FINAL

ENVIRONMENTAL ASSESSMENT OF PROPOSED WHITE LAKES DROP ZONES FOR KIRTLAND AIR FORCE BASE

September 2005

Prepared for
Air Education and Training Command
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ACRONYMS AND ABBREVIATIONS

AETC	Air Education and Training Command
AFB	Air Force Base
AFI	Air Force Instruction
AFSOC	Air Force Special Operations Command
AGL	above ground level
ANSI	American National Standards Institute
ATC	Air Traffic Control
CFR	Code of Federal Regulations
CO	carbon monoxide
dB	decibels
dBA	A-weighted decibels
DNL	Day-Night Average Sound Level
DZ	Drop Zone
EA	Environmental Assessment
EO	Executive Order
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FICUN	Federal Interagency Committee on Urban Noise
Hz	hertz
IAC	Interagency Airspace Coordination
IFR	Instrument Flight Rule
LAX	Los Angeles International Airport
lb	pound
Ldnmr	Onset-Rate Adjusted Day-Night Average Sound Level
Leq	Sound Pressure Level
LOS	Level of Service
MSL	mean sea level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NM	nautical mile
NMAAQS	New Mexico Ambient Air Quality Standards
NMDG&F	New Mexico Department of Game and Fish
NMEMNRD	New Mexico Energy, Minerals, and Natural Resources Department
NMNHP	New Mexico Natural Heritage Program
NO_2	nitrogen dioxide
$PM_{2.5}$	particulate matter equal to or less than 2.5 micrometers in diameter
PM_{10}	particulate matter equal to or less than ten micrometers in diameter
SEL	Sound Exposure Level
SIP	State Implementation Plan
SLO	State Land Office
SO_2	sulfur dioxide
SOS	Special Operations Squadron
SOW	Special Operations Wing
UCLA	University of California at Los Angeles
USAF	United States Air Force
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
V/C	Volume-to-Capacity
VFR	Visual Flight Rule

FINAL
FINDING OF NO SIGNIFICANT IMPACT
FOR THE
PROPOSED WHITE LAKES DROP ZONES
FOR KIRTLAND AIR FORCE BASE,
ALBUQUERQUE, NEW MEXICO

The 58th Special Operations Wing (58 SOW), a unit of Air Education and Training Command (AETC), and the Air Force Special Operations Command prepared the attached Environmental Assessment (EA) to determine the potential environmental consequences of a Proposed Action located near White Lakes, New Mexico. The action assessed in this document is for the use of the proposed White Lakes Drop Zones (DZs) for C-130 rescue/special operations drop training.

PURPOSE AND NEED FOR THE PROPOSED ACTION

Since the loss of the Burris DZ, training requirements are being met by dropping cargo bundles and personnel at the Roswell Municipal Airport. The location is unrealistic since the drops are being conducted at an airport under the control of the Roswell Tower. Additionally, when drops are made at Roswell Municipal Airport, ground personnel must drive to Roswell from Albuquerque to recover the dropped bundles. This requires the equivalent of one week of temporary duty funds per trip and consumes funds that were not allocated for this purpose.

Failure to secure a replacement for the Burris DZ would result in aircrews graduating with training deficiencies that would have to be corrected by the United States Air Force units to which they were assigned. This would require additional flight hours not budgeted by the gaining unit.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The 58 SOW is proposing the use of three areas near White Lakes in Santa Fe County, New Mexico as new DZs to replace the Burris DZ. These DZs would be used for the next one to five years until a long-term solution could be implemented. Only existing roads or jeep trails would be used for recovery of dropped bundles, therefore no construction or terrain modifications would be required. Airdrops would consist of personnel drops, simulated airdrop training bundles (each weighing approximately 15 pounds[lbs]), and simulated rescue bundles/kits (each weighing approximately 45 lbs).

To ensure ground safety, two to four personnel would arrive at the designated DZ prior to the airdrops to ensure that the area is clear of obstacles (i.e. people, cattle, trucks, and other ranching equipment). When the airdrops were completed, ground personnel would recover dropped bundles and place them in military pickup trucks.

No-Action Alternative

Under the No-Action Alternative, C-130 rescue/special operations drop training would continue at the Roswell Municipal Airport once a week. Unrealistic pilot training would continue, and ground personnel would still need to travel from Albuquerque to Roswell for bundle recovery, using funds which have not been budgeted.

SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS

Proposed Action

Implementation of the Proposed Action could result in minor negative impacts to air quality, noise, soils, and biological resources for the duration of use of the DZs. Minor changes to airspace management and land use would also occur. No impacts are anticipated to occur to human health and safety, water resources, floodplains, wetlands, minority and low-income populations, utilities, socioeconomics, environmental management, or cultural resources from the Proposed Action. Only those resources that potentially could be impacted, other than cultural resources, are discussed below. Cultural resources has been included because a survey was done to identify locations of historic/archaeological artifacts in the vicinity of the proposed DZs.

Airspace Management: Use of the DZs would increase the amount of air traffic that the area currently receives. However, no significant impacts are expected from the use of these DZs since current airspace is used infrequently by private and military aircraft.

Air Quality. Implementation of the Proposed Action would increase air emissions in the White Lakes area due to increased C-130 overflights of the DZs. Overflights would consist of a single C-130 aircraft using the DZs a maximum of three times a week. Emissions from the aircraft would cause a very minor increase in air pollutants in the rural area proposed for the DZs and would not result in any violation of the de minimis levels set for the area.

Noise. An increase in noise would occur during DZ training operations. The DZs are proposed to be in a rural setting with no nearby homes; therefore noise disturbance to humans would not occur.

Geological Resources. Implementation of the Proposed Action could result in minor short-term negative impacts to soils from vehicles used to recover dropped bundles or from the impact of dropped bundles.

Land Use. While DZ operations would change the land use of the area, they would not conflict with existing land uses. Cattle grazing is the current land use of the area, and DZ operations would be scheduled to avoid conflict with these rangeland activities.

Biological Resources. Minor impacts to vegetation and wildlife may occur from the operation and use of the DZs. Vegetation would be crushed during bundle drops and

some smaller species of wildlife could also be potentially crushed. However, the vegetation found in the area is very resistant to this type of disturbance (grazing and trampling by cattle) and any loss of wildlife would be minor as those species potentially impacted are common and have stable populations throughout the area.

Cultural Resources. The proposed White Lakes DZs have been positioned to avoid all known cultural sites. Therefore, no significant impacts would occur to this resource.

No-Action Alternative. Under this alternative, AETC and the 58 SOW would not use the White Lakes DZs. No change to current conditions would occur from the No-Action Alternative.

CONCLUSION

After careful review of the EA of this Proposed Action, I have concluded that the Proposed Action would not have a significant impact on the quality of the human or natural environment. Therefore, issuance of a Finding of No Significant Impact is warranted, and an Environmental Impact Statement is not required. This analysis fulfills the requirements of the National Environmental Policy Act and the implementing regulations promulgated by the Council on Environmental Quality.

Accepted By: _____ Date: 12 SEP 2005

D. BRENT WILSON, P.E.
Base Civil Engineer
Kirtland Air Force Base

FINAL
ENVIRONMENTAL ASSESSMENT
OF PROPOSED
WHITE LAKES DROP ZONES
FOR
KIRTLAND AIR FORCE,
ALBUQUERQUE, NEW MEXICO

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SECTION 1
PURPOSE AND NEED FOR THE PROPOSED ACTION

This Environmental Assessment (EA) evaluates the potential impacts on environmental and human resources associated with the proposed operation of the White Lakes Drop Zones (DZs) for Kirtland Air Force Base (AFB) in Albuquerque, New Mexico. Air Force Special Operations Command (AFSOC) and the 58th Special Operations Wing (58 SOW); a unit of Air Education and Training Command (AETC) are the proponents of this action. This EA also evaluates any reasonable alternatives to the Proposed Action, including the No-Action Alternative. This document complies with the Environmental Impact Analysis Process set forth in 32 Code of Federal Regulations (CFR) 989, which incorporates Air Force Instruction 32-7061 and implements the National Environmental Policy Act (NEPA), and the regulations implementing NEPA promulgated by the President's Council on Environmental Quality as Title 40 of the CFR, Parts 1500-1508. In addition, Executive Order 12372, *Intergovernmental Review of Federal Programs*, directs federal agencies to consult with and solicit comments from state and local government officials whose jurisdictions would be affected by federal actions (Appendix A). NEPA procedures and United States Air Force (USAF) policies are intended to ensure that environmental information is available to public officials and citizens before decisions are made and before actions are taken. This EA describing the potential impacts of this Proposed Action will be made available to the public for 15 days prior to the decision on whether to proceed with the action.

