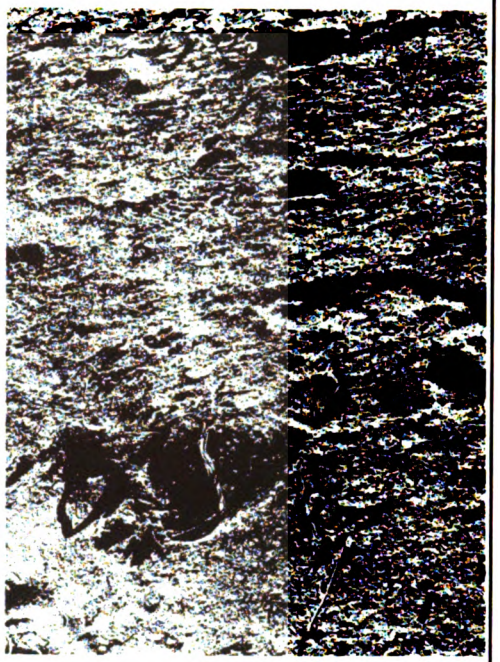

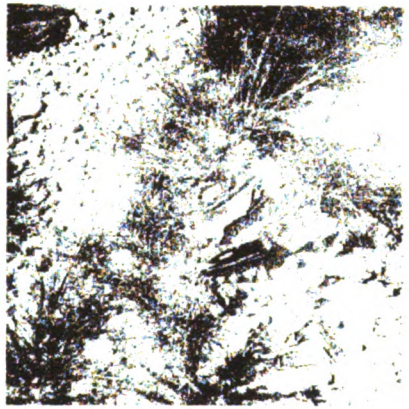

Post F-16 Crash Photos
El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

0038

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS
Exhibit W

0038

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

0038

Planes in Relation to Ranch Structures
El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

Exhibit X

0038

Planes in Relation to Ranch Structures
El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

0038

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
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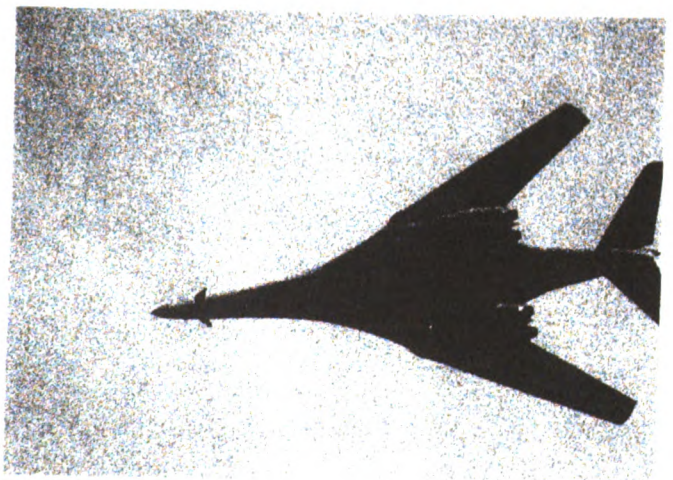

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
NMTRI DEIS COMMENTS

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El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott
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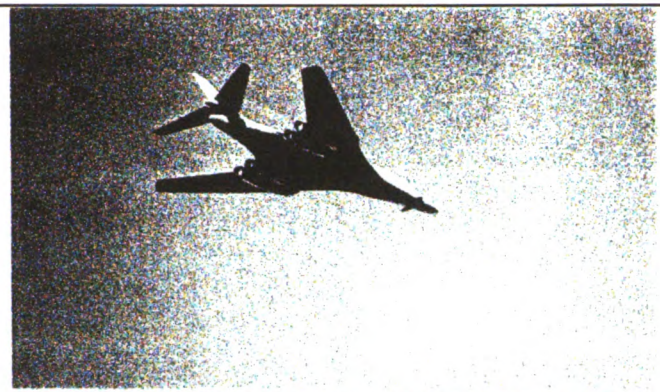

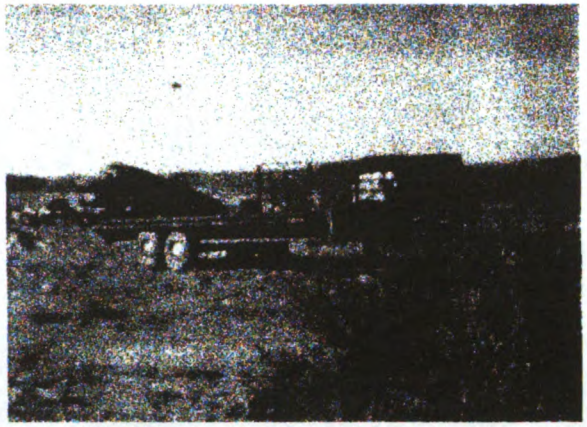

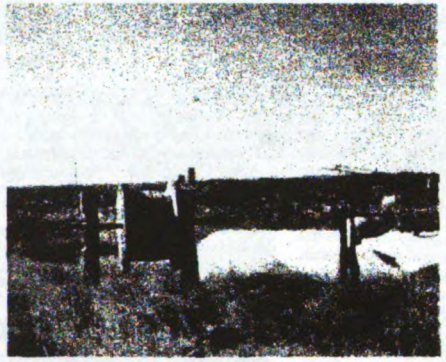

Planes Maneuvering near Ranch Headquarters

El Bigote Cattle Co., LLC, Gottomitee, Ltd. and A.S. "Tex" and Jan Elliott

NMTRI DEIS COMMENTS

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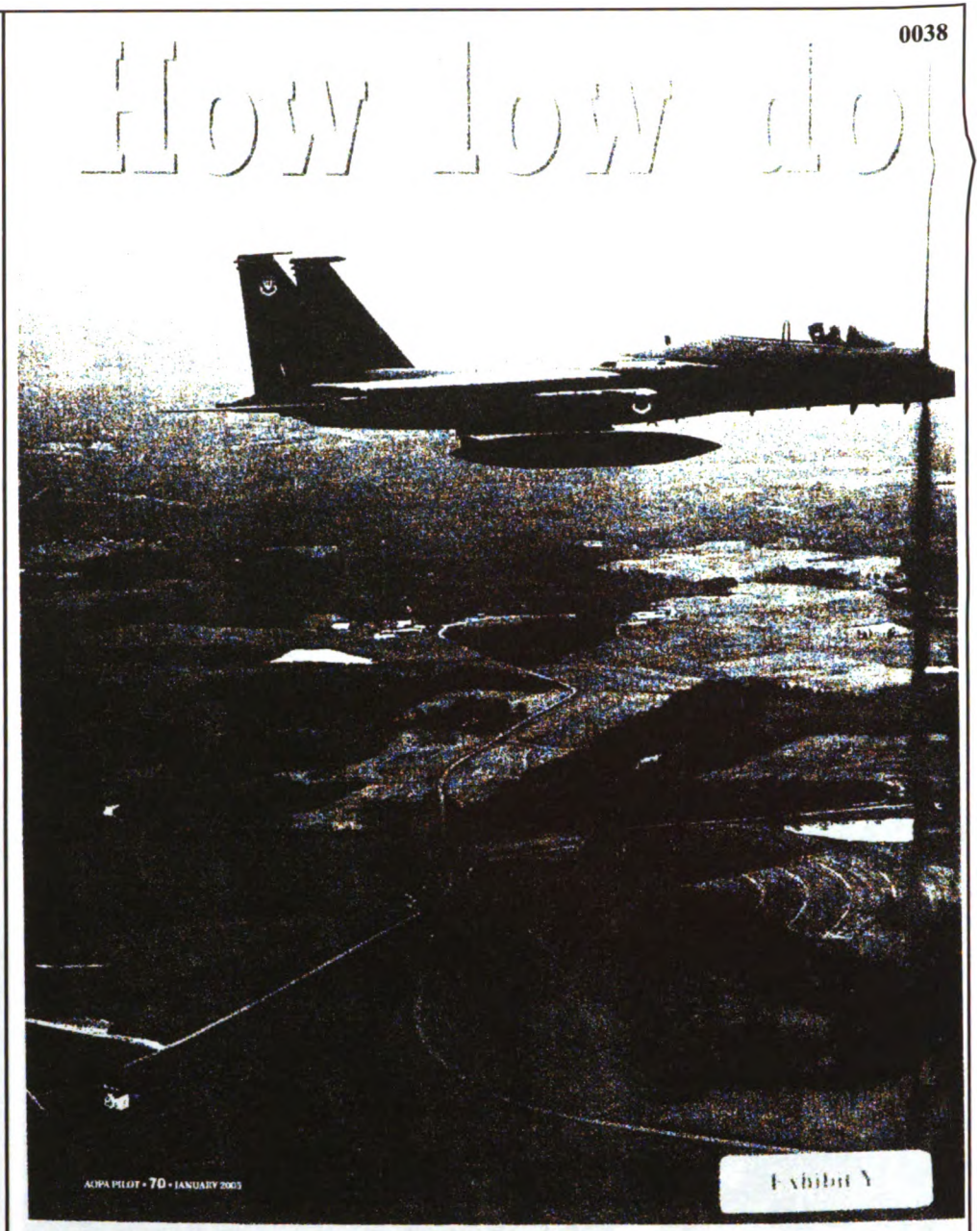


they go?

F-15s fly in formation over rural Virginia. U.S. Air Force Capt. Jared Santos prepares for the flight (inset).

In military airspace, when it's hot, look out

BY TIM WRIGHT

PHOTOGRAPHY BY THE AUTHOR

... the world ... so close and so fast, you don't ... Just an additional, unin... 10 to 15 degrees of bank mean you slam into the ground in about three seconds. It's not a place for surprises or inattention.

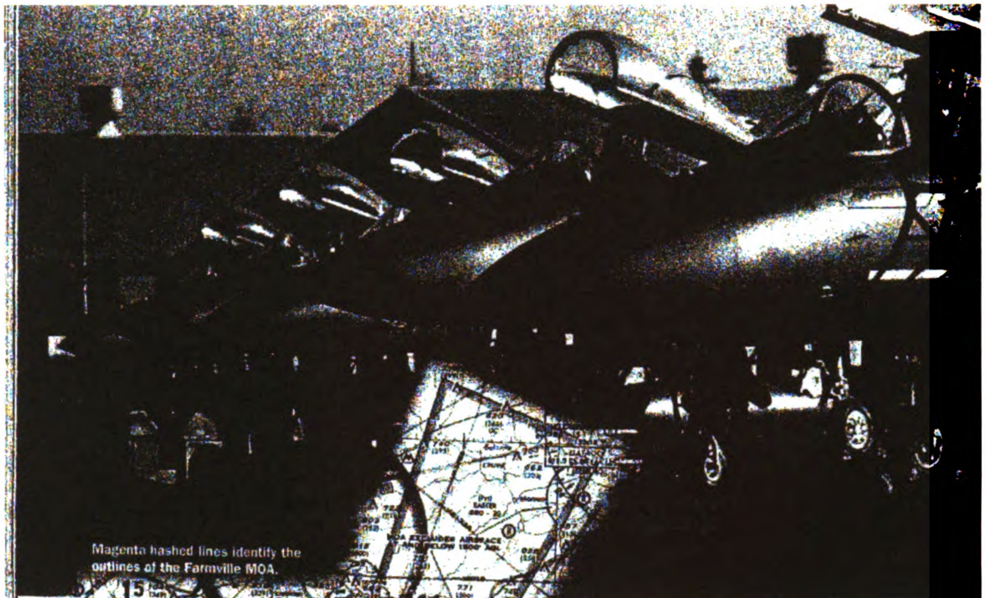
In an attempt to get a better picture of how the military uses low-level airspace, the U.S. Air Force agreed to let AOPA tag along for a flight on VR1754, one of the many high-speed, low-level military training routes (MTRs) scattered across the mid-Atlantic coast. But with the weather over West Virginia holding a steady 300-foot ceiling our VFR plan was scrapped before we could launch from Langley Air Force Base in Hampton, Virginia.

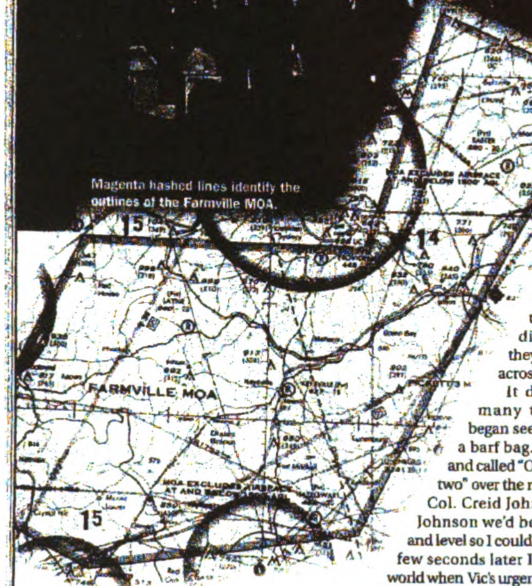
With our original plan in the trash, my pilot and guardian from the 71st Fighter Squadron, a 20-something blond-haired, blue-eyed walking recruiting poster named Capt. Jared Santos, proposed plan B. "Vic," as he introduced himself by phone a few weeks before, said we could cancel the flight altogether or switch to the Farmville MOA (military operations area) for routine low-level training. The decision took less than a second to consider and, as plan B went into action, Vic canceled VR1754 and filed for Farmville.

The F-15 is designed to be a high-altitude interceptor. Its job is to fly high and shoot down bad guys from far away. But as most military folks will tell you, "The enemy has a vote," and he won't always fight the way you want him to. To be ready, F-15s, F-16s, F-18s, and other air superiority fighters need to come down to Earth and practice combat operations in a low-altitude environment. That need is why the Farmville MOA, a golf-club-shape chunk of airspace over the rolling Piedmont of Virginia, was created.

With a full-bird colonel for his wingman, Vic leads us into the MOA with a steady step down from 12,000 feet msl to 1,000 feet agl. Radio calls to Washington Center air traffic control provide the local altimeter setting and initiate the MOA as being "hot." In honor of my civilian status, it was deemed beforehand that Vic would try to maintain 1,000 feet agl instead of the normal 500 feet and we'd slow to 420 knots from a typical 480 knots. Vic would later describe the flight as "pretty vanilla."

Once inside the MOA, Vic warns we're about to take some Gs as a "warmup" for the rest of the flight. Immediately we violently roll into a series of right and left turns. Each turn





Magenta hashed lines identify the outlines of the Farmville MOA.

develops at least 6 Gs and as much as 8.5 Gs for as long as 30 seconds. The camera in my hand becomes nearly impossible to keep to my eye and my stomach starts working its way to my toes.

With the G warmup out of the way, we began flying what the Air Force calls "tactical turns." In short, the two aircraft take turns making high-G, 45-to-90-degree heading changes in order to check each other's blind spots with radar and eyeballs. Then they repeat the process to the opposite direction so that they snake their way across the MOA.

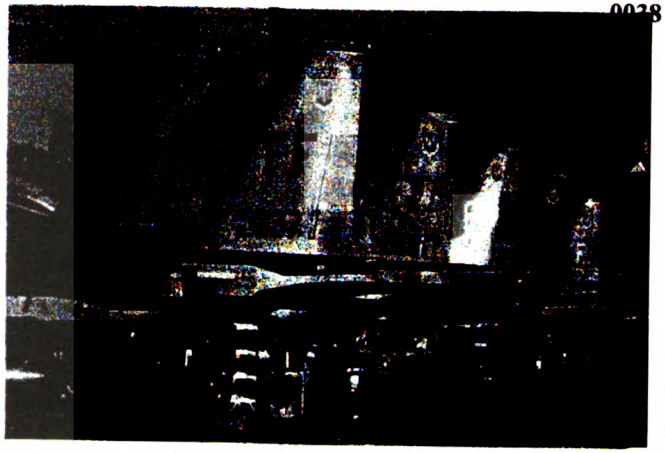
It didn't take too many turns before I began seeking the relief of a barf bag. Vic rolled level and called "One-Bravo is code two" over the radio to wingman Col. Creid Johnson. That told Johnson we'd be flying straight and level so I could begin heaving. A few seconds later I was in my own world when Vic's urgent voice and sharp words penetrated my consciousness. I pulled my head out of my little white bag in a futile attempt to see a Cessna that Vic had spotted cruising southbound through the middle of the MOA.

The irritation in Vic's voice as he directed my gaze was unmistakable and more understandable with my new enlightenment. At these speeds and altitudes, just avoiding the ground and your wingman is a lot of work. Add to that the need for situational awareness regarding other aircraft, navigation requirements, communications, and weapons tactics, and you've got a "task saturated" environment for the pilot.

As a general aviation pilot, I've always been too chicken to fly into a hot MOA because my first flight instructor instilled a simultaneous fear of God and MOAs—and I'm glad he did. Now I know firsthand that when a GA aircraft flies through the middle of maneuvering jets, it's like a blind man walking through traffic. With up to 20 military aircraft crammed into a chunk of sky during training for major strikes, the risk of a collision is so high for everyone that the military stops what it's doing until the GA aircraft has cleared the area.

While MOAs and MTRs are special-use airspace, they are not restricted airspace. Air Force pilots are quick to point out that civilian and military aircraft have equal rights to the airspace even when the airspace is active. "It's see and avoid," Vic repeatedly stated with a shake of his head. "Even though it's legal, it doesn't make it smart."

Vic and his fellow pilots don't try to mask their incredulity to what they see as the enormous safety risks that simul-



Air Force F-15Cs of the First Fighter Wing on the ramp at Langley Air Force Base in Hampton, Virginia, as aircraft maintainers prepare them for flight (left and right).

taneous military and civilian operations can create in a hot MOA. From my backseat vantage point, where all I had to do was watch, listen, and accurately barf into my little white bag, I became acutely aware that this type of flying is enormously demanding and dangerous without including the potential aerial landmines of GA aircraft. One Langley pilot said he was convinced that the vast majority of GA pilots just don't care if MOAs are hot. However, according to AOPA surveys, at least 73 percent of the members say they will divert around MOA airspace if they're unable to learn if it is hot or cold. In fact, the inability to get information regarding the status of special-use airspace is seen as one of the biggest concerns for the GA community. With the upsurge in military training since the terrorist attacks of September 11, 2001, the problem has grown. Thankfully, because of AOPA's education and persistence, progress is being made as the military has come to understand GA concerns. Recently, the controlling agency frequencies for each slice of airspace have started appearing on new charts. Hopefully this will give GA pilots a direct link to current, real-time information. The FAA has even begun a new Web site (http://sua.faa.gov/atcaa Splash.jsp) to help notify all pilots when areas across the country are hot and when others should be (see "Consulting the AP/1B," page 75).

Defining airspace

Whether they're flying in a MOA or along an MTR, some GA pilots assume that military pilots always see them on radar. That's a huge assumption. A busted radar is not a go/no-go decision for many missions. In fact, during our 20 minutes at Farmville, the wingman's radar was acting up and never displayed either of the two GA aircraft that flew through the MOA. Further clouding the matter is that the on-board radar is not designed to look for GA aircraft. The algorithms that control what displays on radar are written to see larger, faster-moving targets. It's entirely possible that the radar may see a GA aircraft, but not display it because of the "Ground Moving Target Inhibitor," a setting on the radar designed to filter out ground clutter. If a target is slow enough, the radar thinks it's a car or truck and won't display it.

There's also the matter of not having enough of a radar return in the first place. Gliders, Piper Cubs, and other small aircraft may not have enough metal in them to even return a signal. And if they do return, their position in relation to the radar may further reduce what little signal they have. Which takes us back to "see and avoid."

Back on the ground at Langley, Vic is at a dry-erase board with a fistful of multicolored markers. Using different colors to represent aircraft, pilot visual coverage, radar coverage, and flight paths, he sketches out a spaghetti of colored lines to diagram tactical turns. As part of the discussion, Vic stresses the importance of knowing where your wingman is at all times. It wasn't too long ago that a wingman looked down to adjust his radar during a four-ship turn and lost sight of his lead. When he looked up, he misidentified another aircraft as his lead. The ensuing collision killed the lead pilot and both aircraft were lost.

'Mission: Possible'

i AOPA ASF's "Mission: Possible" course is available online (www.aopa.org/asf/mission_possible).

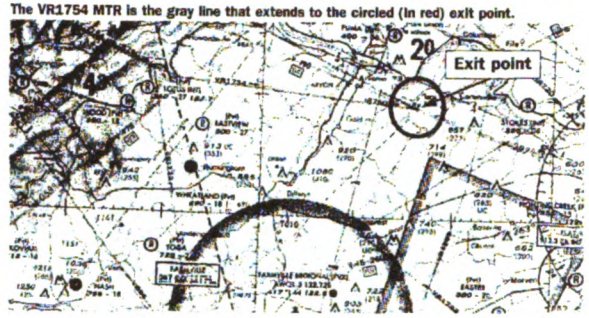
At 480 knots, an aircraft covers 8 miles a minute or 1 mile every 7.5 seconds, says Vic. With a GA aircraft crossing Vic's flight path at two miles, a distance that he considers realistic for sighting another aircraft visually in the typical mid-Atlantic haze, that gives a maximum of 15 seconds before the sky begins to rain twisted aluminum. In those 15 seconds, the GA pilot should hope that Vic isn't distracted by reading a chart, adjusting his radar, making a radio change, or any number of things. "Do the math," says Vic. "That's a short time to die."

Unfortunately for the GA pilot, his chances of seeing a military aircraft closing in on him aren't very high. Combat aircraft are deliberately painted to make them hard to see, their flight tactics are meant to make them difficult to spot, and the visibility from GA aircraft is often poor compared to that out of a military canopy. While admitting there is no way to know it for a fact, Vic and his fellow pilots are convinced that few GA pilots ever know that they—the military—are nearby.

If you spot a military aircraft at your altitude and suspect he is unaware of your presence, some suggest raising your wing to make yourself more visible. If you have enough altitude, Vic suggests you make like a bird and descend. At the speeds the military flies, you're essentially motionless to them and you're not going to outrun or outclimb them. Also, if you see one fast target moving across your windshield, a collision threat most likely still exists because combat aircraft almost never fly solo. Formations of four to eight aircraft are common, and GA pilots have been surprised to find themselves bracketed right, left, top, and bottom by passing aircraft. The military pilot's reaction, if he does spot you, should be reflexive training, and most likely he'll instinctively "climb to cope." He'll convert airspeed to altitude to give himself time to determine what is happening and what his options are. The reduced speed and higher altitude give him time to fix problems and improve his chances for a successful ejection. Last year, an F-15E on VR1752 crossed paths with a vulture at 700 feet agl near Callaway, Virginia. The bird went down the right intake and while being converted to sausage it destroyed the engine. The engine caught fire, turbine blades went flying like shrapnel, electrical and hydraulic lines were cut, and the Eagle started slowly rolling out of control to the right. After riding through a complete roll, the crew was able to safely eject partly because the pilot was able to convert airspeed to altitude.

While MOAs are clearly marked on sectionals, the thin gray lines marking MTRs can be somewhat misleading. The gray lines supposedly indicate the centerline of the route, but aircraft can be anywhere within the corridor that the line helps define. Muddying the waters, the charts don't show the multiple alternate entry and exit points and corridors that may accompany a route, nor do they indicate that the centerline is frequently well away from the center of the route corridor. For instance, VR100 in New Mexico shows one route segment to be five nautical miles right and three nm left of the centerline. Another segment of the same route is listed as two nm right and 28 nm left. Most routes, however, tend to be between three and five nm on either side of the centerline. Like MOAs, they ought to be avoided when they are hot. If you plan to fly in an MTR, the military emphatically urges you to contact a flight service station or the controlling agency to learn if the route will be hot. They'd also like you to know the route's location and what air bases are in your area

The VR1754 MTR is the gray line that extends to the circled (in red) exit point.



Author and photographer Tim Wright says of this photo, "At those Gs, I could only point the camera and shoot."

Consulting the AP/1B

The AP/1B is a Department of Defense flight information publication* that is revised every 56 days. The AP/1B describes:

- MTR routes in detail (warnings include uncharted radio towers, small airstrips, ostrich and horse farms, bald-eagle nests, noise-sensitive areas, fish-spotting aircraft, and radio telescopes).
- Special Operating Procedures (warnings identify towns, neighborhoods, and individual houses to be avoided because of "congressional" or "presidential" interest in the peace and quiet of that location).
- SRs, or *slow routes*, for aircraft operating below 250 knots and between 250 feet and 1,500 feet agl.
- VRs, or *visual routes*, low-altitude MTRs used only when the cloud ceiling is 3,000 feet agl or higher and visibility exceeds five miles.
- IRs, or *instrument routes*, MTRs that are flown only under IFR regardless of weather conditions and may be in use when the weather is worse than "3,000 and five."
- ARs, or *aerial refueling routes*, areas where military tankers routinely refuel other military aircraft (in most cases above 10,000 feet).
- VRs or IRs charted with 3-digit route numbers (VR123) can include airspace from the surface up to (and sometimes above) 10,000 feet.
- VRs or IRs identified with 4-digit route numbers (VR3456) can extend from the surface to 1,500 feet agl. —*JSW*

* According to a November 18, 2004, press release from the Department of Defense, as of October 1, 2005, the National Geospecial-Intelligence Agency (NGA) intends to remove flight information publications, including the AP/1B, from public sale and distribution.

so you'll know where to look and what aircraft to look for.

Unfortunately some GA pilots, like Al Carpenter, are caught between a rock and a hard place. His airfield lies within five nautical miles of the centerlines for five busy MTRs. Two of those centerlines are a mile or less away from his airfield. "If I didn't fly when it was hot," complains this former Navy fighter pilot and multiyear guest at the Hanoi Hilton, "I would never fly!" Even though Carpenter has had jets at pattern altitude, he doesn't consider them to be a major problem. Just "keep your head up and on a swivel" and assume all routes are always hot. After all, he says, "You are never relieved of your responsibility to see and avoid."

Right or wrong, it appears many military pilots are convinced that a large segment of the GA population is reckless when it comes to flying in hot, special-use airspace. While studies and anecdotal evidence suggests otherwise, it's plain from my 20 minutes over Farmsville (with two GA aircraft going through the MOA) that there's reason for their belief. While wrapping up this story, I sent out an e-mail to some of my flying buddies asking about their experiences. Leo Callahan, a former Air Force pilot who now flies GA, wrote back saying, "If the MOA is active, *I don't fly there.* If I cannot contact the controlling agency, *I don't fly there.* I spent many hours flying in MOAs during my Air Force career and I have no intentions of playing with F-15s, A-10s, or any other high-performance machines. It could ruin everyone's day."

Whether through mistake, need, or defiance, GA pilots will continue to fly in hot special-use airspace, a fact that doesn't sit well with the military. In some instances, these flights are essentially unavoidable. For the vast majority of us, they're not. When this airspace is hot, it's best that GA pilots avoid it for the simple reason that we'd all like to live to fly another day. As CFI Becky Luther says, "there are no rules to stop them, only common sense." AOPA

i Links to additional information about low-level military flights may be found on AOPA Online (www.aopa.org/pilot/links.shtml).

Tim Wright is a pilot and freelance writer and photographer living in Richmond.

A CASE FOR AN ENVIRONMENTAL REAL ESTATE MARKET

If environmental real estate is a contemporary market, real estate counselors need to recognize that supply and demand factors influence its value.

by Donald C. Wilson

As more and more lands with environmentally significant attributes (e.g., wetlands, shorelines, endangered species' habitats, etc.) transact for the purpose of conservation, a valuation question arises for real estate counselors: do these lands, related transactions and transactors constitute a market?

The Significance Of Asserting A Market

If conservation lands, related transactions and transactors do constitute a market, then counselors should be able to use comparable sales properly drawn from the market as valid indications of market value. If they do not constitute a market, counselors probably will continue to be asked by public agencies to appraise these rarely condemned lands by using condemnation valuation methodology, to ignore highly comparable sales involving public agencies and rely on sales of dissimilar properties bought for alternative uses in more traditional markets. In short, counselors will continue to be asked to ignore in their valuation of conservation lands the most probable use of many properties—conservation—and the most similar comparable sales—properties purchased for conservation.

Valuation of protected wetlands is an example. A counselor may be asked to rely on sales of lands with alternative uses involving private parties, rather than rely on relatively similar sales of wetlands involving public agencies. The potential for estimation error, because of reliance on dissimilar comparable sales, and ensuing transactor conflict is significant.

Public agencies encourage counselors to apply condemnation valuation methodology often because of policy. This policy has four apparent roots:

1. Public agencies have condemnation power; so even if they are not planning to use it, they apparently think they must follow condemnation valuation methods in case they change their minds and decide to condemn these properties.

2. The historic tendency of public agencies to use condemnation power to acquire other types of lands, particularly for transportation and utility right-of-ways, has created a habit of valuing other lands in this way.

3. Public agencies find standardization of appraisal approaches cheaper and easier to deal with; so they impose condemnation valuation across the board regardless of its appropriateness.

4. Bureacratic inertia.

None of these is a particularly persuasive reason for continuing the policy, and all fly in the face of

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Exhibit Z

the fact that public agencies rarely condemn conservation lands. Experience suggests that most acquisitions of land for conservation purposes are made by negotiated purchase, with negotiations open to competition from other public agencies, land trusts, wildlife organizations and for-profit entities.[1] Further, many public agencies openly advocate negotiated purchases and frequently will delay a transaction indefinitely rather than incur the political and financial costs of condemnation. Finally, land owners frequently negotiate as if condemnation were an unlikely possibility.

Given these factors, public agencies' reliance on condemnation valuation methodology and their disregard for the use of significant, comparable sales involving public agencies is inconsistent with reality (public agencies tend to negotiate purchase rather than condemn), frequently unnecessary (it is based on policy not law) and likely prone to estimation error and transactor conflict (several buyers and sellers had litigated for decades over disagreements concerning the value of conservation properties).

Hence, the only valid reason for many public agencies to continue their policy is if the lands, transactions and transactors involved simply did not constitute a market. This article asserts the contrary: i.e., that these lands, transactions and transactors do constitute a market, that the basic condition for estimating market value—the existence of a market—is met and that comparable sales properly drawn from this market constitute valid indications of market value.

Environmentally Significant Land Defined

Environmentally significant land or conservation land are accurate terminologies for land that has environmentally significant attributes. The former term is advocated here, since conservation land (i.e., land protected as it is) is only one type of environmentally significant land. Other environmentally significant lands include those protected for rehabilitation purposes (e.g., a degraded wetland) or those protected for the introduction of significant environmental attributes (e.g., an upland graded and flooded to mitigate destruction of wetlands elsewhere).

Environmental Real Estate vs. Environmentally Significant Land

Environmentally significant land is a resource; real estate with environmentally significant attributes is space that has been delineated by man, relative to a fixed geography, to contain an activity for a period of time.* The activity may include conservation, rehabilitation or introduction of environmentally significant attributes. The period of time may be perpetuity or a designated number of years.

The distinction between land and real estate is significant because transactors do not value and transact for environmentally significant land; they value and transact for ownership interests in real estate encompassing environmentally significant attributes. These may be land, flyways over the land, antiquities buried in the land, events that once happened on the land, etc. Interests may be full or partial. Environmental real estate therefore is selected as a suitable term for property rights to environmentally significant land.

Environmental Real Estate Defined

Environmental real estate is a space-time delineation (e.g., park days, wetland acres in perpetuity, etc.) relative to a fixed geography that has been delineated by humans to conserve, rehabilitate or introduce attributes of geographical, biological, ecological, archaeological or historical significance. It is a subset of real estate—not exclusive of it.

Further, environmental real estate is a spatial infrastructure much as transportation, sewers and utilities. Environmental real estate not only serves a basic function (providing the consuming public with the environment it is willing and able to pay for); it also shapes where and how society lives. As society once controlled and channeled development with transportation and utility infrastructure, it now may use environmental real estate.

The Case For An Environmental Real Estate Market

For environmental real estate, related transactions and transactors to constitute a contemporary real estate market, one would expect to find consistency with a basic definition of a market, distinguishable characteristics of supply and demand, market facilitation of pricing and supply and significant governmental regulation and subsidy.

Consistency With A Basic Definition Of A Market

"A market," Martin L. Bell says, "is composed of people, people with money, people with money wanting goods and services; and the basic opportunity in marketing is to provide these people with want-satisfying goods and services."[3] People, it may be added, may act individually or through organizations to satisfy their wants.

Looking at environmental real estate transactions in the United States through the lens of this very basic definition, yields a readily recognizable market. The market is citizens (people) with money acquiring the environmental real estate they want through public agencies (tax monies), private not-for-profit corporations (contributions and surpluses from operations) or directly (typically with user fees, occasionally with fee simple acquisition) in the space-time unit they want (e.g., a park day, an acre in perpetuity, etc.). Many segmentations of sub-markets also are possible.[4]

Distinguishable Characteristics Of Supply

Supply in a regulatory context may be designated (expressly protected by statute or policy) or undesignated (not expressly protected, but likely to be if traditional development were proposed). Properties outside of these classifications may be actually or potentially significant, but they may not be put to such use; therefore, they may be distinguished as tertiary.

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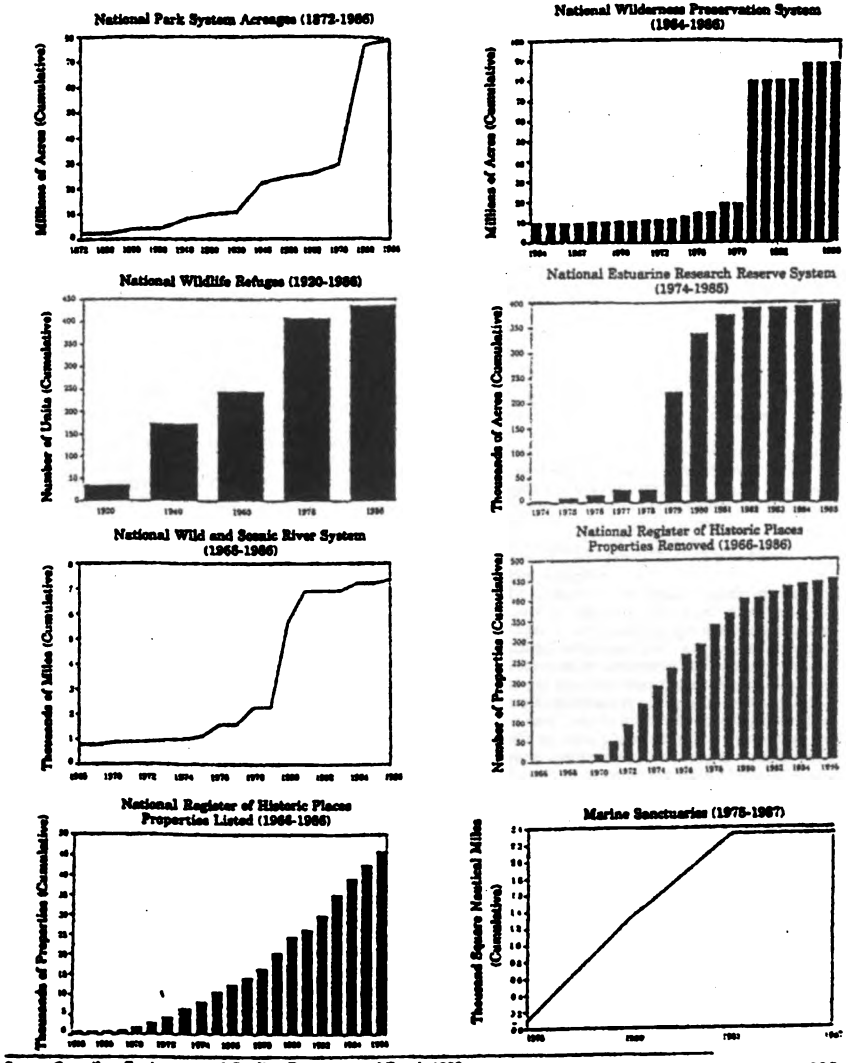
Exhibit 1

Selected Trends in Environmental Real Estate Acquisition



Source: Council on Environmental Quality: Environmental Trends 1989.

032

Designated inventory has gr . significantly since the late 1960s, as the escalation in acquisitions of real estate by public agencies suggests and the proliferation of conservation land trusts implies (see Exhibit 1). Undesignated inventory is dynamic; it loses acreage to designation but gains acreage as society continues to develop and pollute and, in turn, create new categories of land that need protection.

Supply in a regulatory context also may be distinguished as real estate-specific (a specific parcel like Yellowstone Park is protected) or attribute-specific (attributes like endangered species' habitats or ecosystems are protected wherever they may be found and so, in effect, is the real estate they occupy).

Supply may be distinguished further by classes of attributes: geographic, hydrologic, biologic, archaeologic or historic types. Each of these classes has many subclasses. The biologic class, for example, includes species and ecosystems; the hydrologic includes oceans, lakes, rivers, streams, waterfalls, groundwater, etc. Within the geographic class are mountain ranges, canyons, buttes, etc.; within the archaeologic class are ancient burial grounds, ruins, etc. The historic class includes battlegrounds, the birthplaces of famous persons, etc..

Note: Certain types of environmental real estate supply (e.g., pristine lands or endangered species' habitats) can be destroyed and lost permanently (sometimes called the effect of irreversibility). However, much polluted environmental real estate supply can be rehabilitated, and many environmentally significant attributes may be introduced at new locations.[5]

While a full quantitative accounting of the environmental real estate supply is beyond the scope of this article, partial figures hint at its magnitude: forests under Forest Service management equal 140 million acres;[6] privately owned wetlands potentially subject to regulatory protection total 70.3 million acres;[7] the National Park System holds 79 million acres;[8] the National Wilderness Preservation System holds 79 million acres;[9] National Wildlife Refuges have 90 million acres;[10] wild and scenic rivers extend 7,363 miles;[11] marine sanctuaries cover 2,200 square nautical miles;[12] the National Estuarine Research Reserve System has approximately 390,000 acres;[13] and the National Historic Register has nearly 47,000 places.[14] Excluding the rivers, marine and estuarine reserves, which may or may not have disposable property rights, and historic places for which acreage was unavailable, a partial inventory of federally protected environmental real estate totals a staggering 458.3 million acres or approximately 20% of the surface area of the United States. If the habitats of endangered species, and lesser holdings of the Bureau of Reclamations, Bureau of Land Management, etc., were tallied, the figure might increase dramatically. States own another 154 million acres of real estate. Assuming a protection ratio similar to that of the federal government (.44),[15] state-owned environmental real estate may be as high as 67.8 million acres.