The mission of AFSOC is delivering special operations combat power anytime, anywhere. The command is committed to continual improvement to provide Air Force Special Operations Forces for worldwide deployment and assignment to regional unified commands to accomplish the following special operations activities: unconventional warfare, counter proliferation, direct action, psychological operations, special reconnaissance, civil affairs, combating terrorism, foreign internal defense, and information operations.

The mission of the 58 SOW is "to train mission-ready special operations and rescue aircrews for the world's best air force." Once trained, students go on to serve with AFSOC, Air Mobility Command, Air Combat Command, Pacific Air Forces, USAF in Europe, Air Force Space Command, and Air Force Reserve and Air National Guard components. The 58 SOW maintains three operational squadrons at Kirtland AFB: the 512th Rescue Squadron, which flies UH-1N and HH-60G helicopters; the 551st Special Operations Squadron (SOS), which flies MH-53J helicopters; and the 550 SOS, which flies MC-130H and H/MC-130P fixed-wing aircraft. The 58 SOW conducts advanced training for aircrews that are tasked with special operations and rescue missions. The unit also provides personnel and aircraft needed to respond to crises around the world and assist civilian authorities in regional rescues. The 58 SOW is the sole provider of advanced special operations aircrew training for the USAF.

1.1 BACKGROUND

One of the missions of the 58 SOW is to train MC-130P and MC-130H aircrews in airdrop operations. Some of these operations occur at the Isleta DZ located at Kirtland AFB and some previously occurred at the Burris DZ located on private property approximately 13 nautical miles (NM) (1 NM equals 6,076 feet) southeast of Belen, New Mexico. The Burris DZ was used for drops of small cargo (15 to 45 pound bundles) and personnel. The Burris DZ can no longer be used by the USAF because the property has been sold to new owners. The Isleta DZ can not be used for this type of training because: 1) a Letter of Agreement with the Albuquerque Tower prohibits the dropping of rescue equipment at the airport; and, 2) this mission profile requires multiple run-ins from different directions which conflict with commercial airline traffic and, in some instances, would require overflight of the City of Albuquerque.

Currently, cargo and personnel airdrops that were once conducted at Burris DZ are being conducted at the Roswell Municipal Airport located at Roswell, New Mexico (Figure 1-1). This short-term solution was implemented so that student air crews can be trained in as much of the syllabus as possible. It is, however, not adequate for an extended period of time. In order to address the needs of the 58 SOW, interim and long-term solutions have been considered. The proposal addressed in this EA is an interim (1 to 5 years) solution that will meet training requirements and funding restrictions until a long-term solution can be achieved.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Since the loss of the Burris DZ, training requirements are being met by dropping cargo bundles and personnel at the Roswell Municipal Airport. The training is unrealistic, since the drops are being conducted at an airport under the control of the Roswell Tower. Realism in special operations training requires that the air crew be guided in by personnel on the ground using hand-held radios in remote areas without approach/departure radar equipment. Drops at the airport can only come in from one direction and require clearance from the tower. If other aircraft are in the traffic pattern, the C-130s must break off their drops and leave the pattern until the other traffic can land or take off. This disrupts the mission and degrades the realism of training. Additionally, when drops are made at Roswell Municipal Airport, ground personnel must drive to Roswell from Albuquerque to recover the dropped bundles. This requires the equivalent of one week of temporary duty funds per trip (4 people at 10 hours total travel time) and consumes funds that were not allocated for this purpose. Therefore, a closer and more realistic DZ location is needed.

Failure to secure an adequate replacement for the Burris DZ would result in aircrews graduating with training deficiencies that would have to be corrected by the USAF units to which they were assigned. This would require additional flight hours not budgeted by the gaining unit.

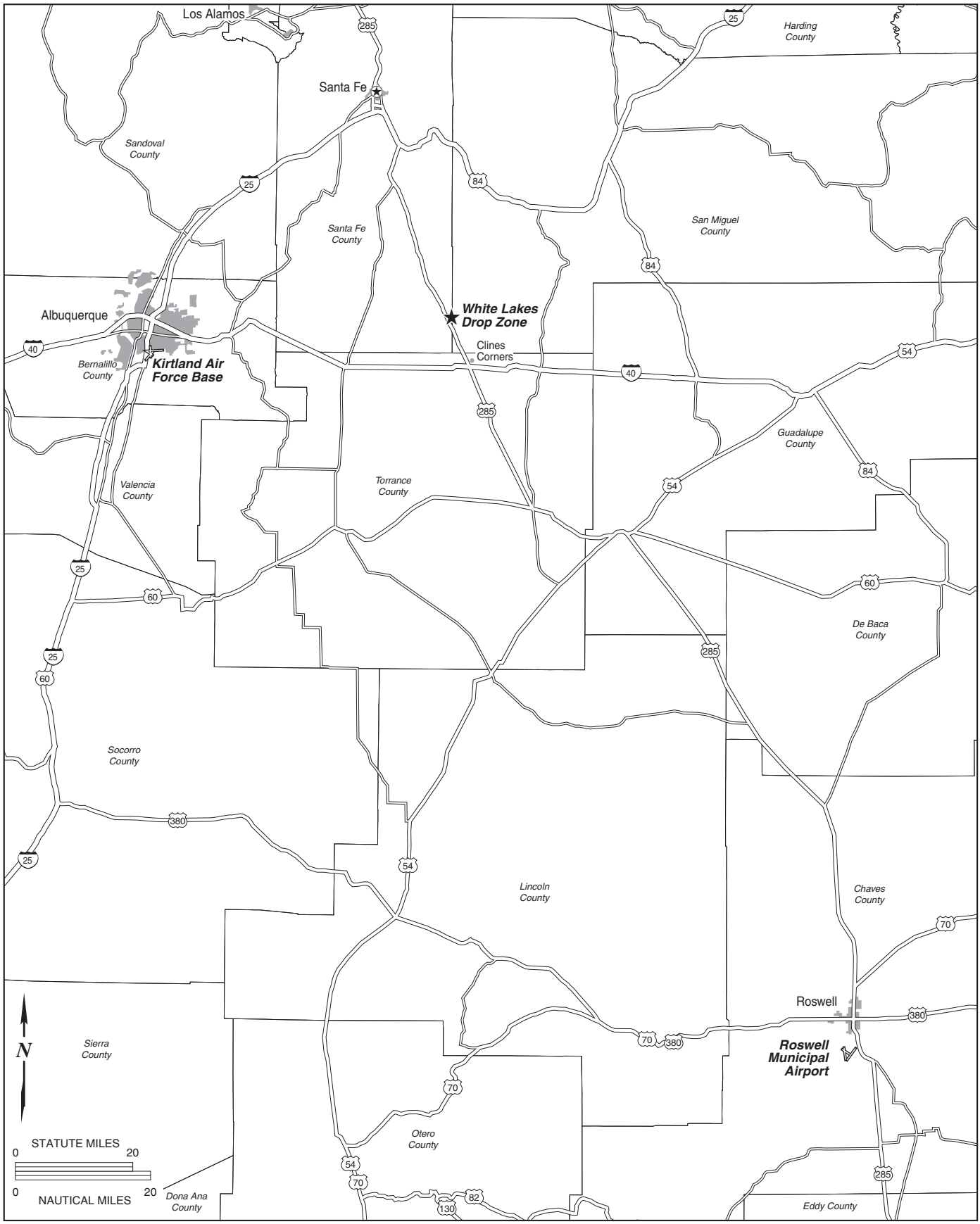

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FIGURE

EA

Location of the Roswell Municipal Airport and White Lakes Drop Zones in relation to Kirtland Air Force Base

1-1

1.3 DECISION TO BE MADE AND DECISION-MAKER

The installation commander will make a decision regarding whether any significant impacts would result from the action proposed in this document and will decide which is the best alternative to support AETC, AFSOC, Air Force Materiel Command, the 58 SOW and Kirtland AFB.

1.4 ALTERNATIVE IDENTIFICATION

For this Proposed Action, alternative sites needed to be large areas (minimum of 320 acres) free of obstructions and located on relatively level, flat and open terrain. In order to minimize travel time and funds required for ground personnel to participate in the drops and to recover rescue bundles and sandbags, DZs must be located within 60 NM of Kirtland AFB. DZs also must be able to accommodate multiple run-ins from multiple directions and require a minimum of interference with other air traffic.

SECTION 2
DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Air Force Special Operations Command and the 58th Special Operations Wing (58 SOW) propose to use the White Lakes Drop Zones (DZs) for the next 1-5 years to meet the requirements of the training syllabus until such time that a long term solution can be found. Once a long term DZ is available for use, the White Lakes DZs would no longer be necessary. The following section describes the Proposed Action and alternatives to this action.

2.1 DESCRIPTION OF THE PROPOSED ACTION

The 58 SOW is proposing the use of three areas near White Lakes in Santa Fe County, New Mexico as new DZs to replace the Burris DZ. The areas proposed as the White Lakes DZs are currently used for grazing cattle and, if the Proposed Action were implemented, would be shared multi-use lands under an agreement with the State Lands Office (SLO) who owns the land. The proposed White Lakes DZs would consist of two DZs consisting of 320 acres and one DZ consisting of 300 acres. The DZs are located in Township 11 North, Range 11 East in Sections 25, 26, 35 and 36. In general, the boundary of each of the three DZs is described as a circular target having a radius of 700 yards (2,100 feet). Figure 2-1 shows the proposed White Lakes DZs location in relation to Kirtland Air Force Base (AFB) where the training flights would originate and Figure 2-2 shows the proposed White Lakes DZs area. Approximately 50 nautical miles (NM) (1 NM equals 6,076 feet) separate Kirtland AFB from the proposed DZs. Only existing roads or jeep trails would be used for recovery of dropped bundles, and no construction or terrain modifications would be required.

Airdrops from one of two slightly different models of C-130 aircraft would be conducted up to 3 times a week, during both the day and night. Airdrops would require multiple passes by a single C-130 from multiple directions at altitudes from 150 to 800 feet above ground level (AGL). Deployment of pyrotechnics (chaff and flares) would not occur during these training exercises. Airdrops of cargo would occur 40 percent during the day and 60 percent at night. A standard cargo airdrop practice operation would include an average of 15 passes across a DZ for the following purposes:

- An initial pass to familiarize the student pilot with the area and any obstacles that might affect the dropped objects;
- An average of ten passes to drop simulated rescue bundles/kits (orange nylon bags measuring 2’ X 3’, filled with rubber ballast (each weighing approximately 45 pounds [lbs]). Half of these drops would occur with parachutes attached to the bundles from an elevation of 300 feet AGL and half would occur with no parachute (freefall) from an elevation of 150 feet AGL;
- Two passes to drop a group of five rescue bundles connected by long tethers (to make them easier to find in water drops or low visibility situations.); and
- Two passes to drop simulated airdrop training bundles (sandbags weighing approximately 15 lbs each).

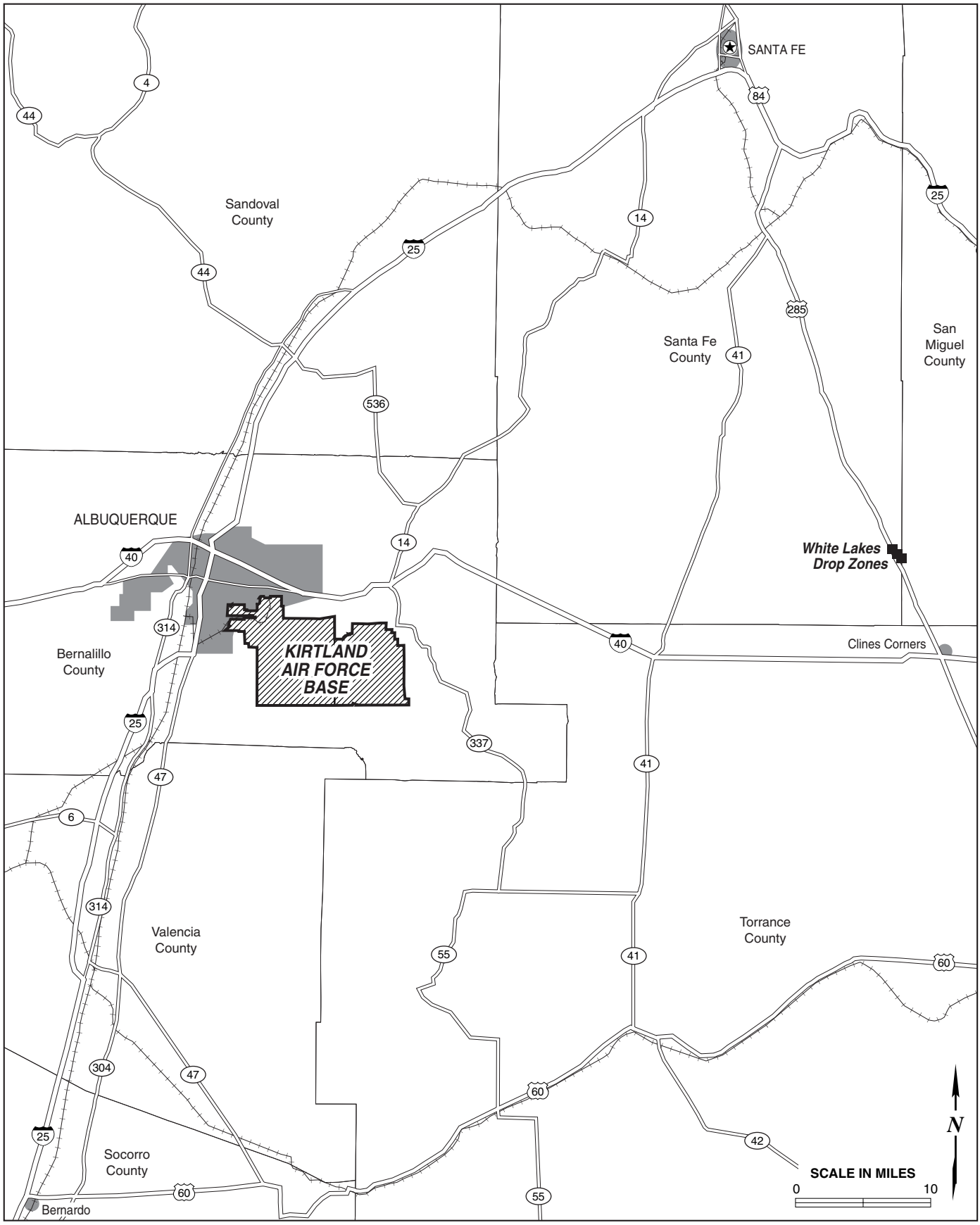

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FIGURE

EA

Location of Proposed White Lakes Drop Zones in Relation to Kirtland Air Force Base