A distinguishable supply of environmental real estate clearly exists. The supply is massive; it is **increasing in size; . . it is segmented into attribute and use types by regulations that result in designated, undesignated and tertiary markets. Ownership, although heavily concentrated in agencies of the federal government, is divided among many public and private sector entities. Of course, the federal government is a significant landowner in more traditional real estate markets as well.**

Distinguishable Characteristics Of Demand

Demand may be distinguished as an individual need (e.g., user fees for experiencing parks) or the collective need of society expressed through acquisitions by public agencies, land trusts, wildlife organizations and, to a lesser degree, for-profit corporations and individuals. These demand sources buy, trade and, in the case of public agencies, land trusts and wildlife organizations, accept donations. Demand tends to move ownership of environmental real estate not only from the private to the public sector but also among public agencies (interagency transfers), land trusts and wildlife organizations.

Demand may be distinguished by the intended use of property. Generic categories of use include experiencing environmental real estate, preserving land for a highest and best use to be determined later, conserving land to maintain the environment or exploiting specific resources such as oil, timber, gold, etc..[16]

Demand may be distinguished further by the intended users of property, i.e., individual users (hikers), collective users (the government) and future **users.**

Individual demand for use of environmental real estate has escalated rapidly. In 1965, approximately 100 million visitors experienced the national parks. By 1986, the number of visitors increased to approximately 350 million. Collective demand appears to be increasing also,[17] although comprehensive figures of the dollars spent by the government for acquisition of environmental real estate are not available. The recent defeat of the Big Green initiative in California and the Environmental Quality Bond Act in New York do suggest, however, a limit to the public's willingness to subsidize the protection of environmental real estate. Because these proposals involved unprecedented sums of money and, in the case of Big Green, controversial collateral political issues, it is unclear whether voters are losing interest in environmental protection, are alienated by collateral political issues or simply want governments to spend less.

Specific public sector organizations that acquire environmental real estate include federal agencies (primarily the National Park Service, the Fish and Wildlife Service and the Forest Service), public agencies of the 50 states (one or more acquiring departments per state), and thousands of regional districts, counties and municipalities. Private sector organizations include over 900 conservation land trusts operating across the United States, which own approximately 2.7 million acres in 48 states,[18] certain wildlife and wilderness organizations and philanthropic foundations. An undetermined, but

probably less significant number rivate individuals and corporations also participate.

Tracking the monies spent on environmental real estate is a topic for another article, but a few random observations may provide some perspective. According to Craig D. Hungerford, a consultant specializing in environmentally significant lands: $3.6 billion of the Federal Land and Water Conservation Fund has been expended since 1964; California appropriated $770 million for environmental real estate in 1989; the Nature Conservancy budgeted $29.6 million for acquisitions of environmental real estate in 1987; and the Trust for Public Land had conveyances of lands totally $362 million in market value for the 15-year period prior to 1990.[19] Rhode Island (a $147 million budget) and Dade County Florida (a $100 million budget) also are appropriating significant monies for parks and open space acquisitions, as is Michigan, which allocates approximately $100 million per year for such acquisitions. The state of Florida recently appropriated $3 billion dollars for acquisitions of environmental real estate over the next ten years.

Organizations active in the environmental real estate market may acquire properties individually or in alliance with others. Alliances may take the form of interim buyer/end buyer (a land trust buys property and resells it to a public agency), cofinancier (various organizations pool funds) or adjoining purchases (individual organizations buy individual parcels of a protected area).

In conclusion, a distinguishable demand in environmental real estate exists. The demand is large, increasing and varied in source, like many real estate markets. Unlike most real estate markets, the demand for environmental real estate is extraordinarily concentrated in the public sector. However, public sector demand dominates other accepted real estate markets (e.g., elderly and low-income housing).

Facilitation Of Pricing

A contemporary real estate market acts as a pricing mechanism, i.e., it is a means for people with money and want and people with goods to agree on a price in a transaction. In a market, transactors allow their individual notions of the worth of a good to be influenced by a consensus on price which has been formed on the basis of a number of recent transactions and offers for similar goods—in a spatial context or market area.

From the perspective of markets as pricing mechanisms, transactors of environmental real estate routinely consider what has been paid and offered for other environmental real estate when making their transaction decisions. Hence, transactors of environmental real estate exhibit behavior that is typical of transactors in other contemporary real estate markets.

Facilitation Of Supply

A contemporary real estate market facilitates supply, i.e., it varies production of supply according to scarcity (due to increased demand or perceived decrease in unprotected supply), as demand increases (which tends to st. late supply) or decreases (which discourages supply), assuming a constant cost of production, as one example.

From the perspective of a market as a supply facilitator, one finds significant evidence that the supply of environmental real estate (protected attributes of the environment) has increased significantly since the late 1960s. In the last 30 years, demand for environmental real estate has increased, along with environmentalism's surge,[20] in popularity (see Exhibit 1) and the perception by influential elements of society that pollution and development have reduced the amount of unprotected environmental real estate to undesirable levels.

Presence Of Government Regulation And Subsidy

Considerable governmental regulation and subsidy are typical of most contemporary real estate markets. Regulation and subsidy are used by society to produce a desired supply of real estate at desired locations and prices under the assumption that unregulated real estate markets will fail to do so within acceptable time frames.

Environmental real estate-related transactions and transactors *are* significantly shaped by regulation that prevents alternative development, which may otherwise outbid environmental real estate uses. They also are affected by government subsidy for the acquisition and use of property as environmental real estate. Governmental regulation and subsidy of the market for environmental real estate is analogous to governmental regulation and subsidy of low-income housing markets: i.e., without regulation, neither market would produce the desired supply at desired prices in desired locations; therefore, the government intervenes to foster, locate, shape and stimulate the markets.

Implications Of Recognizing An Environmental Real Estate Market

The body of environmental real estate transactions fits the definition of a market and exhibits the characteristics of a contemporary real estate market. It follows, therefore, that a comparable sales properly drawn from the environmental real estate market constitute valid indications of market value.

Several significant implications beyond admissibility of comparable sales also flow from recognition of an environmental real estate market. They are:

1. Environmental real estate probably will be increasingly viewed by society as a monetized environmental property having significant market value; it will be viewed less as an aesthetic natural resource having marginal market value.
2. The market value of environmental real estate, at any given time, will depend significantly on supply and demand factors in the market as they are perceived by transactors.
3. As society allocates more money to the conservation of environmental real estate, society can expect market mechanisms to increase supply and/or raise prices.

4. When supply is not consist. with demand, price inflation may be expected.
5. As with other monetized real estate assets in markets with stable to increasing demand, environmental real estate can expect development (i.e., the systematic application of skills and capital by organizations to increase revenues and/or market value) and speculation (i.e., opportunistic exploitation of supply/demand relationships by investors).

Implications 2, 3, 4 and 5 are subjects for further research because, collectively, they suggest a real estate asset that is well-suited to valuation, development, underwriting and management by traditional real estate principles of appraisal, enterprise science finance and investment.

Summary

Increasing acquisitions of environmentally significant lands, in particular, negotiated purchases involving public agencies, raise a valuation question: do they constitute a market? Assuming they do, properly drawn sales of environmental real estate involving public agencies should be valid indices of market value. Further, public agencies' policy of encouraging the use of condemnation valuation methodology should be stopped, unless public agencies intend to condemn and sellers acknowledge that the possibility of condemnation will alter significantly their negotiations.

According to analysis, environmental real estate-related transactions and transactors constitute a contemporary real estate market because they are consistent with a basic market definition; they have identifiable supply and demand; they facilitate pricing and supply; and they are subject to significant governmental regulation and subsidy. Essentially, the environmental real estate market is people and organizations with money who price and facilitate the supply of property that will be used for conservation, rehabilitation and introduction of environmentally significant attributes according to people's wants but subject to governmental regulation and subsidy.

Recognition of an environmental real estate market brings with it several significant implications. Comparable sales properly drawn from the environmental real estate market should constitute valid indications of the market value of the real estate. There will be a tendency to view environmental real estate more as a monetized environmental asset with a significant market value that is subject to influences of supply and demand and less as an aesthetic natural asset with marginal market value.

Ultimately, a perceived scarcity of desired environmental real estate, plus increasing demand for it, likely will attract more governmental regulation, development and speculation to a market process aimed at supplying demand, attracting revenues and enhancing marke. alue. For society, public agencies, relevant decision-makers and real estate counselors to assess effectively planning, acquisition and valuation decisions, it is appropriate to recognize the environmental real estate market, admit appropriate comparable sales involving public agencies and sensitize participants in the market to the supply/demand factors that influence the value of environmental real estate.

NOTES

1. No statistics have been found to indicate the ratio of conservation lands acquired by condemnation vs. those acquired by negotiated purchase.
2. Graaskamp, James A. *Fundamentals of Real Estate Development* (Washington, DC: Urban Land Institute, 1981) 3.
3. Bell, Martin L. *Marketing Concepts and Strategies, 3rd ed.* (New York: Houghton Mifflin Company, 1979) 108.
4. One submarket might be citizens who acquire wetlands through public agencies in California. Another might be citizens who acquire large-area ecosystems through not-for-profit corporations in the Upper-Michigan peninsula. Another might be direct acquisitions by citizens of wilderness/grazing habitat near Yellowstone National Park, etc..
5. See an informative discussion of restoration in Berger, John J. (ed.) *Environmental Restoration: Science and Strategies for Restoring the Earth* (Washington, DC: Island Press, 1990).
6. Council on Environmental Equality and Interagency Committee on Environmental Trends. *Environmental Trends* (Washington, DC: U.S. Government Printing Office, 1989) 87.
7. Ibid, 100.
8. Ibid., 115.
9. Ibid., 117.
10. Ibid., 116.
11. Ibid., 117.
12. Ibid., 118.
13. Ibid., 118.
14. Ibid., 119.
15. 458.3 million protected acres divided by 720 million federally owned acres.
16. Wilson, Donald C. "Basic concepts of environmental real estate development," *Colloquium on Establishing Environmental Values in Land Appraisal* (Rapid City, South Dakota: Western States Land Commissioners Association, Summer 1989 Conference).
17. According to *Land Use Digest* (Washington, DC: The Urban Land Institute, Nov, 1989), land acquisition programs are on the rise nationwide, as state and local governments buy property and development rights to preserve open space, provide more parks and save farmland from urbanization. Private land trusts have been growing throughout the 1980s, but the entry by government agencies is relatively new. Interest in the Northeast has been intense, where states and localities have committed over $1 billion in public funds to such programs, including Vermont's new $3 million housing and land conservation program and Suffolk County, New York's $300 million commitment to preserving watersheds. California's Proposition 70, a $770 million land acquisition bond issue that was passed last year, includes $63 million earmarked for the purchase of agricultural property rights. Libertyville Township, Illinois, has acquired more than 700 acres of land through an open space district. (California Planning and Development Report, Sept. 1989; Torf Filton Assoc., 1275 Sunnycrest Avenue, Ventura, CA 93003).
18. "Attractive land parcels gain a powerful ally," *Wall Street Journal*, May 28, 1991, *Section B*, p. 1.
19. Hungerford, Craig D. "Colloquium on establishing environmental values in land appraisal (Rapid City, South Dakota: Western States Land Commissioners Association, Summer 1989 Conference).
20. Other major surges of environmentalism (or conservation) occurred during the administration of Theodore Roosevelt and on the heels of the Dust Bowls of the 1930s.

February 20, 2005
Department of the Air Force

Ms. Brenda Cook
HQ ACC/CEVP
129 Andrews St., Ste. 102
Langley, AFB, Va. 23665-2769

I am writing to you in reguard to the expansion of the Cannon Fly zone.
I am a property owner with some land in that expansion area.
I am for our defense and their training, it is very necessary, except training people from other countries on our soil.
My main concern is retaining the full use and full property value after the expansion, due to the low flying planes and the noise.
I have interested people in developing a wind farm and the expansion should not interfere with my right to do that. I am also planning to sell building sites along the 4 and 1/2 miles of highway frontage. I am concerned of the sound bearier booms making it a less desirable place to develop and to live. I want to build a home on my ranch but don't want to live my life out hearing loud booms. SO-5
There is lots of public domain for such training over land of much less value and potential. I think if the Government needs such land they should purchase it and lease it out if it can be used.

Please send me a answer so I know your feelings and I will have a record of our comunication.
My mailing address and telephone number is:

Don Essary
[redacted]
Floyd New Mexico [redacted]
[redacted]
Don Essary

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

February 15, 2005

Attention: Ms. Brenda Cook

Re: NMTRI proposed airspace expansion and the EIS recently completed

We irrefutably support CAFB and all branches of our military, just like all Americans, as a vital means for our country's national security and freedom.

We received a copy of the EIS and have tried to comprehend the findings on the issues that will detrimentally affect our property, livelihood (our living depends on the land), and our private rights. Although the studies seem to dictate a very minor negative impact on people, land, and animals in all the proposed expansion areas, we, respectfully, but adamantly disagree. The impact will be significant to the people trying to live and work under the airspace. We agree that this proposal affects a wide area of people as a whole, but many indirectly. We (property owners, etc.) that must live directly under this proposed change should have priority in establishing what happens to us.

We found no specific examples given in the EIS that have explored the specific and direct impact of noise, chaff, and flares at different altitudes, etc. on property, people, and animals under the existing and proposed areas. Our cattle operation involves running stocker cattle. This livestock consists of young-aged calves that are shipped in, have been handled little, are skittish, and are very susceptible to sickness. Therefore, we keep them in small pastures or traps (may contain from approximately 100 acres to one section) that connect to corrals where we can feed and treat sickness. It is possible we may have up to 500 head spread throughout these traps and keep them up to six weeks, maybe longer, for treatment and preconditioning. There is no set time scale on this operation. Fresh cattle may come in anytime during the year on a continuing basis. The cattle are turned out in these traps to give them some room, yet are close enough to keep watch on them. Stress is a huge detriment to the operation. There will no doubt be an **absolute adverse impact of startle and panic due to the increase of noise intensity and activity.** PR-7

According to the EIS there will be increased noise from aircraft at 500 feet (ESI states around 43 dB); increase in number of sonic booms to two every three days or 243.3 sonic booms per year; increase in sonic boom intensity due to lowering of flight down to only 5000 feet above ground level; ESI states the overall intensity of noise will increase from 16 dB to 42 dB in the eastern expansion area.(pg. 4-15) The EIS states the Melrose AFR (R5104 and R5105) has a combination of low altitude and high altitude activity, and noise levels are around 50dB.(pg. 4-14) The acceptable level from the USEPA is 55dB. According to Table 4.2-2 under proposed action in the R-5104B area, the number of events/day ABOVE sound exposure level of 65dB will increase to 2.1 events/day. That is 766.5 events per year ABOVE 65dB.(pg. 4-15) Along with such an increase in overall intensity, the number of "events" and their intensity, this seems to be unacceptable to us. NO-18

0040

How are we supposed to operate our business under these conditions? Also noted is some of the studies mentioned for reference in the EIS on livestock are anywhere from 31 to 38 years old?(pg.4-32) Are these out-dated studies acceptable for comparison today? NO-18 BI-25

According to the EIS, 303,850,000,000 non-biodegradable chaff strands will be dispensed from aircraft in the new, modified, and proposed airspace per year.(pg.2-12; 60,770 bundles x 5 million strands) Have any medical studies been done, currently or through the years, concerning illness or cause of death on the people living in and around Melrose AFR that can rule out chaff exposure as a contributing factor? Also, two plastic end pieces and one felt spacer are ejected with the chaff bundle, and one felt spacer and one plastic end cap for each flare fired will make for a total of 262,882 pieces of debris falling per year.(pg.2-13) There is a definite threat for fire with well over 40,000 flares being used per year, and the EIS states " flares may be used under all conditions of fire risk."(pg.2-13; 4-22) It only takes one incident to burn off thousands of acres (rough and hard to access) and severely cripple or ruin someone's livelihood and property. The EIS states "no increase in the quantity of chaff and flares is anticipated," but this is not guaranteed.(pg2-10) It can be estimated then that there is no guarantee that missions will not also increase by CAFB and other military including foreign countries. How can the EIS conclude this will have "no significant impact" with build-up now and over time? Define "significant impact". It can be concluded that under the circumstances mentioned above, our cattle operation, including ourselves, personal property, and others under the **airspace, will be severely and detrimentally impacted.** SA-4 SA-2 NP-2

The vast majority of our time (including winter months) is spent outdoors. Our operation and livelihood depends on it. We have chosen the peaceful country life and feel we have the right to maintain it. We have the right to raise our sons and daughters in a peaceful, safe, and clean environment. According to the book, The Language of Real Estate, 2nd edition, by John W. Reilly, the definition of land is a follows: "The surface of the earth extending down to the center and upward to the sky, including all natural things thereon, such as trees, crops, or water, plus the minerals below and the surface and the air space above."

It seems to us this proposed expansion of military operations is a violation of our private property rights protected under the fifth amendment of the United States Constitution. If this proposal goes through, note the following realizations: Not if, but when a fire (directly or indirectly AF related) takes place, who takes responsibility and how will it be taken? Who and how will responsibility be taken for damage to homes, water wells, storage tanks, and windmills? Not if, but when cattle are not only unsettled, but panicked, and fences, corrals, etc. are torn down, who takes responsibility and how will it be taken? How can compensation be determined for not only loss of personal property and crippled and dead animals, but for labor, distress, agitation, disquiet, and the overall nuisance, disturbance, and even increased cost of daily operation and living? Even though we fully support our military, it is hard to grasp the fact that the Federal Government has allowed foreign countries access to our property through this proposal. There is no way we would be able to track all those involved, therefore, will CAFB be held accountable for all actions of all those using the MOA for military purpose? If your LU-1 NP-3 AM-1

0040

activities create a situation in which we are charged because of the build up of trash and hazardous materials, will the Air Force and Federal Government indemnify and hold us harmless for this action? Vioxx was approved by the Federal Government FDA, and now has been recalled and determined to be a serious threat to people's health. Can it be guaranteed these materials and actions won't later be truly detrimental? Who is held accountable if illness or death results from these materials? How will responsibility be taken not only for devaluation of property due to noise and trash pollution, but disruption of current and potential diverse future business operations or developments? What guarantee do we have that companies looking to develop wind farms or oil exploration will not shy away from our area in the near future? Devaluation includes breach of the serenity of the property. In step with the Fifth Amendment, as mentioned prior, Roosevelt County Ordinance #93-8(adopted 11-15-93) establishes procedures and guidelines concerning the County's land use and environmental policy. It specifically addresses the effects on private property including a provision for "a private party to receive compensation equal to the devaluation of his land or private rights from any governmental agency whose act devalues said land or rights." SA-4 SO-5

Our clear intent and preference is not to have to deal with this hardship and intrusion; however, in light of the fact that this proposal will presumably be approved, it cannot and must not be ignored that property owners and those directly impacted are giving up numerous and specific private rights and request that these rights be seriously considered and compensated for. Ms. Cook noted at the Clovis meeting that the results of the EIS are to balance the needs of the Air Force with the affect on the Public. Where is the balance? The affects of this proposal must not be taken lightly by the Air Force or any of those intending on using this MOA, now, and in the future.

Respectfully,

Buddy Taylor
Donna Taylor

Buddy and Donna Taylor
[redacted]
Elida, NM [redacted]

0041

HQ ACC/CEVP
129 Andrews St. Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

[redacted]
Portales, NM [redacted]
Febuary 19, 2005

Subject: Melrose AFA Initiative - MOA Expansion

My name is Betty Toliver Greathouse, I am an American a descendant of a homesteader to the territory of New Mexico in 1906. I believe that we should be good stewards of everything, one of which is our land. The Air Force isn't good stewards of the land. Evidence is the Melrose Bombing Range and the AFA purposed MOA Expanson. NP-9

Reason # 1 Russian Thistle or tumble weeds are literally covering up the ranches and farms next to the MBR. Reason (#2). We were told the MBR expansion wouldn't hurt or curtail the future leasing or exploration for oil or gas, but it has. Reason (#3). The wind turbines are new to our area. Can we believe that this vital energy source will be expanded in the MOA area? Reason (#4). In your EIS Draft you treat Aluminum Chaff and Flares as no problem to land or cattle. Aluminum is non-biodegradable. Once on the land forever on the land. Reason (#5). In your EIS you didn't cover some very important endangered species. Ranchers and Farmers. You failed to find out how this expansion will effect the farmer and rancher. You will (a) devalue his land. (b) destroy his future hopes of oil, gas, or wind exploration (c) obliterate his barns, homes, and sanity and etc. Reason (#6). With 3.9 million acres in Mt. Dora MOA, belonging to Cannon Air Force Base. Why don't you use what you have? That would be realistic training. NP-9 SO-7 PR-6 SO-5

It is hard for me to really believe that this expansion is needed, with war strategies changing (of course I know as much about war strategies as you know about cattle, land, birds, ranching and farming,) but war strategies seem to be changing from Super Sonic Flight (which seems to have little effect on terrorist or roadside bombers) to deadly weapons of mass destruction and UAV's. PN-3

I believe in a democracy and America . I believe in a strong America. I also believe it requires the best from each and every one of us. Do you believe that you EIS has adequately covered the ranchers
Thank you!

Betty Jo Greathouse

cc. Senator Pete Domenici
Senator Jeff Bingaman
Rep. Tom Udall

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! **DATE:** June 16, 2005

PLEASE PRINT

See Attached **GE-1**

****** CONTINUE ON BACK FOR MORE SPACE ******

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	Dwain Woody
ORGANIZATION:	Woody Investments, L L C
ADDRESS:	[redacted]
CITY/STATE/ZIP:	Lubbock, Tx [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

0042

To Whom It May Concern:

The reason for this belated letter is that the closure of Cannon Air Force Base, Clovis NM, would force Albuquerque Center to monitor the Melrose Bombing range. I am a rancher that uses a Cessna 182 in my ranching operations checking water conditions, stray cattle, sick cattle. My ranch is located approximately four statute miles from the southern border of the Melrose Bombing Range. The elevation is approximately 4,000 to 4,500. I understand that the M O A requests at 10,000 for supersonic and lower for subsonic bombing runs. I have never known a fighter pilot that colored between the lines. Supersonic and other bombing runs at lower altitudes concern me in the area, because we are at the same altitude. If an accident happens the Air Force Pilot punches out. A few days later there is another plane to take its place: however I have to ride mine to the ground.

I understand that this supersonic M O A can not be implemented between New York and Boston. Therefore the citizens living in that area should have no problem letting the Air Force lease the air space of the ranchers within 20 miles of the Melrose Bombing Range. I propose that the Air Force lease the deeded acres at the same rate that we pay for our New Mexico Lease Lands. Under such an agreement I would leave my airplane at home.

Written Comment Sheet
Public Hearing for the New Mexico Training Range Initiative
Draft Environmental Impact Statement (EIS)

Thank you for your input! **DATE:** 4-22-05

PLEASE PRINT

To WIN a WAR we Need a great AIR FORCE!

We dont Need any GERMANS FLYING PLANE IN This Country. Especilly in FRENCH PLANES.

We dont Need the Air Force Flying over our Ostrich Pens south east of Fort Sumner. You Know the Location!

We Now our hatching our Baby Ostrich. PLANES Flying over cause STRESS on the Ostrich.

The baby birds die from stress and the big birds run into fences & buildings when the planes are "dog fighting" over the pens. We not only lost birds but much damages have been done to the property. NP-3

****** CONTINUE ON BACK FOR MORE SPACE ******

Comments will be published in the Final EIS. The names and city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME:	LEONA AND JAKE WEST
ORGANIZATION:	FARMERS
ADDRESS:	[redacted]
CITY/STATE/ZIP:	FORT SUMNER, N.M. [redacted]

Please hand this form in or MAIL BEFORE FEBRUARY 21, 2005 to:

HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn: Ms. Brenda Cook

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NEW MEXICO

TRAINING RANGE INITIATIVE

EIS PUBLIC HEARING

JANUARY 24, 2005

ROSWELL, NEW MEXICO

701 EAST COUNTRY CLUB ROAD

REPORTED BY: LORENA H. ROMERO

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APPEARANCES:

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Print Maggard

NMANG:
Lt. Col. Frank Carillo

SAIC:
Bob Van Tassel
Sheri Freemuth
Deborah Hiller-LaSalle

CANNON AFB:
Lt. Jennifer Geeslin
Col. Tip Wight

USAF HEADQUARTERS:
Brenda Cook
Troy Anderson

INDEX

(Open House 5:30 to 6:30 p.m.)

(Whereupon, at 6:30 p.m., in Roswell, New Mexico, at Goddard High School, the following proceedings were had:)

MS. GEESLIN: Good evening, ladies and gentlemen. I'm Lieutenant Jennifer Geeslin and I'm the Deputy Chief of Public Affairs at Cannon Air Force Base.

First of all, I would like to welcome all of you here this evening and thank you for coming to be part of the Training Range Initiative Process. We are really happy to see all of you here, and your comments are greatly appreciated so we can make sure that we have this process down pat and analyze everything that we need to.

As you know, this process started about a year ago, back in January, 2004, when we held scoping meetings and we held one right here in Roswell. We presented our proposal to you and let you comment on the proposal so we could analyze all your questions and concerns and ideas about the proposal. And now we're going to talk about the Draft Environmental Impact Statement which basically compiled everything together, and we're here this

evening to get your comments on that statement.

We're going to be doing this in two parts here this evening. First, we're going to start with a couple briefings. The first briefing is going to be from Col. Tip Wight, our Operations Group Commander at Cannon Air Force Base. And he'll talk a little bit about the proposal and kind of go over the proposal and what it means, as well as the different alternatives that go with the proposal.

And then we'll turn the floor over to Ms. Brenda Cook from Headquarters Air Combat Command and she'll talk about the National Environmental Protection Agency process, the overall documentary environmental aspects, as well as what was kind of found in the documents to save you reading 400-plus page documents, she'll give you a brief synopsis of it. So without further ado, Col. Wight, if you'd like to come forward?

Col. Wight: Thank you, Jennifer. For those of you who don't know me, I'm Col. Tip Wight. I'm the Commander of the 27th Operations Group, which means I'm in charge of all the flying operations at Cannon Air Force Base. We also have General Frank Carillo over here from the New Mexico Air National Guard, and he's in charge of the flying

operations up there for the F-16s. Both of our wings, we fly the F-16, Fighting Falcon. And for those of you who aren't familiar with it, it's a high-performance, all-weather, precision-guided emissions capable fighter aircraft; so both air-to-air and air-to-ground missions. We have that role to fly -- do that throughout.

Our mission within the 27th Fighter Wing, and essentially that -- although there's additional missions within the Guard itself, but in terms of the National mission and our mission of the active duty F-16s at Cannon is to provide combat power to the combatant commanders any time, anywhere. That means with relatively short notice we can be tasked to deploy -- and most recently we were tasked to deploy in support of Operation Iraqi Freedom. And we have one of the Veterans of that Operation here, and I'll ask him to stand up: Captain Johnson.

And again, a young Captain as you can see, and we deployed him to fly combat missions over Iraq, and he's a veteran of that conflict, although we've deployed him to support numerous other operations and he could be called on to go anywhere in the world, at any time in support of National

Objectives.

We talked about that. The point being we do both air-to-air and air-to-surface missions training against a variety of threats both airborne, enemy aircraft, the radar-guided surface-to-air missiles, as well as deploy a wide variety of aircraft missions ranging from the unguided gravity munitions that were popular over the -- to Vietnam and early Desert Storm to our all-weather, precision-guided, both laser-guided bombs and joint direct attack position or global position satellite guided munitions if you go through the weather to precise coordinates at any time. So you might say -- I've heard a lot of you ask -- I was over at the airspace model talking about this -- but "Why do we need this range"?

Well, I'll tell you: Captain Johnson here is why we need this range. Your sons and daughters that are in the military, we need to train them realistically in combat. Before Captain Johnson here got deployed to Operation Iraqi Freedom and the first time he employed the tactics and weapons he did at supersonic air speeds was in combat with the enemy shooting at him. And that's not the way I want our young pilots to have to go to

war. They need to be able to train realistically in our training airspace for the kind of threats and tactics that they will perform in actual combat.

The reason he couldn't do that, the reason he had to go to combat and do things for the first time is because our airspace structure doesn't support that. So we need to make that airspace more usable and meet the needs of our combat training. So realistic combat training is why we need to do this so that the next Captain Johnson doesn't have to go to combat and do it for the first time.

The other thing to take in mind and kind of keep in mind is that as an Air Force, we've evolved in our weapons and tactics. I've mentioned that our munitions, our bombs are more capable now. The threats have also evolved. The bad guys have learned how to counter us better, they've developed new systems and it's not a status quo world, if you will. So they're threats are able -- they know we're going to try to stand off and stay outside their ranges. So they've gotten better defensive weapons as well. They're able to threaten us at greater ranges. Again, our tactics and our capabilities have evolved. Moreover, for those of you who may have been familiar with the 27th Fighter

Wing in the 10 or 15 years past, the Air Force flew F-111s, the majority was down at a lower altitude. That's the way we thought we were going to fight against the former Soviet Union. However, as we saw in Desert Storm, the first couple nights of that, we found out low altitude wasn't the way to go against that threat and we changed. And ever since then, in the recent conflicts we've fought ranging from Bosnia, Iraq and various places, Kossovo, we've all gone at medium to high altitude. And that's a majority of the way our tactics are.

So the airspace structure, while it's adequate from the a low altitude perspective, from a medium to high altitude it's not. And it doesn't support the way we do our fighting today; it doesn't support deploying munitions at longer ranges, at faster speeds; and throughout the airspace the way we need to do that. We've got kind of this wedding cake structure that I showed many of you over there with the plastic models and we'll give you a little bit of detail here.

So that's the big reason we need to do this is because we've changed the way we fight. The current airspace doesn't support that realistic combat training against the threats and tactics that

are out there.

The bottom line -- the three sound bites, if you would -- that we'll take out of this in terms of what we're changing: Try to make this wider, to try and be able to go higher, if you will, at more volume -- so wider, higher -- and we need to go a little bit faster and lower that floor. We currently are limited to supersonic operations at or above 30,000 feet mean sea level, lower that down to approximately 10,000 feet mean sea level, or about 5,000 feet above the ground in most places.

Again, while we currently are authorized to deploy chaff and flares throughout the current airspace, when we modify that airspace we'd like to be able to do that again. The whole point being, right now the current structure is not intuitive to the pilots, us being fighter pilots, the simple lowest common denominator, if you will. What we do is, there's a piece of the airspace where we can't go below this altitude and a piece that we can only go this high. What we try to do is find the one chunk of airspace that we've got the same altitude and we use that. And the same restrictions; if we can only use chaff and flares here and we can't use them here, what we'll do is

not use them so we don't get in trouble using them when we're not supposed to.

So we're trying to make those restrictions go away so my young pilots who are flying at 500 knots, plus working their tactics, managing their formations and defeating their threats don't have to worry about it as long as they're inside the boundary then they're okay inside the airspace and they're okay to use chaff and flares. We're trying to make it simple throughout the airspace in terms of both the altitude, airspace restrictions and supersonic and chaff and flares. All right.

The one piece that I didn't talk about there in creating the new training airspace, we're talking about the Capitan Military Operations Area -- and I think we'll have a chart here in a minute that will show it, and unfortunately, I don't know if I have a laser pointer here or not, I'll try not to laser our Judge here. I know he appreciates that. Let's see. This piece right here is the Capitan Military Operations Area that connects the Holloman controlled Beak Military Operations Areas, and again, there's no change to those Holloman modes. We're not proposing any kind of change to

this. All we're doing is adding a piece here that connects that and this so once or twice a month, for a couple hours at a time when we need to do large force training exercises, we marshal here, join up, get ready and we push across here because we have an air-to-ground range located over here at Melrose and we're trying to attack so the threats are usually up here defending it and we push in this way to attack and defeat 'em and we just want to be able to maneuver to execute our tactics in this corridor that connects the two pieces of airspace. So that's the purpose to that. We propose it only go down to 12,500 feet mean sea level. We propose to allow chaff and flare use, and above that altitude supersonic operations. And again, that would only be active as per noted. And again, we're talking probably a couple times a month for a couple hours at a time maximum; we don't do that all the time.

Okay. The other pieces that I've shown many of you that are key to this proposal, right now, as I talked about, this chunk here is from 500 feet above the ground level up to 18,000 feet is the military operations area, and then above that as assigned by air traffic control. Frequently that's capped at about 28,000 feet to

30,000 feet based on airline traffic that's coming out of Dallas-Fort Worth, flies right over the top of us, or on the jet route to the north and goes direct here and other traffic point-to-point routed. A majority of airline traffic nowadays is being routed point-to-point. We oftentimes do based on our global positioning system capabilities. So oftentimes we will re-captain our airspace to allow airline traffic to fly over the top of us. We are proposing to remove that -- re-route the traffic, move the jet route to the north -- just kind of an artist's depiction, if you will, of the red line here -- remove the departure traffic out of Dallas-Fort Worth, remove that over the top and we should be able to go 500 feet AGL to 50,000 feet, and it's going to be in one chunk of airspace.

And then currently, what you see here on this yellow piece, is only from 24,000 feet and up. So as you can guess, being fighter pilots and we don't want to get in trouble and lose our wings for going somewhere we're not supposed to go, we don't use that airspace much. Okay? And when we do, we just say okay, everything is 24,000 feet and up. Obviously that's pretty restrictive and some people say why do you even need to go down to

500 feet above the ground since most of your tactics are medium attitude? Well, again, never say never. We don't always go medium altitude. There may be some situations where we do need to train down. We do have currencies and requirements to be able to go down that low if we need to. We don't do it a majority of the time, but we still have a requirement to do it. As well as, the bad guys, as you might guess, aren't going to hold still for us and always be in the middle at 20,000 foot attitudes, they could be anywhere. And if I don't train my pilots to look in low altitude coverage, so with having threats down at 500 feet or having them up to 50,000 when they get in combat they'll be used to always looking at one piece of airspace and they're going to get surprised. So that's why we need to do it. As well as, when we get over in this area to do our weapons delivery, obviously we transmit those and certainly munitions that we drop, while they're not live munitions, they're still ordinance, it is going all the way down to the surface there within the restricted area, the impact area itself. And many of our tactics will support that. Okay?

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Col. Wight: There you have it, never. And right now -- he didn't know I was going to ask him that, but that is the only place we can go right now supersonic is above 30. And you just heard him, he never did that in combat. The majority of our stuff is flying low 20's, thousand feet if you will, and again, that's where the majority of our training, plus for our air-to-air tactics, they could be at any altitude. But again, predominantly in the mid to high 20's and 30's is where we employ an air-to-air role.

So that's the intent here is to remove the airline traffic, get everything up to 50,000 feet. There's a chunk down here that the floor is only 11,000 feet so we can't go below 11,000 -- so another restriction our folks have to remember which results in they don't fly down here

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Now no proposed action would be complete without a couple of alternatives. And we do have some alternatives to that.

Alternative A just essentially means they would not shift that jet route. That jet route, currently J-74, goes right here, so that would still be there. And when air traffic control could not reroute the traffic, again we'd probably be capped like we are at 30,000 below or 28,000 below. So Alternative A is just not moving the jet route but everything else is the same.

Alternative B here -- if I can get it to go -- would be shifting the jet route, everything

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And then Alternative C is the way it is today. We have a hodgepodge of airspace, a lot of restriction, and we have to send pilots into combat without the fully realistic training.

Again, that goal is exactly what we have sitting before you here tonight. We want to train to the threat, train with the tactics, train realistically to deploy in combat. And I don't want to have to send any more Captain Johnsons into combat without the preparation of that -- without that full preparation.

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MS. COOK: Good evening, ladies and gentlemen. I'm an environmental analyst at Air Combat Command at Langley Air Force Base. And my job in this process has been to oversee the preparation of the Environmental Impact Statement, which I hope a lot of you got in the mail. We have copies available, and also on the web site and in

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MS. COOK: This is our Court Reporter. She's recording everything that happens in this meeting so you need to talk slowly and clearly. All right.

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Okay. What is the NEPA and what is this environmental process all about? It all stems through the National Environmental Policy Act of 1969. This is a law that was passed in December of 1969 and signed into law in January of 1970.

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actions prior to undertaking that action. And all Federal agencies are required to adhere to the National Environmental Policy Act. It includes opportunities for public involvement so participation throughout the process is a very key part.

Ultimately, the goal of NEPA is to make better decisions. And we feel by involving the public throughout the process we can successfully balance the New Mexico Training Range Initiative with the environment and community concerns.

As the proponent for this action, the Air Force is serving as the lead agency in preparation of this Environmental Impact Statement. It involves airspace changes. The Federal Aviation Administration is our cooperating agency on the document because of their legal jurisdiction, and their expertise in airspace issues. Okay.

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and ask you to identify key issues that you thought were important that you felt we should address in the Environmental Impact Statement.

The process began, actually, in December of 2003 with the Notice of Intent that appeared in the Federal Register. This basically was the Air Force announcing to the world that we were going to be preparing this Environmental Impact Statement.

The scoping process was about 45 to 50 days in length, and that's when we held a series of scoping meetings a year ago. And now we have drafted the Environmental Impact Statement where we analyzed various resource areas and issues that you shared with us that you felt were important, and we're in the middle of a 45-day public comment period. This draft EIS was released to the public on the 7th of January, and a 45-day public comment period will extend through the 21st of February.

Each of the comments that you provide to the Court Reporter, the Hearing Officer today, written comments that you provide either here at the meeting or that you mail in, will become a part of the record and will appear in the final Environmental Impact Statement. Your issues and

concerns will be addressed in that document. And we anticipate that that will be available to you in September of this year. And then the record of the decision or ultimate decision the Air Force will make will be in the October time frame of this year.

Okay. Scoping meetings; again, this was a dialoguing process. It was our first opportunity to come out to the public and describe what this proposal is all about, why the Air Force feels it's important and why we think we need to be able to do it to increase driver survivability. And that series of meetings determined what specifically we addressed in the Environmental Impact Statement.

And now we're at the second big opportunity for public involvement. This is the public hearings series, and this is the first of four hearings we have scheduled for the week. And here is where we would like you to give us your comments on the analysis in the Draft EIS. And again, your input into the process will become a part of the final document.

We had approximately 75 people who attended the scoping meeting, so it's great to see a good crowd and we appreciate you coming out tonight to listen to what we have to share with you.

Here's our schedule: Tomorrow night we'll be at Santa Rosa, and then Thursday night Fort Sumner, and then Friday night in Clovis. All the meetings are 6:00 to 8:00 p.m. Okay.

I'd like to tell you a little bit about the elements in the Draft EIS. The description of the purpose and need and the description of the Proposed Action and alternatives, that's basically the who, what, when, where, and why of the action. And that's found in Chapters 1 and 2 of the EIS.

Chapter 3 is the baseline environment or the existing conditions, what we have today in terms of the airspace and various resource areas.