2-1

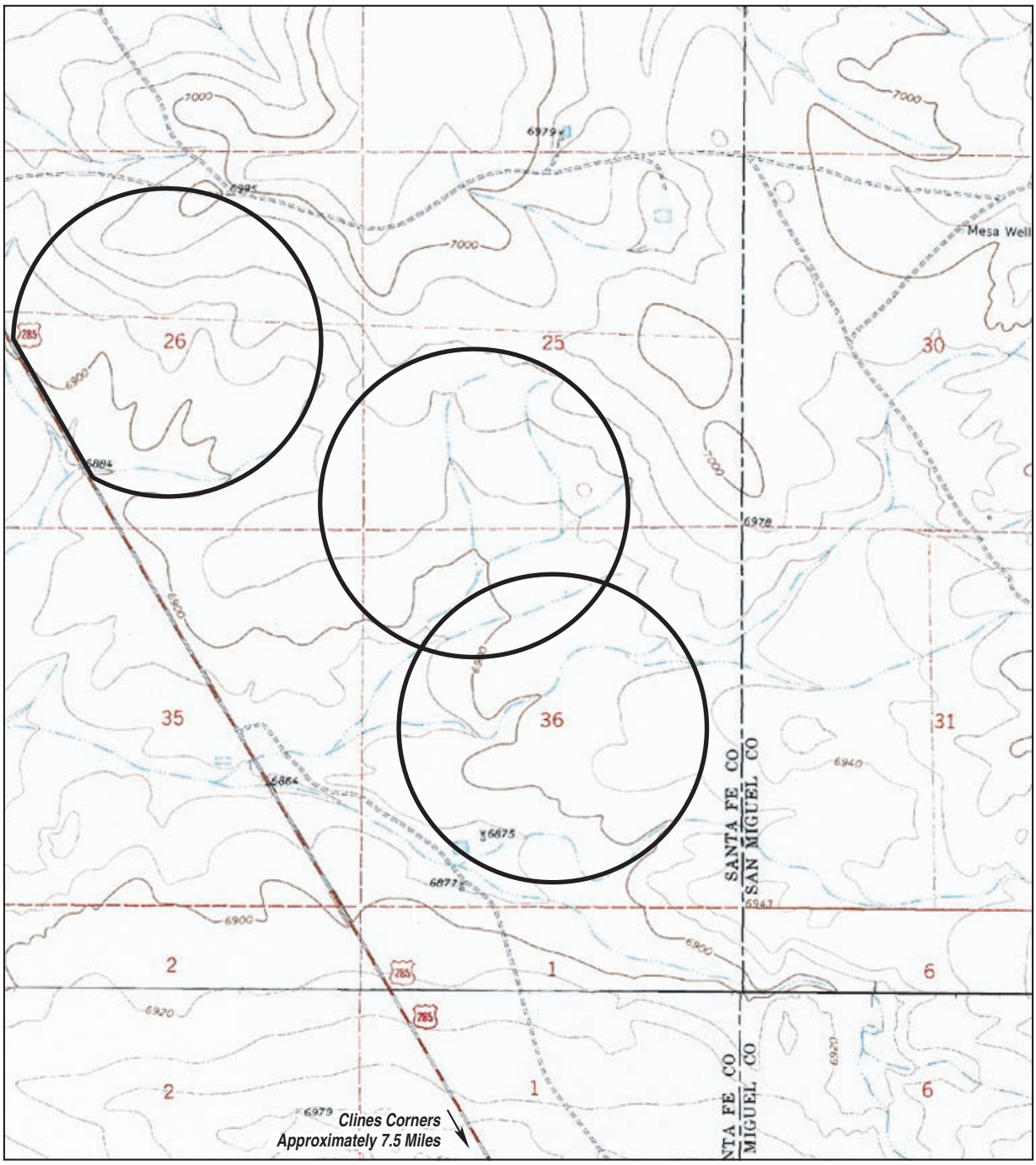

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FIGURE

EA

Proposed White Lakes Drop Zones

2-2

On other training missions, personnel drops would occur from no lower than 800 feet AGL using static lines. One person would jump on each pass and the average number of jumpers would be eight. Personnel drops would occur primarily during the day (80 percent).

To ensure ground safety, two to four personnel would arrive at the designated DZ prior to airdrops commencing to ensure that the area is clear of obstacles (i.e. people, cattle, trucks, and other ranching equipment). Military personnel would work closely with the rancher of these lands to schedule training flights around the rancher's grazing schedule. Military personnel would not move cattle off a DZ. If cattle are present at a DZ, they would move the training operation to a DZ free of cattle. In the event that cattle are present at all three DZs, dropping of bundles would not occur and training would be cancelled. Once the area is clear, ground personnel would radio pilots to give clearance for airdrops. When the airdrops were completed, ground personnel would recover dropped bundles and place them in military pickup trucks. Recovery of dropped bundles would occur on foot since the current Right of Entry Permit prohibits off road traffic (Appendix B). Once all bundles have been recovered, ground personnel would leave the DZ via the existing dirt roads or jeep trails and return to Kirtland AFB.

2.1.1 Permits and Consultations

The White Lakes DZs are located on New Mexico State Lands and would require a One-Year Special Use Permit from the SLO to access the land for training purposes. The permit would be renewable for up to five years.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

2.2.1 No-Action Alternative

Under the No-Action Alternative, C-130 rescue/special operations drop training would continue at the Roswell Municipal Airport once a week. Unrealistic pilot training would continue, and ground personnel would still need to travel from Albuquerque to Roswell for bundle recovery, using funds which have not been allocated for that purpose.

2.2.2 Alternatives Considered But Not Carried Forward

The State Lands Commission authorized the potential use of a very large area of State Lands for DZ training by the 58 SOW. Initial topographic analyses eliminated much of the area from consideration and field surveys further reduced the feasible areas to the three proposed in this document.

2.2.2.1 Increased Use of the Isleta Drop Zone

The use of the Isleta DZ at Kirtland AFB was considered, but not carried forward, due to operational requirements. The Lletter of Agreement with the Albuquerque Tower prohibits the dropping of rescue equipment because this mission profile requires multiple

run-ins from different directions. This conflicts with commercial air traffic and requires overflight of the city. Furthermore, the freefall bundle drop altitude of 150 feet AGL has been deemed a possible safety hazard by air crew members due to the height of other structures on Kirtland AFB. This alternative was therefore removed from further consideration.

2.2.2.2 Use of Stallion Army Air Field, New Mexico

Stallion Army Air Field (approximately 90 NM from Kirtland AFB), located on the White Sands Missile Range was considered, but eliminated because it is too far away and has been found to be contaminated with unexploded ordnance (cluster bombs) that would make it very dangerous for ground personnel to participate in the drops or to recover the bundles once they were dropped.

2.2.2.3 Use of Fort Bliss Drop Zones, Texas

The use of existing DZs at Fort Bliss was eliminated because of the distance that ground crews would have to travel, over 190 NM from Kirtland AFB, to participate in the drops and to recover the bundles after they are dropped.

2.2.2.4 Use of a new Drop Zone near Pecos, New Mexico

The option of using a new DZ on US Forest Service land south of Pecos (located approximately 65 NM from Kirtland AFB) was considered but eliminated because the only access road is unimproved and impassable in bad weather. In addition, local residents have expressed displeasure with aircraft overflight noise in the past.

2.2.2.5 Use of a new Drop Zone near Bernardo, New Mexico

The use of a new DZ located on Bureau of Land Management property northeast of Bernardo (located approximately 45 NM from Kirtland AFB) along the Rio Puerco draw was considered but eliminated when field surveys found extensive cultural resources in the area. DZ activities would have disturbed these resources and the site was eliminated following the field survey.

2.2.2.6 Use of existing Helicopter Landing Zones

The use of some or all of the 40 Helicopter Landing Zones used by the 58 SOW was considered, but not carried forward, because of the remote locations and lack of access to the sites. Many are on hilltops with no access roads at all and the rest are accessible via slow unimproved roads only during good weather.

2.3 OTHER FUTURE ACTIONS

No other future actions are expected to occur on or near the lands proposed for the White Lakes DZs. Additionally, use of these DZs would only occur until a more permanent

location could be obtained. Therefore, potential cumulative impacts in the analysis of this Proposed Action are not addressed.

2.4 RESOURCES ELIMINATED FROM FURTHER ANALYSIS

Socioeconomic, environmental justice, environmental management, safety-flight safety, and utility resources will not be analyzed in this Environmental Assessment. The proposed White Lakes DZs are located in a very rural setting that is dominated by ranching activities, thus very few people live or recreate in the area. Clines Corners is the closest village to the proposed DZs and consists of a few homes and a truck stop. Therefore, no impacts to socioeconomics and environmental justice are expected to occur. In addition, no impacts to any low income or minority populations or businesses would occur. Use of the White Lakes DZs would not involve any hazardous materials or hazardous wastes. Therefore, no impacts would occur to environmental management. Safety-flight safety was not analyzed because there would be no increased risk of bird-aircraft strike hazards or midair collisions. There would be no change in current flight hours; the aircraft would be flying at a different location. There are no large breeding colonies of birds or water bodies within the DZ area. In addition, the majority of bird airstrikes for the United States Air Force (USAF) occur during takeoff and landings from 0-49 feet AGL. Comparatively in Fiscal Year 2004, the USAF had a total of 101 Class A & B mishaps while the 58 SOW had none (USAF 2004 & 2005). No utilities occur on or near any of the proposed DZs, therefore, no impacts would occur to this resource.

SECTION 3
AFFECTED ENVIRONMENT

3.1 AIRSPACE MANAGEMENT

3.1.1 Definition of Resource

The Department of Defense defines airspace management as the coordination, integration, and regulation of the use of airspace of defined dimensions. The management of airspace entails the safe and efficient use of navigable airspace.

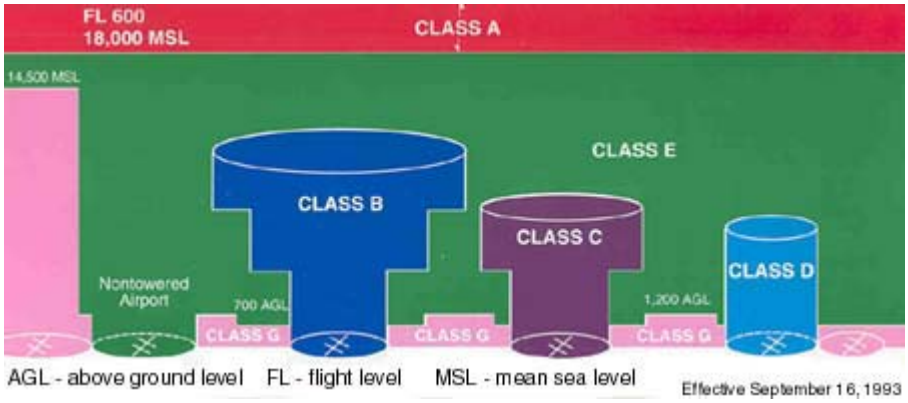
Airspace areas are defined by: a) volume of airspace being used; b) proximity of airspace to a specific geographic area such as an airport, airfield, or military installation; c) allotted time for airspace use; and d) physical characteristics of the land below the airspace. There are two categories of airspace areas: regulatory and non-regulatory. Within these two categories, there are controlled, uncontrolled, special use, and "other" types of airspace. The Interagency Airspace Coordination (IAC) Guide of 2003 defines airspace classifications based on: 1) complexity and density of aircraft movements; 2) the nature of operations conducted within airspace; 3) safety; and 4) national and public interest (IAC 2003).

3.1.1.1 Controlled Airspace and Uncontrolled Airspace

In accordance with the Federal Aviation Administration 14 Code of Federal Regulations (CFR) 71, controlled airspace is airspace that has specific defined dimensions such as altitude ranges, surface area boundaries, and requires specific pilot qualifications, operating rules, and equipment requirements. Air Traffic Control (ATC) is provided under controlled airspace. Controlled airspace consists of five classes including Class A, Class B, Class C, Class D, and Class E. Instrument Flight Rules apply to all classes. Visual Flight Rules apply to Classes B through E.

Uncontrolled airspace is airspace that does not fall under Classes A-E and is not provided ATC services. Class G airspace is designated as uncontrolled airspace (see Appendix C for description). Table 3-1 identifies US airspace classifications.

Table 3-1. United States Airspace Classifications



Source: Federal Aviation Administration/Office of Systems Safety 2004.

3.1.2 Existing Conditions

Airspace in the area of the proposed White Lakes Drop Zones (DZs) is Class G, uncontrolled airspace. Currently, C-130 aircraft take off from Kirtland Air Force Base (Albuquerque International Sunport) to conduct DZ training at the Roswell Municipal Airport. Airspace used during training operations takes place in Class D, with pilots being under the control of the Roswell Tower. Figure 3-1 shows airspace surrounding the proposed White Lakes DZs and Figure 3-2 shows airspace surrounding the Roswell Tower.

3.2 SAFETY

3.2.1 Definition of Resource

Safety issues typically associated with and specific to military airfields include the potential for mid-air aircraft mishaps, aircraft collisions with objects on the ground (e.g. towers, buildings, or mountains), weather-related accidents, and bird-aircraft collisions

Air Force Policy Directive 91-2, *Safety Programs,* (September 2003) and Air Force Instructions (AFI) 91-204, *Safety Investigations and Reports*, (April 2004) present reporting guidelines for flight, ground, and explosives mishaps.

Because children may suffer disproportionately from environmental health risks and safety risks, Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, was introduced in 1997. This EO prioritized the identification and assessment of environmental health risks and safety risks that may affect children and ensures that federal agencies' policies, programs, activities, and standards address environmental and safety risks to children.