And then the analysis is found in Chapter 4. And that's where we take NMTRI and we look at the changes it would have on the existing environment to determine the Delta or the change in the various resource areas, how is it going to be different in terms of the noise environment, and how will this change in terms of socioeconomics in the communities.

There is also a Chapter 5 in the document which is cumulative impacts where we look at other Federal, or State or local initiatives that

are under way to determine whether there is collectively any asynergy or increased potential for impact from NMTRI in conjunction with these other programs that might be ongoing. Okay.

Now I'm going to try to walk through the various resource areas in the document. And you'll find, when you thumb through the EIS, that Chapters 3 and 4 mirror one another. So the first resource area of the document is airspace and range management. And as Col. Wight pointed out, NMTRI has no impacts on the ground. In other words, the boundaries, the location of Melrose Training Range does not change. NMTRI is basically airspace changes and the way they operate within that airspace. So no changes on the ground.

Now when the MOA complex is active for training, private pilots have the option of flying through that airspace under "see and avoid" conditions, or many of them choose to fly around that airspace. MOA's are not restricted airspace so people -- or not participating aircraft are not restricted from flying through there, but many times we've been told private pilots prefer to fly around that airspace when it is active.

So for private pilots in the area,

when the MOA airspace is active, there could be some general changes to your flight schedules, your routes and times or altitudes you would choose to fly if you were transmitting some of this airspace.

For commercial flights, on the jet route 74 or directly routed commercial flights that might go through that airspace, if the airspace is active, we're the ones who are going to be asking the Federal Aviation Administration to shift that traffic north. So we think about one to two minutes would be added to their overall schedule if they went around that airspace rather than directly through it.

And again, when the airspace is active, there would be increased "see and avoid" areas for private pilots who elect to fly through that airspace.

The acoustic environment, this is also noise in general. For subsonic noise, let me point out one thing: NMTRI does not change the type of aircraft at Cannon Air Force Base or at the New Mexico Air National Guard, and it doesn't increase the overall number of sorties that are going to be flown. Again, it just changes how they're going to be operated a little bit. So in terms of subsonic

noise in most areas of the restricted airspace, the change is going to be you're not going to be able to discern it with the exception of the Eastern wing, Eastern expansion of the Pecos MOA where you have an increase of up to 6 to 17 decibels above the existing conditions. And that's because to even up that airspace, that floor is dropped to 500.

In some cases, if you'll notice in the EIS, the noise level goes down. That is because you're not having extra sorties, but you're having a larger area within which they operate so the noise level might go down a little bit. But overall, in terms of subsonic noise, you're not going to notice a whole lot of change there.

Now, sonic booms, that will be a little bit different. Today the Wing can fly above 30,000 feet MSL. And with NMTRI they're proposing to allow them to fly down to 10,000 MSL, which is approximately five to six thousand feet AGL.

Now today with the current supersonic activity, the average number of sonic booms is .2. What that means is about one boom every five days. Now with NMTRI, under the Proposed Action or one of the two action alternatives, that will increase to about two booms every three days, or we've

calculated it out to be.6 booms per day. So you would hear a few more booms in the environment.

Not every boom that is generated every time a plane goes supersonic, they're not always heard at the ground and that's because of the physics of the atmosphere. Sonic booms depend on the Mach number -- how fast they're going, the altitude that they're at, and the atmospheric conditions. So again, many times booms are generated, they're refracted back up and never heard on the ground.

The -- the amplitude, the strength behind the boom, is measured in peak over pressure and pounds per square foot. Most of the booms that are going to be generated are going to be in the 1 PSF range. Less than 1 percent of the booms could be in the threes -- or could be above 4 pounds per square foot, and an exceptional boom could be in the 6 to 7 pounds per square foot range. But again, most of them are anticipated to be about 1 PSF.

So people will hear booms a little more often, and sonic booms tend to annoy people sometimes. Sometimes they interrupt your activities. They have -- they can rattle your windows; they can rattle brick-a-brack that you

might have on the shelves; and there might be a startle effect associated with it, an unexpected noise. A loud clap of thunder is an impulsive type noise as well, and sonic booms are categorized as an impulsive noise.

Generally, structural condition, at 1 PSF booms, there's no impact. However, if there is damage to your structure, the Air Force has a claims procedure and process in place to deal with those issues, and that starts with contacting Cannon Air Force Base Public Affairs Office. Okay.

Safety; the safety category deals with flight safety, explosive safety and ground safety. And for the most part, because nothing is really changing on the ground, ground safety is not an issue. But when you start moving commercial air traffic around, like we're proposing to move it north of the airspace, that means more flights are going to be north of the airspace so the controllers of that airspace in the FAA world will have a little bit greater magnitude of flights to deal with.

There are other jet routes that are north of the airspace so when you start moving it up, things can stack up. So they would have an additional requirement to deal with more flights.

We feel -- you know, they're the experts in air traffic management and we're confident they can de conflict this airspace to make it more usable for the 27th Fighter Wing and the New Mexico Air National Guard.

As far as the flare use, the existing management procedures that are in place to minimize fire potential would continue, so we don't anticipate any additional safety risks from flare use. And again, I want to point out, when MOA is active and you -- a private pilot, chooses to fly through that airspace, that in addition, "See and Avoid" Rules would be in place. Okay.

Physical resources is basically soils, water, land forms, hydrology and such. And for the most part, again because NMTRI did not involve any on the ground structure or changing things, no significant impacts are associated with physical resources.

Biological resources includes wildlife as well as domestic animals, their habitats and to include threatening endangered species as well. Now because in the subsonic environment, as I mentioned earlier, in general in most areas the noise will not change that much, we really don't

anticipate from the subsonic noise perspective, any significant impacts. Or from the use of chaff and flares, because as Col. Wight pointed out, chaff and flares have been used in this airspace since 2001, and even longer than that in the restricted airspace above Melrose Range. And so that would just kind of continue just being a larger area where they would be able to deploy the defensive counter measures.

Now sonic booms; with the increase up to about one boom every five days to two booms every three days, people and animals are going to hear more impulsive noise. And in some cases, both humans and animals get the startle effect, and sometimes it interrupts activities, whether you're doing something outside and you have to stop, or animals might look up or move. But studies have shown that in most cases that this is very temporary, animals tend to habituate and they resume normal activity quite often after a boom occurs.

Airplanes have been flying in this airspace for a long time so aircraft noise is really not anything new. So with that in mind, and the fact it's part of the existing environment, the additional noise or changes in the subsonic noise or additional sonic booms we don't anticipate will be

an extreme significant impact on biological resources in your area. All right.

Cultural resources; this includes historic structures and also traditional resources. And there are some that lie under the airspace and some of which are listed on the National Register. And aircraft noise that occurs today, or the visual aspect of aircraft over flights have not affected the National Register listing of these properties. And so the increase in the frequency of sonic booms or the additional use in chaff and flares in the expanded airspace we don't anticipate will impact cultural resources.

Land use and recreation; again, no changes to the ground, so your land use, land ownership, property values, the BLM's areas of sensitive environmental concern, or the BLM special recreation management areas will not be affected by the NMTRI proposal. Access to recreation areas will not be affected either, however discrete hunting events or activities, if someone is doing an outdoor recreational activity and there's a sonic boom, there could be some adverse effect or impact on those individuals. But overall, we don't anticipate significant impacts. All right.

Socioeconomics; this mainly deals with the private aviation community who would be flying around the airspace when it's active. Again, you're not required to fly around the airspace, you're able to transit that airspace under "See and Avoid" Rules, but if you choose not to, that would mean some additional time or changing your schedule. Time or money in terms of fuel is the bottom line if you fly around the airspace and it happens to be active.

As Col. Wight pointed out, for the Capitan MOA bridge, that's only going to be activated a couple times a month to support the large force scale exercises.

The other area that is addressed in the EIS is, like, windmills, existing windmills or windmills you might want to put up in the future for electric power or any petroleum activities you might be looking at will not be impacted by NMTRI. You will not be restricted in any way from pursuing those areas in conjunction with the NMTRI proposal. Okay.

Environmental justice is an area that we look at, it's required by an Executive Order. And the focus deals with potential impacts on

minority or low income populations. And we also have an Executive Order that requires us to look at the environmental safety effects on children. So as we look at NMTRI and what it would mean to this local area, we have determined -- excuse me -- determined that there are no environmental justice issues associated with the proposal.

Now I just have given you a quick overview of the highlights. The detailed analysis is in Chapter 4 of the EIS. And there's two tables I want to point out to you in the document. One is at the end of Chapter 2; it's Table 2-12. And that is a full summary of the environmental impact per resource area. So I'd like to point that out to you.

And the second is a table, I believe it's 2-6, and we also have a display over here which addresses how -- shows how we addressed the issues that you raised during scoping, like whether you had concerns about sonic booms, impacting hunting operations on your land or whatever, the issues that are raised, that board right over there with the color coding shows where in the EIS that issue is addressed.

Cumulative impacts is where we look

at, again, the -- the actions that have occurred in the past; the actions that occur in other Federal agencies today, reasonably foreseeable actions in the future. And when you kind of roll all that together, you see does it add up to impacts more than by itself, the outcome is basically no, the Federal activities and non-Federal activities in the area, if you add NMTRI to it, it doesn't develop any significant impacts. Okay.

In a moment I'm going to turn the hearing over to Lt. Col. Print Maggard who is our Hearing Officer, and he will give you the opportunity to come up and make oral comments for the record for the Court Reporter to record to be addressed in the Final EIS.

Again, you also have the option of taking a written comment form. You can leave your comments with us tonight or you can mail it to me at this address. And we have handouts that have various information, and my address is on that handout. If you want to think about your comments and send a letter later -- doesn't have to be on a comment form, it can be just a general letter, whatever you're comfortable with -- but we're interested in getting your feedback on the analyses

of the Draft EIS. Okay. Yes. We'll turn it over to Lt. Col. Print Maggard.

LT. COL. MAGGARD: Good evening, ladies and gentlemen. I'm Lt. Col. Print Maggard and I am the Presiding Hearing Officer for this public hearing on the Draft Environmental Impact Statement for the New Mexico Training Range Initiative.

Can you hear me in the back okay? Barely? Okay. I'll try it sitting down since I'm reading most of this, but let me know if you can't hear me.

This hearing is held in accordance with the provisions of the National Environmental Policy Act and the Regulations that are published by the Council on Environmental Quality. The purpose of this hearing is to receive public comments; that is, your comments about the Draft Environmental Impact Statement. Before moving to the comments session, I'd like to explain a little bit about my role at this hearing. I'm a full-time Air Force Military Judge. I am stationed at the Western Judicial Circuit which is at Travis Air Force in California. I am not stationed at Cannon, I have nothing to do with Air Combat Command, and Cannon

Air Force Base is not in my judicial circuit. I have not been involved in the development of this Draft Environmental Impact Statement, and I am not here to act as a legal advisor to the Air Force representatives of this proposal.

My role as the Presiding Judge or Hearing Officer is simply to ensure that we have a fair, orderly and impartial hearing. That all who wish to be heard will have an opportunity to speak. In summary it is important that you understand that I will be serving as an impartial moderator for this hearing.

We now are going to enter into the second part of this hearing which is your opportunity to provide the Air Force with your comments on the MMTRI Draft EIS and make any comments for the record.

A Court Reporter, as you can see, is recording everything stated during this portion of the hearing. The public hearings and comment period are part of the environmental impact analyses process. This comment process gives you, the public, the opportunity to provide the Air Force with your issues and concerns about the Draft EIS and information on your community relevant to the

analyses.

These comments will be part of the official record and will be included in the Final EIS. This will ensure that the Air Force decision makers benefit from your local knowledge and are aware of your concerns about the environmental analysis for this EIS.

Throughout this hearing I ask that you keep in mind that this is not an arena for a debate; or a popularity vote on the Draft EIS; nor is this hearing designed as a question and answer session. Rather, this hearing is a venue for the Air Force -- uses to gather your concerns (whether through oral or written comments) about the adequacy of environmental analysis and environmental impacts identified under the Proposed Action and alternatives.

We ask that you focus your comments on the environmental issues related to this proposal. Nonenvironmental issues will take away time from others' opportunities to comment on the Air Force's analysis of environmental concerns and will not add to the adequacy of the analysis used in the EIS.

If you have any questions, Air Force

representatives will be available at the display area and will be happy to answer any of your questions following the hearing.

You can officially comment in several ways. First, you can speak now and have it recorded by the Court Reporter. You can provide comments in writing by submitting them during this hearing or through the mail; or give extended written remarks to the Court Reporter as part of your presentation.

When you came in, you should have signed in. And if you wished to speak at the hearing, have indicated that you wish to speak on your sign-in card. If you have not done so and would like to speak, please raise your hand and we'll sign you up.

If you'd like to turn in written comments of this hearing, give them to any Air Force representative located in the room or at the sign-in table. Written comments will be accepted throughout the comment period or until 21 February, 2005. If you do not turn in written comments at this hearing, please send comments to the address shown and provided in your materials.

Comments made at all the public hearings or provided in writing throughout the

public comment period will be given equal consideration and are all part of the official record.

In order to move through this testimony efficiently, I ask you to observe the following ground rules during the hearing. Elected officials that choose to comment will be given an opportunity to speak first. And members of the public will then be called up in the order in which they have signed up to speak.

Your name will be announced and please stand and address your remarks to me so that the Court Reporter will hear all of your comments and get it down correctly. Please speak clearly. State your full name and spell it out so we can record it correctly. If you are representing someone or some group other than yourself, please let us know. We need this information to make sure that the Court Reporter gets an accurate record of what is said here and who has said it.

Please do not provide any personal information in your comments if you do not want to see it published in the Final EIS.

Each person will be allotted three minutes to speak, and this applies to everyone;

public officials, spokes persons and individuals. You do not have to speak for the full three minutes, however, if you do choose to speak for the three minutes, a yellow card will be raised when you have 30 seconds remaining. When your three minutes have ended, a red card will be raised and you'll need to end your statement.

Following your presentation, I ask that you sit down so I may call the next person. Out of respect for others who would like to make comments, I ask that you to please honor your three minutes and any requests I have for you to stop speaking if you go over your time.

If you think you have more comments than the present time allotted, make you're most important comments first. If you don't get a chance to voice all your comments, you can and should submit them in writing.

If you have a written statement already prepared, you may hand it in, read it allowed within the time limit, or do both. Any way you present it, it will be a part of the official final official record and included in the Final EIS.

This hearing is scheduled to end at 8:00. However, if we have time and you would like

the opportunity to expand your remarks, you may have that chance at the end of the hearing.

Also I ask that you do not repeat what another speaker has said. If you agree with a previous speaker on a particular issue, you may state your agreement. This will allow more other people to speak.

As I have said earlier, the Court Reporter will record verbatim everything that's said. The transcript of these proceedings will become part of the record and be included in the Final EIS. The Court Reporter will be able to make a complete record only if she can hear and understand what is said, so please speak slowly and clearly.

As mentioned previously, if you have a written statement to accompany your testimony, the Court Reporter will appreciate you giving it to her following the presentation so names, places, references and scientific terms you use can be recorded accurately.

As I mentioned before, please limit your comments to the Draft EIS. That is why the Air Force is conducting this hearing and that is the purpose of this public comment period.

We will start with comments from elected officials. Following their remarks, we will take oral statements from those of you who have indicated you would like to speak. You may now begin the oral testimony.

MS. HILLER-LASALLE: Is there anyone who would like to speak who did not check off that they would like to speak just raise your hand. Okay.

First speaker, Steve Uslan and it's spelled S-T-E-V-E, U-S-L-A-N. Okay. **2000**

MR. USLAN: Good evening everyone. My name is Steve Uslan and I'm here representing the United States Pilots' Association and the New Mexico Pilots' Association. I'm also an FAA National Safety Counselor under the Lubbock, Texas Flight Standard District Office. I've been empowered to speak for them at this meeting.

I formally served in the Air Force and I have no quarrel with the concept of stand-off bombing and I support the implementation of the NMTRI, and I favor Alternative B.

My problem is the fact that the Air Force had a year to address the issue of poor radio communications and lack of positive radar control in **AM-5**

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505-625-1710

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the requested area of controlled airspace. AM-5

Currently VFR civilian traffic flying at 10,500 feet or lower cannot communicate with Albuquerque Center and cannot be seen on Center radar from a point of about 30 miles north of Roswell to 10 miles east of Albuquerque. To allow civilian aircraft to fly through this airspace unprotected would be criminal and grossly negligent. AM-5

Tuesday, January 18th, an air tractor crop duster on its first flight after having been built by the factory in Ollie, Texas was struck by an Air Force T-37 training jet near Frederick, Oklahoma. The crop duster was destroyed and the pilot killed. The two pilots of the Air Force aircraft ejected and survived, but their aircraft did not.

This accident occurred in an area densely populated by military training aircraft, but legal for civilian aircraft to fly through. In other words, we have the same recipe for disaster in New Mexico if this issue of traffic separation is not resolved. AM-5

In 2000 near Brighton, Florida, two F-16s descended into controlled airspace, IFC airspace, without clearance. And one of them ran

42

into a Cessna 172 operating on a positive radar radio control. The Air Force was found totally responsible for the results of a civilian fatality and the loss of the two aircraft.

The solution is easy. We propose the Air Force install a radar remote site in the western area of the proposed initiative, along with a remote radio communication facility on VHF frequency. The Air Force should control the traffic separation, not the FAA. If these two facilities could be remoted to the Albuquerque Center, then it would be so much the better. SA-3

The USPA and the NMPA believe so strongly in this issue of aviation safety that we will file an order to show cause here in the Federal Court in New Mexico to compel the Air Force to install these facilities as part of the Training Range Development.

A negative consequence as to corporate and airline operators would be enormous if their aircraft have to detour to Clovis just to get around the new MOA.

Thank you for permitting me to speak tonight. I hope the Air Force will use good judgment before commencing operations in this

airspace.

MS. HILGER-LASALLE: The next speaker is Pat Boone, if you'll come on up. The spelling is P A T, B-O-O N-E.

2001

MR. BOONE: As you said, my name is Pat Boone. I'm a rancher in Elida, which is on the very eastern edge of the proposed thing here tonight, and I believe, right in the middle of what I think is Alternative A.

Years - several years ago, as the Colonel here mentioned, lots of low flying activity went on. My place lies right in a draw that's on a direct approach to the bombing range and so we had lots of trouble with low flights. And you could go back probably and look in the records at Cannon Air Force Base and find that for several years I was on a first name basis with the people there because I would call up there quite often and complain about the noise levels.

And I have not done my homework on this, I haven't looked at the EIS and haven't studied it, but coming here tonight and what I've done in the last two or three days, I have realized that the thing I'm concerned about with are the noise levels. The 500 foot floor, to me, is

NO-6

ridiculous. When I used to call and complain, we would have cattle break out -- several times we had cattle break out. We had livestock get startled, the windows rattling in our house; just several aggravating things to happen. I would call and the first two questions were "How high were they flying?" and "What kind of plane". Well, I didn't know the answer. And they said, "We assure you that they're not flying under a thousand feet." And I said, "Well, if they're not flying under a thousand, it's too low. If it's 10,000, they're still to low because it's bothering me." So that's the first concern. I think the 500-foot floor is ridiculous and unreasonable.

NO-6

Where the thing up here said there would be no significant impacts on noise? You know, I was born at night but it wasn't last night. Sonic booms are going to be -- they're going to be significant and they're going to bother us. And I know that we're few and far between out there in the country, but they are going to bother us. And the animals will habituate, I'm sure they will. After a few wrecks, I'm sure they will habituate unless something unusual happens that's even more so than the norm.

NO-7

And I do want to state for the record that I do have great respect for the United States military and appreciate what they do to ensure our safe. And I'm not here to hen-peck, I'm just here to express my concerns. And I do think the noise levels are going to be unreasonable. Thank you very much.

LT. COL. MAGGARD: Thank you, sir.

MS. HILLER-LASALLE: The next speaker is John Haumont. J-O-H-N, H-A-U-M-O-N-T.

2002 GE-1

MR. HAUMONT: Good evening. My name is John Haumont, rancher north of town here, and I agree with Mr. Boone's statement at this time. Thank you.

LT. COL. MAGGARD: Thank you, sir.

MS. HILLER-LASALLE: The next speaker is Bill Bird. Spelled B-I-L-L, B-I-R-D.

2003 GE-1

MR. BIRD: I prefer to send in a written comment. Three minutes is not long enough for an ol', slow-talking country boy.

MS. HILLER-LASALLE: Thank you, sir. Next speaker I have is Sid Goodloe. Spelled S-I-D, G-O-O-D-L-O-E.

2004

MR. GOODLOE: Thank you. First, I'd like to express my gratitude and admiration and

appreciation for the work the Air Force has done in Kossovo and Afghanistan and Iraq.

And Captain Johnson, thank you. Really appreciate that.

I'm a rancher at the west end of the Beak MOA. And after talking to Col. Wight and Major Carillo and Col. Chris -- I'm sorry, I can't pronounce your last name, Chris -- they've alayed my concerns considerably. But I notice that Col. Wight's laser drifted over my house several times, so I'm going to speak as if I was a little closer to your practice area.

I've been ranching in that area for 48 years. And I've been through the F-4Fs, F-111, F-15, F-16 and Tornadoes, and again, the F-16s. I notice that Ms. Cook mentioned the fact that there would be no problems with wildlife and with children. Well, I've had both problems.

NO-8

Wildlife is a major source of income. Sonic booms would affect that drastically. And so I'm concerned about that.

SO-6

And as far as children are concerned, I remember very well I was riding with my two children about 35 years ago and we all got dumped because of a sonic boom, and I don't want that to

happen to my grandchildren so that's a concern.

I feel like those of us in the Beak MOA -- and that takes in quite a few people here tonight -- have probably done our part as far as living with the disturbance that occurs with this sort of activity. I guess I wonder a little bit about why you picked this particular area, and I guess it's because of the low population density. And I know you have a very large area at White Sands and I know it's a completely different operation, and I can't -- I really can't understand if you can put a bomb through a doorway, why you can't work out something with those people and do your work over in that area. PN-1

Lastly, I would like to recommend Alternative B because I'm concerned about the Capitan MOA. And I really appreciate you letting me come and talk. Thank you.

LT. COL. MAGGARD: Thank you, sir.

MS. HILLER-LASALLE: Mr. Tom Martin, you had a "maybe". Would you like to speak at this time?

MR. MARTIN: I think -- I can't resist it.

MS. HILLER-LASALLE: Okay. T-O-M,

M-A-R-T-I-N. 2005 GE-1

MR. MARTIN: Tom Martin, Colonel in the '50s and '60s with the Strategic Air Command.

We got involved in this same type of study in the '50s. We were able to resolve our problems. We need to resolve them if we possibly can. You cannot deny airspace if the aircrews need it. We've got to have that airspace, according to what I have heard tonight. I hope the problems that I've heard tonight can be resolved. We did resolve them in the '50s and I think we can do it now. And apparently everybody has halfway cooperated at this point. I would think it's a criminal act if we don't give our aircrews the training space that they need. That's all I have.

LT. COL. MAGGARD: Thank you, sir.

MS. HILLER-LASALLE: Would anyone else wish to speak at this time?

(No response.)

MS. HILLER-LASALLE: Okay. That's all the speakers, Lieutenant Colonel.

LT. COL. MAGGARD: We got done pretty quick here so if anybody wants to take a little bit longer or finish up their comments, feel free to do so. Even the slow talkers. Anyone else?

Ladies and gentlemen, thank you for your participation and your input. Please remember the public comment period for the NMTRI Draft EIS will extend through 21 February 2005 and you can leave your written comments here at the meeting or send them to the address that you've been shown. Members of the team will be available in display area until 8:00 if you'd like to speak. I'll now turn the floor back over to Lt. Geeslin.

MS. GEESLIN: Again, thank you for coming this evening. If you haven't received a copy of the Draft Environmental Impact Statement and you'd like one, there's a couple different ways you can do that. There's a copy at the local library, as well as you can look at a public web sit at www.cannon.af.mil or the ACC web site at www.cevp.com, or you contact me at my office and request a CD or a written copy of the document and we'll mail it to you.

Again, thank you for coming this evening and participating in this process.

(The proceedings concluded at 7:30 p.m.)

STATE OF NEW MEXICO
COUNTY OF CHAVES

REPORTER'S CERTIFICATE

I, Lorena H. Romero, New Mexico CCR and Notary Public within and for the State of New Mexico, DO HEREBY CERTIFY that I did report, in stenographic shorthand, the proceedings set forth herein, and the foregoing is a true and correct transcript of the proceedings had.

Lorena H. Romero
Certified Court Reporter #184
License Expires: 12/31/05

ORIGINAL

NEW MEXICO TRAINING RANGE INITIATIVE (NMTRI)

PUBLIC HEARING

SANTA ROSA, NEW MEXICO

JANUARY 25, 2005

5:00 P.M.

REPORTED BY: Beverly Ann Schleimer, RDR, CCR #66
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No Verbal Comments Made

NEW MEXICO

TRAINING RANGE INITIATIVE

EIS PUBLIC HEARING

JANUARY 27, 2005

FORT SUMNER, NEW MEXICO

514 AVENUE C.

REPORTED BY: LORENA H. ROMERO

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MR. ELLIOTT: I'll defer to the latter part of the meeting, sir, if I may. If not, I'll speak.

LT. COL. MAGGARD: Sir, if you want to, why don't you go ahead and use your full three minutes now if you'd like, and I believe with this number of speakers, we will have extra time. **2006**

MR. ELLIOTT: I've been here for --

(Interruption by Reporter.)

LT. COL. MAGGARD: Sir, would you mind just coming up here so the Court can get an accurate record? Thank you. And it's E-L-L-I-O-T-T, is that correct, sir?

MR. ELLIOTT: That is correct.

LT. COL. MAGGARD: Thank you.

MR. ELLIOTT: May I speak into this or to the audience?

LT. COL. MAGGARD: As long as she can see you and get down what you're saying.

MR. ELLIOTT: Okay. I've been dealing with the Air Force intervention for about 26 years now. 1978, the New Mexico International Guard created a hundred foot AGL VFR rought over the top of my house. We have continually filed complaints for FAR violations. I am a pilot; I have been a

pilot. I own two civilian small aircraft. I know the rules and regulations of VFR's.

I have had to file nine damage claims within the previous nine years. The EIS or EA, Environmental Assessment, of 2001 stipulated that a certain size canister was going to be implemented for the chaff and flare. What I'm retrieving off my private property is twice the size of the M cap, plastic end cap that was proposed, and a lot of metallic canisters that were never included or never stated in the Environmental Assessment. NP-18

We have suffered the inconveniences of several sonic booms. One was several years ago that was not paid satisfactorily because the Air Force does not want to pay for my time and inconvenience to deal with your imposition on my ranch operation, lifestyle and personal safety.

We experienced a fatal F-16 crash, that most of you are aware of, a little over two years ago. In dealing with the AIB, it is rift of errors and omissions. And the fella that interviewed my son, who was the witness to the accident, he chose to libel me in the official Accident Investigation Board Document. There's no reason for that, but my past 24 or 26 years' history

has been that the Air Force misrepresents the truth, will outright lie to you.

Col. Remington, several years ago, qualified CYA'd a violation FAR by stating that the avionics on an F-16 military aircraft can be 10 miles off. Absurd, isn't it?

The trash in the Environmental Assessment of '01 is going to be covered up by the blowing dust. Through the Freedom of Information Act I requested a source of that statement. There can be none found. The statement that it's not trash, it's residual material left over from it's intended purpose? So is a beer can; so is a whiskey bottle; so is any kind of food container or chemical container. NP-12

False statements; we're fined on the highways of New Mexico for depositing our trash, left over container or residual container. I am against this because you have not been truthful with me. You have impugned my character, you have abused the truthfulness of the presentations.

LT. COL. MAGGARD: Thank you, Mr. Elliot. Next speaker is Betty Greathouse. G-R-E-A-T-H-O-U-S-E.

MS. GREATHOUSE: Good evening. My

name is Betty Joe Toliver Greathouse. Do I need to spell it?

LT. COL. MAGGARD: I just spelled it for her, ma'am; you're good.

2007

MS. GREATHOUSE: All right. Greathouse is G-R-E-A-T-H-O-U-S-E; it's a German name. Okay.

I am an American, a descendant of a homesteader who homesteaded in Roosevelt County when it was a territory in 1906. I think this gentleman said he would probably be a "Mister" by the time all of this came about. Well, we'll be here forever or, you know, until we're put under.

But anyway, I believe we should be very good stewards of what we have. We have a lot of gifts that God has given us. And, I believe, one thing that we should be good stewards of is our land. I think we should respect it.

The Air Force doesn't seem to know how to be good stewards of the land. The recent evidence and the weed problem at the Melrose Bombing Range is vindictive of this. NP-9

I have several reasons why I don't think the Air Force is good stewards of the land. The Russian Thistle, a tumbleweed grows in the

Melrose Bombing Range are literally cutting up ranches and farms on each side next to the MBR boundary lines. And the Air Force is failing to do anything about it.

Reason two: We were told that the Melrose Bombing Expansion would not curtail any kind of oil or gas research or exploration. It has. Not one -- not one nibble of leasing our land or anything else, which is unusual. NP-9

The third reason, the large wind farms or the tall wind turbines are now in our area; they're new. Can we believe you, this vital source of energy, will not be interrupted, that they can go ahead and build turbines in our areas? Can we believe you? SO-7

And the fourth reason is that you're EIS draft state aluminum chaff and flares is no problem to the land. You say it's aluminum coated. Teaching science for several years, aluminum is not biodegradable; it's non-biodegradable, it means it won't break down. So once on the land, forever on the land. PR-6

Reason five, in your EIS you didn't cover some very important endangered species -- ranchers and farmers; and of course, the Sandhill BI-9

cranes and Whooping Cranes. But we know that some things will become extinct. Is it the American farmer?

I would like to finish the statement, please. I know my time is up --

LT. COL. MAGGARD: Go ahead, ma'am.

MS. GREATHOUSE: Could I, please? You've had a year to do all of this, can I finish this one thing?

LT. COL. MAGGARD: Yes, ma'am. Thank you.

MS. GREATHOUSE: Judge, thank you. I'd like to say how -- tell you how you're going to obliterate and do away with the ranchers and farmers.

First, you will devaluate his land. You will destroy his hopes of oil, gas and wind exploration. You'll obliterate his old barns and maybe his old homes, and deprive him of his sanity and quietness of a quiet picnic.

It is hard for me to really believe that this expansion is really needed. With war strategies changing -- and of course I know as much about war strategy as you do about land, farmers and ranchers. But anyway, war strategies seem to be

PN-3

changing from the supersonic flights which are still needed, but it is changing. Which supersonic flights seem to have little to do with the effect on tourists -- terrorists, and one seldom bothers.

PN-3

LT. COL. MAGGARD: Ma'am, if I could stop you, I think there's going to be time at the end to get back up, okay?

MS. GREATHOUSE: Okay.

LT. COL. MAGGARD: Thank you, ma'am. Next speaker is, I believe, Ross Greathouse.

2008 GE-1

MR. GREATHOUSE: That's Ross Greathouse. You know how to spell that and this is U.S.A. -- that's U.S.A. -- and what I understand and what -- it's hard to understand how many Germans are going to be flying out there, I guess. I mean, you all take over and take over and take over, relinquish all our rights and what rights we have, trying to be a good American citizen for our country. But then you all have Germans flying down at White Sands. I mean, where does it stop? It never stops.

I've dealt with you all for 25 years hearing all of you all's propositions and accusations and you all's take over, that's for sure.

The land we have, it's like -- it's military, you know. It's a pilot from back east or who knows, he might be a terrorist out there. Hope not. These actions like this, you all creating -- create terrorism. I mean it's hard to understand what you all do. Let's change jobs, you know? I'll let you -- take your job and let you have what I have in my life and see what you all are doing to me.

LT. COL. MAGGARD: Thank you, sir. Next speaker is Dan -- I believe it's Sturlock? Surelock?

2009
GE-1

MR. SCURLOCK: Scurlock, yes, sir.

LT. COL. MAGGARD: Okay. Thank you, sir.

SPEAKER: Scurlock. Do you need me to spell the last?

LT. COL. MAGGARD: If you could, please.

MR. SCURLOCK: Yes. S-C-U-R-L-O-C-K. My full name -- first name and middle name is Jack Daniel.

I'm an environmental historian. I've lived here in Fort Sumner and DeBaca County for six and a half years. I have a BS in science; I have a

BA and MA Degrees in anthropology with a specialization in archeology. And we archeologists now consider ourselves scientists. I also did postgraduate environmental science work at the University of Texas at Austin. And I've been dealing with the Air Force off and on for 37 years.

And that dates back in 1967 when I entered the National Parks Service with a Mandate from Congress and the American people to protect the natural and cultural resources in those park areas. And I was personally witness to violations, obstacles to my trying to do that, not to mention the impact on tourists and whatever with low level flights at Chaco Canyon. Chaco Canyon, the walls are about 500 feet high, and I was out in winter patrol, and in those days we were looking for people but I didn't want them at 500 feet and a jet going 500 miles per hour.

And I did witness -- I was in the National Park Service Training Academy on the south rim of the Grand Canyon, an intensive paramilitary 12-week boot camp. And we made a visit to Canyon Duche and saw the recent cracks in the pre-historic ruins there caused by sonic booms and it was documented. And to my knowledge, the Air Force

never admitted any culpability.

Nor in my 37 years have I ever had an Air Force person, orally or in writing or to the press, apologize for any infraction. And you've heard about some of those infractions previously hear tonight.

And I've experienced them here in Fort Sumner. I had a window broken. I'm not going to take up taxpayers' time or your time making a claim on a broken window. Besides, when I call over to Cannon they ask me things like, "Well, did you get the number off the plane?" At night at 500 miles per hour? Are you kidding me? I don't think -- well, in that case supersonic. No way; no way.

I just talked with Capt. Tom Cook a few weeks ago. We went into about 20 minutes of conversation, and I apologized to him, I said, "I've got to hang up." Because he got into Iraq and Afghanistan and some other things.

And I was interested in a previous comment by one of the Air Force personnel here. You called Iraq a war and the President in May, 2003 said the war was over, and a month later he said, "Bring it on" and they brought it on.

That's the justification, I guess, for you to expand your training area and use new technology and whatever. But in my opinion, the Iraqi Air Force and the Afghani Air Force really hasn't existed since Desert Storm, at least in Iraq.

LT. COL. MAGGARD: Thank you, sir.

MR. SCURLOCK: We up? We stopped? I have much more. We'll talk later.

LT. COL. MAGGARD: Okay. Thank you. Next speaker is Charles Vaughn. **2010 GE-1**

MR. VAUGHN: Judge, you said we could not ask questions and if we can't ask questions, I'll just wait and talk to these officers later if that's fine.

LT. COL. MAGGARD: Okay, sir. Thank you very much. Next speaker is Sharon Russell. **2011**

MS. RUSSELL: Sharon Russell, two S's, two L's.

LT. COL. MAGGARD: Thank you.

MS. RUSSELL: I wasn't planning to speak tonight but I got too much to say to wait until tomorrow night. I'm going to talk to them.

LT. COL. MAGGARD: As long as the Court Reporter can hear you.

MS. RUSSELL: If she can't, she needs

to holler at me.

My pleasure to hear Ms. Betty Joe Toliver Greathouse get up here and explain how her ancestor's homesteaded in 1906. She was up on the Mesa in the south; I was down in the Valley in the Homestead. My grandma and grandpa came in a covered wagon. They dug a hole in the ground, they set the top of the wagon there and lived there for the first year and my Uncle Harold was born in that wagon by a midwife. I go way back. And I'm fourth generation. Damn proud of it.

Guess what? I'm fourth generation; guess how many is coming behind me? I'm going to be a grandma next month.

Guess what? My daughter and my granddaughter want to live on the farm on Sundale Valley Road. We're adjacent to the Melrose Bombing Range.

I can tell you about tumbleweeds. I can tell you about six hours and three friends to clear the path to the back door of my house so I could get in and go to the bathroom. I can tell you.

Pleasure to see you, Betty. Mother's doing fine. She fell a few times trying to drag 8-foot diameter tumbleweeds behind her on the plowed

ground. They didn't take a picture of that.

Excuse me if I get a little emotional. Those of us that have lived here our entire lives or -- even like me, I left for a while. I was gone. I taught school for 10 years, State of New Mexico. I went to work for a major oil company for 18 years. I came back to take care of my mother. I was going to take it easy. So much for that plan.

You all talk about the Federal Register; most of these ol' country boys and girls never saw a Federal Register. I have. I worked for a major oil company. They didn't ever see a Federal Register; they don't even know what the hell it is.

You all had a scoping process. I don't know who you scoped but I didn't get the letter; my mother didn't get the letter. We didn't go to a meeting. You all did that from apparently 12-31-03 to 3-1-04. And then I don't know what happened from March 1st of '04 until now. But it seems like you all had a lot of time there. Now we have from January 7th to February 21st to give our comments. Doesn't seem quite fair. Just a dumb ol' country girl here. NP-20 NP-21

By the way, I have a Bachelor's Degree from Eastern; mathematics. I have a Master's Degree

in education; dumb ol' farm girl. Dumb ol' farm boy, he farms for my mother on the place, he has a degree from Texas Tech, agriculture, and now it's agri-business. He told Rick Crow to put the cows back on those tumbleweeds. He said he'd look into it. We know how that went.

LT. COL. MAGGARD: Thank you, ma'am.

MS. RUSSELL: You're welcome.

LT. COL. MAGGARD: Next speaker is Leona West, I had a question mark so --

2012

MS. WEST: Well, I just had some comments. I have some concern about our last time we had one of these things. Do you all ever really pay any attention to what the people tell you or ask you? I'm just wondering if I'm still a red dot over there at Cannon. We raise ostriches here and yes, we have to watch the eggs and these sonic booms are definitely going to play a big part. I'm afraid we're going to have a very low yield this year on our egg production.

AM-1

I asked it the last time, to the environmentalist, have you done an environmental study on what this does to domestic animals and to human beings? At that time they were concerned about the owl and a few things like that, that I'm

BI-10

not too concerned about. But I really am concerned -- I'm like these other people here. I have some concerns. We've had some problems with the Air Force, a lot of destruction from their planes. Those planes fly low enough that I can see the pilot's head when they go by where I raise my ostriches. That's too low. I really wonder if you all really are concerned about what you're doing to the people.

I feel for these people that have been here even longer than I have, and my family has been out here since about 1916. I'm fourth generation Fort Sumner, and our people are having to leave, too.