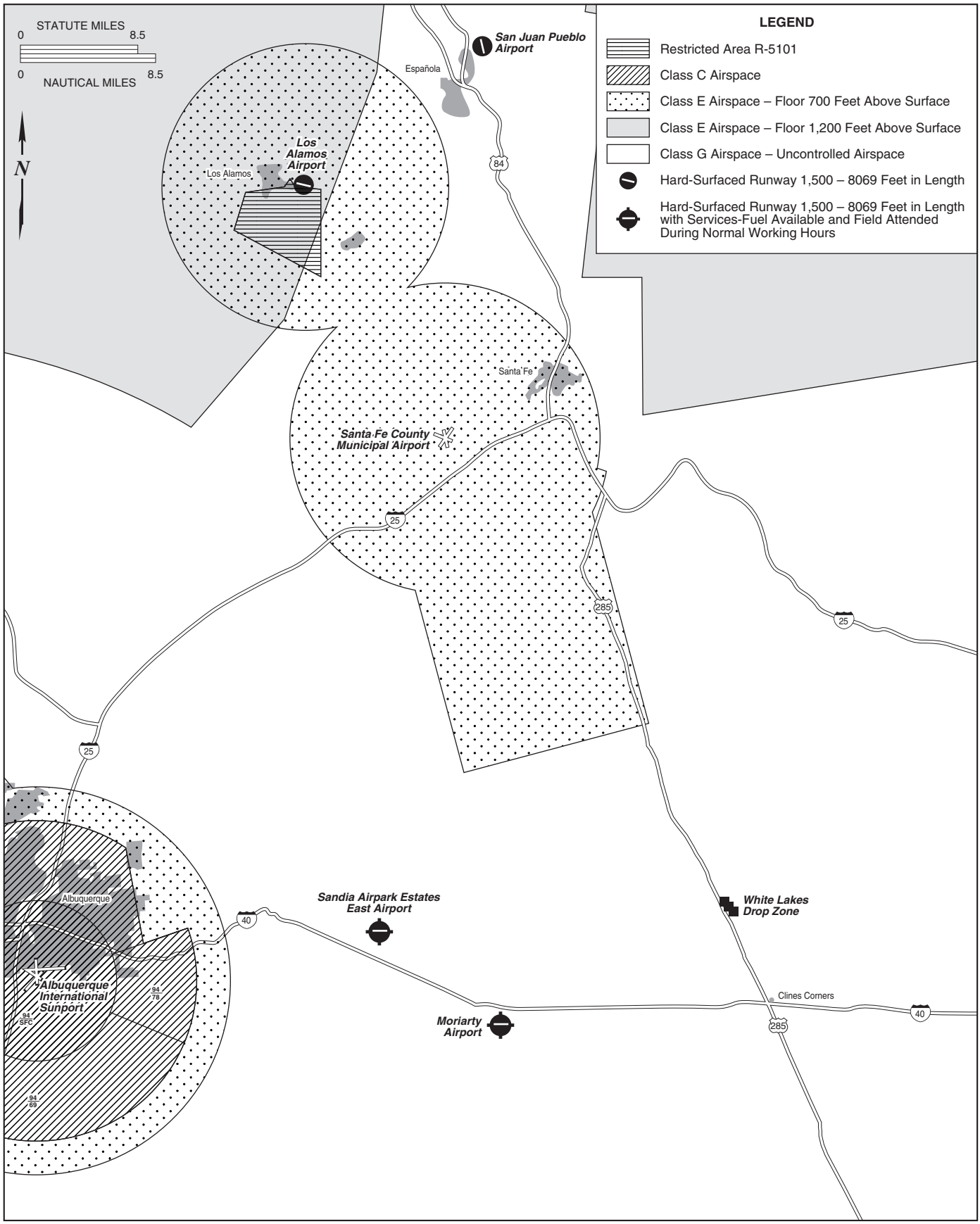


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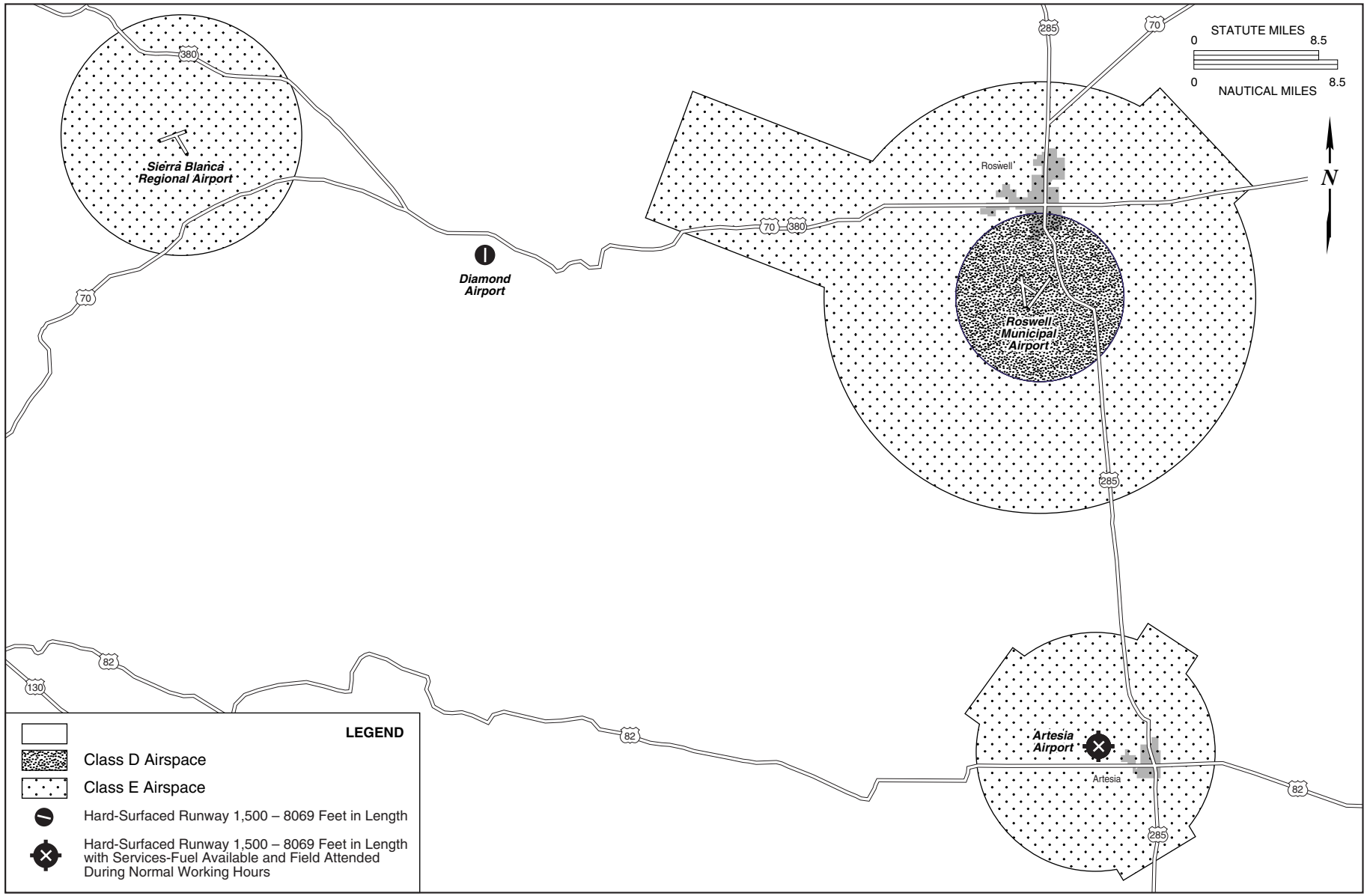
FIGURE

EA

Airspace in the Vicinity of White Lakes Drop Zones, Santa Fe County, New Mexico

3-1



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Airspace in the Vicinity of
Roswell Municipal Airport, Roswell, New Mexico

FIGURE

3-2

3.2.2 Existing Conditions

3.2.2.1 Ground Safety

Ground safety includes many categories (AFI 91-204) consisting of ground, industrial, operational and occupational safety hazards, motor vehicles, off-duty military, maritime, and fire. Ground mishaps can occur on ground or water, as well as, on or off an installation, and may involve Air Force personnel, contractors, and property losses. They can occur in a work environment from the use of administrative, supply, custodial, or maintenance equipment or materials for Air Force functions.

Air Force Manual 91-201, *Explosives Safety Standards*, represents the Air Force guidelines for complying with explosives safety. This regulation, as well as AFI 91-204 identifies explosive safety standards required for both explosive and chemical agents.

3.3 AIR QUALITY

3.3.1 Definition of Resource

Outdoor air quality in a given location is described by the concentration of various pollutants in the atmosphere. Air quality is a function of several factors, including the quantity and dispersion rates of pollutants in the region, temperature, the presence or absence of inversions, and topographic and geographic features of the region. For the purposes of this Environmental Assessment (EA), Santa Fe County forms the region of concern for air quality. The US Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for criteria pollutants, including ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter equal to or less than ten micrometers in diameter (PM_{10}), particulate matter equal to or less than 2.5 micrometers in diameter ($PM_{2.5}$), and lead. The Clean Air Act requires that all states attain compliance through adherence to the NAAQS, as demonstrated by the comparison of measured pollutant concentrations and the NAAQS.

The NAAQS represent the maximum levels of background pollution that are considered acceptable, with an adequate margin of safety to protect public health and welfare. These pollutants are typically quantified in units of parts per million, milligrams per cubic meter, or micrometers per cubic meter. The State of New Mexico has adopted additional standards for air quality, the New Mexico Ambient Air Quality Standards (NMAAQS), which apply a more stringent standard for CO, SO_2, and for the 24-hour standard for NO_2. Both the NAAQS and NMAAQS are depicted in Table 3-2.

Table 3-2. National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS Value	Standard Type
Ozone	1-hour[1]	0.12 ppm (235 µg/m^3)	Primary and Secondary
	8-hour[2]	0.08 ppm (157 µg/m^3)	Primary and Secondary
Carbon monoxide	8- hour[3]	9 ppm (10 mg/m^3)	Primary
	1-hour[3]	35 ppm (40 mg/m^3)	Primary
Nitrogen dioxide	Annual (Arithmetic mean)	0.053 ppm (100 µg/m^3)	Primary and Secondary
	24-hour	None	
Sulfur dioxide	Annual (Arithmetic mean)	0.03 ppm (80 µg/m^3)	Primary
	24-hour[3]	0.14 ppm (365 µg/m^3)	Primary
	3-hour[3]	0.50 ppm (1300 µg/m^3)	Secondary
Particulate matter equal to or less than 10 micrometers in diameter	Annual[4] (Arithmetic mean)	50 µg/m^3	Primary and Secondary
	24-hour[3]	150 µg/m^3	Primary
Particulate matter equal to or less than 2.5 micrometers in diameter	Annual[5] (Arithmetic mean)	15 µg/m^3	Primary and Secondary
	24-hour[6]	65 µg/m^3	Primary
Lead	Quarterly	1.5 µg/m^3	Primary and Secondary

Source: Environmental Protection Agency 2004. Title 40, Part 50 of the Code of Federal Regulations.

Notes:
[1] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
[2] The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is <= 1, as determined by Appendix H.
The 1-hour NAAQS will no longer apply to an area one year after the effective date of the designation of that area for the 8-hour ozone NAAQS. The effective designation date for most areas is June 15, 2004. (40 Code of Federal Regulations 50.9; see Federal Register of April 30, 2004 [69 Federal Register 23996].)
[3] Not to be exceeded more than once per year.
[4] To attain this standard, the expected annual arithmetic mean particulate matter equal to or less than 10 micrometers in diameter concentration at each monitor within an area must not exceed 50 ug/m^3.
[5] To attain this standard, the 3-year average of the annual arithmetic mean particulate matter equal to or less than 2.5 micrometers in diameter concentrations from single or multiple community-oriented monitors must not exceed 15 ug/m^3.
[6] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 ug/m^3.

NAAQS = National Ambient Air Quality Standards ppm = parts per million
µg/m^3 = micrometers per cubic meter mg/m^3 = milligrams per cubic meter

3.3.2 Existing Conditions

3.3.2.1 Climate and Regional Air Quality

The climate in the Clines Corner area is mild, sunny, and dry. This region can be classified as having a temperate, semiarid continental climate with light precipitation, abundant sunshine, and low relative humidity (Western Regional Climate Center 2004). Annual high temperatures at Clines Corners average 64 degrees Fahrenheit (ºF) and low temperatures average 35ºF (Western Regional Climate Center 2004). The area receives an average of 17.91 inches of precipitation annually.

Table 3-3 displays the most recent criteria pollutant emissions data for Santa Fe County. Santa Fe County is in attainment for all criteria pollutants. Current sources of emissions at the proposed White Lakes DZs are from fugitive dust, which contributes to PM_{10} and $PM_{2.5}$.

Table 3-3. Emissions Inventory of Santa Fe County (1999)

Source Category	CO (tpy)	NO_2	$PM_{2.5}$	PM_{10}	SO_2	VOCs
Highway Vehicles[a]	53,787	5,706	131.72	170.12	215.50	4,322
Off-Highway Vehicles[b]	8,848	632.90	65.13	70.63	77.69	783.79
Industrial Processes	148.80	1,074	30.01	45.9	287.32	71.93
Misc. (fugitive dust)	0	0	8,168	51,941	0	0
Waste Disposal & Recycling	908.72	38.33	171.27	180.77	4.06	135.50
Aircraft	96.7	0.53	1.36	1.98	0.07	3.59
Railroads	26.8	272	6.07	6.75	17.0	10.1
Area Sources[c]	4,806	423.30	448.94	508.37	43.92	404.61
Agriculture & Forestry	0	0	76.7	439	0	0
Storage & Transport	0	0	0	0	0	563.70
Solvent Utilization	0	0	0	0	0	1,459.42
TOTAL	**68,622**	**8,146**	**9,099**	**53,365**	**645**	**7,754**

Source: Environmental Protection Agency 2004.

Notes: [a] Highway vehicles include motorcycles, light and heavy duty gasoline and diesel vehicles and trucks.
[b] Off highway vehicles include non-road gasoline and diesel vehicles.
[c] Area sources include residential wood burning, natural gas combustion and propane combustion, electric utilities, solvent utilization (dry cleaning and surface coating), as well as other small stationary point sources.
CO = carbon monoxide tpy = tons per year NO_2 = nitrogen dioxide
$PM_{2.5}$ = particulate matter equal to or less than 2.5 micrometers in diameter
PM_{10} = particulate matter equal to or less than 10 micrometers in diameter
SO_2 = sulfur dioxide VOC = volatile organic compounds

3.4 NOISE

3.4.1 Definition of Resource

Noise is defined as unwanted sound or, more specifically, as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying (Federal Interagency Committee on Noise 1992). Human response to noise varies according to the type and characteristics of the noise, distance between the noise source and the receptor, sensitivity of the receptor, and time of day.

Due to wide variations in sound levels, sound is measured in decibels (dB), which is a unit of measure based on a logarithmic scale (e.g., 10-dB increase corresponds to a 100 percent increase in perceived sound). According to the EPA Office of Noise and Abatement (1972-1982), under most conditions, a 5-dB change is necessary for noise increases to be noticeable to humans. Sound measurement is further refined by using an A-weighted decibel scale (dBA) that emphasizes the range of sound frequencies that are most audible to the human ear (between 1,000 and 8,000 cycles per second).

Ambient background noise in urbanized areas typically varies from 60 to 70 dBA, but can be higher; suburban neighborhoods experience ambient noise levels of approximately 45 to 50 dBA (EPA 1978). Table 3-4 identifies noise levels associated with common indoor and outdoor activities and settings and identifies subjective human judgment of noise levels, specifically the perception of noise levels doubling or being halved.

A noise-sensitive receptor is defined as a land use where people involved in indoor or outdoor activities may be subject to stress or considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries. Sensitive receptors may also include noise-sensitive cultural practices, some domestic animals or certain wildlife species.

Aircraft operations over DZs are different from those associated with airport environments. Aircraft operations at airfields tend to be continuous or patterned, while sortie-operations in airspace are more sporadic. In addition, the C-130 has a low, slow flight pattern when compared to commercial aircraft.

Table 3-4. Typical A-Weighted Sound Levels

Noise Source	A-Weighted Sound Level in Decibels	Noise Environment	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a few feet away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Moderately Loud	
Pneumatic Drill; Vacuum Cleaner	80	Moderately Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	
Near Freeway Auto Traffic	70	Moderately Loud	
Average Office	60	Moderate	½ times as loud
Suburban Street	55	Moderate	
Light Traffic; Soft Radio Music in Apartment	50	Quiet	¼ times as loud
Large Transformer	45	Quiet	
Average Residence Without Stereo Playing	40	Faint	⅛ times as loud
Soft Whisper	30	Faint	
Rustling Leaves	20	Very Faint	
Human Breathing	10	Very Faint	Threshold of Hearing

Source: LSA Associates, Inc. 2002.

3.4.2 Existing Conditions

The proposed White Lakes DZs occur in a very rural setting. The primary human source of noise comes from traffic associated with highway US 285. No noise data are available for this area but noise levels at the proposed DZs likely range from 40 dB to 60 dB with moderate noise levels occurring next to the highway. Military and civilian aircraft do fly over the area and may increase noise levels temporarily, but these events are not continuous, usually occurring 0-3 times per day.

3.5 LAND USE AND VISUAL RESOURCES

3.5.1 Definition of Resource

Land use is the classification of either natural or human-modified activities occurring at a given location. Natural land use includes rangeland and other open or undeveloped areas. Human-modified land use classifications include residential, commercial, industrial, communications and utilities, agricultural, institutional, recreational, and other developed areas. Land use is regulated by management plans, policies, regulations, and ordinances (e.g. zoning) that determine the type and extent of land use allowable in specific areas and protect specially designated or environmentally sensitive areas.

Visual resources are defined as the natural and manufactured features that constitute the aesthetic qualities of an area. These features form the overall impression that an observer receives of an area (i.e. its landscape character). An area's susceptibility to visual impacts is related to visual sensitivity. Highly sensitive resources include national parks, recreation areas, historic sites, wild and scenic rivers, designated scenic roads and other areas specifically noted for aesthetic qualities.

3.5.2 Existing Conditions

The Proposed Action occurs in a very rural setting where land use consists primarily of cattle grazing. The land is owned by the State of New Mexico and managed by the State Land Office. Figure 3-3 shows existing land use in the area of the Proposed Action and Figure 3-4 shows land ownership. The visual environment consists of grass covered hills with scattered trees. No official scenic values have been designated at or surrounding the proposed White Lakes DZs.