We're patriotic here; nobody is more patriotic than the people that are out here in the southwest, and we want our Air Force to be the best in the world. But in the meantime, do you have to ruin our livelihood? Isn't there some way that we can be compatible about these things and be -- like I said, I don't know if these meetings do any good or not. I don't know if you all really listen to us. Do you really hear our concern? I don't know, I guess it's because of our beautiful climate here that we get so much of the Air Force. It's pretty

well taken over the state. I'm beginning to wonder, would the Air Force like to come down there and buy my ostrich farm and then I can quit worrying about it? I think that's a real serious question. NP-3

Good luck to the Air Force. We love our military, we pray for their safety all the time, and that's very sincere. But quit stabbing us in the back. Thank you.

LT. COL. MAGGARD: Thank you, ma'am. That was Leona West, W-E-S-T.

Scott Stinnett?

SPEAKER: I'm --

LT. COL. MAGGARD: Not a speaker? Okay. Is there anyone who has not spoken yet who would like to? Sir, come on up.

MR. MACK: My name is Michael Mack, 2013 M-A-C-K. I'm a councilman with the Village of Fort Sumner, and that's the direction I'd like to address my comments in.

Our airspace is restricted at the airport, and we have NASA at the airport. And I just -- I see you guys just really affecting our contracts with them and them pulling out. And that will hurt, not only the airport, but our community. SO-1

And I'm really concerned about the

financial end of what this is going to do to our community. We don't have a lot of income. I think the statistics says the national -- or the census was 19,000 was average. And if we lose a few jobs, such as NASA and some others, it's going to hurt us financially and that's where my concerns are, is in those areas there. SO-1

I work on a ranch south of town. I see the other things that these folks are talking about, but basically just how is this going to affect our community is my concern, my main concern. And that's basically it. I've got some questions that I'll address to you later, but that's my concerns because NASA launches the hot air balloons and that's going to be a problem, I'm afraid, if you start increasing flights and restricting the airspace over the airport. Thank you. AM-6

LT. COL. MAGGARD: Thank you, Mr. Mack.

MR. MACK: One more comment: I would prefer the Marine Air Corps up there.

LT. COL. MAGGARD: Anyone else who has not spoken yet that would like the opportunity to do so? We still have a little time. Any of the speakers who already spoke who would like to get up

and continue making comments or make additional comments, we'll take you in the order that you came up. So Mr. Elliott, would you like to come up?

2014 GE-1

MR. ELLIOTT: What Ms. West said about our patriotic acts and our patriotism? My patriotism has been questioned many a time. I was a commissioned officer at one time in the Army, 35 years ago. We took an oath. Our constitutional rights are being compromised by this taking of this military operations out here, the dropping of chaff and flare on private property.

Again, what I stated earlier, to have to file, almost annually, a damage claim with you folks and go through the intimidation, harassment and dealing with ignorant Air Force personnel that know nothing about our lifestyles or our environment.

The truthfulness is what really hurts after all these years. For those of you that don't know, my mother's family's ranch was condemned in WW II north of Laredo, Laredo Air Force Base Aerial Gunnery Range. 60 years later we continue to pick up 50 calibre brass; and occasionally bullets and occasionally live rounds complete with the bells from 60 years previous. That was an all-out,

all-country, as you more-senior-than-I folks recall, declared war; all-out nationwide effort.

We're not in a declared war status right now, but for you to continuously condemn my lifestyle and my operation, out of the nine -- out have the nine damage claims, there's been numerous more FAR violations. Two Christmas' I've had to gather a horse, re-gather cattle, sort the calves out and patch fence and go home and be with my family. Two Christmas' that you all have affected my life, my operation. This is after notifying Cannon Air Force Base every year, you've got an established MSA.

Prior to that, in 1987 I had an agreement with Air Force Pentagon, not to the entirety of my ranch, below a certain altitude. They sent the Office of the Special Investigator up here to Fort Sumner in the fall of '87 and ascertained I had moved my family to Texas. So the Air Force just chooses to just rescind that agreement from Air Force Pentagon. No courtesy notification to me.

That went on for eight years, dealing with Tacos and their hundred foot VFR route over the top of my house. Not until I received the

chronology submitted by Cannon Air Force Base and the 150th Tactical Fighter Wing or Fighter Group, whatever you want to call them, i.e., the Tacos, this was confirmed. And eight years later I met with the Air Force and the National Guard in my house, and they finally admitted it.

But why? Why can't we be truthful, sir? Why can't we be upright? Why does somebody want to impugn or condone my patriotism or character with statements involving my son having to pick up body parts of the deceased pilot to verify there was no survivors and then come out -- and they interviewed my son 36 hours after the incident. They did not interview the pilots on the record for about 27 days later.

The AIB report, as I mentioned, they don't know what the elevation of my ranch is. It varies for more than 300 feet, but we have to continuously deal with you folks because you interrupt our lives you cause us damage. I've got old homestead ruins all over my property, some of them very valuable. And we don't want to create a historic location because that involves other government intervention. The historic -- what you call the National Old Buildings Preserve, whatever

it is, that condemn and protect it to a degree that we're not allowed to live with it.

The sonic booms, we had one just a couple weeks ago at ten-thirty at night. We don't have, in the country, the other buildings and trees to act as buffer zones for these sonic booms. The claim I mentioned earlier was at 30,000 feet testing a remanufactured or re-overhauled engine that broke my window. And for you not to offer to pay me for my inconvenience for having to secure a carpenter, fix the window, meet with him again to let him in the house, again, it's costing me money. You're invading my time and my space.

But it's ridiculous to have to file almost annually a claim because of inconsideration, FAR violations, whatever. Condemnation of our land, that's what it is; it's a taking. With false and absurd statements like the blowing dust is going to cover up the plastic end caps, it's not trash. What I'm picking up is not the size that was proposed in the Environmental Assessment of three years ago. Again, where's the truthfulness, where's the integrity, where's the consciousness of our government?

And for the record, I have engaged

the law firm of Holland and Heart and will be pursuing this in another theater. Thank you.

LT. COL. MAGGARD: Thank you, sir. The other prior speakers, I believe Mr. Scurlock, you raised your hand?

2015

MR. SCURLOCK: Thank you, sir. I just want to respond to some comments that were made by by Air Force personnel prior to our speaking this evening. Also, I had a conversation with Lt. Gesalin -- did I get your name right? Okay. And Bob, I've forgotten your last name. The economist consultant, where are you, Bob? What's your last name, sir?

UNIDENTIFIED VOICE: Van Tassel.

MR. SCURLOCK: Bob didn't say this, but I'm sorry, Brenda, you did that all animals - you were talking about animal reaction to sonic booms. I don't know of any detailed studies that suggest that all animals are temporarily disoriented or whatever but then go back to whatever they were doing behavior wise. Starting about age 8 I raised quail and I raised Bantam chickens and I had a neighbor that raised oh, a new species in New Mexico -- I'm sorry, I drove from Tularosa starting at 8:15 this morning and had to go to Santa

Rosa and then come back here. And so I'm probably just going to cut this short because I'm falling asleep.

There is some terms I would -- that aren't in the glossary, there are things like "biologically significant" or "biologically insignificant", and there's no qualification of that in the EIS; there wasn't qualification in the 2001. I think my expertise or my experience -- I don't claim to be an expert in anything except environmental history and some people don't understand what this is. And here's a monograph I self-published here on the middle Pecos. It was not looked at by any of you all, Brenda, or Bob. And it's not just about cultural resources but it's about biological resources and the interrelation of humans with those. Now I chose to start in 1962 because the U.S. military just down the river incarcerated -- it's been called a concentration camp -- 8,000 Navajos and over, what? Almost a thousand Mescaleros, in the process killing over 2000 of those. And we have a new Memorial to that finally after much hard work by few individuals, not myself, between here and Santa Fe and Washington. This report is not in the EIS Draft. And I can't

BI-6

CU-4

even remember when we published it -- May 2001, about the same time the first -- or the last EIS before this one came out.

I think from what I've seen -- and I've worked with biologists across the Southwest -- and one of the criticisms I had in the 2001 EIS, all of the so-called experts-consultants to the Air Force -- and that applies here tonight -- don't really know the Southwest. Now, you can sit in your office at a computer, you can go to the library and do a certain amount of research, and you can go out in the field for X anybody of days. It's not the same thing as working here 30 or 40 or 50 years. All right? If nothing else, you can go to a library -- and apparently the consultants didn't go to the Eastern New Mexico University library, there are copies there. UNM Zimmerman Library ordered three copies of this; it's on -- on the Internet. It's not a big deal. You don't have to be a biologist or environmental historian to locate these things.

NP-6

And as I pointed out to Bob before the meeting, there are statements in the EIS that just -- very unspecific, very general, with no real -- no scientific qualification and without, I think, adequate documentation.

NP-13

I'm going to submit some of this in writing. And besides making critiques I like to make suggestions at the same time. But I don't think the job's been done. I asked Bob how much money he gets paid by the Air Force and he said more than he made when he was a carpenter; in other words, he wouldn't tell me.

And 2001, I tried to find out what the operating annual budget was in Clovis. The only answer I got was well, we pumped X millions of dollars into the economy in Clovis. I'd love to see that money go to restorations of ranches and farms here and do something else with that money besides degrade the environment. And that's what, basically, what you're here talking about doing. 3300 square miles? That's one quarter the size of Delaware for Pete's sakes. And when does it stop?

I've been going to these things, I've written EIS's myself. I testified. When is it going to stop? How much airspace do you need? How much lower? How much faster? You know, where is the real threat in the world? I thought we did real well in Desert Storm.

PN-2

We had a little film one of the

pilots showed in 2001 with antiaircraft and other things going. Hey, I appreciate that, but we only lost one plane in Desert Storm, is that not right? And there's still a question. Are you shaking your head? Okay, we can talk later. I'd like to know, and there's a question about where that pilot was captured or killed in Iraq.

Well, I'm going to skip some of this. I mentioned Canyon Duche; I mentioned the Grand Canyon and I mentioned Chaco Canyon. I didn't mention Everglades National Park, which is the third largest in the system and the most fragile because it's mainly water environment. And oh, the violations I saw by the Air Force, by the Army.

The Army would come in at that time, and that was -- oh, boy, I'm going to give away my age. I was a young ranger, okay? I was a young naturalist. And they would come in -- and this is well documented, and there were letters to Washington, there were calls -- just come in to the Glades on a weekend, National Guard or whatever, and just trash an area. And again, these are areas and resources we, as American people, are supposed to protect. And that was partly my job, it was almost all of my job. And to interpret it, to talk to the

public about it, why is the Everglades important? Why is the Middle Pecos important? Why are ranches and farms here, traditional ranches and farms important?

We've got to take this into consideration. It's not in the EIS. And those five National Register sites are all here in town. We've got a lot of important archeological sites, historical sites, architectural sites here that are national consequence. Okay. So you say why don't you get out there and do it? I'm getting old and I work 14, to 16 hours a day and I live off of less than $10,000 a year. I'm not asking for sympathy. I'm not -- certainly not asking for money from the Air Force, I wouldn't take it. I've worked for Federal agencies, I've worked for state agencies, I've worked for a half dozen universities. So I just don't see the quality of work from my experience of -- well, if you count before the 37 years, from the age of 12, okay? I was a strange child, but a lot of time, a lot of years.

CU-1

I want to read a letter I wrote Jeff Bingaman, Senator Bingaman in August of 2002. Just one of those days trying to work in my office, and in the summer especially I leave the door open, and

here they come. And in the 2001 EIS, they said it in here and I have it in my notes, and it's in the 2001 EIS and I have a copy, we will not fly over communities like Fort Sumner. Pardon my English but bull caca. That's just not right.

And during this process, from August to finally got an answer from Washington from William A. Groves, Col. USAF, Chief Program Legislative Division, Office of Legislative Liaison. God must love all them titles. I'm on the phone long distance. And apparently one of the letters I had written had got to Cannon -- this just supposition. I'm on the phone, have the door open, and my God, I couldn't even say anything for 15 seconds, a jet actually came over. And hey, I used to be in geology and I've done a lot of maps and articles and stuff, I can tell the difference between 100 feet and 1,000 feet. Aside from the fact they weren't supposed to be flying over my house or anyone else's here, and I only live a block from the school. Well, this person flying that jet, it was retaliation, okay? Maybe he was from Mars, maybe Kirkland Air Force Base, I don't think so. So I talked to Capt. Tom Cook. I didn't report that to Jeff, not yet, not to Senator Bingaman. I talked to

Cook a few weeks ago, he shipped out, he left three days later, classified deployment, we didn't get to finish the conversation. I told him I gotta go, we've been talking 20 minutes. And he was giving me reasons for the war and the dangers in Iraq and whatever, and I had other things to do. I said look -- well, he said well, did you get the number of the plane? Huh. Are you kidding me? How am I going to get out of my office when this guy is out over the roof of my house going 500 or 600 miles per hour? Give me a break.

I did find a gentleman who runs a feed store in Santa Rosa. And I talked to Don today, between '81 and '83 he was working part-time at Rhonda Deal's ranch and he and his wife were also running the airport for Santa Rosa. And they were out roping and herding and whatever, and two jets came in. And they buzzed and one of them came around and was practicing strafing while he was trying to round up these cattle. He said they went in all directions.

Interestingly, when he went later that day to the airport at Santa Rosa, the Commander of Cannon Air Force Base was there. So Don asked him what was going on. He said well, did you get

the numbers? That's what I always hear. Don got the number off the one. And Don said he hadn't seen any problem since, but Don works in the food store in Santa Rosa, he's not on a one day deal sitting there.

Let me read on this briefly, this one paragraph from Col. William A. Groves. And remember, it took two letters from me to Jeff, to Senator Bingaman, I worked on his campaign, I'm sorry, it comes out Jeff. Two letters from me to him, to Jeff, to the Pentagon, and finally on October 24 -- and I wrote about three issues, I'll only talk about the first one. The other was the Marine pilot and copilot that killed 18 people in Italy when he tried to fly under a ski tram. Okay? The Air Force never admitted error as far as I know. That's serious stuff to me.

Regarding the first issue -- and that's about the flights over Fort Sumner Please conduct a review of current flying operations in this area. The aircraft in question were two Cannon Air Force Base, New Mexico F-16s flying on a pre established route. That's obviously a direct contradiction to the EIS and what was said in the meeting here in 2001. We weren't supposed to be on

AM-1

it according to those people. And none of the staff here, by the way, consultants or whoever, were here in 2001. I've got four different contacts to call at Cannon since 2002 -- late 2001. There's no continuity, you know; besides consultants who don't really, I don't think, know the Southwest and live in Boise and work at Boise State or, pardon me, Arkansas or Virginia, whatever.

Anyway. Fort Sumner is located underneath a military operations area near a military training route. The Military operations area and military training route was established and are flown according to FAA safety guidelines for low altitude flight. It used to be illegal, according to the FAA. And the FAA is a political body. Come on, if you know anything about politics. It used to be illegal to produce sonic booms.

AM-1

LT. COL. MAGGARD: Sir, you want to wrap up a little bit?

MR. SCURLOCK: Yeah, I want to finish this paragraph, sir. May I?

LT. COL. MAGGARD: You may. Thank you.

MR. SCURLOCK: The community of Fort Sumner lies within the flight of an area that

requires pilots to fly no lower than 1500 feet above ground level in the area. Air Force pilots are required to comply with flight altitudes that ensure safety for private citizens, themselves, and their aircraft.

Well, I obviously have problems with that because -- direct violations of that.

We appreciate Mr. Scurlock communicated his concerns. We work hard to reduce the impacts associated with our operations. Blah blah blah.

LT. COL. MAGGARD: Thank you, sir.

UNIDENTIFIED VOICE: Could I have one moment?

LT. COL. MAGGARD: You may, ma'am. For the record, you're Betty Greathouse, I believe. **2016**

MS. GREATHOUSE: Yes, Betty Toliver Greathouse. I do not want to come across as a neurotic, sobbing, hysterical woman. I think I have researched your book in two weeks as much as I could, but I need to ask one question. Why can't you use the MOA at Mount Dora? There are 3.9 million acres there. Why do you have to disrupt ranches here when you already have 3.9 million acres at Mount Dora? Thank you, sir. You've he been very **PN-1**

kind.

LT. COL. MAGGARD: Thank you.

Yes, ma'am.

LT. COL. MAGGARD: Sharon Russell. **2017 GE-1**

MS. RUSSELL: Good old farm boy I was telling you about, his name is Butch Bigler, I've known him since 1957 when we moved from the Uptown community to Sundale Valley Road. We buried his uncle today, Bob Bigler; great man. He lived on Sundale Valley Road. I baby-sat his four kids. Go way back.

This old farm boy, Butch Bigler, he sent an e-mail to Pete Dominici about three months ago. They sent an e-mail back saying we can't accept your complaint. He explained it very well. 64,000 acres of tumbleweeds, got 30 inches of rain, got 8-foot in diameter tumbleweeds, 64,000 acres of them. That's the equivalent of 400 really bad farmer to the west of you. It only takes one to put you in bankruptcy, you know.

Butch explained all that. The e-mail came back, they wouldn't accept his complaint via e-mail. Good letter, I got a copy. Supposed to send it to Andrew Morales, representative to the State Governor. Hadn't had time to do it yet.

And then I went to the County Commissioners meeting. They swore they told me that night at Cattle Baron, the outgoing County Commissioner, they sent a letter to Cannon Air Force Base that day. So I want to go on record saying I apologize because I misstated that. I thought I could trust that good ol' country boy who told me they sent that. I found out he has a vested interest in the grazing land back here on the bombing range and he stopped that letter from being sent. So apologize saying there was a letter sent to Cannon Air Force Base from the County Commissioners, Roosevelt County. It didn't happen.

I also want to state that something I said to the Clovis newspapers the other day about an insurance agent who told me that he would type up a letter for me to give so I could have that in the file stating that his insurance agency he as an insurance agent could not insure my mother's farm, farm equipment, her fences, her irrigation sprinkler, her shop that would cost $200,000 to replace, the camping trailer, the house, everything that's there. He couldn't insure that because of the tumbleweeds. He reneged on me that's probably not a good term, sorry. He backed out on

me and he said he couldn't do that.

Well, this is what we're -- we do in Roosevelt County, with the help of some people. It's called "Save Your Neighbor Fire Call List Map". Because whenever somebody throws out a cigarette butt, or some kid smoking pot sits on a tumbleweed too long, that catalytic converter catches it on fire, that bolt of lightening, or maybe they drop chaff, whatever the hell you want to call it, the grass is that high on the bombing range. It's dry. Where does the wind blow from? Southwest. I got a south and a west fence that adjoins Melrose Bombing Range. That's my mom and dad's house. My dad built that house in 1955. I have friends, neighbors, relatives in that community. If it goes in the middle of the night, they'll all dye. This is our plan. You can have 8 to 12 people on your call list. The first person calls the person at Floyd School, at the Fire Department then they call the person at the bottom of the list. And when it meets in the middle, the person says "bottom up", that means they've already got a phone call. Then you grab your cat and dog and get in your Chevy or Ford and get the hell out of there before you burn up. See, I love my neighbors and my friends.

LT. COL. MAGGARD: Thank you, ma'am. Ladies and gentlemen, thank you for your participation and your input.

UNIDENTIFIED VOICE: One more question --

LT. COL. MAGGARD: I'm sorry, is there another person?

UNIDENTIFIED VOICE: Can I ask a few questions?

LT. COL. MAGGARD: You can ask them in the back, not for the public hearing, official part of the program. We're going to adjourn in just a minute and they're going to be back there and they can answer questions at that time, sir, okay?

Please remember the public comment period for this New Mexico Training Range Initiative Draft Environmental Impact Statement will extend through 21 February, 2005. You can leave you're written comments here at the meeting or send them to the address shown on the screen. Members of the team will be available in the back display area to answer your questions if you'd like to speak with them. The public portion of this meeting is adjourned. I now turn the floor back over to Lieutenant Geeslin.

LT. GEESLIN: Thank you, sir.

Again, thank you for coming out this evening. Without your comments we can't do a thorough analysis so we do appreciate you taking an active role in this process. If you haven't been able to thoroughly review a copy of the Draft Environmental Impact Statement, there's a few ways that you can do that. Two different web sites if you have a computer at home or at your business; you can access the Cannon web sit at www.cannon.af.mil; or the ACC web site with the Draft Environmental Impact Statement, or the New Mexico Training Range Initiative is on that web site as well, at www.cbp.com. Or contact my office, my phone number is in your handout today, do you -- or I can give you one of my business cards as well. You can contact my office and we can mail you a copy of it on CD or mail you a hard copy if you'd like. So again, your comments are available for us until February 21st and we look forward to hearing all your comments. Thank you for coming this evening.

(The proceedings concluded at 8:00 p.m.)

STATE OF NEW MEXICO
COUNTY OF CHAVES

REPORTER'S CERTIFICATE

I, Lorena H. Romero, New Mexico CCR and Notary Public within and for the State of New Mexico, DO HEREBY CERTIFY that I did report, in stenographic shorthand, the proceedings set forth herein, and the foregoing is a true and correct transcript of the proceedings had.

Lorena H. Romero
Certified Court Reporter #184
License Expires: 12/31/05

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NEW MEXICO

TRAINING RANGE INITIATIVE

EIS PUBLIC HEARING

JANUARY 28, 2005

CLOVIS, NEW MEXICO

417 SCHEPPS BLVD.

REPORTED BY: LORENA H. ROMERO

CCR #184
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start the comments from elected officials. Following their remarks, we will take oral comments from those of you who have indicated you would like to speak.

I believe our first speaker will be David Lansford.

MR. LANSFORD: Your Honor, I appreciate it. I'll wait for the opportunity to speak, that will be fine.

LT. COL. MAGGARD: Okay. The next speaker is Joe Thomas. **2018 GE-1**

MR. THOMAS: Thank you, Colonel. Joe Thomas. I am the city manager for the City of Clovis. I am also a member of the local area Employers Support Guard and Guard and Reserve Unit, former area chairman for that organization. I would like to speak in support of the training range initiative. I am a hunter, avid hunter, and the issue of the additional noise created by these additional sonic booms I think is a non-issue. Anyone that has ever been in the field on a hunting expedition knows that rifle fire is quite frequently occurring, and I don't see additional noise would be any more intrusive than what you experience with that.

As a former area chairman for the Employers Support and Guard and Reserve I've had the opportunity to obtain training -- attend training sessions both in New Mexico and other areas of the country. I've had the opportunity to observe training as a reservist, and I feel it is very important that we have the ability to allow training for our Armed Forces, Air Force, Navy, Marines, across the board. So I would definitely speak strongly in support of this initiative. I believe its benefits far outweigh the negative impact we have on our area. Thank you.

LT. COL. MAGGARD: Thank you, sir. Next speaker is Carter DuBois? DuBois?

2019

MR. DUBOIS: My name is Carter DuBois, President of the New Mexico Pilots Association, and a corporate pilot around the State of New Mexico and have been for the last 30 years -- or a pilot, not here for 30 years.

One of -- several things that you do not address in this initiative is the flight level -- the flights between Santa Fe through Corona to Roswell, that corridor that goes through there. This is going to close that corridor, or one of the -- the initiative in Alternative A would close

DP-3

that corridor for flights period, above 12,000 feet, 12,500 feet. A turbo prop aircraft does not operate officially below 12,500 feet. There are a lot of corporate flights that go into Roswell, Hobbs, Santa Fe-Midland, Albuquerque-Midland, those areas, and this does not address that at all. It just says closed some of the time.

DP-3

I've been flying this area for the last 30 years and the Air Force just takes that airspace at the drop of a hat. You'll be flying along DFR and all of a sudden they say well, you've got to get out of the airspace.

Flight service does not have any kind of way to tell you in advance and when you get a flight plan, it just doesn't happen.

In that corridor from Corona to Roswell, flying at low altitudes is unsafe, or it has been at best, due to inadequate radar and radio coverage. Below 10,000 feet you can't talk to Albuquerque Center; they can't see you. If they can't see you, if they can't talk to you, they can't tell you that the pointy things that go real fast are coming at you.

SA-1

We would suggest -- and flight in this area at night is even more hazardous since

sometimes you fly without lights; not supposed to but it happens.

We would suggest, New Mexico Pilots Association would suggest that you add radar and repeater sites for -- for radio communications so that we can at least talk to flight -- or to Albuquerque Center and get "See and Avoid". I've been between a flight of F-16s on the west side of Pike's Peak, and it was real uncomfortable and it surprised all three of us. Thank you. SA-1

LT. COL. MAGGARD: Thank you, sir. Next speaker is Carl Melinat. 2020 GE-1

MR. MELINAT: My name is Carl Melinat, M-E-L-I-N-A-T. Thank you, sir.

I'm in favor of the proposal. I guess I look at it and the fact is I have a son-in-law that's already in the Air Force and as far as the airspace goes, I think if I look back to the time I spent in the service, the type of weapons and the type of aircraft we were flying in the '50s and '60s are no comparison to what happens today. Things happen in a nanosecond today where they used to happen in 30 seconds.

I think first of all, if we're going to have a good defense, we need a great offense and

this is the way to get it. And I think the impact on this is going to be an impact no matter where you go, something is going to be different than it was the day before. But I think that they're so minute that they aren't really a consideration that needs to be looked at to the point that it should cause any detriment to the area at the present time. Thank you very much.

LT. COL. MAGGARD: Thank you, sir. Next speaker is Dwain Woody. 2021

MR. WOODY: My name is Dwain Woody, D-W-A-I-N, W-O-O-D-Y.

Let me begin by saying I sincerely believe that the sound of freedom is jet noise. Freedom -- if Freedom had a sound, it would be jet noise.

Now I have a ranch that lies in Roosevelt, Chaves and DeBaca Counties, right south of the Melrose Range. I use a Cessna 182 in my ranching operations, and I'm concerned that where most of my ranch lies in the proposed extension. Now Cannon, at the present time, does not have radar capability and to pick me up at 500 feet, nor a jet fighter. I doubt that they could even talk to them on the radio.

Now, my proposal is what would it take, Mr. Woody, to leave your Cessna in the barn? Now, I propose that the ranches around the office -- and the office being Melrose Range -- you're out like this and you've got all these planes coming in and -- into this office, and the ranchers that are close to the range have more flyover time than, say, ranchers out close to Roswell.

My proposal would be this: Lease the airspace on their deeded land. Now the public lands are public lands. And I also propose the compensation would be because the public thinks that we have a bird nest on the ground that we lease these public lands at cheap rates. I would suggest that they pay for the deeded lands, say 25, 30 miles out, at the same rate that - per acre that the public lands -- that they pay for the public lands. Does that make sense? **AM-7**

That's all I got. And think of the advantages. I mean if -- you sign a contract, we break -- break your picture window, don't call us. If we run cattle through a fence and some of them are crippled, don't call us. If we get a bull where he's so nervous he doesn't know what he's doing and you've got to carry him to a psychiatrist, don't

call us.

LT. COL. MAGGARD: Thank you, sir. Next speaker is Loren McCaslin. **2022 GE-1**

MR. MCCASLIN: All my concerns have been answered, Your Honor.

LT. COL. MAGGARD: Okay. Thank you. Karen McCaslin. **2023 GE-1**

MS. MCCASLIN: And all of my concerns have been answered, Your Honor.

LT. COL. MAGGARD: Okay. Thank you. Tex Elliot. **2024**

MR. ELLIOTT: For the record, I am A, as in alpha, S as in Sierra, Elliot; two L's, two T's.

My greatest concern is we are being impacted more than has been let on. While folks in Clovis and Portales are benefiting from the commercial aspects of Cannon Air Force Base, we in DeBaca County suffer the intrusion of low-flying aircraft. I've had nine claims in less than nine years.

This is the AIB resulting from a fatal F-16 explosion less than a mile from my house on 9, September, 2002. This document is full of errors and omissions, and a statement that a Major

who interviewed my son about 36 hours after the incident libeled me in a totally unnecessary statement that impugns my character.

There is an inconsistency of elevations on the property varying from up to 310 feet. I don't know whether you folks know the elevation of my ranch. I've gone through an agreement with Air Force Pentagon in '87. It was rescinded because I moved my family to Texas. We established the next December '88 MSA. It was expended in January of '96 it took the Tacos 27 months to put it on their flip charts; again, totally unnecessary.

I've got some comments here that we'll -- will address the inadequacy of the EIS, the Environmental Assessment of 2001 initiating the practice of dropping chaff and flare. We're picking up trash -- and I meant to bring it down with me just now -- that is not the size of the ordinance deployment that is proposed in the Environmental Impact Statement. We're picking up metal canisters, aluminum canisters that were not stated to be deployed on private property. The plastic end caps that are stated in the documents, they're twice the size proposed.

NP-12

I'm really disappointed in dealing with you folks for 24 to 26 years, trying to get along and trying to work with the multiplicity of people who come through Cannon Air Force Base, and to CYA the violations of FARs that are qualified by statements as the avionics of an F-16 aircraft can be 10 miles off. There's more training out here supersonic a mile above our property, I think you need to get you're F-16s, your avionics improved.

Again, my total disgust and disappointment is the lack of integrity and honesty by the various and numerous personnel of the United States and New Mexico Air National Guard that I've had to deal with.

LT. COL. MAGGARD: Thank you, sir. Next speaker is Terry Moberly.

2025 GE-1

MR. MOBERLY: Your Honor, my name is Terry Moberly, it's T-E-R-R-Y, M-O-B-E-R-L-Y. I live here in Clovis, businessman here in Clovis. My family moved to this part of the country back in the late '20s. We've lived in this area and have had a good relationship with Cannon Air Force Base.

At this time in the world and the surroundings and the things that are going on, it's important, I think, it's a small sacrifice that we

make to let these -- let this air expansion happen so that our pilots will be better trained. And the lot -- a lot of people in this community in Portales and the surrounding area do support it. Thank you.

LT. COL. MAGGARD: Thank you, sir. Next speaker is -- only word I can read is Ellis.

MR. ELLIS: My name is David Ellis. You have this on a slide? Over here?

MS. COOK: This map? 2026

MR. ELLIS: Yeah. I would like to ask, really, questions on your proposal. What altitude would the airplanes be entering this area? AM-8

LT. COL. MAGGARD: Sir, as I stated earlier, this isn't a question and answer period, but you can feel free to answer the question, just don't expect --

MR. ELLIS: Okay. It's been my experience, No. 1, Cannon as a whole has been very cooperative. Being as you can't tell us how we're going to get in there, where you're going to come in from, and you do have a few people break the rules. Up at the north end of it one time I was flying my crop duster. I was in the turn, wasn't a 16, it was a 111, flew underneath me. And 300, I'm sure turning that thing was not that -- high.

If we want to go from here to Albuquerque, we -- there is no way we can't stay out of routes for you people. Could it please be addressed in the future? Some way we could get to Albuquerque without going through an area where there is warnings. I'm curious as to where the airplane's going to be coming in. It's not clear here. Thank you. AM-5

LT. COL. MAGGARD: Thank you, sir.

We still have time, is there anyone in the audience who did not get a chance to speak who would like to make a statement?

LT. COL. MAGGARD: Ma'am? Come on up. 2027 GE-1

MS. RUSSELL: Give me just a second. I signed the paper, I guess you all didn't get it. I was waiting for my sister to get here.

LT. COL. MAGGARD: If I remember right, ma'am, your name is Sharon Russell, two S's, two L's.

MS. RUSSELL: Yes, sir, that's correct. Two S's, two L's, sir. It's a little tall for short people. I think you -- oh. You all know I like to talk to them.

Well, maybe last night you all got

the idea we weren't patriotic from the Fort Sumner meeting. I went to my closet today, I pulled out 10 patriotic shirts just to prove it. Pretty good for an old farm girl who hasn't washed clothes in two months because they're piled on the floor because of tumbleweeds.

So we do appreciate you; we do appreciate you. There's not anybody here that don't. I say that from the bottom of my heart. 95 percent of the people that I know, in Roosevelt, and Curry and Quay County, want a strong military. And they probably voted for that man that is the one that's keeping a strong military.

I want to show you something. It's not a very big picture. I apologize. It's the best I could do. You recognize those people? I bet you seen those people. I lived with them in Texas for eight years, I know those people; not personally but I feel like I do.

This is a letter to some old country boy in Roosevelt County. I did -- I didn't ask him if I could call his name so I'm not going to. It's to this fine gentleman, he does some farming and ranching, raises some organic feed. Says, "Dear Mack Lane: Thank you for your early commitment and

dedication as a charter member -- of New Mexico. Grassroots leaders like you are the key to real -- Laura and George."

This is not the only copy. See, he gave me one which I promptly lost at my house in the piles. Of them on their ranch in their jeans. I like it better.

Like to show you what I bought right after George W. Bush was elected because I could spend $45 for this because I'm proud of it. Says W. Is For Winner, certified 43d president of the U.S. of A. Hell yeah. We're proud. We're proud and we're proud of you all. That's not the issue here. That's not the issue.

You know, proud takes on another picture. I don't know if you all can see this. It's a sunrise, it's out my mother's front window. Her property, south and west fence is against the bombing range. I can't get to the house. The Clovis paper misstated me, I didn't say that I spent a few hours getting the tumbleweed problem taken care of at the house. I said three people took six hours to clear a path where I could get to the bathroom.

I got more. I'll talk to you all later.

Three minutes passes real quick when you got something to say.

LT. COL. MAGGARD: Ma'am, if you want to go ahead and finish up, I think there's no more speakers. Go ahead, ma'am.

MS. RUSSELL: Okay. I'll be glad to say a little more.

I showed you all last night. I'll show it again. Sundale Valley Road; I been there since 1957 off and on. My mom and dad lived there for -- well, they were married for how long, Donald? 58 years, almost 60? They lived in this pink house on Sundale Valley Road. You all'll see it if you go to the bombing range, it's the last house before you get to the bombing range. They lived there since 1957. My mother finally left town less than two years ago. I still have family and friends beyond belief down Sundale Valley Road, down Baseline Road. Hell, Don Elswick's one of my best friends in the whole wide world, he's sitting back there with me.

If I don't have this and if we don't have fire call lists, if that burned in the middle of the night, all my friends and neighbors and loved ones will die in a damned fire because of the 8-foot diameter tumbleweeds. I've asked for help for three

months; I have begged for help. I have gone to the County Commissioners' Meeting; I have asked the Portales paper; I have asked everybody. I spoke with Andrew Morales with the Governor's office. He's finally helping me; he's a nice young man. He knows how to listen.

You know what it is to go home when you left that morning at 8:00 and it was a beautiful day, sun shining, wasn't much of a wind, birds singing, you didn't have one tumbleweed in the backyard and you get home at midnight and you sit there in your truck in awe because you can't see the house? You can't see the fence. You got 20-foot high barricade, 360 degrees around the place where your house is. You sit there for 10 minutes in total awe. You drive back to town, thank God you got another house in town, because you ain't getting to that bed.

Tommy Dan told me that Tommy and Taylor Lee, they live right down the road, they went and got their mail off and on three, four days at a time for three months because the post lady can't get to 'em because of tumbleweeds.

He called me that night at home and he said, "Sharon, you can't get down the road." And I

said, "I can go in the house and sleep." And he said, "No, you can't." That's like telling me you can't spit, so I drove out there; hell, he was right.

I love the American Dream. Last night in Fort Sumner, a man came in and said who wants this, this is a machine to help you with the tumbleweeds. I said, "hell yeah, I'll take one of those."

American Dream; he's going to help people that need help and taking care of a major problem before everything burns to the ground. And maybe he'll get rich, but hell, he deserves to if he can solve this problem, nobody else will talk to me about it.

Talked to Arvis Cobb, Junior at the Fire Department and was asking if he had a plan; he don't have a plan. I asked him, I said, "Clovis, Portales, all the volunteer fire departments, what are we going to do?" He said, "No way".

It will burn into Texas, guys. It will burn past Melrose; it will burn past Elida. You all know it as well. Just think about it. And if you don't believe me -- and I say this from the bottom of my heart -- drive down Sundale Valley

Road, three and one fourth miles, first pink house, Polly and Pany Bigler, they were there when we got there in '57. They're just a little bit past and they've been there since '40 something. Go to the second pink house on the south side of the road -- that would be the left for some folks -- south side of the road. I'll fix you a cup of coffee if you can get in the back door. Look at my tumbleweeds and then maybe you won't have that look of rolling your eyes when I try to tell you about the tumbleweeds that I saw last night. Don't be condescending. We're just people trying to hang on to the land that we've had for four generations. Don't be condescending to me. I'm intelligent. I've got a Master's Degree; I have worked from the time I was eight years old hoeing cotton. Until I took this silly retirement a few years ago and I swear, I work harder now than when I took it.

I appreciate you all's time. I've got more to say, maybe another time.

Oh, I would like to mention, we don't have any insurance agencies that will now insure my mother's farm because of the tumbleweeds. Had to get certified written appraisals so that when it all burns you all will know that shop is worth $250,000.

I don't know who is going to pay for it, but I'm not responsible, I didn't grow 64,000 acres of tumbleweeds.

Oh, and I apologize more misstating. I said the County Commission were going -- did send a letter to Cannon Air Force Base. I found out and re-confirmed that today from the County administration that that letter never got sent because some old country boy on the Commission decided he could handle it himself. So I apologize for saying there was a letter on file because there was not.

I got -- I guess I'm tired.

LT. COL. MAGGARD: Any other comments for the official record? Mr. Elliot?

2028

MR. ELLIOTT: Mr. Elliot again. I'm on the record I understand.

This is an example of what we're picking up off our property, these canisters that were never disclosed to be deployed on private property. We've been in DeBaca County for 44 going on 45 years. We're a hundred percent deeded land; we have no public land.

The canisters and chaff here, for members of the press interested in seeing this and

did not see it last night, this is what we're being subjected to. And again, my complaint and argument is the lack of integrity and truthfulness in these documents and these presentations.

The AIB report for the press, the cause of the accident released on Christmas Eve morning, 2002, stated that there was no mechanical malfunction, and the cause of the crash unknown. But then on the summary page of this AIB document it states that the pilots ran out of the blue and encountered the ground; i.e., they ran out of altitude, and for the training maneuver the pilot was performing, he ran out of airspace.

Again, the truth. Please, the truth. If it's pilot error, it's pilot error. If it's unknown, it's unknown, but why the contradiction? These are the bases of my complaints. I was a commissioned officer in the U.S. Army. I took an oath to uphold the Constitution of the United States. Our Fifth Amendment rights are being bastardized, for lack of another term; they're being compromised by the taking of my private lands for these operations.

My older brother, a Fed Ex pilot for 37 some odd years flew in the Navy; we're patriotic.

48

But the lies and inconsistencies and continual, almost annual, filing of damage claims is unnecessary. And the FAR violations explained away by absurd statements, absurd statements. I had a sonic boom claim three or four years ago that was not settled because the Air Force does not want to pay me for my time and expense to recover for the imposition of our ways of life and our time. Again more aggravation, inconsistency, lies. I believe that's all I have to say. Thank you.

LT. COL. MAGGARD: Sir, we have a digital camera available, would you mind taking a picture of that for the record?

MR. ELLIOTT: I have. And I have presented it to Mr. Van Tassel in the rear. And there again, I showed this stuff to him a year ago in Fort Sumner, the inconsistencies of the Environmental Assessment of 2001. It's been a year since I showed him, but where is there any reference to it in the Draft EIS? Isn't that some inconsistency that needs to be addressed, or a major fault? These were just found on the ground, on bare ground, and in the road. We picked up one Friday a little bit in the pasture off the road, but this -- this is unnecessary.

NP-14

49

And the explanation in the environmental assessment, "This is not trash, this is residual material left over from its intended purpose." So is a beer can; so is a whiskey bottle; and so is any trash. And it's also qualified by findings of no significant impact in the statement that I received through the Freedom of Information Act, cannot be substantiated that states blowing dust in West Texas and Eastern New Mexico is so bad it's going to be covered up. Some of you who have farmed and ranched here forever have old homesteads on your property. We've got trash a hundred years old; burnt coal, cans, old frying pans, tea kettles, et cetera, et cetera; has not been covered up by blowing dust. We farmers and ranchers cannot operate if our top soil is blowing away or in such a condition it's going to cover up Air Force trash. Again, it's an absurdity and a lack of investigation and environmental impact on our private property. Thank you.

NP-12

LT. COL. MAGGARD: Thank you.

MR. ELLIOTT: If need be, I'll present more of it or get it out to where other people can photograph it.

LT. COL. MAGGARD: Thank you.

Appreciate that. Any other speakers?

Ladies and gentlemen, thank you for your participation and your input. Please remember that the public comment period for the New Mexico Training Range Initiative for the Draft Environmental Impact Statement will extend to February 21, 2005. You can leave you're written comments here at the meeting or send them to the address provided. Members of the team will be available in the back display areas until 8:00 if you would like to speak to them.

This public hearing is adjourned and I'll turn the floor back to Lt. Geeslin.

LT. GEESLIN: Thank you all for coming out this evening. Again, we can't do this process unless we're able to hear your concerns and you're able to take part in this whole process so we're grateful for all of you who have attended this evening and throughout the entire week as you've done at these hearings this week.

There still are a couple of ways you can take part in this process, as Lt. Col. Maggard said. You can voice your concerns this evening for the record; you can also send in your comments; as well as please keep in mind that any conversations

that go on between us, please make sure you write those portions down because we want to make sure that all those portions that take part in the beginning part or the ending part of this evening are taken into consideration as well. Just because you're speaking to an Air Force representative about the issue doesn't necessarily mean that they're going to be able to write that down for you. So please make sure any questions you have this evening are being written down and submitted to the Judge.

Again, if you haven't been able to see thoroughly the Draft of the Environmental Impact Statement, there's still a couple of ways that you can receive a copy of that. There's two web sites if you have computers at home or in your business, you can visit the Cannon web site at "www.cannon.af.mil" or the ACC web site to view this draft of this Environmental Impact Statement and they're web site is "www.ccbp.com".

And in addition, if you'd like a paper copy, you can call me at my office. My number is in the handout you received when you came in this evening. Give us a call and we'll send you a CD or a regular copy of the draft if you would like to continue to review it before submitting your

comments. And again, thanks for coming this evening and taking part in the process.

(The proceedings concluded at 7:35 a.m.)

STATE OF NEW MEXICO
COUNTY OF CHAVES

REPORTER'S CERTIFICATE

I, Lorena H. Romero, New Mexico CCR and Notary Public within and for the State of New Mexico, DO HEREBY CERTIFY that I did report, in stenographic shorthand, the proceedings set forth herein, and the foregoing is a true and correct transcript of the proceedings had.

Lorena H. Romero
Certified Court Reporter #184
License Expires: 12/31/05

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3001

New Mexico State Senate

State Capitol
Santa Fe

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·Radioactive & Hazardous Materials
·Water & Natural Resources Committee

January 24, 2005

Ms. Brenda Cook
New Mexico Training Range Initiative EIS Project Manager
HQ ACC/CEVP, 129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769

To Whom It May Concern: **GE-1**

This letter is in support of the proposed action identified in the Draft Environmental Impact Statement for the New Mexico Training Range Initiative.

As outlined in the proposed action in the DEIS, expanding the existing airspace, creating a new Military Operations Area airspace, increasing the availability for supersonic flights, and expanding the use of defensive chaff and flares will allow for more realistic fight training opportunities for New Mexico military installations. Specifically, the F-16 squadrons at both Cannon AFB and the New Mexico Air National Guard, can utilize this area to prepare for the challenges they face in real life battle situations.

New Mexico has always supported the role that our military installations play in preparing soldiers for the defense of our country. I believe that the expansion of the existing airspace available for pilot training will allow our bases to continue to provide exceptional military value to the Department of Defense.

The benefits of this proposed action far outweigh the minimal negative environmental impacts such as additional sonic booms to this sparsely populated area.

Thank you for your consideration.

Sincerely,

Gay G. Kernan

Senator Gay G. Kernan

3002

New Mexico State Senate

State Capitol
Santa Fe

SENATOR STUART INGLE
MINORITY FLOOR LEADER
R-Chaves, Curry & Roosevelt-27

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Portales, NM 88130

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COMMITTEES

MEMBER
·Corporations & Transportation
·Rules
·Committees' Committee

January 25, 2005

Ms. Brenda Cook,
New Mexico Training Range Initiative EIS Project Manager
HQ ACC/CEVP, 129 Andrews Street, Suite 102,
Langley AFB, VA 23665-2769.

To Whom It May Concern: **GE-1**

Please accept my comments on the Draft Environmental Impact Statement (DEIS) concerning the New Mexico Training Range Initiative.

I endorse the proposed plan of action in the DEIS. Allowing the expansion of the existing airspace and creating a new air Military Operations Area (MOA) and Air Traffic Control Assigned Airspace (ATCAA) will provide additional military value to New Mexico's four military installations specifically to Cannon Air Force Base located at Clovis, New Mexico. The increased use of supersonic flights as well as use of defense chaff and flares, are key elements in creating pilots that are properly trained.

New Mexico is a proud supporter of our military bases and understands the need for pilots to receive training that prepares them for the challenges of battle. The proposed action will create realistic training opportunities for our military's pilots. The F-16 squadrons that train at Cannon AFB and the New Mexico Air National Guard will both benefit from this proposed action being implemented.

Negative environmental consequences to this area will be minimal as much of the area is sparsely populated.

Thank you for consideration of my comments.

Best regards,

State Senator Stuart Ingle

3003

State of New Mexico
House of Representatives
Santa Fé

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Appropriations & Finance
Agriculture & Water Resources

INTERIM COMMITTEES:
Legislative Committee on Compacts
New Mexico Finance Authority Oversight
Redistricting (Advisory)
Water & Natural Resources

January 26, 2005

Ms. Brenda Cook
New Mexico Training Range Initiative EIS Project Manager
HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769

Re: New Mexico Training Range Initiative

Dear Ms. Cook: **GE-1**

The purpose of this letter is to state my support of the New Mexico Training Range Initiative to expand existing airspace, increase availability for supersonic flights, and expand the use of defensive chaff and flares for New Mexico military installations.

New Mexico has always supported the role that our military installations play in preparing soldiers for the defense of our country. I believe that the expansion of the existing airspace available for pilot training will allow our bases to continue to provide exceptional military value to the Department of Defense.

In my opinion, the benefits of the above proposed action far outweigh the minimal negative environmental impacts such as additional sonic booms to this sparsely populated area.

Sincerely,

Brian K. Moore,
Representative New Mexico District 67

BKM:jb

3004

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

073252

DEC 30 2004

RECEIVED
JAN 11
LMM/WH
HISTORIC PRESERVATION DIVISION

MEMORANDUM FOR New Mexico Historic Preservation Division
228 East Palace Ave, Room 320
Santa Fe NM 87501
Katherine Slick, Director

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

SUBJECT: New Mexico Training Range Initiative (NMTRI) Draft Environmental Impact Statement (EIS) **GE-1**

1. In accordance with the National Environmental Policy Act (NEPA), the United States Air Force (Air Force) has prepared the attached Draft EIS for the proposed federal action of implementing the New Mexico Training Range Initiative (NMTRI) in existing and proposed airspace associated with Cannon Air Force Base (Cannon AFB), New Mexico. The purpose of this letter is to announce the distribution of the Draft EIS and to request comments from your agency on the document. The Draft EIS can also be accessed electronically at the following websites: *www.cevp.com* and *www.cannon.af.mil*. A public hearing schedule is also provided for your convenience.

2. The NMTRI proposal consists of four elements: modifying existing training airspace; creating new training airspace; authorizing supersonic operations in Cannon AFB's local training airspace; and extending the use of chaff and flares into the new and modified training airspace. In addition to the proposed action, two other action alternatives and the no-action alternative are analyzed in the Draft EIS.

3. We are submitting the enclosed Draft EIS for your review and comment as part of the NEPA process and in compliance with Section 106 of the National Historic Preservation Act. Additionally, we request your concurrence be provided in writing on or before the close of the public and agency comment period on 21 Feb 05 in order to fully document our coordination and consultation for the NMTRI project record.

4. Please send your comments to the EIS Project Manager, Ms. Brenda Cook, at the above address or contact her at (757) 764-9339. Comments can also be faxed to (757) 764-1975. Thank you for your continued assistance in this matter.

BRENDA W. COOK
Acting Chief, Environmental Analysis Branch

Attachments:
1. Public Hearing Schedule
2. NMTRI Draft EIS

NO COMMENT
2/15/05
NAGPRA

3005

HOUSE MUNICIPAL SCHOOL

P.O. Box 673
309 Apple Street
House, New Mexico 88121
(505) 279-7353

February 17,2005

Ms. Brenda Cook
HQ ACC/CEVP
129 Andrews St., Ste. 102
Langley AFB, VA 23665-2769

Dear Ms. Cook, **GE-1**

I am writing to acknowledge receipt of the Draft Environmental Impact Statement (DEIS) for the New Mexico Training Range Initiative.

Sincerely,

Dr. Art Brokenbek, Superintendent

3006

County of De Baca
Office of County Commissioners
P.O. Box 347 · Ft. Sumner, NM 88119
(505) 355-3601 · Fax (505) 355-2441

February 13, 2005

HQ/ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 236652769

Attn: Brenda Cook

Dear Ms. Cook:

Almost all of De Baca County, New Mexico, is under the NMTRI also known as the New Mexico Training Range Initiative. As De Baca County Commissioners we are concerned about this initiative and the impact on Private property rights. Many of our citizens are directly affected by supersonic booms, low flights and chaff or flare debris. These citizens are concerned that the expansion of the NMTRI will have a dramatic and adverse impact on our businesses, our way of life, and our private property. As proud, patriotic, taxpaying citizens we are earnestly asking for a different approach when dealing with this possibly destructive situation. **LU-2**

Our suggestions for stronger support of the U.S. Air Force and better civilian relationship are as follows:

1. Be open and honest about actual events.
2. Have more continuity in the local USAF public affairs officials by having the position a permanent station. That way the personnel are not deployed every year or two, creating problems with follow-up and having to constantly train and inform new personnel. **AM-13**
3. No double standard. The NEPA rules are not enforced with the military.
4. Prompt attention to land owner concerns. Many times the landowners feel that the military procrastinates and prevaricates when dealing with problems.
5. Fair compensation for damages and payment for debris cleanup. Chaff and flare debris does not just disappear, anymore than beer cans do. **NP-3**

The USAF has dismissed the landowners concerns, by portraying them as money grabbing, unpatriotic or as poor citizens. These citizens feel that their livelihood and private property rights are being jeopardized.

P.O. Box 347 Fort Sumner, New Mexico 88119 Phone 505-355-3601 Fax 505-355-2441

We are proud Americans and support our troops with great pride. Our dependence on their ability to be the best-trained military in the world is paramount. Please take into consideration your support base, i.e. the taxpayer. Also, remember that it is easier to catch flies with honey than with vinegar.

We have documented facts to support our concerns about the USAF treatment. Please do not hesitate to contact us for documentation. We appreciate the opportunity to add and exchange comments about the NMTRI.

Sincerely,

DE BACA BOARD OF COUNTY COMMISSIONERS

Powhatan Carter, III, Commission Chairman

Joe Steele, Commission Member

Tommy Roybal, Commission Member

Written Comment Sheet

Public Hearing for the New Mexico Training Range Initiative (NMTRI)
Draft Environmental Impact Statement (EIS)

Thank you for your input! DATE: February 7, 2005

PLEASE PRINT

To whom it may concern:

My name is Gregory Scott Smith, and I attended the NMTRI hearing held in Fort Sumner on January 27, 2005. I represent Fort Sumner State Monument—a unit of the New Mexico State Monuments, a division of the Department of Cultural Affairs, State of New Mexico. I received two copies of the NMTRI EIS and forwarded one copy to Jose A. Cisneros, Director, New Mexico State Monuments. Fort Sumner State Monument is a historical site that can be negatively impacted by USAF training activities associated with the New Mexico Training Range and the Melrose Bombing Range. Negative impacts in the past resulted from low-level overflights (less than 500 feet), from aircraft noise associated with sustained flight activity occurring above our site at higher altitudes and from the startle effect of sonic booms. These negative impacts are listed in declining order of importance. CU-2

My understanding of the impact of proposed changes is that USAF considers the issue of sonic booms to be most significant. This is not the case for our site. An increase of sonic booms from one every five days to two every three days will not seriously impair our activities. There is potential for damage from an increased frequency, of course. But the colonel briefing us indicated that virtually all of these supersonic flights will take place at higher altitudes and generate pressure waves at ground level that are unlikely to cause damage. The most significant impacts on our activities in the past have been from the first two causes cited above (low-level overflights and sustained flight activity directly overhead at higher altitudes). In fact, we have complained of both of these impacts in the past, which resulted in the area in the immediate vicinity of Fort Sumner State Monument being designated an "NSA." The situation improved as a result, and we haven't had cause to complain in the past couple years. CU-3

(continued . . .)

*****CONTINUE ON BACK FOR MORE SPACE*****

Comments will be published in the Final EIS. The names, city and state locations of persons making comments will appear in the Final EIS. Specific address information of commenters and meeting attendees will not be printed in the Final EIS, but will be used to create a mailing list for the document.

NAME: Gregory Scott Smith
ORGANIZATION: Fort Sumner State Monument, Department of Cultural Affairs
ADDRESS: PO Box 356; 1060 Long Walk Place
CITY/STATE/ZIPCODE: Fort Sumner, NM 88119-0356

Please MAIL BEFORE FEBRUARY 21, 2005 to:
HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769
Attn. Ms. Brenda Cook

3007

The 111 acres of Fort Sumner State Monument should be considered "a site of significant cultural activity" as defined under the EIS. We host a large number of Navajo (Dineh) visitors throughout the year. This is a place of pilgrimage for them, and they often perform ceremonies and conduct prayer services while visiting. Fort Sumner was the terminus of the Long Walk, and approximately 3,000 Navajos (Dineh) died here during the 1860s. It is our responsibility as caretakers of the site to ensure that they are able to conduct these ceremonies and prayers without unreasonable interference. We also conduct year-round tours for thousands of tourists and school groups. The noise impacts cited above often hampered the ability of my staff to perform those duties before the NSA was established.

Both I and my supervisor appreciate the need for USAF personnel "to train the way they fight" so that they can do their job. However, we also need to be able to do our jobs. New Mexico State Monuments doesn't oppose the expansion of the New Mexico Training Range as proposed under NMTRI. However, we would like USAF to address the following specific concerns:

- Will the NSA for Fort Sumner State Monument be maintained? Is there a possibility that it might be reduced or enlarged?
- Would it be possible to revise the EIS so that the "significant cultural activity" taking place at Fort Sumner State Monument is noted for the record?
- Would it be possible for USAF to supply New Mexico State Monuments with written assurance that the proposed expansion of the New Mexico Training Range and the concomitant increase in flight activity shall be adjusted if we find that these have a significant negative impact on the operation of Fort Sumner State Monument.

CU-3

I appreciate your attention to these comments and hope you find them useful.

Gregory Scott Smith, Monument Manager

3008

Village of House

109 East 4th Street
P.O. Box 682
House, NM 88121-0682

Telephone (505) 279-7372
Fax (505) 279-6053

February 16, 2004

Ms. Brenda Cook
HQ ACC/CEVP
129 Andrews St., Ste. 102
Langley, AFB, VA 23665-2769

Re: Draft Environmental Impact Statement (DEIS) for the New Mexico Training Range Initiative

Dear Ms. Cook:

GE-1

We have reviewed the New Mexico Training Range Initiative Draft you sent to the Village of House. We have no comment to make at this time.

Sincerely,

Sherman W. Martin
Mayor

02/22/2005 TUE 14:08 FAX 505 355 2542 SUMNER LAKE

3009

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

BILL RICHARDSON
Governor
Joanna Prukop
Cabinet Secretary

David Simon
Director
State Parks Division

NEW MEXICO STATE PARK & RECREATION DIVISION
REGION IV
SUMNER LAKE STATE PARK
HC 64 BOX 125
FORT SUMNER, NEW MEXICO 88119
(505) 355 2541

MEMORANDUM **DATE: 2/22/05**

TO: Troy Anderson

GE-1

FROM: Richard Terrell, Park Supt.

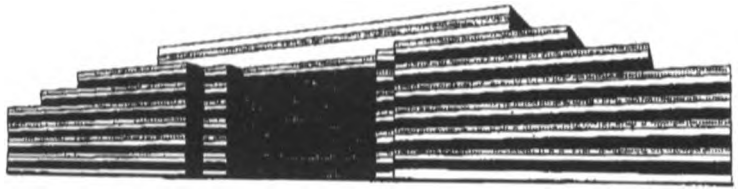
SUBJECT: New Mexico Training Range Initiative

This letter is to acknowledge that I have received a Copy of the New Mexico Training Range Initiative. It is my understanding that the current flight training range will be expanded causing our property to be effected by more commercial air traffic and will not be effected by military aircraft. This being the case, I have no reservations about the changes proposed in the initiative.

Sumner Lake State Park, HC 64 Box 125, Fort Sumner, New Mexico 88119
Phone: (505) 355-2541 ♦ Fax (505) 355-2542 ♦ http://www.emnrd.state.nm.us

FEB. 22. 2005 1:50PM CENTRAL ENROUTE

3010



Federal Aviation Administration
Southwest Region
Fort Worth, Texas 76193-0500

DATE: 2/22/05
To: **HQ ACC/CEVP Project Manager**
Attn: Mr. Troy Andersen
Phone No.
FAX No. 757-764-1975
No. Of Pages 14
Including Cover Page

From: ASW-520.5
Attn: Nan L. Terry
Phone No. 817-222-5594
FAX No. 817-222-5983

REMARKS

Dear Mr. Andersen:

Please find the letter and attachments for the Draft Environmental Impact Statement for the New Mexico Training Range Initiative. If you have any questions, please contact Ms. Nan L. Terry, Central En Route and Oceanic Area Operations Environmental Specialist, at 817-222-5594.

U.S. Department of Transportation
Federal Aviation Administration

ATO En Route & Oceanic Central Service Area
Minneapolis, Chicago, Kansas City, Fort Worth, Memphis, Houston

2601 Meacham Blvd.
Fort Worth, TX 76193

FEB 22 2005

Mr. Troy Andersen
HQ ACC/CEVP Project Manager
129 Andrews St., Suite 102
Langley AFB, VA 23665-2769

Dear Mr. Andersen:

Thank you for the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the New Mexico Training Range Initiative. We have the following general comments on the DEIS, in addition to the specific comments set forth in the attached table.

The Federal Aviation Administration (FAA) does not concur with the assessment of the impacts to the airspace described in the DEIS. We believe the enclosed letter from Ms. Joan M. Mallen, Manager, Albuquerque Air Route Traffic Control Center, to Colonel Charles A. Hale dated February 11, 2005 (Mallen letter), more accurately describes the impacts of the proposed action. We appreciate your acknowledgement of the ability and expertise of FAA controllers. However, we believe the impacts from moving J-74, raising the ceiling in the North Sumner Air Traffic Control Assigned Airspace (ATCAA), and creation of the Capitan Military Operations Area (MOA)/ATCAA (as described in the DEIS) would necessitate compression and rerouting of air traffic, and would create unacceptable delays with additional miles-in-trail. **AM-15**

The FAA would like the USAF to clarify the description of the airspace in alternative A, incorporating the floors and ceilings defined in the Mallen letter. If these clarifications to alternative A are made, the FAA may be in a position to consider this alternative for identification as the Agency's preferred alternative prior to publication of the Final Environmental Impact Statement. **DP-3**

We wish to clarify that the FAA has no regulatory approval over any military's use of supersonic flight nor can the FAA prevent non-participating VFR aircraft from operating within an active MOA. However, as described in the Mallen letter, we have safety concerns regarding supersonic flights in the vicinity of victor air routes, specifically in the proposed Capitan MOA area. **AM-18**

Enclosed are additional comments on the draft. We look forward to completing this process with you.

Donald R. Smith
Acting Manager, Airspace Branch
Central En Route and Oceanic Service Area

Enclosure:
Mallen letter

PAGE	SEC/PARA	COMMENT
1-6	1st	Use definition from 7400.2
2-30	2.4.4	Delete the reference to FAA Order 7400.2.
3-2	2nd	Please use the definition of Special Use Airspace (SUA) as defined in FAA Order 7400.2., Paragraph 2I-1-3a.
3-2	3rd	Please use the definition of other types of SUA as defined in 7400.2, 21-1-3b.
4-8	Beginning	Delete the sentence beginning with "The extent or number…."
4-8	2nd	The paragraph beginning with "As discussed in Section 3.1.2, …." is incomplete and misleading because the term MARSA is not explained in what specific types of operations it "could" apply. Please define the term in accordance with the Pilot/Controller Glossary (P/CG), effective 02/19/04 (includes Change 1 dated 08/05/04). The P/CG is an addendum to: Aeronautical Information Manual, Order 7110.10, Flight Services, and Order 7110.65, Air Traffic Control. (For your benefit, We have attached the MARSA definition.) MILITARY AUTHORITY ASSUMES RESPONSIBILITY FOR SEPARATION OF AIRCRAFT- A condition whereby the military services involved assume responsibility for separation between participating military aircraft in the ATC system. It is used only for required IFR operations, which are specified in letters of agreement or other appropriate FAA or military documents. **1-4-8. USE OF MILITARY AUTHORITY ASSUMES RESPONSIBILITY FOR SEPARATION OF AIRCRAFT (MARSA)** The application of MARSA is a military service prerogative and will not be invoked by individual units or pilots except as follows: a. Military service commands authorizing MARSA shall be responsible for its implementation and terms of use. When military operations warrant an LOA and MARSA will be applied, the authority to invoke MARSA shall be contained in the LOA. It must be noted that an LOA will not be required in all cases involving MARSA. b. ATC facilities do not invoke or deny MARSA. Their sole responsibility concerning the use of MARSA is to provide separation between military aircraft engaged in MARSA operations and other non-participating IFR aircraft. c. DoD shall ensure that military pilots requesting special use airspace (SUA)/ATC assigned airspace (ATCAA) have coordinated with the scheduling agency, obtained approval for entry, and are familiar with appropriate MARSA procedures. ATC is not responsible for determining which military aircraft are authorized to enter SUA/ATCAA.

AM-9

U.S. Department of Transportation
Federal Aviation Administration

Air Route Traffic Control Cen
8000 Louisiana Blvd. NE
Albuquerque, NM 87109

FEB 11 2005

Colonel Charles A. Hale
Chief, Ranges, Airfields, Airspace
Operations Requirements Division
HQ ACC/DOR
205 Dodd Boulevard, Suite 101
Langley AFB, VA 23665-2789

Dear Colonel Hale:

Enclosed is Albuquerque Center's response to your memorandum of December 9, 2004, Subject: New Mexico Training Range Initiative (NMTRI) Draft Airspace Proposal.

Upon evaluation of the draft NMTRI airspace proposal, we have considered historical data and modeled the proposed Special Use Airspace, applying recent traffic data (January 2005). Additionally, we weighed the proposal with an eye towards supporting initiatives and requirements outlined in the proposal, while also considering the needs of the National Airspace System.

We appreciate the opportunity to comment on the draft NMTRI proposal, and highly value our relationship with Cannon AFB and the service we provide the 27th Fighter Wing. We look forward to further participation in developing NMTRI airspace.

Please contact Mr. Jon Semanek, Support Manager, Airspace, Procedures and System Requirements, at (505) 856-4530 or DSN 245-1530, with any questions regarding this draft proposal response.

Sincerely,

Joan M. Mallen
Air Traffic Manager

Enclosure

cc: ASW-500/-530/-910
ZAB-541/-542/-543
ZAB NATCA

ZAB NMTRI Draft Airspace Analysis

In evaluating the draft proposal, we used the Sector Design Analysis Tool (SDAT), version 5.7 and the Performance Data Analysis and Reporting System (PDARS) Tool. Traffic data was utilized from April 2004, July 2004, and January 2005.

We have segregated our comments into three sections, CONCUR, NON-CONCUR and PROPOSED.

CONCUR

Albuquerque ARTCC (ZAB) concurs with the redefinition of the Pecos North High, Pecos North Low, and Pecos South Military Operations Areas (MOA), with the exception of the inclusion of excluded airspace for Fort Sumner Municipal Airport (section 1.2.1 add, excluding that airspace at and below 1500 feet AGL, within a 3 NM radius of the Fort Sumner Municipal Airport and within 3 NM each side of a 360° bearing from the airport to the northern boundary of the MOA).

NON-CONCUR

Capitan. ZAB does not concur with the establishment of the Capitan MOA and associated Air Traffic Control Assigned Airspace (ATCAA) as proposed (section 1.4.2). The draft proposal establishes the MOA/ATCAA from 12, 500 feet MSL to FL500. Creation of MOA/ATCAA with these vertical dimensions, in the location proposed, poses access problems from both a low and high altitude perspective. Victor Airway V68 and V83, along with Jet Route J15 transit the proposed airspace. Non-participating aircraft that utilize these routes and airspace are constricted by the Beak MOA/ATCAAs to the west and the Pecos Complex to the east. The existing Special Use Airspace (SUA) configuration creates a corridor from central New Mexico to the southeast portion of the state, and vice versa. High altitude traffic utilizing J15 to south Texas and northwest bound to destinations north of Albuquerque also transit this area. Modeling of traffic data through the proposed airspace yielded information that, during the times proposed for activation of the Capitan MOA/ATCAA, there would be a significant impact to re-routing non-participating aircraft that would otherwise fly through the proposed SUA. Figure 1, displays traffic data that transited the proposed Capitan MOA/ATCAA. DP-3

Figure 1

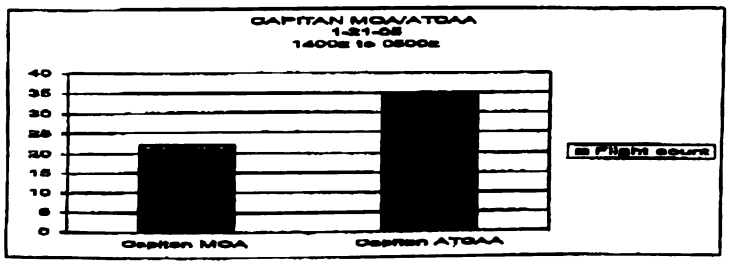
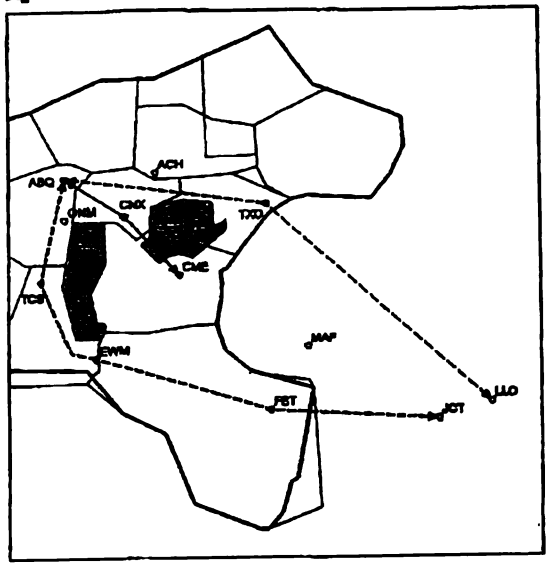


Figure 2, displays projected routings that non-participants would utilize to avoid the proposed SUA when active.

Figure 2



Routings for high altitude non-participants to avoid Capitan, around the northern side of the Pecos complex would exacerbate traffic compression and workload factors in the Texico VORTAC (TXO) area that are addressed later in this section. Routings to avoid Capitan west of the proposed airspace would entail a route not only clear of Capitan, but also the White Sands Missile Range (WSMR), that would add traffic to an already dense traffic area in the El Paso, TX area.

AM-16

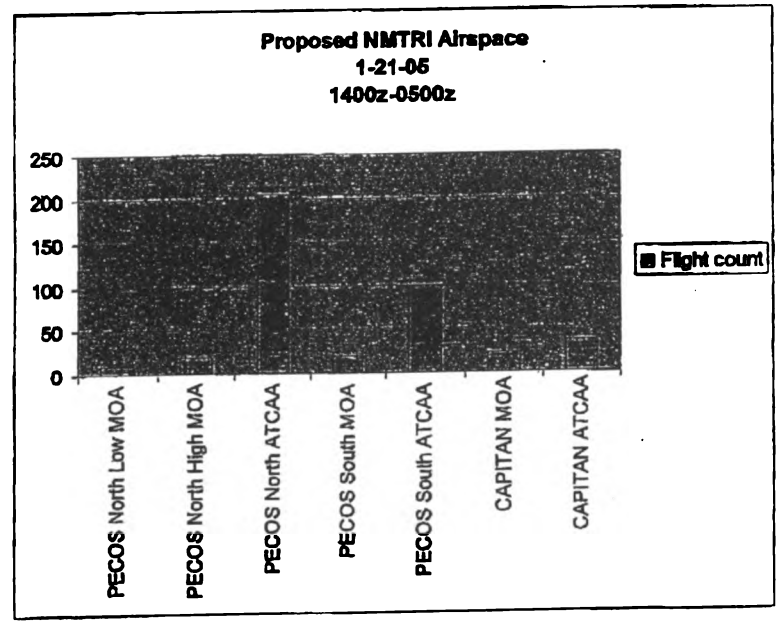
Another area of concern is traffic utilizing existing approaches to Ruidoso/Sierra Blanca Regional Airport (SRR). ZAB provides approach control service to SRR. Currently, there are two Standard Instrument Approach Procedures (SIAP), with a third SIAP proposed for late 2005. IFR altitudes for both existing approaches are 12,000 feet MSL (Chisum IAF 11,600 feet MSL LOC/DME RWY 24, Corona feeder route 12,000 feet MSL GPS RWY 24). It is routine during high volume events and holidays (American Futurity Horserace, 4th of July, Labor Day, etc.) for ZAB Sector 23 to hold aircraft requesting approach to SRR. The holding can typically occupy three altitudes over Chisum, NM VORTAC (CME). ATC operations for SRR, along with other IFR traffic along V68/83, render the proposed floor of the Capitan MOA unfeasible.

ATCAA Airspace over Pecos Complex. ZAB does not concur with ATCAA airspace as proposed (section 3.1.2). The proposed creation of the Sumner North ATCAA, FL240-500, in the northern area of the Pecos Complex poses issues with coordination, compression of flows, traffic management concerns and safety.

DP-3

ZAB modeled traffic for the proposed airspace for January 21, 2005. Traffic count numbers of non-participants that would transit the proposed airspace are reflected in figure 3.

Figure 3



On this particular day, for the proposed use times for the Pecos North High MOA/ATCAA and Sumner North ATCAA, non-participants would require a reroute around the SUA.

Figure 4 displays Dallas/Ft. Worth (DFW) arrivals that correspond to the proposed charted use times. Sequencing points (when required during high demand periods) for these arrivals changes with the proposed SUA configuration. Due to the inability of ZAB

Sector 87 to accomplish this sequencing task with proposed SUA (the sector that normally sequences DFW arrivals over TXO), this task now would be required to be accomplished much further west of the current location. This most likely would require Denver ARTCC to be involved in this flow. ZAB sectors currently are not designed for the compression of these flows. Mitigation of complexity, compression and workload factors takes the form of miles-in-trail (MIT) restrictions based on demand through the airspace.

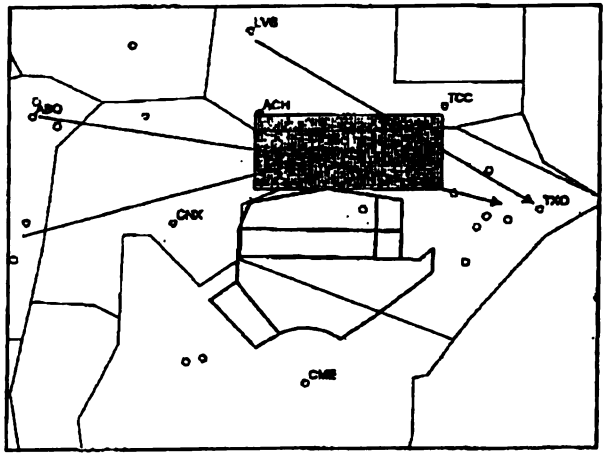
Figure 4

Figure 5 displays flows of aircraft that would normally transit the proposed Sumner North ATCAA that would be routinely re-routed clear of the proposed SUA. The modeling points to major compression issues in the area north of the Sumner North ATCAA, the area south and southwest of the Tucumcari, NM VORTAC (TCC) and TXO (blue shaded area). This 19NM wide corridor would become very dense for periods of

time, thus possibly compromising sector integrity and safety. Mitigation techniques would involve MIT and/or reroutes south of the Pecos complex and WSMR.

There are periods during the proposed charted use times when non-participant traffic count numbers are lower than peak period numbers. We considered these periods and the coordination required to move major flows of non-participants. These periods are quite short length of times, when considering the length of time required to effect coordination to change flows around the proposed SUA.

Figure 5



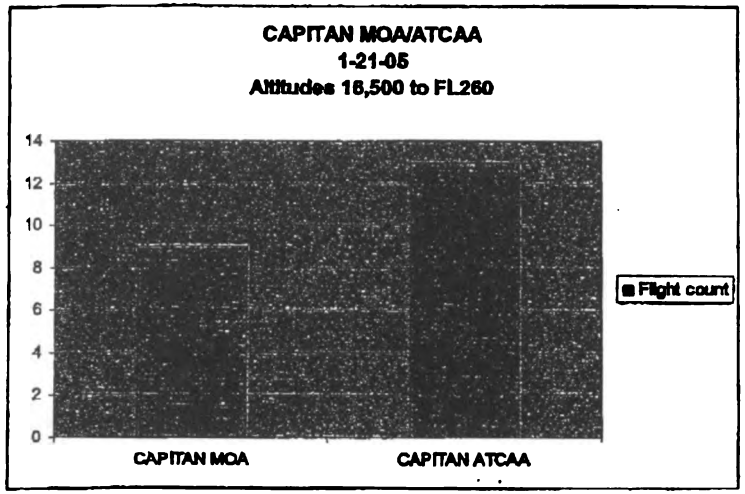
Movement of Jet Route J74. ZAB does not concur with the request to realign J74. This route is an integral part of the high altitude stratum in the eastern portion of the Center's airspace. It provides definition and structure to heavily used en route airspace. For reasons listed above, in our remarks concerning proposed ATCAA airspace, we do not agree with the realignment of J74. **DP-3**

PROPOSAL

Capitan. ZAB concurs with the establishment of the Capitan MOA/ATCAA, 16, 500 feet MSL – FL260, using the lateral boundaries contained in the NMTRI draft proposal. We concur with the proposal to chart times of use BY NOTAM. For the reasons listed NON-CONCUR area above, the proposed floor of the Capitan MOA is not feasible. A **AM-16**

base altitude of 16,500 feet MSL allows ZAB the ability to utilize IFR altitudes of 16,000 feet and lower. Establishing a ceiling of FL260 allows access to the corridor of airspace between the Beak MOA/ATCAAs and the Pecos Complex. This proposal mitigates a major concern of re-routing non-participants west around the El Paso area or east around the eastern side of the Pecos Complex. This proposal also allows Albuquerque Sunport (ABQ) departures to climb above the Capitan ATCAA along J15 to destinations southeast of ABQ. Figure 6 displays traffic data that would transit the Capitan MOA/ATCAA that is proposed by ZAB. **AM-16**

Figure 6

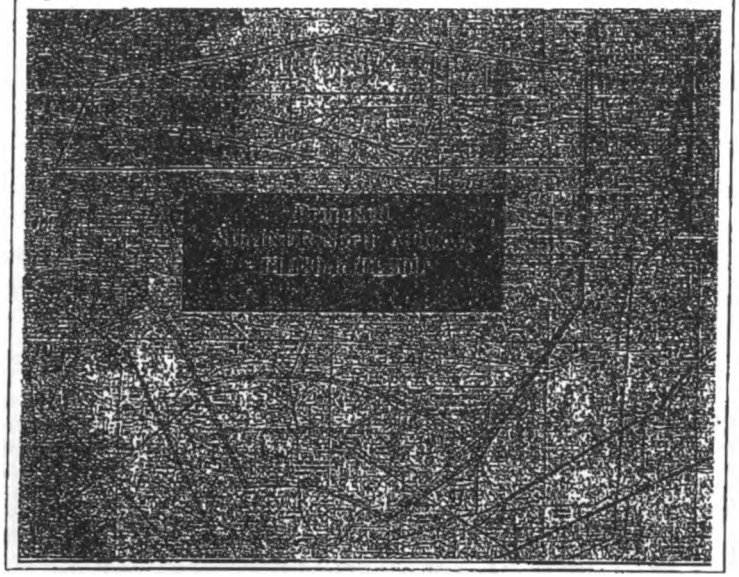


ATCAA Airspace over Pecos Complex. ZAB proposes to divide the ATCAA overlying the Pecos MOAs into two areas. For the purposes of this response and proposal, we have named the two areas Sumner North ATCAA and Sumner South ATCAA (figures 7 & 8). **DP-6**

Sumner North ATCAA (Proposed)

Proposed Boundaries **Beginning** **at lat. 34 37 00.00N., long 104 30 02.00W**
FL180 to FL300 **to lat. 34 33 00.00N., long 103 55 02.00W**
to lat. 34 20 58.43N., long 103 55 01.91W
to lat. 34 20 20.00N., long 105 10 00.00W
to lat. 34 31 00.00N., long 105 05 02.00W
to the point of beginning.

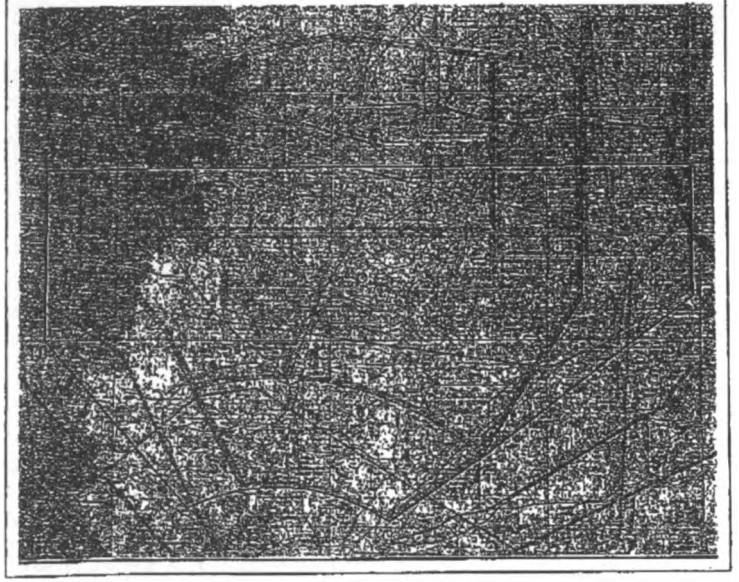
Figure 7



Sumner South ATCAA (Proposed)

Proposed Boundaries **Beginning** **at lat. 34 20 20N., long 105 10.00W.;**
FL 180 to FL500 **to lat 34 21 00N., long 103 40 02W.;**
to lat 34 05 00N., long 103 40 02W.;
to lat 33 37 58., long 104 21 36W.;
thence counterclockwise along the 22NM arc of the Chisum VORTAC
to lat 33 40 00N., long 104 50 00W
to lat 34 00 00N., long 105 10 00W.;
to the point of beginning, excluding the airspace within R5104B.

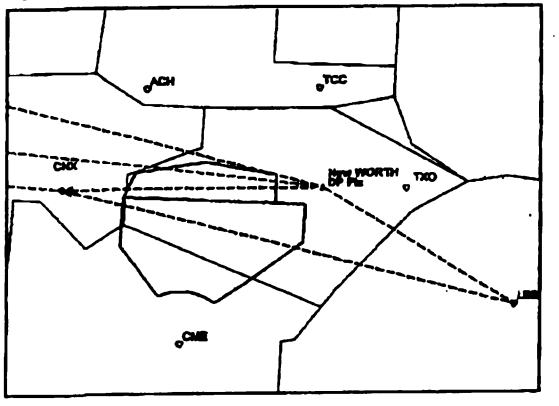
Figure 8



This proposal retains the intent of the NMTRI draft proposal to overlie the Pecos Complex MOAs with ATCAA airspace. Due to concerns outlined in the NON-CONCUR section above, ZAB does not concur with the NMTRI draft proposal Sumner North ATCAA. ZAB's proposal allows use of airspace FL500 and below in an area approximately 5NM south of J74 to the southern boundary of the Pecos Complex. This ATCAA airspace would be used in conjunction with the underlying Pecos Complex. This is a gain of 600 square miles of SUA, as compared to the present day ATCAA airspace. Under this proposal these ATCAA descriptions would be contained in the ZAB/27th FW Letter of Agreement. Our intent is that these vertical dimensions would be available as per the daily SUA schedule transmitted to ZAB from the 27th FW. In addition, ZAB proposes to modify the Worth Departure Procedure (DP) from DFW (and satellite departures) to add a transition routing that deconflicts the proposed Sumner South ATCAA and the proposed transition. This transition would proceed from Ft. Worth ARTCC airspace to a point approximately 8NM north of the northeast corner of the Pecos Complex. From that point, westbound routings would proceed to various NAVAIDs (figure 9).

DP-6

Figure 9



We believe this to be a viable alternative to address the training and SUA modification concerns outlined in the NMTRI draft proposal. These alternative proposals allow ZAB to balance the needs of all users that utilize airspace over eastern New Mexico.

ZAB NMTRI Draft Airspace Analysis

SUMMARY

We support the needs of the USAF Air Combat Command identified in the Draft Airspace Proposal. While some of the proposed SUA configurations pose problems with non-participant traffic flows, we believe other en route operations can be modified to allow the training environment and outcomes that are desired in the proposal.

We wish to comment on proposed supersonic operations throughout the Pecos Complex and proposed Capitan MOA below FL180. We have a safety concern of mixing non-participants (VFR aircraft who may or may not be in contact with ATC) and supersonic operations and the ability to adhere to the provisions of FAR 91.113. Our concern is magnified in the proposed Capitan MOA, which includes the airspace of V68/83. **AM-18**

We are hopeful that these comments help with the development of the NMTRI. Albuquerque ARTCC looks forward to further participation in the development of this airspace.

New Mexico State Senate

State Capitol
Santa Fe

COMMITTEES:
MEMBER
· Conservation
· Judiciary

SENATOR CLINTON D. HARDEN, JR.
R-Colfax, Curry, Harding, Taos,
San Miguel, Quay & Union-7

1348 CRH
Clovis, NM 88101

Phone: (505) 389-1248
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February 14, 2005

Mr. Brenda Cook,
New Mexico Training Range Initiative EIS Project Manager
HQ ACC/CEVP, 129 Andrews Street, Suite 102
Langley AFB, VA 23665-2769

To Whom It May Concern, **GE-1**

Please accept my comments on the Draft Environmental Impact Statement (DEIS) concerning the New Mexico Training Range Initiative.

I wholeheartedly endorse the proposed plan of action in the DEIS. Allowing the expansion of the existing airspace and creating a new air Military Operations Area (MOA) and Air Traffic Control Assigned Airspace (ATCAA) will provide additional military value to New Mexico's four military installations and specifically to Cannon Air Force Base located at Clovis, New Mexico. The increased use of supersonic flights as well as use of defense chaff and flares will ensure that our pilots receive the training they require for today's missions.

Our state has always given outstanding support to our military communities, and we thoroughly understand the importance of providing realistic training opportunities for our Air Force aircrews. The F-16 squadrons that train at Cannon AFB and the New Mexico Air National Guard will both benefit from implementation of this proposed action.

Negative environmental consequences to this area will be minimal as much of the area is sparsely populated.

Thank you for consideration of my comments.

Best Regards,

Sincerely,

Clinton D. Harden Jr

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
P.O. Box 26567 (MC-9)
Albuquerque, New Mexico 87125-6567

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

February 18, 2005

9043.1
ER 05/066

Brenda W. Cook, Acting Chief
Environmental Analysis Branch
HQ ACC/CEVP
129 Andrews Street, Suite 102
Langley AFB VA 23665-2969

Dear Ms. Cook:

The U.S. Department of the Interior (DOI) has reviewed the Draft Environmental Impact Statement (DEIS) for the implementation of the New Mexico Training Range Initiative (NMTRI) at Cannon Air Force Base (Cannon AFB), New Mexico. The proposed NMTRI would modify existing training airspace, develop new airspace, authorize supersonic operations in Cannon AFB's local training airspace, and extend the use of chaff and flares into the new and modified training airspace. In this regard, we are providing the following comments for your use as you prepare the final document.

Based on our review of the DEIS, an adequate range of alternatives were analyzed for the project. The DEIS provides adequate background information on the project area and adequately explains the purpose and need of the project. The DEIS also adequately addresses the direct and indirect effects of the proposed project on fish and wildlife resources in the project area. Although the likelihood of flare induced wildfire is small, we recommend that flare use be avoided during periods of high fire risk. We also recommend that flight routes and training schedules be planned to avoid sensitive nesting locations, migratory routes, and migratory seasons.

The DOI has reviewed this project in relation to any possible conflicts with the Land and Water Conservation Fund (L&WCF) and found there are numerous L&WCF projects in Roosevelt and Curry Counties which could be adversely affected. We recommend you consult directly with the official who administers the L&WCF program in the State of New Mexico to determine any potential conflicts with Section 6(f)(3) of the L&WCF Act (Public Law 88-578, as amended). This section states: "No property acquired or developed with assistance under this section shall, without the approval of the Secretary [of the Interior], be converted to other than public outdoor recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the then existing comprehensive statewide outdoor recreation plan and only upon such conditions as he deems necessary to assure the substitution of other recreation properties of at least equal fair market value and of reasonably equivalent usefulness and location." The administrator for the L&WCF program in New Mexico is Ms. Sandra Massengill, Planner Director, Department of Energy, Minerals & Natural Resources, 1220 S. Saint Francis Drive, Santa Fe, New Mexico 87505-4000; 505-476-3392. **NP-16**

3012

Thank you for the opportunity to review and comment on this Draft EIS.

Sincerely,

Stephen R. Spencer
Regional Environmental Officer

3013

GOVERNOR
Bill Richardson

DIRECTOR AND SECRETARY
TO THE COMMISSION
Bruce C. Thompson

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

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February 20, 2005

Ms. Brenda Cook
HQ ACC/CEVP
129 Andrews St., Ste. 102
Langley AFB, VA 23665-2769

Re: New Mexico Training Initiative Draft Environmental Impact Statement
NMGF Doc. No. 9872

Dear Ms. Cook:

The New Mexico Department of Game and Fish (Department) has reviewed the New Mexico Training Initiative (NMTI) Draft Environmental Impact Statement (DEIS). The NMTI would authorize the expansion and reconfiguration of existing airspace, create new airspace, authorize supersonic flight above 10,000 feet above mean sea level in the airspace, or about 5,000 to 6,000 feet above ground level, and expand the use of defensive countermeasures (chaff and flares) into the new and modified airspace.

The Department does not support any alternatives that would increase the number of low-level (500 feet above ground level floor) jet overflights above State Game Commission-owned Lesser Prairie Chicken conservation areas (PCAs) without mitigation. These areas were purchased by the state specifically for management and conservation of lesser prairie chickens (*Tympanuchus pallidicintus*), which have been in decline across their five state distribution. The Department is cooperating with neighboring states to recover lesser prairie chickens to preclude the need for federal listing under the Endangered Species Act. **BI-24**

Lesser prairie chicken populations in New Mexico are generally most abundant on state-owned PCAs, but are generally low-density and scattered, particularly for two PCAs, Liberty (DeBaca County) and Claudell (Roosevelt County) that are within the region of influence. It is not clear, from the information provided, that increased low-level jet overflights over these PCAs would not potentially significantly impact populations of lesser prairie chickens, particularly during the critical breeding season.

Startling noises and large shadow-cast over lekking male lesser prairie chickens may disrupt lekking behavior and interfere with male communication (booming). Male vocalizations on

3013

breeding grounds, when assembling at leks, is a high intensity booming call. Booming may serve to advertise locations of leks to hens and to defend a male's individual territory. Therefore, noise from low-level overflights may interfere with the ability of lesser prairie chickens to assemble in leks and attract females for breeding. This assumption is supported by information cited on page 4-36 of the DEIS, which states "Lesser-prairie chickens are known to cease lekking activities for several minutes to several hours in response to noise disturbances (Giesen and Connelly 1993); therefore, a sudden onset low-level noise event from an aircraft overflight could disturb lekking prairie chickens."

When considering the effects of overflights of raptors (birds of prey) on lekking male prairie chickens (flushing, crouching, leaving leks), it is reasonable to assume that noise and large cast-shadows of low-level jet overflights could potentially elicit a similar response.

Depending on the frequency and intensity of low-level jet overflights on PCAs, this type of temporal disturbance may have considerable impacts on breeding dynamics and success, particularly with the low-density and scattered populations that occur at Liberty and Claudell PCAs. The Department is not able to estimate the existing or potential future number of low-level jet overflights of these PCAs, nor will we be able to monitor the potential for adverse affects.

Therefore, we disagree with 1) the DEIS statement on p. 4-37 in reference to special status species that "entire populations would not be expected to be impacted"; and 2) the arbitrarily high threshold for significance standard stated on page 4-28 that "impacts to resources would be considered significant if special-status species or habitats are adversely affected over relatively large areas or disturbances cause significant reductions in population size or distribution of a special status species." "Significant reductions" in population sizes or distribution of lesser prairie chickens from low-level jet overflights would be virtually impossible to demonstrate, even under controlled experimental conditions. **BI-11**

We therefore request that should an alternative be selected that may increase the potential for low-level jet flyovers of these two PCAs, flight restrictions be adopted that preclude low-level flyovers during the breeding season (15 February until 15 June, between 3:00 and 9:00 A.M.). It is our understanding that similar diurnal and seasonal flight restrictions have been adopted for sage grouse at the Army's Yakima Training Center in central Washington.

Legal descriptions for Liberty and Claudell PCAs are:

Liberty: T2S, R28E, Sec. 30; DeBaca County;

Claudell: T2S, R29E, Sec 20 NW1/4, N1/2 of NE1/4, S1/2; Sec 21 SW1/4, N1/2; Sec 28 W1/2; Sec 29 SE1/4; Roosevelt County.

Should the selected alternative increase the potential for low-level jet flyovers of these two areas, and flight restrictions not be adopted, then the Department would not concur with the DEIS assertion that this action would be insignificant.

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 (505) 476-8115, or <mwatson@state.nm.us>.

Sincerely,

Lisa Kirkpatrick, Chief
Conservation Services Division

LK/MLW/DD

CC: Susan MacMullin (Ecological Services Field Supervisor, USFWS)
Tod Stevenson (Deputy Director, NMGF)
Roy Hayes (Southeast Area Operations Supervisor, NMGF)
Bill Dunn (Furbearer and Small Game Supervisor, NMGF)
Dawn Davis (Lesser Prairie Chicken Biologist, NMGF)
Mark Watson (Conservation Services Habitat Specialist, NMGF)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

February 16, 2005

Ms. Brenda Cook
HQ ACC/CEVP
129 Andrews St, Ste 102
Langley AFB, VA 23665-2769

Dear Ms. Cook: **GE-1**

In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality Regulations (CEQ) for Implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Environmental Impact Statement (DEIS) for the proposal to modify the training airspace for training New Mexico based pilots near Cannon Air Force Base (AFB), New Mexico. The modification would provide more realistic training opportunities for the 27th Fighter Wing and the New Mexico Air National Guard at Cannon AFB.

EPA classified your DEIS and proposed action as "LO," i.e., EPA has "Lack of Objections" to the proposed alternative. Our classification will be published in the Federal Register according to our responsibility under Section 309 of the Clean Air Act, to inform the public of our views on proposed Federal actions.

EPA appreciates the opportunity to review the DEIS. We request that you send our office one (1) copy of the Final EIS at the same time that it is sent to the Office of Federal Activities (2251A), EPA, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20044.

Sincerely yours,

Bonnie Braganza, Acting Chief
Office of Planning and
Coordination (6EN-XP)

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Responses

AM = Airspace Management
BI = Biological Resources
CM = Cumulative
CU = Cultural Resources
DP = Description of Proposed Action and Alternatives
EJ = Environmental Justice
GE = General
LU = Land Use
NO = Noise
NP = National Environmental Policy Act
PN = Purpose and Need
PR = Physical Resources
SA = Safety
SO = Socioeconomics

Letter # / Commenter #	*Response Code*	*Response*
0003; 0008; 0040; 2012; 2015	AM-1	As discussed in the Draft Environmental Impact Statement (EIS) Section 3.3.2.3, pilots are required to avoid direct overflight of populated areas and structures. Furthermore, the Federal Aviation Administration (FAA) and Department of Defense (DoD) have identified and published avoidance criteria for specific aviation-related or noise sensitive areas (NSAs). Cannon Air Force Base (AFB) manages and is responsible for aircraft using the Pecos Military Operations Area (MOA) complex. There are several NSAs under the Pecos MOA that Cannon pilots must avoid. These areas are locally published at Cannon AFB for aircraft using Cannon's airspace; Fort Sumner airport and the surrounding area is one of these NSAs. If it appears that a pilot is violating avoidance requirements, please contact the Public Affairs Office at Cannon AFB.
0003; 0004; 0006; 0017; 0022; 0033; 0036	AM-2	The New Mexico Training Range Initiative (NMTRI) Draft EIS recognizes commercial and general aviation and addresses potential environmental consequences to civil and general aviation that could result from implementation of the Draft EIS Proposed Action. The Capitan MOA is not a part of the preferred alternative and the Capitan Air Traffic Control Assigned Airspace (ATCAA) was reduced in size in direct response to public and agency concerns. Appendix E and Draft EIS Sections 3.1 and 4.1.3 document Worth 3 flight activity and reflect the use of Worth 3 by civil aviation. During NMTRI airspace discussions, Albuquerque Center proposed a transition to the Dallas-Fort Worth departure procedure that would minimize the impact to nonparticipating aircraft when Pecos MOA and/or Sumner ATCAAs are active. The United States Air Force (Air Force) requested this to ensure the northern portion of the Pecos complex is deconflicted from air carriers to maximize safety and F-16 training missions. The MOA "see and avoid" concept is described in Draft EIS Section 3.1.2 and general aviation consequences are described in Section 4.1.3.
0007	AM-3	To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to Flight Level (FL) 180 - FL320 or as assigned. It is activated approximately twice per month for two hours each. The structure of the proposed Capitan ATCAA is described in the Final EIS Section 2.2.1.
0034	AM-4	The NMTRI proposal is intended to support the existing training mission of New Mexico-based F-16 squadrons. The Pecos airspace complex is not routinely used for F-16 pilots to train with Air National Guard or active duty air defense units or in combination with any ground units.
0006; 0010; 0011; 0013; 0030; 0031; 0033; 0038; 2000; 2026	AM-5	Potential impacts to civil and general aviation that could result from implementation of the Draft EIS Proposed Action are discussed in Draft EIS Section 4.1.3.1. The Air Force is aware of, and sensitive to the fact that "terrain masking" in some areas associated with the NMTRI proposals west of the Pecos MOAs and under the expanded Pecos South MOA has the potential to affect the effective use of radar for tracking all aviation activity in the region, as well as

Letter # / Commenter #	*Response Code*	*Response*
		affecting timely communications with aircraft transiting the regions. Neither military nor civilian pilots desire undue exposure to safety-of-flight risks. Potential impacts to civil and general aviation that could result from implementation of the Draft EIS Proposed Action are discussed in Draft EIS Section 4.1.3.1. As stated in this section *"Existing military training avoidance practices would be applicable to all the private airports."* Part of those avoidance practices includes the publication of notices to airmen (NOTAMS) concerning the use of military training airspace. Airmen are required under FAA rules to review such NOTAMs during preflight planning. To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned. The Air Force does not have a requirement for Air Traffic Control (ATC) radar and ATC communications below the proposed Capitan ATCAA. Albuquerque FAA Center can see and communicate with traffic in the Capitan ATCAA. Neither military nor civilian pilots desire undue exposure to safety-of-flight risks. (See response SA-1)
2013	AM-6	Potential impacts to civil and general aviation that could result from implementation of the Draft EIS Proposed Action are discussed in Draft EIS Section 4.1.3.1. When other unique aviation activities occur in military training airspace, the FAA coordinates with the Air Force to avoid exposing any party to risk. High altitude balloon launches from Fort Sumner airport have been thoroughly planned and coordinated with Cannon AFB and Albuquerque Center to ensure safety is maximized.
2021	AM-7	As discussed in Draft EIS Section 3.1.1, Congress has charged the FAA with management of the National Airspace System. This question proposes leased land and private property rights under the airspace.
2026	AM-8	Aircraft operating to and from the training airspace are under the control of Air Traffic Controllers. The structure of the proposed airspace is described in Draft EIS Section 2.2.1. Aircraft can fly no lower than 500 feet above ground level (AGL) in the Pecos MOAs. Two standardized routes are used for entry in to Pecos – both entry points are on the east side of Pecos MOA. Entry altitudes are 14,000 to 15,000 feet above mean sea level (MSL).
3010	AM-9	These text changes are incorporated in this Final EIS.
0038	AM-10	The Air Force and FAA continue to work together to satisfy FAA Order 7400.2, *Procedures for Handling Airspace Matters.*
0020; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032	AM-11	The 27th Fighter Wing (27 FW) requested Sumner North ATCAA up to FL500 during low air traffic density times as defined by Albuquerque Center and twice per month for large-force exercises (LFEs) (2 hour duration). Currently, it is undetermined how many, if any, air carriers will be rerouted. To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned. The Air Force does not have an ATC radar or ATC radio requirement below the Capitan ATCAA. Visual Flight Rule (VFR) aircraft may transit MOAs. Furthermore, flights responding to medical emergencies (life-flights) are normally provided priority routing by Air Traffic Controllers. This has been added to this Final EIS Section 2.2.1.1.
0008	AM-12	F-16 pilots coming to Cannon AFB are qualified to fly the aircraft. Pilot training requirements are specified for relevant training missions by Headquarters Air Combat Command (ACC) and Headquarters Air Force. Pilots hone their skills

Letter # / Commenter #	*Response Code*	*Response*
		and maintain proficiency in each F-16 mission by using simulators and flying in military training airspace. Pecos is subdivided into north and south, and high and low areas. North high and low areas are active from 0800-2200 Monday-Friday; south high is active from sunrise to sunset Monday-Friday; and south low by NOTAM only. All other times will be posted by a NOTAM. (See response AM-5)
0008; 3006	AM-13	Cannon AFB personnel including Public Affairs are assigned by Air Force Manpower and do relocate to new bases around the world on a recurring basis. An April 26, 2005 review of records at Cannon AFB indicates that one pilot is still based at Cannon since 2001.
0008	AM-14	Fuel consumption varies by specific aircraft type, altitude, and the intensity/duration of throttle settings used in flying. For the F-16 flying in non-afterburner straight and level state, the average fuel use of JP-8 at 18,000 feet is 4,000 pounds per hour.
3010	AM-15	27 FW, Headquarters ACC/A3A (formerly DOR), and Albuquerque Center mitigated airspace specifics from December 04 to July 05. Airspace specifics discussed in the airspace proposal July 05 were agreed on by the Air Force and Albuquerque Center. Under the airspace proposal, Jet Route J-74 (J-74) will not be moved. To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned. Sumner North ATCAA would be created from FL180 to FL300 or as assigned by Albuquerque Center. Sumner North ATCAA is requested to FL500 for LFEs twice per month and during low density air traffic times as determined by Albuquerque Center.
3010	AM-16	The 27 FW, Headquarters ACC/A3A (formerly DOR), and Albuquerque Center mitigated airspace specifics from December 04 to July 05. Airspace specifics discussed in the airspace proposal July 05 were agreed on by the Air Force and Albuquerque Center. Under the formal airspace proposal, the creation of the Capitan MOA is cancelled. In addition, the Capitan ATCAA proposed in the Draft EIS was reduced in size and is proposed in the Final EIS from FL180 - FL320 or as assigned. This mitigation deconflicts instrument approaches into Ruidoso/Sierra Blanca airport.
3010	AM-18	To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned. The Air Force is very safety conscious, especially concerning supersonic flight. One of the primary reasons for NMTRI is to obtain supersonic airspace to enhance aircrew training in a safe environment. NMTRI complies with Air Force supersonic aircraft instructions and operations. NMTRI MOA airspace will be published on sectional charts and published in Flight Information Publication as supersonic flight starting at 10,000 feet MSL.
0004; 0038	AM-19	The primary users of NMTRI airspace would be F-16s. Wake vortices from an F-16 flying at 500 feet AGL break up before reaching ground structures. This applies to various flight attitudes and speeds, even under very calm atmospheric conditions. Transient users of NMTRI airspace can include larger aircraft. Under normal flight conditions, and all but rare atmospheric conditions, wake vortices from B-52 and B-1B low-altitude flights fail to generate sufficient velocities to damage structures and vehicles, or pose a hazard to people or animals on the surface. Under infrequent circumstances, such as unusual aircraft maneuvers, damage could occur (Jurkovich and Skujins 2006). The Air Force has

Letter # / Commenter #	*Response Code*	*Response*
		an established procedure for damage claims which begins by contacting the Cannon AFB Public Affairs Office.
0038	AM-20	The Draft EIS Sections 4.1.3.1 and 4.8.3.1 describe the concerns of local pilots and the reasons why land use value is not affected by military training in the airspace. There is no documentable difference in land values between land underneath the existing 500-foot MOA floor and land not underneath the MOA. Overflight effects upon people and animals are addressed in Draft EIS Sections 4.5.2.1, 4.5.3.1, and 4.8.3.1. Since the MOA floor is 500 feet AGL, aircraft do not come closer than 500 feet to any person, vessel, vehicle, or structure. (See responses SA-1 and SO-9)
0001; 0034	BI-1	The potential effects of the ingestion of chaff filaments by cattle, sheep, or wildlife are discussed in the Draft EIS in Section 4.5.2.2. Chaff filaments are about 1 inch in length and about the thickness of human hair. The filaments disperse widely on release. A study cited in Section 4.5.2.2 (Barrett and MacKay 1972) found no negative effects (pre- and post-mortem) on calves. Calves would only consume chaff if it was mixed in with molasses.
0003	BI-2	The effects of aircraft noise on animals are reviewed in the Draft EIS in Section 4.5.2.1. The Draft EIS reviewed numerous documents that report on studies of the effects of low-altitude aircraft noise and sonic booms on livestock and wildlife. Habituation of the animals to aircraft noise was documented. However, in Section 4.5.3.1, the Draft EIS does explain that animals can be startled by a particularly close or loud noise event. The effect would be short-lived and would not be expected to impact long-term health of the animal or population.
0004	BI-3	The effects of aircraft noise on animals are reviewed in the Draft EIS in Section 4.5.2.1. This section indicates that, "For most wild species in the region of influence (ROI), no specific studies on their response to aircraft noise are available. A discussion of general patterns of animal response to noise and published studies on effects of aircraft noise on wild and domestic animals is included in this discussion." Therefore, general conclusions are necessary in some cases.
0004	BI-4	The effects of aircraft noise on livestock are reviewed in the Draft EIS Section 4.5.2.1. The total number of flights between 500 feet and 1,000 feet AGL is expected to remain the same and that total will be distributed in the expanded airspace. This means that fewer low-level overflights are projected to occur within the existing Pecos MOA under any alternative (except for the No-Action Alternative). The public comments on the Draft EIS included four specific damage claims to ranch animals attributed to low-level overflights between 1994 and 2005 (see comments in this Chapter 6.0). As the Draft EIS states and the commenter describes, cattle are particularly vulnerable to low-level overflights during end-of-year roundups when cattle are concentrated in enclosed spaces.
0004	BI-5	The effects of aircraft noise on animals are reviewed in the Draft EIS in Section 4.5.2.1. A study by Workman *et al.* (1992) concerning aircraft noise effects on pronghorn antelope has been added to this Final EIS and summarized in Section 4.5.2.1. An additional study by Luz and Smith (1976) has also been added.
0008; 2015	BI-6	The methodology for analyzing whether the aircraft noise effects on animals would be significant is discussed in the Draft EIS in Section 4.5.1. The term

Letter #/ Commenter #	*Response Code*	*Response*
		"biologically significant" relates to the ability of a population of wildlife to survive and reproduce. This phrase has been clarified in the text and defined in the glossary.
0008	BI-7	A complete list of federally listed threatened and endangered species and State of New Mexico listed threatened, endangered, and sensitive species is provided in Appendix H of the Draft EIS. A discussion of federally listed species that are extinct in New Mexico is in Section 3.5.2.3 of the Draft EIS. This discussion is limited to species protected under the Endangered Species Act (ESA) and by the State of New Mexico and does not include other species that may no longer be locally occurring. The Draft EIS is intended to provide a succinct summary of the biological resources that could be affected by the Draft EIS Proposed Action and its alternatives and should not be considered an encyclopedic review of the natural history of a region.
0038	BI-8	An impact discussion of noise from overflights on poultry has been added to the EIS analysis.
2007	BI-9	A complete list of federally listed threatened and endangered species and State of New Mexico threatened, endangered, and sensitive species is provided in Appendix H of the Draft EIS. Sandhill cranes are not listed as threatened, endangered, or sensitive under the ESA or by the New Mexico Department of Game and Fish (NMDGF). Whooping Cranes are listed as endangered under the ESA and by the NMDGF. However, they are not listed as potentially occurring in the affected counties of the ROI by NMDGF (NMDGF 2003) or the United States Fish and Wildlife Service (USFWS) (letter dated January 21, 2004).
2012	BI-10	The effects of aircraft noise and sonic booms on domestic animals are reviewed in the Draft EIS in Section 4.5.2.1. In this section, the effects on humans were discussed in relation to their interaction with agricultural resources. The effects of sonic booms on humans are discussed in Section 4.2. Additional information is included in the Final EIS regarding the hatchability of eggs exposed to sonic booms. As discussed in Section 4.2.3.1 of the Draft EIS, only 1 percent of the sonic booms associated with the Draft EIS Proposed Action and alternatives would exceed 4 pounds per square feet (psf). Bowles and Seddon (1994) found no difference in the hatch rate of 4 groups of chicken eggs exposed to 1) no sonic booms (control group), 2) sonic booms of 3 psf, 3) sonic booms of 20 psf, and 4) sonic booms of 30 psf. No eggs were cracked by the sonic booms and all chicks hatched were normal.
3013	BI-11	The preparers understand the difficulty of field monitoring of population levels, however, explaining significance as "significant reduction in population size or distribution" is an appropriate metric and is commonly applied in impact assessment, especially with indirect effects, such as the effects of noise on populations. If an effect is not large enough to be measurable, then its significance is questionable. In the specific case of lesser prairie-chickens, breeding is localized in leks, which are small areas within suitable habitat at which breeding displays and mating occur. An F-16 flying at 500 feet AGL would leave a very small shadow because of the small size of the plane and the altitude. With less than 1 percent of the

Letter # / Commenter #	*Response Code*	*Response*
		flights below 1,000 feet AGL, and the large area of airspace within which the flights could occur, the chances of an overflight or shadow crossing a particular lek during breeding season are very low and the chances of repeated effects of low-level overflight are even lower, given that most of the low-level activity would be concentrated over Melrose Air Force Range (AFR). Given the infrequency of low-level (between 500 and 1,000 feet AGL) overflight described above and the expected resumption of normal breeding activities following a behavioral response if present, the likelihood of a substantial effect on the local population related to aircraft overflight seems very low. Furthermore, the likelihood of habituation to the noise from more distant overflights reduces the chances of a substantial effect even further.
0038	BI-12	The Draft EIS Sections 4.5.2.1 and 4.5.3.1 identify the potential consequences to wild and domestic animals. In addition, the Draft EIS Appendix G describes the noise effects on domestic animals. (See response BI-23)
0038	BI-13	The Air Force appreciates having these references brought to our attention. After review, we find that they do not substantively affect the overall validity of the conclusions presented in the Draft EIS. Many of the references cited deal with conditions that do not equate with those that would be encountered under the training airspace. Those that do, generally support our overall assessment of impacts on livestock due to aircraft operations in the training airspace. Nonetheless, the Air Force has taken the available studies into consideration in revision of the Final EIS. (See response BI-23)
0038	BI-14	This reference, Espmark *et al.* (1974), was cited in the Draft EIS in Section 4.5.2.1. Espmark *et al.* (1974) "reported that impacts may be greater in gestating animals because they jumped backward in response to being startled." This statement misrepresents what Espmark *et al.* (1974) actually said (page 112). Their article actually said "It is also possible that the effects of disturbances could be more severe for animals under other physiological conditions, for example gestation." Moreover, Espmark *et al.* (1974) did not actually study this, but merely speculated this at the end of their document. With respect to the comment about jumping backward in response to disturbance, Espmark *et al.* (1974) stated (page 112) "Such a reaction is normally of no consequence to an animal out in the open field but might be dangerous for a tied up animal." Comment BI-14 also states that Espmark *et al.* (1974) found that, "...cattle did not adapt to low-level flights when subjected to 10 flights at elevations between approximately 150 and 650 feet AGL over a two day period. " The commenter states: "This is contrary to the Draft EIS assertion that livestock habituate." However, Espmark *et al.* reported that the animals had reduced possibility to adapt to the low-level flights because of the limited number of overflights and the brief 2-day experimental period. Espmark *et al.'s* overall conclusion was that, "Both cattle and sheep were less disturbed towards the end of the test period, thus indicating that adaptation [=habituation] had taken place." Espmark *et al.'s* conclusion is completely consistent with the Draft EIS's statement that research shows that livestock habituate. The commenter also fails to note that the studies by Espmark *et al.* dealt with exposure to overflights most of which were at lower altitude than would be encountered under the Draft EIS Proposed Action or alternatives. As noted in

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		the Draft EIS, no sorties would be conducted at less than 500 feet AGL. Further, less than 1 percent of the operational hours would be expended between 500 feet and 1,000 feet. This works out to roughly 6.5 low-level sorties per day distributed over the full area overlain by the training airspace. Given that much of such low-level flight as does occur would be concentrated over Melrose AFR, the actual exposure over most of the affected training space area would be much less than the levels examined in the referenced study.
0038	BI-15	We have been unable to locate a study by Oda (1960) on dairy cows. However, the Draft EIS cites more recent studies concerning dairy cattle production and these more recent studies were consistent the conclusions drawn in the Draft EIS.
0038	BI-16	The Air Force appreciates their attention being drawn to the work by Head *et al.* (1993) and recognizes the importance of the dairy industry in Chaves County. A reference to this work has been included in the Final EIS. Head *et al.* (1993) is a study of dairy cows, but the study, which involved exposure to recorded overflight noise of an F-4D Phantom at a distance of 125 feet and B-1B bombers at a distance of 415 feet, did not document negative effects on dairy cows. Moreover, neither the Draft EIS Proposed Action nor alternatives include lowering the overflight levels to less than 500 feet AGL.
0038	BI-17	The Draft EIS Section 4.5.2.1 correctly cites Gladwin, D.N., D.A. Asherin, and K.M. Manci 1988. *Effects of aircraft noise and sonic booms on fish and wildlife: results of a survey of USFWS endangered species and ecological services field offices, refuges, hatcheries, and research centers.* U.S. Department of the Interior Fish and Wildlife Service (USFWS), National Ecology Research Center, Fort Collins, Colorado. NERC-88/30. This is the publication listed in Chapter 6.0 (References). The cited document is not a review of abstracts. It summarizes the results of a survey of USFWS personnel at a variety of locations as indicated in the title. The commenter mistakenly refers to Gladwin, D.N., K.M. Manci, and R. Villella 1988. *Effects of aircraft noise and sonic booms on domestic animals and wildlife: bibliographic abstracts.* USFWS, National Ecology Research Center, Fort Collins, Colorado. NERC-88/32. This document, a collection of noise-related research abstracts, is not cited in the Draft EIS.
0038	BI-18	In the following responses to BI-18, the letters before paragraphs respond to lettered points made in Letter 0038. The references in the comment and response are to Air Force 1993. *The Impact of Low Altitude Flights on Livestock and Poultry.* Vol. 8. 28 January. a and f) The observation that cattle in corrals or feedlots may stampede and injure themselves after low-level overflights was addressed in the livestock section of 4.5.2.1 and found to be a less than significant impact because the average noise exposure from subsonic flight would be comparable to that experienced in the current airspace, which has not resulted in significant negative impacts to livestock. Low altitude aircraft (between 500 and 1,000 feet AGL) operations would occur less than 1 percent of the time. Text was added to the EIS to clarify that "small enclosures" includes corrals and feedlots. United States Forest Service (USFS) (1992, cited in the Department of the Air Force 1993) showed that adverse impacts on livestock only occurred when aircraft were less than 330 feet AGL, which is below the minimum overflight altitude (AGL) allowed in the proposed airspace, except over Melrose AFR. Additionally,

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		flights below 1,000 feet AGL, and the large area of airspace within which the flights could occur, the chances of an overflight or shadow crossing a particular lek during breeding season are very low and the chances of repeated effects of low-level overflight are even lower, given that most of the low-level activity would be concentrated over Melrose Air Force Range (AFR). Given the infrequency of low-level (between 500 and 1,000 feet AGL) overflight described above and the expected resumption of normal breeding activities following a behavioral response if present, the likelihood of a substantial effect on the local population related to aircraft overflight seems very low. Furthermore, the likelihood of habituation to the noise from more distant overflights reduces the chances of a substantial effect even further.
0038	BI-12	The Draft EIS Sections 4.5.2.1 and 4.5.3.1 identify the potential consequences to wild and domestic animals. In addition, the Draft EIS Appendix G describes the noise effects on domestic animals. (See response BI-23)
0038	BI-13	The Air Force appreciates having these references brought to our attention. After review, we find that they do not substantively affect the overall validity of the conclusions presented in the Draft EIS. Many of the references cited deal with conditions that do not equate with those that would be encountered under the training airspace. Those that do, generally support our overall assessment of impacts on livestock due to aircraft operations in the training airspace. Nonetheless, the Air Force has taken the available studies into consideration in revision of the Final EIS. (See response BI-23)
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		the Draft EIS, no sorties would be conducted at less than 500 feet AGL. Further, less than 1 percent of the operational hours would be expended between 500 feet and 1,000 feet. This works out to roughly 6.5 low-level sorties per day distributed over the full area overlain by the training airspace. Given that much of such low-level flight as does occur would be concentrated over Melrose AFR, the actual exposure over most of the affected training space area would be much less than the levels examined in the referenced study.
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		Anderson (cited in Department of the Air Force 1993) reinforces the finding that minimal adverse impacts occur from low level overflights by examining livestock impacts from low altitude (500 feet AGL) overflight supersonic operations in the area around Naval Air Station Fallon, Nevada. Anderson's study found that 92 percent of the cattle showed no adverse response, while 8 percent of the cattle showed a startle response by running less than 10 meters (Department of the Air Force 1993). b, the second c, and e) A loss of an animal to a farmer or farmers is a direct economic loss that could occur in the project area and losses to multiple farmers could affect the economy of the area. This economic issue was addressed in the Draft EIS but was not identified as a significant impact. The text states that "because the proposed NMTRI expansion of the airspace would not include an increase in the number of sorties, the likelihood of a particularly loud event (>95 Sound Exposure Level [SEL]) occurring directly above an individual animal or human would be the same as current conditions. Noise from supersonic flight would increase in all parts of the airspace, but at levels that would not be expected to significantly impact biological resources. Resident wildlife and livestock experiencing new noise levels may initially react to the noise and may temporarily shift habitat use or activities as a result (Harrington and Veitch 1991). Based on previous studies (reported in Section 4.5.2.1), most wild species and livestock are expected to habituate and return to normal activities." Should a claim arise due to Air Force actions, the text states, the "Air Force has established procedures for dealing with damage claims that begin by contacting the Cannon AFB Public Affairs Office." c) The statement that "a potentially high overall impact can occur if resources (i.e., livestock and poultry) are present in substantial numbers throughout the area under the airspace" could be true only if there were significant effects on the livestock. However, the EIS evaluated impacts to livestock under the airspace due to low-level overflights and concluded them to be less than significant because the average noise exposure from subsonic flight would be comparable to that experienced in the current airspace, which has not resulted in significant adverse impacts to livestock, as explained further in this response above under "a." Espmark *et al.* (1974) subjected cattle to low altitude flights of 160 to 650 feet AGL and also found minor reactions from cattle, ranging from raising the head to running or walking less than 65 feet in response to the flyovers. Studies have consistently suggested habituation to overflight noise, with reactions diminishing or disappearing with additional exposure. g) The EIS evaluated impacts to livestock under the airspace due to low-level overflights and concluded them to be less than significant because the average noise exposure from subsonic flight would be comparable to that experienced in the current airspace, which has not resulted in significant negative impacts to livestock. Low altitude aircraft operations would occur less than 1 percent of the time below 1,000 feet AGL. In, *The Impact of Low Altitude Flights on Livestock and Poultry* (Department of the Air Force 1993), three sources reviewed conclude that pregnant cattle are unaffected by overhead aircraft flights and two sources conclude that pregnant cattle are affected by overhead aircraft. Data on altitude of overflights were not provided and the references were not generally available.

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		As noted in the Draft EIS, should a claim arise due to Air Force actions, the "Air Force has established procedures for dealing with damage claims that begin by contacting the Cannon AFB Public Affairs Office."
0038	BI-19	With regard to the selected quotations from the "Handbook of Veterinary Claims" by Milligan *et al.* (1983), it is noted, in general, that the damages documented in the selected quotes and elsewhere in the document are related to practices that are not part of the Draft EIS Proposed Action, and are principally related to flights that were considerably lower than 500 feet AGL. As noted in the Draft EIS, no sorties would be conducted at less than 500 feet AGL. Further, less than 1 percent of the operational hours would be expended between 500 feet and 1,000 feet. This works out to roughly 6.5 sorties per day between 500 and 1,000 feet AGL distributed over the full area overlain by the training airspace. The Air Force has an established process for investigating and paying claims for damages to livestock attributable to aircraft overflight. Following are notes on the specific lettered paragraphs in the comment: a) This quotation is taken out of context. The following sentence indicates that only about 22 percent of the claimed amounts were paid, the reduction in the amount paid being "primarily due to facts developed by the claims investigators." b) In both of the turkey claims, the deaths occurred during extraordinary periods of high heat and humidity which caused the confined animals to succumb to heat stress, suffocation, or physical trauma when they bunched together following overflight. It illustrates the Air Force's established process for investigating and paying claims for damages to livestock attributable to aircraft overflight. In one case, the overflights were at 150 to 200 feet AGL by multiple RF-4C Phantoms along an established Military Training Route (MTR). This is considerably below the 500 feet AGL lower limit associated with the Draft EIS Proposed Action. The overflight altitude in the other case was not given. c) In this example the overflight level was not given, but the rancher was compensated for the fair market price of three head of cattle for injuries suffered by three calves in a confined area. d) The damage awards referenced in this paragraph were associated with confined calves or feeder cattle injured by running into fences following low-level overflight. In two of the cases, the aircraft were B-52s flying low-level on military training routes. In one of the reports the lack of previous exposure of the newly introduced calves to overflight was cited as a factor. These examples again illustrate the Air Force's established process for investigating and paying claims for damage to livestock attributable to aircraft overflight. With regard to the statement in the first paragraph of page 25 in comment letter 0038, we note that the only "Exhibit S" we found attached to the letter was a photograph, not a copy of an Air Force Handbook. Since there was no list of references cited attached to the letter, we assume that the reference in the comment was to the 1983 Handbook of Veterinary Claims discussed above. The principal points in that document related to the comment are the following.

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		• Timely investigation of possible livestock damage is a very important phase of the claims process. • Qualified veterinarians or other experts can play an important role supporting a claims investigation in documenting damages and identifying causal, contributing, and confounding factors. • Upon investigation, many of the claims of livestock damage attributed to overflight are also found to involve specific and atypical circumstances judged to contribute to or enable the damage. Examples include stresses from episodes of high heat or humidity, weaning, confinement of animals within a small enclosure, a first exposure of naive animals to a very low-level overflight without an opportunity to habituate, and exposure to very low-level overflights. • The altitude of the overflights to which damages were attributed, where known, was in many cases substantially lower than the 500 feet AGL minimum altitude of the Draft EIS Proposed Action and involved larger, noisier aircraft than the F-16s associated with the Draft EIS Proposed Action. • A percentage of the claims received and investigated are found to be attributable to other factors unrelated to overflight. • There is an established process for filing, investigating, and paying claims for damages to livestock attributable to aircraft overflight.
0038	BI-20	Discussions of livestock and other related claims have been included in this Final EIS Section 4.8.3.1 and in this Chapter 6.0.
0038	BI-21	The EIS describes the materials that could fall to the ground after chaff or flare deployment in the Final EIS Appendices A and B. The pieces of materials include plastic and felt spacers and aluminum-wrapped mylar. Additional details about flare wrapping material, provided through the Draft EIS process, have been included in Section 4.7.3.1 and Appendix B of this Final EIS. Chaff and flare residual materials do not consist of heavy, sharp, metallic objects. A review of literature cited did not yield any case of traumatic reticuloperitonitis attributed to a piece of chaff or flare residual materials. The metallic piece to which the commenter refers was not a chaff or flare part (it was debris from the scene of an F-16 crash). Information regarding traumatic reticuloperitonitis in general has been added to this Final EIS (Section 4.5.2.2).
0038	BI-22	The Kovalcik and Sottnik (1971) study referenced in the comment was not accessible in original form to the preparers [Kovalcik, K., and J. Sottnik. 1971. Vplyv Hluku Na Mliekovú Úžitkovosť Kráv [The Effect of Noise on the Milk Efficiency of Cows]. Živočíšna Výroba, Vol. 16, Nos. 10-11, pp. 795-804.] According to secondary sources, this paper describes repeated immediate exposure to high intensity noise (about 105 decibels [dB]) and draws impact conclusions as a result of that exposure. As described in the Draft EIS Section 3.2.2.1, an F-16 at 500 feet AGL produces maximum A-weighted sound level (L_{max}) of 107 dB and at 1,000 feet, 100 dB. This means that, to replicate the effects of the study, F-16Cs would have to repeatedly fly at altitudes near 500 feet AGL directly over livestock (constrained within an enclosed area such as a pen). The random nature of training overflights and the fact that the training aircraft are between 500 feet and 1,000 feet AGL only 1 percent of the time (Draft EIS Section

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		2.2.1.5) would indicate that the Kovalcik and Sottnik (1971) study results are not relevant to the Draft EIS Proposed Action or alternatives.
0038	BI-23	The Air Force has reviewed the references cited in this comment to adequately respond to this comment. Below is the review of the references in the order they appeared in the comment letter. U.S. Air Force, ALCM/Talon MOA Environmental Assessment (EA) (1997). The comment letter cites conclusions from this EA that say that long-term effects on wildlife are unclear and that responses vary among species. The NMTRI Draft EIS, Section 4.5.2.1, states: 1) "The literature indicated that the type of noise that can stimulate the startle reflex is highly variable among species" (page 4-30); 2) "However, species differ in their ability to habituate to aircraft noise" (page 4-30), this is followed by an example; and 3) "McClenaghan and Bowles (1995) emphasized the research difficulty in distinguishing potential long-term effects on free-ranging wild population due to aircraft noise compared to other environmental factors." Variability in species response to noise and the lack of long-term studies of noise effects on wildlife are noted in the conclusions in Section 4.5.3.1 of the Final EIS. Workman *et al.* (1992), pronghorn antelope. The comment letter states that Workman *et al.* (1992) "found that pronghorn would run when subjected to military jets flying at 5000 feet AGL." The commenter fails to mention (1) that the pronghorn used in the study "had no prior conditioning to aircraft disturbance"; (2) that the overflight was supersonic and accompanied by a sonic boom, in response to which the pronghorn ran a short distance; and (3) that on exposure to the third boom, the pronghorn did not run. The primary objective of the Workman *et al.* (1992) study was to measure the change in heart rate and body temperature in response to various stimuli, including intruding humans, aircraft overflights, and sonic booms, not to study the behavioral response. Workman *et al.* (1992) concluded that heart rate rose in response to the animals' first exposure to sonic booms and subsonic flyovers by F-16s, but that heart rate decreased in response to successive exposures which "indicates rapid habituation to the disturbance." Body temperatures were not affected. Luz and Smith (1976). This study involved helicopters at 150 to 400 feet AGL, which is lower than the floor of the Draft EIS Proposed Action (500 feet AGL), and the Draft EIS Proposed Action does not include helicopters. The Draft EIS, Section 4.5.2.1, notes many studies documenting animal responses to helicopters. Stockwell *et al.* (1992). We did not find a Stockwell *et al.* (1992), however we reviewed a report by Stockwell *et al.* (1991), which evaluates and compares foraging efficiency of desert bighorn while being exposed to helicopter overflight versus while not being exposed to helicopter overflight. Note that helicopters are not included in the Draft EIS Proposed Action or alternatives. Foraging efficiency (an index of time allocated to feeding or searching for food relative to time spent scanning; it is not intended to convey information about assimilation efficiency) of bighorn sheep did decrease by 43 percent in winter; however, the comment letter did not interpret the summer results correctly. Stockwell *et al.* (1991) found that foraging efficiency decreased 17 percent in summer for one geologic stratum (Hermit Shale) that had helicopters that were typically closer

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		than another stratum (Supai Formation) where sheep also occurred during summer. Because there were no habitat differences between the 2 strata, the authors combined the data for further analysis. The combined data showed that there was no statistically significant difference in foraging efficiency when helicopters were present or not (control). They estimated a disturbance threshold for helicopters with the summer data as 850–1,476 feet AGL. The comment letter claims that the effects of overflights on bighorn sheep were not addressed. However, Draft EIS Section 4.5.2.1 discusses Krausman *et al.* 1998 a peer-reviewed study regarding overflight effects on bighorn sheep and the study is included in Chapter 6.0, References. The comment letter provides a quotation from the ALCM/Talon MOA EA which includes 4 references that report on variable effects of low-level overflights on bighorn sheep. These studies are discussed below and are included in the Final EIS. Krausman and Hervert (1983). The commenter provides an incomplete discussion of the data reported in this study: "19% of sheep were greatly disturbed and ran from less than 330 feet to 1.2 miles." The 19 percent involves 6 events, 4 of which occurred when the plane was <164 feet AGL and 2 of which were 164–328 feet AGL (Krausman and Hervert 1983). These distances are far below the proposed floor of 500 feet AGL. MacArthur *et al.* (1979). The comment letter states that bighorn ran in response to a helicopter that was 490–660 feet AGL and that this is "well above range of some overflights under the Draft EIS Proposed Action." As noted in Draft EIS Section 4.5.2.1, helicopters are known to induce the startle effect more readily than fixed wing aircraft. Helicopters are not a component of the Draft EIS Proposed Action or alternatives so this study is not relevant. Workman *et al.* (1992), bighorn sheep. Comment BI-25 states that Workman *et al.* (1992) reported that bighorns had an accelerated heart rate in response to jet aircraft overflights. Although this is true for the bighorns' first exposure, it is important to note that Workman *et al.* (1992) observed a decrease in heart rate with each successive exposure. They concluded that, "There appeared to be a process of habituation with successive disturbances as reflected in the reduction of duration of elevated heart rate." Lamp (1989). In reviewing this preliminary study, we could find no reference to bighorn abandoning an area in response to flights 100–500 feet AGL. Lamp (1989) reported that in 1 of the 28 observed reactions the bighorn sheep "roused and fled in response to 3 very low S3 Viking aircraft." (S-3 Vikings are moderately large swept-wing jets with two engines mounted on pylons under the wings). In four of the 28 observations, reactions were minor, which included head raising and orienting towards the sound. The average time for the sheep to return to normal behavior was 30 seconds. Twenty-three of the 28 observations indicated no response by the bighorns.

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		Comment BI-23 states that "no long-term studies of overflights or noise are cited." No published long-term studies are available. Section 4.5.2.1 of the Draft EIS indicates that the response of many animal groups has not been studied and that conducting long-term studies on noise effects on wildlife is problematic. "McClenaghan and Bowles (1995) emphasized the research difficulty in distinguishing potential long-term effects on free-ranging wild population due to aircraft noise compared to other environmental factors." Krausman *et al.* (1993a, b). Draft EIS Section 4.5.2.1 discusses the study by Krausman *et al.* (1998) regarding bighorn sheep. That study, which appears in the peer-reviewed Journal of Wildlife Management, is included in the Chapter 6.0, References. Krausman *et al.* 1998 builds on the earlier results described in Krausman *et al.* (1993a, b), which are unpublished contract reports on the same study discussed in the 1998 paper. Weisenberger *et al.* (1996). This reference is included in the Draft EIS in Section 4.5.2.1 and in Chapter 6.0, References. Comment BI-25 states that, "it should be acknowledged in the Draft EIS that accelerated heart rate is an indication of excitement or stress in animals." This has been included in the Final EIS. Comment BI-23 also cites Weisenberger *et al.* (1996) in reference to the need for more studies on free-ranging animals. Section 4.5.2.1 on page 4-30 of the Draft EIS acknowledges this need also ... "Most studies of the physical effects (e.g., heart rate, blood chemistry) have been restricted to captive or semi-captive animals." Ellis *et al.* (1991) and USFWS (1998): Ellis *et al.* (1991) is included in the Draft EIS in Section 4.5.2.1 and in Chapter 6.0, References. The Biological Opinion by USFWS (1998) does not include original research but does include a literature review and identifies concerns with regard to studies conducted to date on raptors, focusing especially on Mexican Spotted Owl, which had been recently federally listed as a threatened species at the time of the Biological Opinion and had not been studied with regard to aircraft overflight. This species is located outside the NMTRI project area but had extensive occurrence under the airspace under the review in the 1998 Biological Opinion. Subsequent to the Biological Opinion, studies on the Mexican Spotted Owl and its response to overflight have been conducted (e.g., Johnson and Reynolds 2002). Johnson, C.L. and R.T. Reynolds. 2002. *Responses of Mexican Spotted Owls to Low-flying Military Jet Aircraft.* USDA Forest Service Rocky Mountain Research Station Research Note RMRS-RN-12. 4 pages. January 2002 Comment BI-23 states that in the Draft EIS, "Information is drawn mostly from sources such as other military reports, internal government reports not subject to peer review, preliminary studies, studies not applicable to the Draft EIS Proposed Action, and telephone conversations to conclude that biological resources including protected species are not likely to be significantly impacted by the Draft EIS Proposed Action." This statement is incorrect. In the Draft EIS in Sections 4.5.2.1 and 4.5.3.1, 34 references are cited. Of these, 17 are in peer-

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		reviewed professional journals; 7 are military (largely Air Force) documents or reports; 4 are government documents available to the public; 4 are from proceedings of professional meetings; and 2 are government documents not available to the public. No telephone conversations or personal communications were used or cited in Draft EIS Sections 4.5.2.1 or 4.5.3.1. Only one of the studies cited could be considered a preliminary study. Concerning "studies not applicable to the proposed actions," Section 4.5.2 indicates that because studies are not available for most species in the ROI, a general review of the literature on animal response to aircraft noise is given. With regard to the footnote 1 contained in this comment (letter 0038 page 25), the preparers appreciate the commenter pointing out that a specific paper included in the references section was not readily available to the public. This reference was not cited in the analysis presented in the EIS, but was inadvertently included in the references list. It will be taken out of the reference list in the Final EIS.
3013	BI-24	The NMDGF identified the location of two Lesser Prairie Chicken Conservation Areas in De Baca and Roosevelt counties. These Prairie Chicken Conservation Areas are on lands owned by the State of New Mexico. Lesser prairie chickens are a candidate for listing under the ESA and are listed as sensitive by the State of New Mexico, as documented in Appendix H of the Draft EIS. The potential impact to lekking prairie chickens was discussed in Section 4.5.3.1 of the Draft EIS. The Prairie Chicken Conservation Area in DeBaca County is under the Pecos South Low MOA, which currently has an approved floor of 500 feet AGL. The Prairie Chicken Conservation Area in Roosevelt County is in the area identified as the "eastern expansion of the Pecos MOAs (Figure 2-2 of Draft EIS)." Under the Draft EIS Proposed Action, this area would be newly exposed to low-altitude overflights (500 feet AGL). Both Prairie Chicken Conservation Areas would experience new noise due to sonic booms. The NMDGF is proposing that the Air Force restrict low-level flights over these Prairie Chicken Conservation Areas from 15 February to 15 June between 3:00 a.m. and 9:00 a.m.
0040	BI-25	Limited studies have been conducted on aircraft overflight on livestock. The studies cited reflect the best available information on potential impacts to livestock from aircraft overflights. Additional studies on aircraft overflight on livestock and wildlife were reviewed and cited in this Final EIS.
0004	CM-1	Cumulative impact analyses were prepared in accordance with the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) guidelines and are found in Chapter 5.0 of the Draft EIS. The selection of past actions is consistent with United States Environmental Protection Agency (USEPA) guidance which states that the NEPA document should consider how past activities have historically affected and will continue to detrimentally affect the resources of concern. All relevant airspace actions within the region were described and assessed. Special attention was given to including cumulative environmental considerations as early as possible to improve decisions. The Air Force sought to develop partnerships with both federal and non-federal stakeholders early in the planning process to improve communication and avoid impacts wherever possible. As described in the EIS, this included meetings and correspondence with local, state and federal representatives, as well as the general public, to identify their concerns and plan project elements to avoid

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		impacts. The potential for cumulative impacts that could come from different elements of NMTRI were specifically addressed in this Final EIS Section 5.1.2.
0038	CM-2	Chapter 5.1.1 describes the military, federal, and non-federal actions that have been considered in the cumulative impact analysis provided in Chapter 5.1.2. Additional information has been added to these sections of the Final EIS to address cumulative impacts. However, with respect to the request for detailed analysis of the impacts of past actions, such as "the noise, traffic, and other effects from aircraft passing through the same airspace," recent cumulative effects guidance by the President's CEQ has emphasized that the review of past actions is required only to the extent it would inform agency decision making. CEQ Memorandum, "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis" (June 24, 2005). Apart from the general demand by the commenter to conduct such a theoretical analysis, no specific information has been provided to the Air Force during scoping or in comments on the Draft EIS that leads the Air Force to believe that such an analysis of past actions would be relevant to analysis of the impacts of the Air Force's proposed action.
0038	CM-3	As noted in Draft EIS Section 1.2.1 and 1.2.2, military aircraft have been training with air-to-ground munitions in the Pecos Airspace Complex and Melrose AFR since 1943. The specific types of aircraft and their dates of operations within the airspace are presented. The cumulative effects analysis considered and evaluated all past, present, and reasonably foreseeable future actions with a potential to produce cumulative effects. As described in the Draft EIS Section 5.1.1.1, several of these actions were identified in the baseline or existing conditions, which is an appropriate and accepted method for evaluating many types of effects, for example noise, in NEPA analyses. The Draft EIS considers activities since 1994 and includes information available on actions announced between November 2005 and May 2006 (see Section 5.1.1.1). In each of these analyses, impacts that could affect wildlife were addressed as they are in this proposal. Since then, the noise levels have changed intermittently for the last 10 years due to U.S military support of No Fly Zones in the Middle East and Operation Iraqi Freedom. Noise effects on wildlife tend not to be cumulative. As discussed in the biological resource analysis, the literature indicates for many different types of animals in many different types of environments that responses of unconfined wildlife to aircraft overflight, if any, are minor and transitory in duration, and response from wildlife diminishes with successive exposures, indicating habituation. Additionally, no significant adverse effects on habitat have been associated with aircraft overflight in the project area. The analysis in Chapters 4.0 and 5.0 indicates no substantial effects of chaff and flare use on the physical or biological environment. The M-206 flare is currently analyzed for use in the training airspace. The M-206 flare can be used either in training or in combat depending upon the anticipated threat. The M-206 flare is described in the Draft EIS, Appendix B. However, during public hearings on the Draft EIS, materials were presented by a commenter that were subsequently identified as coming from a Multi Jettison Unit (MJU)-7 type flare. Such flares are not analyzed for use in the Pecos MOA/ATCAA or any NMTRI proposed airspace. The Air Force has implemented standing instructions to brief pilots training in the existing or NMTRI proposed airspace that only RR-188 chaff canisters or M-206 or

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		equivalently sized flares are permitted for training use within the MOAs and ATCAAs.
2015	CU-1	Existing conditions for cultural resources are found in the Draft EIS in Section 3.6. Only those resources that are listed on the New Mexico State Register or the National Register of Historic Places (NRHP) are listed in Draft EIS Section 3.6.2, Table 3.6-1. These resources are concentrated in Fort Sumner. Cultural resources that may be eligible or potentially eligible for the State or National registers are mentioned in Section 3.6.2.2. Although cultural resources that are not listed on either register may still be subject to impacts under NEPA, no such impacts have been specifically identified. It is beyond the scope of the Draft EIS Proposed Action or alternatives analysis to identify and evaluate unlisted properties for NRHP eligibility.
3007	CU-2	Issues and concerns for cultural resources are discussed in Section 4.6.2 of the Draft EIS. Your concerns regarding possible effects from the Draft EIS Proposed Action have been addressed through edits to Sections 3.6 and 4.6 of this Final EIS.
3007	CU-3	The affected environment for cultural resources is found in the Draft EIS in Section 3.6; environmental consequences are presented in Section 4.6. Your background information concerning the traditional cultural uses of Fort Sumner State Monument, interaction with the Air Force, and concerns over maintenance of the existing NSA have been addressed through textual changes in Sections 3.6 and 4.6 of this Final EIS.
2015	CU-4	The Draft EIS was prepared with the best available information. The Air Force sought the additional sources suggested during the public comment period. The monograph that commenter refers to was not publicly available.
0007	DP-1	To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned, which will deconflict F-16s from most general aviation traffic that fly below FL180.
0038	DP-2	As stated in Chapter 1.0 of the Draft EIS, Section 1.2.2, the military training airspace for combat training associated with NMTRI includes ATCAAs, MOAs, and Restricted Areas that comprise what is termed the Pecos complex. Section 1.2.2 explains that there are no proposed changes to MTRs that traverse the Pecos complex. These MTRs are discussed in Section 3.1.2. Neither the configuration nor use of the MTRs would be affected by NMTRI. The Draft EIS clearly described the effects of proposed changes in airspace use by addressing the environmental consequences to resources underlying the ATCAAs and MOAs. Comments on the Draft EIS recommended including the baseline aircraft MTR use as well as any changes in airspace use associated with NMTRI proposals. In response to the comment, the Air Force has assessed the noise levels on MTR segments traversing the Pecos complex. When compared with Table 4.2-2 of this EIS, the levels presented below are within the levels projected for the Pecos MOA complex.

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		Noise Levels of MTRs Traversing the Pecos MOA Complex[1]

MTR	*Annual Operations*	ROUTE WIDTH *3*[2]	*8*	*10*	*45*[3]
VR-100/125	375/year	<43.0 L_{dnmr}	41.7 L_{dnmr}	40.7 L_{dnmr}	<36.0 L_{dnmr}
IR-113	26/year	<31.4 L_{dnmr}	30.9 L_{dnmr}	29.1 L_{dnmr}	<24.4 L_{dnmr}
VR-1107/1195	272/year	<41.6 L_{dnmr}	40.3 L_{dnmr}	39.3 L_{dnmr}	<37.3 L_{dnmr}

Notes:
1. This is for all F-16s, flying at 500 feet AGL. In lieu of actual busiest month operations data, this is calculated from 1/12 of annual operations. All operations are assumed to be daytime.
2. Noise level estimated at 4 nm route width.
3. Noise level estimated at 30 nm route width.

L_{dnmr} = Onset-Rate Adjusted Monthly Day-Night Average Sound Level

2019; 3010	DP-3	Certain aspects of Alternative A, the preferred alternative, including floors and ceilings, have been clarified as a result of the Draft EIS process. These clarifications have been incorporated in this Final EIS as mitigations by avoidance to reduce the potential for significant airspace impacts.
0038	DP-4	The Draft EIS Proposed Action, Alternative A (the preferred alternative), and Alternative B offer different airspace modifications to meet the purpose and need for action. These alternatives are designed to meet airspace changes as described in the purpose and need for NMTRI. The primary, but not sole, impacts of the action are related to airspace management. The impacts under these alternatives may be similar for resources not markedly affected by the specific differences between the actions considered. Other resources, such as airspace management, may show substantial differences.
0038	DP-5	The No-Action Alternative is described in paragraph 1 of Section 2.2.4 of the Draft EIS. This description is accurate. The Draft and Final EIS Chapter 1.0 describes the limitations to Cannon airspace, the mission and tactics needed for Cannon aircrews, and the current airspace constraints. The description in Section 2.2.4 could repeat all of Chapter 1.0, but that is neither desired nor required in an EIS. Section 2.2.4 correctly and adequately summarizes the No-Action Alternative. Additional details of training foregone by the No-Action Alternative are comprehensively presented in Chapter 1.0, Purpose and Need. The effects of the No-Action Alternative are addressed for each resource section of Chapter 4.0, Environmental Consequences. In general, the resource specific discussions note that the level of Air Force operations in the area would remain unchanged, and as a result no change in environmental conditions over baseline conditions would be expected to arise. Any effects currently experienced by a given resource would continue to be experienced. However, selection of the No-Action Alternative would not exacerbate or mitigate any such effects.
0036; 3010	DP-6	Part of the lateral expansion of Pecos MOA is included in the "shadow" of the White Sands complex. Albuquerque Center agreed on the airspace proposal specifics submitted to the FAA by the Air Force on 12 July 05. Military training airspace and physical dimensions were mitigated and agreed on by the Air Force and Albuquerque Center to maximize the NMTRI mission without unduly impacting the National Airspace System Commercial aircraft crossing the Pecos MOA/ATCAA as part of the described White Sands "Shadow" area are included in the aircraft numbers presented in Draft EIS Sections 3.1, 4.1, and Appendix E.

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		Clarifications to Alternative A, the preferred alternative, have been incorporated into this Final EIS in response to information provided during the public review of the Draft EIS.
0038	DP-7	Chapter 2.0 of the Draft and Final EIS presents the proposed action and alternatives. Criteria for developing the proposed action and application of criteria and considerations to develop the proposed action and alternatives are presented in Section 2.1. In accordance with 40 Code of Federal Regulations (CFR) 1502.14, the Draft and Final EIS reviews all reasonable alternatives and explains alternatives which were considered but not carried forward for detailed study. Alternative A, the preferred alternative, has been clarified in response to the EIS process as noted in response DP-3.
0027	EJ-1	Sections 3.9 and 4.9 of the Draft EIS consider low income communities and the minority and youth population under the airspace. There are no known studies of unborn children and unborn animals in Roosevelt County.
	GE-1	Public and agency involvement is an important part of the NEPA process, and all letters and their associated comments whether bracketed or not are taken into consideration by the Air Force in its decision making process. The Air Force would like to express appreciation for your comments and participation in the NEPA process.
0040	LU-1	Section 4.7 of the Draft EIS describes impacts to land use including ownership and Section 4.8 discusses the effects of noise on property values. Residential property values in the vicinity of airfields in general are affected by a variety of non-noise factors such as national, regional, and community economic conditions; national and regional trends in employment, inflation and interest rates; local population changes; and real estate development. A recent study indicates that aircraft noise, "is predictably unrelated to residential property sale prices in the vicinity of Langley Air Force Base [and]...strongly suggests a lack of causal relationship as well" (Fidell *et al.* 1996a). The study of property near Langley AFB found property sales trends to be historically similar within and outside of the 65 Day-Night Average Sound Level (DNL) and above noise contours. While the property value study does not specifically address the overland training airspace associated with the Draft EIS Proposed Action which is more rural in character, property values are likely to be affected by similar types of factors. Noise levels are expected to remain below 45 Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) under the MOAs under both baseline and project conditions (see Table 4.2-2 in the Draft EIS). While property values may be affected by local perceptions of environmental issues, such as noise exposure, the complex interaction of multiple economic and real estate factors makes the estimation of such effects highly speculative.
3006	LU-2	Section 4.7 describes the impacts to land uses including ownership. The NMTRI proposal involves strictly a change in airspace and not a land acquisition. Therefore as stated in Section 4.7.3, a change in ownership is not expected as a result of the Draft EIS Proposed Action or alternatives. Potential impacts from overflights on land are found in numerous sections of the Draft EIS including 4.2.3 Noise, 4.3.3 Safety, 4.4.3 Physical, 4.8.3 Socioeconomics, etc.
0038	LU-3	The effects of aircraft overflights and noise in human resources are discussed in both Sections 4.7 (Land Use) and 4.8 (Socioeconomics).

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		It is difficult to assess potential impacts on individual lifestyles. Various conventional lifestyles may be potentially affected by the proposal including farming and ranching, recreation, and military. The military has been conducting military aircraft operations in the area for 60 years. Projected military operations and associated changes to the noise environment are described in the Draft EIS. Over the years, Cannon AFB has created a No Fly Zone over the commenter's property.
0001	NO-1	The effects of sonic boom on windows and adobe houses are found in the Draft EIS in Sections 4.2.2 and 4.2.3. Rattling of windows may occur, and is part of the annoyance aspect of sonic booms. Annoyance is subjective. It is expected that some individuals, especially near the center of the airspace, may be annoyed. The Capitan Mountain area is outside the proposed supersonic airspace. The potential for damage to windows or adobe is extremely small.
0003; 0005	NO-2	The effects of noise and sonic boom on various types of structures are found in the Draft EIS in Sections 4.2.2 and 4.2.3, and Appendix G. Sonic booms do not pose a risk to wells or cement structures in good condition. As noted in Section 4.2.3.1, the Air Force has established procedures for damage claims.
0038	NO-3	The Air Force complies with all applicable Federal Aviation Regulations. The Air Force establishes avoidance areas as needed to avoid sensitive locations. Such locations are identified in flight charts and related documentation. One percent of training flights would continue to be between 500 feet AGL and 1,000 feet AGL, and the majority of time spent at these altitudes is over Melrose AFR.
0015	NO-4	The environmental consequences of sonic booms from the Draft EIS Proposed Action are found in Draft EIS Section 4.2.3. It is expected that some individuals, particularly toward the center of the airspace, will be annoyed. The community of House is near the edge of the airspace, and (as illustrated in Figure 4.2-2) will experience about one-tenth the sonic boom exposure as the center of the airspace. That corresponds to, on average, a boom once every two weeks
0016	NO-5	The current noise and sonic boom environment is described in the Draft EIS Section 3.2.2, and the noise and sonic boom environment under the Draft EIS Proposed Action is described in Sections 4.2.2 and 4.2.3. A summary comparison of aircraft noise is presented in Table 4.2-2. Operations and jet noise in the community of House will not increase. Sonic booms will increase. The community of House is, however, near the edge of the airspace, and (as illustrated in Figure 4.2-2) will experience about one-tenth the sonic boom exposure as the center. That corresponds to, on average, a boom once every two weeks.
2001	NO-6	Approximately 1 percent of training time would be between 500 and 1,000 feet AGL as described in Section 2.2.1.5 of the Draft EIS. This does not represent a change from current training flights. The expanded airspace proposed under NMTRI would mean that some land areas under the airspace would experience more noise and some areas would experience less from the distributed training flights.
2001	NO-7	The environmental consequences of sonic booms from the Draft EIS Proposed Action are found in the Draft EIS Sections 4.2.3. As stated in the Draft EIS, some individuals, particularly toward the center of the airspace, are expected to be annoyed by an increase in sonic booms.
2004	NO-8	The environmental consequences of noise from the Draft EIS Proposed Action are found in the Draft EIS Sections 4.2.3 (people and structures) and 4.5.3

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		(wildlife). Effects on land use are discussed in Section 4.7.3. While individual responses to noise vary, analysis shows that overall there is little or no expectation of adverse impact in the area affected. The Draft EIS Proposed Action will cause no changes in noise in the Beak MOA.
0020; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032; 0034	NO-9	The potential for damage from sonic booms is discussed in Sections 4.2.2 and 4.2.3 of the Draft EIS. The damage probabilities cited in Section 4.2.2 are very low. In some cases, damage from sonic booms may be difficult to distinguish from deterioration due to weather or age. There is, however, a possibility of damage to susceptible structures. If a sonic boom causes damage, the Air Force has established procedures for claims.
0020; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032	NO-10	Noise consequences of the Draft EIS Proposed Action are described in the Draft EIS Sections 4.2.2., 4.2.3, 4.5.2, and 4.5.3. Background information on noise and its effects may be found in Appendix G. Studies used in the analysis are cited. All documents cited will be part of the Administrative Record for this action, and will be available for inspection.
0033; 0032; 0038	NO-11	Noise consequences of the Draft EIS Proposed Action are described in the Draft EIS Sections 4.2.2., 4.2.3, 4.5.2, and 4.5.3. Background information on noise and its effects may be found in Appendix G. The conclusions in the Draft EIS are based on a large body of mainstream scientific data.
0034	NO-12	The consequences of noise on animals are addressed in the Draft EIS Sections 4.5.2 and 4.5.3. Noise levels resulting from the Draft EIS Proposed Action and alternatives were computed by state-of-the-art models described in Section 3.0 of Appendix G. The Draft EIS Proposed Action does not involve any change in activity at Cannon AFB. The total flight activity from Cannon AFB is not projected to change as part of NMTRI.
0038	NO-13	The recreational activities in the ROI are recognized in the Draft EIS. Fidell and Silvatti (who are independent consultants, not Air Force researchers) have assessed noise impacts on outdoor recreationists. An interesting finding in a recent study by Fidell (Fidell, White, and Sneddon 2003) is that most of the noise experienced by recreationists is self-generated. That study was also of interest because it included observer-based measurements and noise monitoring at fixed locations. An earlier study by Fidell, Silvatti and others (1996b) (Fidell, S., Silvatti, L., Howe, R., Peasons, K. Tabachnick, B., Knopf, R., Gramann, J., and Buchanan, T., "Effects of aircraft overflights on wilderness recreationists," *J. Acoust. Soc. America*, 100 (5), November 1996) showed that a Schultz-like curve, offset 7 dB from the standard community noise Schultz curve, was a good predictor of annoyance by recreationists in National Forest Service wilderness areas. This contradicts the opinion of Harrison *et al.* that the assumptions and methodology of the Schultz curve are not appropriate for wilderness areas, but certainly supports a conclusion that the criteria in wilderness areas should be different than those in communities. While the results of Fidell *et al.* (1996) indicate that conventional noise analysis methodology is applicable to wilderness areas, studies of aircraft noise in National Parks have suggested that the most important noise quantity is the time that outside noise events are heard. Background information on the National Park Service's time audible analysis may be found in "Report on Effects of aircraft Overflights on the National Park System," July 1995, a report to Congress pursuant to Public Law 100-91. Figure 6.8 of that report shows dose response of

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		park visitors annoyance versus the percent of time aircraft are audible. The figure contains data only for times greater than 1 percent. The Park Service has subsequently concluded that natural quiet in the Grand Canyon would be restored if tour aircraft were audible no more than 25 percent of the time in 50 percent of the park. Table 4.2-2 of the Draft and Final EIS presents the number of audible events for the Proposed Action. The total time associated with these events is less than 1 percent, which is well within the criteria the Park Service has established. There are, of course, no National Parks in the ROI, and the National Park Service criteria are based on a specific park situation. The work presented in Fidell *et al.* (1996), which is based on the exposure of recreationists in National Forest Service wilderness areas and is relatable to the Schultz curve, could have been used for the current analysis. The National Park Service practice is, however, also observer-based in real recreationists situations, and we consider it to be applicable to the kind of occasional noise associated with the Proposed Action. The margin between the projected noise and the thresholds applied to parks is so large that no risks are expected.
0038	NO-14	Section 4.2.2 of the Draft EIS identifies the form of the Schultz curve referenced in the analysis. This is the form endorsed by the Federal Interagency Committee on Aircraft Noise, whose members include the USEPA and the National Park Service, as well as DoD, FAA, National Aeronautics and Space Administration, and the Department of Housing and Urban Development. We are aware of opinions such as those presented by Miedema. Because of the controversy and complexity associated with those diverse models, analyses such as Miedema's, although scientifically interesting, are not accepted as the best available technology.
0025; 0038	NO-15	A quantitative analysis of sonic booms associated with the Draft EIS Proposed Action may be found in Draft EIS Section 4.2.3. Sonic boom exposure will increase, as stated. The greatest sonic boom exposure, in the center of the airspace, will be C-weighted Day-Night Sound Level (CDNL) of 52 dB. This level of exposure will not have significant adverse effects. It is recognized that some individuals will be annoyed by sonic booms, and there is potential for occasional damage. Historic damage claims are recognized in the analysis. The damage possibilities presented in the Draft EIS (Section 4.2 and Appendix G, Table G-3) are derived from damage experience and claims. The sonic boom damage claim presented as Exhibit M - a broken window - is the kind of damage that can occur from time to time.
0038	NO-16	The noise analysis methodology and models are described in detail in Appendix G of the Draft EIS, and are cited in the body of the document, particularly Sections 3.2 and 4.2. The methods and models represent the best available technology, and are the state of the art. The FY96/97 Environment, Safety and Occupational Health Strategic Plan attached as Exhibit P is not Air Force policy, and was never actually published by the Air Force.

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		DNL does not account for the surprise effect of the sudden onset rate of high-speed aircraft noise, and by itself would underpredict noise effects. That is the reason the Air Force sponsored the development of the L_{dnmr} metric presented in the cited works by Plotkin and Stusnick. Those studies followed well-established processes for quantifying loudness effects. Subjects were selected from rural populations that were exposed to this type of noise. The importance of the onset rate effect was initially identified from anecdotal accounts of residents in a sparsely populated Western ranching area. The onset rate adjustment embodies in L_{dnmr} is recognized by the scientific community, and is standardized in American National Standards Institute S12.9 Part 4, cited above.
0038	NO-17	Most of the mitigation measures suggested are generally not feasible or are nonexistent for military aircraft, and many are not commonly practiced for any aircraft. There are no quiet versions of the aircraft that require this airspace, nor are there add-on mufflers for any jet aircraft. Noise cancellation is not available for practical application to in-flight noise from any type of aircraft, and will probably never be feasible for high-performance military aircraft. Altitudes, maneuvers and number of operations are dictated by training needs. Sound insulation is an effective solution for structures around airports, where noise exposure is regular and frequent. It carries some adverse effects itself, such as the need to seal windows. It has never been regarded as a cost effective measure for this kind of noise environment, where noise events are infrequent as quantified in Table 4.2-2 of the Draft EIS.
0040	NO-18	The predicted noise and sonic boom levels associated with the Draft EIS Proposed Action may be found in the Draft EIS Section 4.2. Effects on people and structures are analyzed in Section 4.2, and effects on animals are analyzed in Section 4.5.3. Further background on noise and its effects is presented in Appendix G. Noise is quantified in terms of L_{dnmr} (an annual average, similar to DNL but incorporating a penalty for the nature of high speed aircraft noise), the maximum level L_{max}, and the SEL. Sonic booms are quantified in terms of CDNL (an annual average, similar to DNL but recognizing the low-frequency content of sonic booms) and the peak overpressure. The USEPA-identified level of 55 dB is DNL, an annual average metric. The L_{dnmr} metric was designed to work on the same scale as the DNL metric, with the major difference being that the L_{dnmr} metric assesses a penalty of up to 11 dB to account for added annoyance caused by high-speed aircraft overflights. There are always individual events whose levels exceed the average. Table 4.2-2 shows both the annual average level L_{dnmr} (which may be compared to USEPA's identified level of 55 dB), plus the number of times that noise from single events exceed a sound exposure level of 65 dB. The single event information provides a description of how often an aircraft might be heard. USEPA's analysis accounted for the presence of individual noise events. For reference, Figure G-1 in Appendix G shows the individual sound levels associated with some common sounds.

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		The sonic boom environment varies across the airspace, as shown in Figure 4.2-2. The stated numbers of sonic booms corresponds to the maximum in the center of the airspace, where CDNL is 52 dB. Elida is near the edge of the airspace, where the sonic boom environment is about 10 dB lower. That corresponds to a sonic boom about once every two weeks, on average.
0038	NO-21	The FY96/97 Environment, Safety and Occupational Health Strategic Plan attached as Exhibit P is not Air Force policy, and was not published by the Air Force. However, all of the needs listed in the Environment, Safety and Occupational Health document have been addressed in the development of the methodology over the last ten years.
0008; 0038	NP-1	This NMTRI Draft EIS has been prepared in accordance with NEPA (42 United States Code [USC] 4321-4347), CEQ (40 CFR § 1500-1508), and 32 CFR 989, *et seq., Environmental Impact Analysis Process* (formerly known as Air Force Instruction [AFI] 32-7061).
0040	NP-2	The NMTRI proposal addresses current Air Force training requirements for the F-16. No future alteration of airspace, basing of additional squadrons, or conversion to different aircraft was contemplated for the NMTRI proposal. However, should the Air Force propose to alter any of these in the future, appropriate action would be taken in accordance with the requirements of NEPA, with the involvement of appropriate government agencies and public. Section 5.1 identifies and discusses cumulative actions, including the recent Base Realignment and Closure decision and proposed mission change at Cannon AFB.
0005; 0038; 0040; 0043; 2012; 3006	NP-3	The Military Claims Act, 10 USC 2733, provides a mechanism for the payment of claims resulting from non-combat activities by the Air Force, including sonic booms caused by the operation of military aircraft. The Air Force is committed to promptly investigate any claims for damages to property or livestock caused by Air Force overflights, and to make payments as permitted under federal law. Claims alleging damage are thoroughly investigated by the Air Force on a case-by-case basis. This ensures that the Air Force meets its obligation to both the claimant and the tax-paying public. At Cannon AFB an established procedure for filing a claim may be initiated by contacting the Public Affairs Office.
0008	NP-4	The New Mexico State University College of Business calculated the 2004 economic impact of Cannon AFB to be: gross receipts of $212,500,000; value added of $122,190,000; and employment of 6,850.
0008	NP-5	Expenditures on the EIS are required to fully meet NEPA procedures, which include public hearings. Nearly all individuals at the NMTRI public hearings who represented the Air Force and provided information to the public were salaried employees who received no additional compensation for their support of the evening public meetings.
0008; 2015	NP-6	Chapter 8.0 presents the list of preparers for this EIS as required by 40 CFR 1502.17. As presented, each analyst possesses the necessary qualifications to prepare the applicable portions of the Draft EIS. Many of these individuals have worked in the southwestern United States during their careers.
0008	NP-7	The cover sheet provides a summary statement of the environmental impact analysis. Chapter 4.0 presents the analysis for all environmental resources and discusses in detail potential effects for the Draft EIS Proposed Action and alternatives.
0008	NP-8	As discussed in Section 2.4, some environmental resources were not carried forward for separate evaluation in this EIS because it was determined that

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		implementation of the Draft EIS Proposed Action or any of the alternatives would be unlikely to affect those resources. This approach is consistent with 40 CFR 1506.3. Air quality is one of the resources not analyzed in this document. NMTRI does not propose any changes in the number of training flights, jet fuel use, or emissions. Air quality within the area is currently in attainment for federal and state standards and no element of the Draft EIS Proposed Action or alternatives are anticipated to have any affect on these standards since no demolition, construction, or changes in aircraft sorties are anticipated.
0012; 0020; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032; 0041; 2007	NP-9	NMTRI does not propose any changes to Melrose AFR dimensions, use, or management. Melrose AFR is currently managed to provide adequate vegetation for long-term environmental quality. Recent weather conditions increased vegetation growth on the range and throughout the surrounding area. Any effects of this vegetation growth are not related to NMTRI. Oil and gas leasing is based upon complex national and international economics. No part of the proposed NMTRI action would affect any decisions regarding oil or gas leasing within the ROI.
0014	NP-10	Through the NEPA process, the public has numerous opportunities to help shape proposals and influence decision making for a project. While public comments under NEPA are not a "vote" on whether to proceed or not with a proposed action, substantive comments on this EIS can and do influence the decision and the final outcome. If any future actions were to be contemplated, the NEPA process for those actions would also provide for public input.
0004; 0038	NP-11	The Environmental Impact Analysis Process, presented in Section 2.4 of the Draft EIS, did not yield significant environmental consequences associated with the proposed action or alternatives. However, the public hearings and agency and public comment process helped to further identify areas for potential impacts. As a result, the Final EIS presents a preferred alternative that incorporates mitigation measures to further reduce potential impacts, and additional mitigation measures are identified in responses to comments.
0004; 0038; 2006; 2024; 2028	NP-12	When chaff is ejected from an aircraft, it is being used for its intended defensive training purpose and is not being "carelessly discarded." As described in the Draft EIS Section 4.7.3.1, "although the likelihood of encountering any chaff or flare residual components is low, if such were found, it could result in annoyance to the observer." There are no applicable federal laws or regulations that specifically identify chaff as litter, or that even indicate that the use of chaff constitutes littering. The USEPA defines litter as "The highly visible portion of solid waste carelessly discarded outside the regular garbage and trash collection and disposal system." (http://epa.gov/OCEPAterms/lterms.html). A field study of two locations where chaff has been used for decades, including an arid location where chaff has been used intensively, examined the potential for chaff to accumulate and create land use or visual impacts (Air Force 1997a). Chaff was found to dispense and settle over broad areas, thus being unnoticeable under most conditions. Occasionally, clumps of chaff that had not dispersed properly were found to be visible at short distances, generally less than 25 feet away. 1-inch by 1-inch chaff or flare plastic or nylon pieces may likewise be visible. Findings indicate that adverse effects on land use or visual resources are unlikely (Air Force 1997a). Annoyance could occur if the end cap or other materials were found on either private or public property. This annoyance is

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		recognized in the Draft EIS and is taken into consideration in the overall statements that chaff or flare materials are not projected to have an adverse effect on land use or a long-term effect on visual resources. NP-3 describes the Military Claims Act.
2015	NP-13	The Draft EIS was prepared by qualified technical analysts. Citations for the assertions in this document are provided where appropriate. Chapter 7.0 provides a list of references used to prepare the Draft EIS.
2028	NP-14	Materials shown at the NMTRI scoping meetings were included with objects identified by the commenter as having come from a crashed aircraft. During Draft EIS public hearings, the commenter provided clarification, more objects, and more detail regarding the materials that permitted identification of some objects. Sections 2.2.1.4, 4.1.3.1, 4.5.2.2, and 4.7.3.1 include information on identified objects.
0020; 0023; 0024; 0026; 0027; 0028; 0029; 0032	NP-15	The public was encouraged to provide verbal and written comments during the public hearings or mail written comments on or before February 22, 2005, the close of the formal public comment period. The public hearings on the Draft EIS were conducted in New Mexico in January 2005, as follows: January 24 in Roswell; January 25 in Santa Rosa; January 27 in Fort Sumner; and January 28 in Clovis.
3012	NP-16	The Air Force contacted Bob Anderson of the National Park Service Midwest Region in October 2004 to discuss coordinating requirements for Land and Water Conservation Fund Section 6(f). As a result of this communication, a Draft EIS was provided to Mr. Nelson in January 2005 along with a transmittal letter requesting concurrence and comments during the public and agency comment period for the Draft EIS. A copy of the Draft EIS was also sent at that time directly to Ms. Massengill in Santa Fe, New Mexico. The Air Force provided all agencies 45 days to make comments. As a result of public and agency review, mitigations were incorporated into Alternative A, which was then designated as the Air Force's preferred alternative. The National Park Service has been provided a copy of the Final EIS.
0038	NP-17	All comments received concerning the Draft EIS are presented in Appendix J of this Final EIS (immediately following this response table). As such, they are automatically part of the Administrative Record. Documents cited and used in preparation of the Final EIS have been incorporated in the Administrative Record.
2006; 0034	NP-18	During public hearings on the Draft EIS, commenters presented materials which were later identified as flare residual materials not consumed during deployment of the flares. Subsequent review of the materials identified them as coming from either MJU-7B or MJU-7 A/B flares. The flare type currently assessed for defensive training within the Pecos MOA complex is the M-206 flare which is one-half the size of the MJU-7 A/B flare. The M-206 flare is currently assessed and can be used either in training or in combat depending upon the anticipated threat. The M-206 flare is described in the Draft EIS, Appendix B. The MJU-7 A/B flare has not been assessed for use in the Pecos MOA complex and is not part of this proposal. Clarification on flare use has been added to this Final EIS, Section 2.2.1.4 and Appendix B.
0038	NP-19	As a cooperating agency, all comments received on the Draft EIS have been provided to the FAA. FAA will independently evaluate the Final EIS including comments received and these responses.

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0020; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032; 0034; 2011	NP-20	Section 2.4.1 of the Draft EIS discusses the scoping process which was conducted from December 31, 2003 through March 1, 2004. Although there is no requirement to prepare registered letters, the Air Force implemented an extensive public information effort that included the soliciting of comments through press releases, newspaper ads, public service announcements, flyers, letters, and postcards throughout the two-month scoping period.
2011; 0020; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032	NP-21	The public comment period of 45 days exceeds the 30 day comment period requirement of 40 CFR 1506.10.
0034	NP-22	As described in the Draft EIS, the potential for damage from low-level overflight or sonic boom overpressure is very low.
0034	NP-23	The 27 FW has taken measures to reduce noise levels in our operating areas by limiting flights over populated areas and reducing low level operations whenever possible.
0001; 0014; 0020; 0021; 0022; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032; 0033; 0038; 2004; 2016	PN-1	The 27 FW and the 150th Fighter Wing (150 FW) needs the ability to train in a realistic environment that approximates combat situations they will routinely face during conflicts overseas. This is discussed in Sections 1.3 and 1.4 of the EIS. Other airspace units in New Mexico have been considered to meet these needs, as discussed in Section 2.1. White Sands Missile Range (WSMR) does not meet the utilization and availability criteria because multiple Army missions, Holloman AFB-based aircraft and other users have priority over Cannon AFB training missions. WSMR is distant from Cannon AFB and would not maximize training time. Similarly, Mt. Dora MOA does not meet the operational criteria of maximizing F-16 training time due to its distance from Cannon AFB. The Mt. Dora MOA is not adjacent to a training range thus inhibiting training in the full spectrum of missions and tactics. Overseas training is impractical to meet the need. Supersonic training needs to be conducted in conjunction with other training events in proximity to Cannon AFB. Although ACC expects the last aircraft to leave Cannon in early 2008, the Air Force maintains the requirement for charting NMTRI airspace. As of spring 2006, 27 FW has 50 F-16 pilots training for a combat deployment to Iraq; NMTRI airspace would greatly enhance their combat training, combat effectiveness, and survivability in war as described in the EIS. Additionally, another 25 pilots will continue to train in NMTRI airspace in preparation for combat later in 2007 and Cannon AFB F-16 aircrews will continue to train in Cannon's airspace well into 2008; it is in the nation's best interest to chart NMTRI airspace as expeditiously as possible to enhance our national security. After the 27 FW aircraft depart Cannon AFB, the 150 FW (New Mexico Air National Guard [NMANG]) at Albuquerque, New Mexico will continue to use the NMTRI airspace to train their F-16 crews. Air Force Special Operations Command (AFSOC) was designated as the new mission for Cannon AFB and Melrose AFR; this is discussed in Section 5.1.1.1. The hours of F-16 use is projected to decrease compared to 27 FW usage and the hours of use of other Cannon AFB-based aircraft is projected to increase. Other users may schedule and use NMTRI airspace as described in the EIS. Airspace is a national asset and NMTRI airspace is especially significant to

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		enhancing aircrew training by allowing low altitude supersonic operations, expanded MOAs/ATCAAs, and improved airspace linkage into Melrose AFR.
0006; 2015	PN-2	The 27 FW needs the elements associated with Alternative A, the preferred alternative, in order to properly train for actual combat. As discussed in Section 1.3 and 1.4, pilots require an airspace complex that is adequately sized, configured and capable of supporting representative engagement distance with hostile forces.
2007; 0041	PN-3	As discussed in Section 2.2.1.3, supersonic operations are one of the elements of the NMTRI. Supersonic employment of existing air-to-air and air-to-ground ordnance makes the F-16 more survivable in combat. In order to most effectively train for and master the evolving tactics for today's air-to-air and air-to-ground weapons, the pilots need to train in the same manner they will employ the weapon in combat situations. In many cases, this involves training for supersonic weapon employment, especially when delivering weapons such as the Advanced Medium-Range Air-to-Air Missile (AMRAAM) and the Joint Direct Attack Munition (JDAM).
0038	PN-4	The alternatives considered were designed to meet the purpose and need described in Draft EIS Chapter 1.0. Some alternatives considered were not carried forward for detailed analysis for a variety of reasons described in Section 2.3. In general, such alternatives did not sufficiently meet the training objectives underlying the purpose and need for action. As such, detailed analysis was not warranted. Figure 2-1 presents the alternative locations including the factors that were applied to potential alternatives and are fully discussed in Section 2.1.
0004	PR-1	Sections 4.4.3.1 and 4.3.3.1 discussed the dud rate of flares. From an ACC study, the dud rate is estimated to be less than 1 percent (Air Force 1997a). In addition, historic data on range clean-ups a Melrose AFR and the Utah Test and Training Range, where flare use is intensive in a relative constrained geographic area, indicated that of all flares expended, only an estimated 0.01 percent were actually found on the ground as duds.
0004	PR-2	In areas of high visual sensitivity such as state parks, any foreign object could detract from the recreation experience. The release of chaff (and flare) end caps and other pieces would average one piece per approximately 9 acres per year. If such endcaps or other related components were found it could result in annoyance to the observer. (See response NP-12) Chaff fibers on the ground rapidly break down to silica and aluminum and become indistinguishable from soil. Chaff particles can rarely be discerned from other types of soil materials, even with an electron microscope (Air Force 1997a). Training flight patterns could result in somewhat higher or lower concentrations under the airspace with higher percentages of chaff releases could occur toward the center of the airspace and a correspondingly lower percentage of chaff releases could occur toward the edges of the airspace. Chaff fibers under the Capitan ATCAA would be even less frequent due to the infrequent use of the Capitan ATCAA airspace. Tufts or clumps of undispersed, malfunctioning chaff have been discerned by the naked eye on military ranges subject to high chaff use. Such chaff does not remain in the environment long due to wind and other weather which break down the chaff.

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		Flare residual materials include end caps and wrapping. It is unlikely that chaff or flare residual pieces would accumulate in sufficient quantities to impact land uses or affect visual resources. (See response NP-12)
0037	PR-3	Draft EIS Section 4.4.3.1 discusses effects on water resources within the ROI.
0038	PR-4	During the Draft EIS process, public input on flare residual materials identified residual flare materials from unassessed flares. Notification has been made to all users of Cannon airspace that only the M-206 flare and R-188 chaff is authorized. (See response NP-18)
0038	PR-5	Section 4.3.3.1 discusses flight safety and the potential for a Class A mishap. As described in Draft EIS Section 3.3.2, the probability of a Class A mishap is 0.00024, or one chance in 42,000. (See responses SA-5 and SA-6)
0041; 2007	PR-6	Studies regarding the concentration of aluminum in the environment as a result of the use of chaff have shown that the concentrations are low enough that no adverse effects to animals would be expected. Studies of farm animals have shown that animals did not eat chaff by itself but could ingest it when mixed with food (the chaff itself had to be coated with molasses for ingestion to occur at all). Cattle and goats were fed chaff in their feed and they showed no differences in weight or development and no abnormalities in their digestive tracts when compared to controls (Spargo 1999). Due to their size, intact chaff fibers are too large to be inhaled. However, chaff fibers can be fragmented once on the ground and the degree of inhalation of these fragments, if any, is not known (Spargo 1999).
0040	PR-7	The environmental consequences of noise from the Draft EIS Proposed Action are found in the Draft EIS Sections 4.2.3 (people and structures) and 4.5.3 (wildlife). Background information on noise and its effects may be found in Appendix G. The environmental consequences as a result of chaff and flares are found in 4.4.3 (as it relates to the natural environment), 4.5.2.2 (wildlife), 4.7.3 (people as it relates to land use), and 4.8.3 (property). Studies used in the analyses are cited in text and listed in Chapter 7.0, References.
0017; 2019	SA-1	To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL 180 - FL 320 or as assigned. This airspace proposal was submitted to the FAA by the Air Force and has been mitigated/agreed on with Albuquerque Center. Neither the Air Force or the FAA have a requirement for ATC radar and ATC communications below FL 180 under Capitan ATCAA. Sections 3.1.2 and 4.3.3.1 discuss "see-and-avoid." See-and-avoid is defined in AIM as "When weather conditions permit, pilots operating Instrument Flight Rule (IFR) or VFR are required to observe and maneuver to avoid other aircraft. Right-of-Way rules are contained in 14 CFR Part 91." All pilots (military and civilian) operating under VFR have the responsibility to exercise extreme caution while flying within an active MOA when military activity is being conducted. The activity status (active/inactive) of MOAs may change frequently. VFR flights by non-participating aircraft through an MTR or MOA must employ see and avoid techniques. The Pecos MOAs will be shown on sectional charts and documented as supersonic airspace. Additionally, this airspace will be documented in Flight Information Publication as supersonic airspace. Lights out training will occur according to a Letter of Agreement between Albuquerque Air Route Traffic Control Center (ARTCC) and the 27 FW. (See response AM-5)

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0001; 0040	SA-2	Risks of a flare-initiated fire are addressed in Draft EIS Section 4.3.3.1. As described, safety risks are minimal.
2000	SA-3	To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned. Neither the Air Force nor the FAA have a requirement for ATC radar and ATC communications below FL180 under Capitan ATCAA.
0040	SA-4	The characteristics of chaff are presented in Appendix A. As noted, the compounds making up the components are commonly found in nature. Studies involving humans and animals have shown that exposure to chaff presents no health risks.
0038	SA-5	The established statistical process for calculating the probability of a Class A mishap is based upon the total number of flight hours of aircraft by aircraft type and the total number of Class A mishaps for the aircraft type. The estimation model takes into consideration the total flight hours during which a Class A impact could occur and the number of Class A impacts that did occur. A Class A impact could occur as a result of system failure, pilot error, or external causes at any time during an aircraft flight. This established statistical process documents the probability of a Class A mishap for a specific aircraft type. If a specific base experience were used to calculate Class A mishap probability instead of the total experience of the aircraft type, the safety risk could be substantially misrepresented. For example, if a base had no historic Class A mishaps for an aircraft type, the erroneous conclusion could be drawn that, at that base, there was a zero probability of a Class A mishap for an aircraft type. The statistical model used in the NMTRI Draft EIS accurately represents the potential for a Class A mishap and presents the Cannon AFB experience with the F-16 aircraft. As noted in the commenter's provided materials, the Draft EIS fully discloses both the statistical probability of a Class A mishap for an F-16 aircraft type and includes the specific number of F-16 Class A mishaps at Cannon AFB since the introduction of the F-16 to Cannon AFB.
0038	SA-6	It is extremely unfortunate that a pilot lost his life in a Class A mishap. It is also unfortunate that the accident occurred on the commenter's property. The Draft EIS explains both the risk of a Class A mishap associated with an F-16 aircraft type and the number of Class A accidents attributable to Cannon AFB-based F-16s. For any accident, the resulting debris field can be large. The information and photographs submitted by the commenter demonstrate that the Air Force responded rapidly to the crash site and continued to respond with a large number of personnel who searched for, identified, marked, and removed as much crash site materials as possible. As with any accident site, be it an aircraft or automobile, there is always the possibility that materials will not be found and removed. The commenter's claims that he has located crash site materials is consistent with what would be expected following a Class A accident recovery effort. It is important to note for both flight and ground safety that the materials identified by the commenter as having come from the aircraft crash site contributed to annoyance but have not contributed to either a human or animal safety risk. As examples, despite cattle regularly grazing the accident site, no

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		cases of cattle suffering from bovine hardware disease attributed to aircraft debris have been reported. Nor has there been any report of human or any other injury from small pieces that had not been found and recovered from the crash site by the Air Force despite their best efforts to recover all materials. The safety analysis contained in the Draft EIS accurately documents the safety risks and potential for impacts associated with military aircraft training within the airspace. The Air Force is grateful to the prompt response that past Class A mishaps have received from emergency response crews, and from the general public. The Air Force is sensitive to all aspects surrounding any Class A mishap. This includes concern for the potential loss of life of the pilot, concerns for their immediate families involved, and concern for any adverse effects to first responders.
0038	SA-7	The Draft EIS explains that it is impossible to predict the precise location of an aircraft accident. Secondary effects of such an accident include potential fire or environmental contamination. The likely health and safety impacts are documented. (See response SA-6)
0038	SA-8	The Air Force considers any Class A mishap, especially one involving loss of life, to be a matter of considerable concern. As a result, the Air Force works diligently to reduce class A Mishap rates. Implementation of any of the alternatives carried forward in this EIS analysis would not the change number of sorties or time spent by Cannon aircrew in the NMTRI airspace. As a result, the Class A Mishap rate would not change. There would be no overall change in safety.
0038	SA-9	The number of flying hours within the airspace under any of the action alternatives is the same as under the No-Action alternative. No change in the number of Class A mishaps would be expected. (See response SA-5)
0038	SA-10	The Draft EIS describes the use by transient aircraft and the Final EIS adds the Class A accident rate for representative aircraft. The F-16 accident rate presented in the Draft EIS is representative of the safety risk from transient users of the airspace (see Final EIS Section 3.3.2.3).
0006; 0017; 2013	SO-1	To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned. Capitan ATCAA will enhance general aviation operations below its floor since Albuquerque Center can see traffic beginning at approximately 10,000 feet MSL. Effects of airspace modifications on aviation use are discussed in the Draft EIS in section 4.1.3.1, 4.3.3.1, and 4.8.3.1. The proposed modifications to military airspace would not prohibit general aviation use, and are not projected to substantially effect existing commercial or general aviation use.
0007	SO-2	To avoid the potential for impacts to civil air traffic, the Capitan MOA is not a part of the preferred alternative; and the Capitan ATCAA was reduced in size to FL180 - FL320 or as assigned. The Capitan ATCAA will permit general aviation operations below its floor. Effects of airspace modifications on aviation use are discussed in the Draft EIS in section 4.1.3.1, 4.3.3.1, and 4.8.3.1. The proposed modifications to military airspace would not prohibit general aviation use, and are not projected to substantially effect existing commercial or general aviation use. Effects of airspace modifications on flight times are discussed in the Draft EIS in Airspace Management Section 4.1.3.1 and Socioeconomics Section 4.8.3.1. When notified of the occurrence of a life-flight, Air Traffic Controllers will

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		provide priority to that flight to the maximum extent practicable, deconflicting other aircraft that may interfere with Life Flight's route.
0020; 0023; 0024; 0025; 0026; 0027; 0028; 0029; 0032	SO-3	Economic impacts of the proposed airspace modifications are discussed in the Draft EIS in Socioeconomics Section 4.8.3.1. The NMTRI proposal does not stipulate changes in economic use of lands underlying the affected airspace, nor is the Draft EIS Proposed Action or alternatives expected to adversely impact the economic use of these lands. Historical land use changes, and their economic effects, are not part of the Proposed Action or alternatives and are not addressed in this EIS.
0038	SO-4	Implementation of the Draft EIS Proposed Action, any of the action alternatives or the No-Action Alternative would not change the frequency of use of the airspace overlying the commenter's property. Economic impacts of the proposed airspace modifications are discussed in the Draft EIS in Socioeconomics, Section 4.8.3.1. Your anecdotes on your ranching experiences have been referenced in the Final EIS, Sections 3.8.2.3 and 4.8.3.1 (also see the comment section of this chapter).
0039; 0040; 0041	SO-5	Economic impacts of the proposed airspace modifications are discussed in the Draft EIS in Socioeconomics Section 4.8.3.1. Noise impacts are discussed in Acoustic Environment Section 4.2.3.1. The NMTRI proposal does not stipulate changes in economic use of lands underlying the affected airspace, nor is the Draft EIS Proposed Action or an alternative expected to adversely impact the economic use of these lands. There is little evidence to suggest that the proposed changes in airspace use and acoustic environment would affect property values in the rural, sparsely populated region under the airspace (see response SO-4). Airspace use and sonic boom overpressures are not anticipated to hamper development of wind energy operations. Turbines associated with wind energy projects are subject to, and designed to withstand, wind loads far in excess of sonic boom pressures. (See response SO-7)
2004	SO-6	Effects of sonic booms on wildlife are discussed in the Draft EIS in Section 4.5.3.1 and Section 4.8.3.1.
0041; 2007	SO-7	Wind energy turbines are discussed in Sections 3.8.2.5 and 4.8.3.1. Airspace use and sonic boom overpressures are not anticipated to hamper development of wind energy operations. Turbines associated with wind energy projects are subject to, and designed to withstand, wind loads far in excess of sonic boom pressures. Any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200 feet AGL or exceeds any obstruction standard contained in 14 CFR Part 77, should normally be marked and/or lighted. However, an FAA aeronautical study may reveal that the absence of marking and/or lighting will not impair aviation safety.
0038	SO-8	The Air Force appreciates the personal perspectives the commenter has provided concerning ranching and lifestyle under the existing Pecos MOA (see the comment section of this chapter). The five claims of cattle or fence damage made by the commenter since 1993 are consistent with the correctness of the Draft EIS explanation of the possibility of effects as described in Sections 4.5.3.1 and 4.8.3.1.
0038	SO-9	The National Airspace System does not detract from or diminish the value of private property. The Draft EIS Proposed Action or an alternative would use elements of the National Airspace System. There is little evidence to suggest that the proposed changes in airspace use and acoustic environment would affect property values in the affected area. The depreciation figures cited in the

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		comment (Marvin Frankel, *Aircraft Noise and Residential Property Values: Results of a Survey Study*, The Appraisal Journal, January 1991) come into effect at noise levels above a threshold disturbance level of 60 L_{dn}. Although there are some areas under the proposed airspace that will experience noise increases, noise levels under the airspace in general are not anticipated to exceed a level of 51 dB. A search of similar research studies consistently reveals that property value depreciation is unlikely to occur at noise conditions below the USEPA-identified level of 55 dB.

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9.0 GLOSSARY

Above Ground Level (AGL): Altitude expressed in feet measured above the ground surface.

Aerial Refueling Tracks (ARs): The act of receiving fuel efficiently and safely while in flight. Refueling operations are performed in designated aerial refueling tracks or FAA approved airspace.

Aerospace Expeditionary Force (AEF): An AEF is a group of different types of aircraft with a mix of capabilities suited to the available tasking of combatant commanders. There are ten AEFs in the Air Force, and consist of wings or squadrons from multiple United States bases, and may operate as a unit or be integrated with existing forces overseas.

Air Force Instruction (AFI): Air Force Instructions implementing United States laws and regulations, and providing policy for Air Force personnel and activities.

Air Combat Command (ACC): The Air Force Command that operates combat aircraft assigned to bases within the contiguous 48 states, except those assigned to Air National Guard and the Air Force Reserve Command.

Air-to-Air Training: Air-to-air training prepares aircrews to achieve and maintain air superiority over the battlefield and defeat enemy aircraft. Air-to-air training often includes some aircraft playing the role of adversaries, or enemy forces. Air-to-air training activities include advanced handling characteristics, air combat training, low-altitude air-to-air training, and air intercept training. This training also requires the use of defensive countermeasures.

Air-to-Ground Training: Air-to-ground training employs all the techniques and maneuvers associated with weapons use and includes low-and high-altitude tactics, navigation, formation flying, target acquisition, and defensive reaction. Training activities include surface attack tactics, different modes of weapons delivery, electronic combat training, and the use of defensive countermeasures.

Air Quality Control Region (AQCR). An administrative unit for monitoring and controlling air quality in a specific geographic area.

Air Traffic: Aircraft operating in the air or on an airport surface, exclusive of loading ramps and parking areas.

Air Traffic Control (ATC): A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.

Air Traffic Control Assigned Airspace (ATCAA): Airspace of defined vertical/lateral limits, assigned by ATC, for the purpose of providing air traffic segregation between the specified activities being conducted within the assigned airspace and other IFR air traffic.

Clean Air Act (CAA): This Act empowered the United States United States Environmental Protection Agency to establish standards for common pollutants that represent the maximum

levels of background pollution that are considered safe, with an adequate margin of safety to protect public health and safety.

Candidate Species: A species for which the United States Fish and Wildlife Service has sufficient information regarding the biological vulnerability of and threat(s) to that species to warrant a proposal to reclassify it as threatened or endangered (Formerly Category 1 Candidate species).

C-Weighted Day-Night Sound Level (CDNL): C-Weighted Day-Night Sound Level is day-night sound levels computed for areas subjected to sonic booms. These areas are also subjected to subsonic noise assessed according to the Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}).

Chaff: Chaff is the term for small fibers of aluminum-coated mica packed into approximately 150 gram bundles and ejected by aircraft as a self-defense measure to reflect hostile radar signals.

Council on Environmental Quality (CEQ): The Council is an Executive Office of the President composed of three members appointed by the President, subject to approval by the Senate. Members are to be conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs of the nation; and to formulate and recommend national policies to promote the improvement of quality of the environment.

Day-Night Average Sound Level (DNL): Day-Night Average Sound Level is a noise metric combining the levels and durations of noise events and the number of events over an extended time period. It is a cumulative average computed over a 24-hour period to represent total noise exposure. DNL also accounts for more intrusive nighttime noise, adding a 10 dB penalty for sounds after 10:00 P.M. and before 7:00 A.M. DNL is the FAA's primary noise metric. FAA Order 1050.1E defines DNL as the yearly day/night average sound level.

Decibel (dB): A sound measurement unit.

Defensive Countermeasures: Coordination of maneuvers and use of aircraft defensive systems designed to negate enemy threats. Those maneuvers (which include climbing, descending, and turning) requiring sufficient airspace to avoid being targeted by threat systems. Aircraft use sophisticated electronic equipment to jam air and ground radar-tracking systems and dispense chaff and flares to confuse hostile radar and infrared sensors.

Endangered Species: The Endangered Species Act of 1973 defined the term "endangered species" to mean any species (including any subspecies of fish or wildlife or plants, and any distinct population segment of any species or vertebrate fish or wildlife which interbreeds when mature) that is in danger of extinction throughout all or a significant portion of its range.

Environmental Justice: As defined by Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, review must be made as to whether an action disproportionately impacts minority and/or low-income populations.

Environmental Night: The period between 10:00 P.M. and 7:00 A.M. when 10 dB is added to aircraft noise levels due to increased sensitivity to noise at night.

Equivalent Sound Level (L_{eq}): The Equivalent Sound Level is a noise metric combining the levels and durations of noise events and the number of events over a specified time period. It is a cumulative average computed that represents total noise exposure over that period. FAA Order 1050.1E defines L_{eq} as a cumulative level of a steady tone that provides an equivalent amount of sound energy for any specific period.

Flight Level: The Flight Level refers to the altitude above MSL. FL230, for example, is approximately 23,000 feet MSL.

Inert Ordnance: Ordnance without explosive or incendiary material. This inert (non-explosive) ordnance is used by training aircrews authorized to verify that aircraft systems are functioning properly, without the use of live ordnance. Inert ordnance is only used at authorized air-to-ground training ranges.

Instrument Flight Rules (IFR): A standard set of rules that all pilots, civilian and military, must follow when operating under flight conditions that are more stringent than visual flight rules. These conditions include operating an aircraft in clouds, operating above certain altitudes prescribed by Federal Aviation Administration regulations, and operating in some locations like major civilian airports. Air traffic control agencies ensure separation of all aircraft operating under IFR.

Maximum Sound Level (L_{max}): L_{max} is the highest sound level that occurs during a single aircraft overflight. For an observer, the noise level starts at the ambient noise level, rises up to the maximum level as the aircraft flies closest to the observer, and returns to the ambient level as the aircraft recedes into the distance. FAA Order 1050.1E defines L_{max} as a single event metric that is the highest A-weighted sound level measured during an event.

Mean Sea Level (MSL): Altitude expressed in feet measured above average sea level.

Military Operations Area (MOA): Airspace below 18,000 feet MSL established to separate military activities from instrument flight rule traffic and to identify where these activities are conducted for the benefit of pilots using visual flight rules.

Military Training Airspace: Military training airspace associated with NMTRI begins approximately 12 miles west of Cannon AFB and extends approximately 90 miles west.

Military Training Route (MTR): A Military Training Route is a corridor of airspace with defined vertical and lateral dimensions established for conducting military flight training at airspeeds in excess of 250 nautical miles per hour.

Mitigation: CEQ Sec. 1508.20 defines "Mitigation" to include:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

Nautical Mile (nm): Equal to 1.15 statute miles.

National Environmental Policy Act (NEPA): The National Environmental Policy Act of 1969 directs federal agencies to take environmental factors into consideration in their decisions.

National Historic Landmark (NHL): NHLs are places that "possess exceptional value or quality in illustrating and interpreting the heritage of the United States" and include battlefields, architectural or engineering masterpieces, ruins, and historic towns and communities.

National Historic Preservation Act (NHPA): The NHPA of 1966, as amended, established a program for the preservation of historic properties throughout the United States.

New Mexico Aircrews: New Mexico-based F-16s.

Notice to Airmen (NOTAM): A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure of, or hazard in the National Airspace System) the timely knowledge of which is essential to personnel concerned with flight operations.

Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}): Onset Rate-Adjusted Monthly Day-Night Average Sound Level is the measure used for subsonic aircraft noise in military airspace (MOAs or Warnings Areas). This metric accounts for the fact that when military aircraft fly low and fast, the sound can rise from ambient to its maximum very quickly. Known as an onset-rate, this effect can make noise seem louder due to the added "surprise" effect. Penalties of up to 11 dB are added to account for this onset-rate. Noise levels are interpreted the same way for L_{dnmr} as they are for DNL. (See DNL above).

Ordnance: Any item carried by an aircraft for dropping or firing, including but not limited to, live or inert bombs, ammunition, air-to-air missiles, chaff, and flares.

Restricted Areas: A restricted area is designated airspace that supports ground or flight activities that could be hazardous to non-participating aircraft.

See-and-avoid: When weather conditions permit, pilots operating IFR or VFR are required to observe and maneuver to avoid other aircraft. Right-of-way rules are contained in FAR Part 91.

Sonic Boom: A sonic boom is the impulsive noise created when a vehicle flies at speeds faster than sound.

Sortie: A sortie is a single flight, by one aircraft, from takeoff to landing.

Sortie-Operation: The use of one airspace unit (e.g., Military Operations Area or Warning Area) by one aircraft. The number of sortie-operations is used to quantify the number of uses by aircraft and to accurately measure potential impacts; e.g. noise, air quality, and safety impacts. A sortie-operation is not a measure of how long an aircraft uses an airspace unit, nor does it indicate the number of aircraft in an airspace unit during a given period; it is a measurement for the number of times a single aircraft uses a particular airspace unit. In this EIS, it is also a measurement of the number of different missions or tactics conducted by an aircraft within an airspace block.

Sound Exposure Level (SEL): Sound Exposure Level (SEL) accounts for both the maximum sound level and the length of time a sound lasts. It provides a measure of the total sound exposure for an entire event. FAA Order 1050.1E defines SEL as a single event metric that takes into account both the noise level and duration of the event and referenced to a standard duration of one second.

State Historic Preservation Office (SHPO): State department responsible for assigning protected status for cultural and historic resources.

Statistical Exceedance Level (L_x): The sound level exceeded x percent of the time. L_{10} is the level exceeded 10 percent of the time, L_{90} is the level exceeded 90 percent of the time, etc.

Threatened Species: A species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Traditional/Cultural Resource: Cultural and traditional resources are any prehistoric or historic district, site or building, structure, or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes.

Transient Aircrews: Aircraft not permanently assigned to 27 FW or 150 FW, including A-10s, B-1Bs, B-52s, C-130s, F-15s, F/A-18s, F-22As, and Tornados.

Visual Flight Rules (VFR): A standard set of rules that all pilots, both civilian and military, must follow when not operating under instrument flight rules. These rules require that pilots remain clear of clouds and avoid other aircraft. See instrument flight rules.

Visual Routes (VR): Routes used by military aircraft for conducting low-altitude, high-speed navigation, and tactical training. These routes are flown under Visual Flight Rules.

Wetland, Jurisdictional: A jurisdictional wetland is a wetland that meets all three United States Army Corps of Engineers' criterion for jurisdictional status: appropriate hydrologic regime, hydric soils, and facultative to obligate wetland plant communities under normal growing conditions.

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