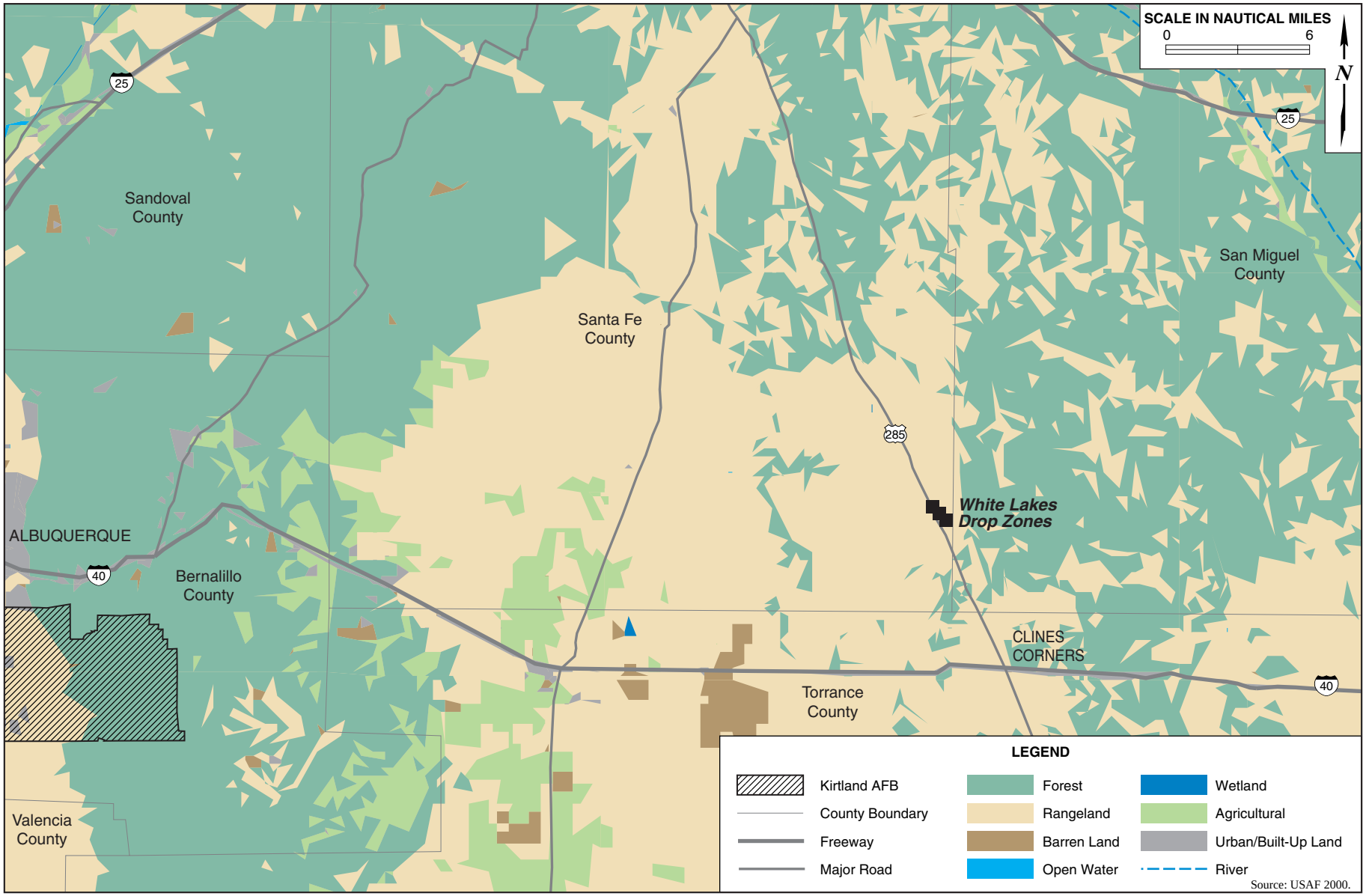
3.6 TRANSPORTATION AND CIRCULATION

3.6.1 Definition of Resource

Transportation and circulation refer to the movement of vehicles throughout a roadway network. Roadway operating conditions and the capacity of the system to accommodate vehicles are described in terms of volume-to-capacity (V/C) ratio, which is a comparison of average daily traffic volume to roadway capacity. The V/C ratio corresponds to a Level of Service (LOS) rating, ranging from free-flowing traffic conditions (LOS "A") for a V/C of less than 60 percent, to congested "stop-and-go" conditions (LOS "F") for a V/C at or near 100 percent. Because the Proposed Action is in a rural area with not many roads, traffic LOS is not analyzed in this EA.

3.6.2 Existing Conditions

Highway US 285 runs from north to south on the west of the proposed DZs, although a small segment of the highway transcends the extreme southwestern portion of the DZ proposed in Section 26. Interstate 40 runs east to west approximately 7 miles south of the Proposed Action. Traffic volumes for US 285 and I-40 near Clines Corners are approximately 1,900 vehicles for US 285 and 14,800 vehicles on I-40 for typical weekday traffic volumes (these volumes include both directions of travel) (Mid-Region Council of Governments 2003). Dirt roads comprise the remaining roads in the immediate area surrounding the proposed DZs. Traffic on these roads is light and many of them are only accessible through a locked gate. Locked gates also control access to the proposed DZs.

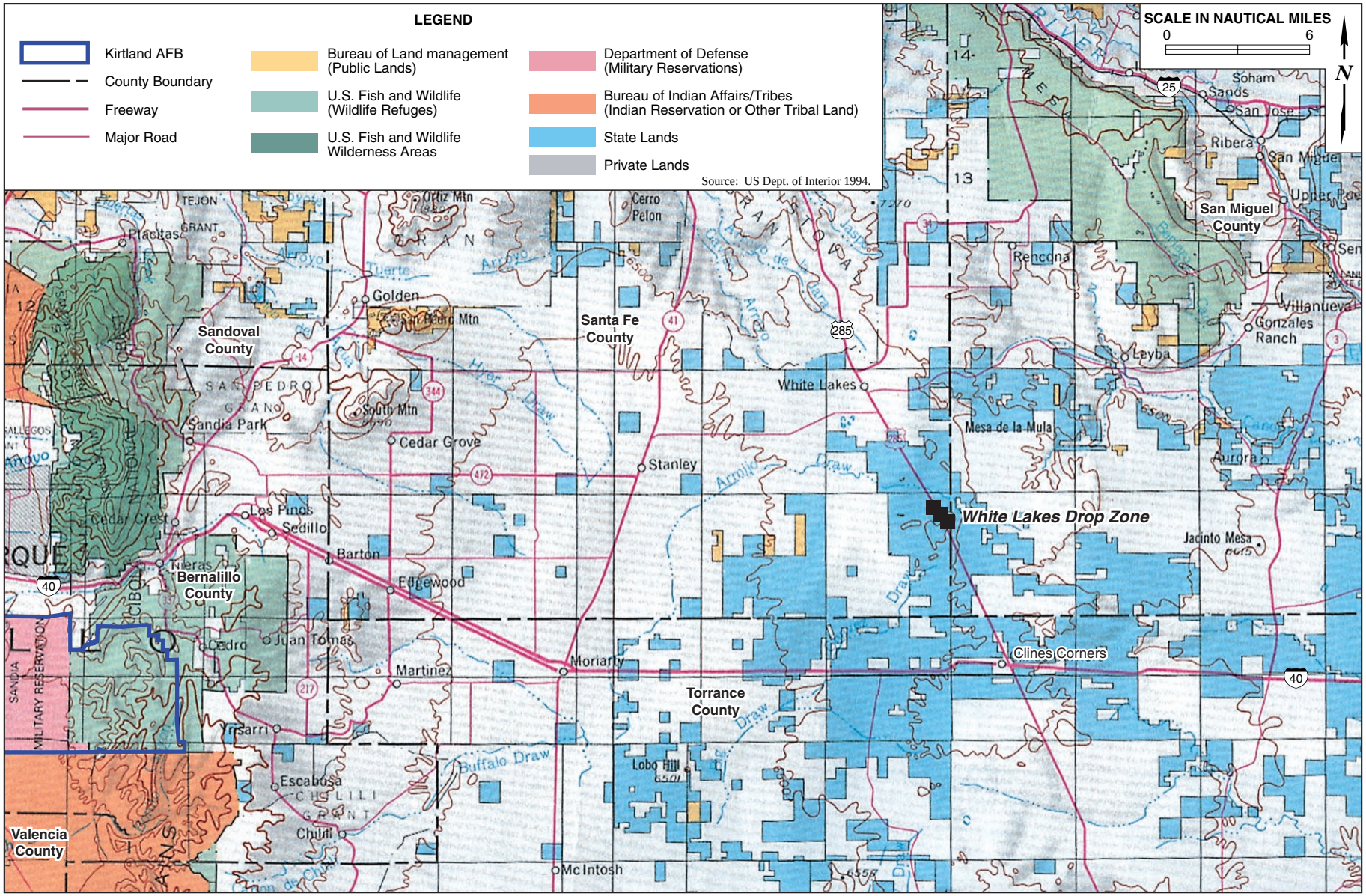


SEP 2005

EA

Land Use in the Vicinity of Kirtland Air Force Base and the Proposed Drop Zones

FIGURE 3-3



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EA

Land Ownership in the Vicinity of Kirtland Air Force Base and the Proposed Drop Zones

FIGURE

3-4

3.7 GEOLOGICAL RESOURCES

3.7.1 Definition of Resource

The geological resources of an area consist of all soil and rock materials. Soils refer to unconsolidated earthen material overlying bedrock or other parent material. For this report, only soil properties pertaining to erosion are described. The geology of an area includes mineral deposits, notable landforms, tectonic features, and fossil remains.

3.7.2 Existing Conditions

3.7.2.1 Geology

The proposed White Lakes DZs are located on the extreme eastern edge of the Estancia Basin. The uplifting of the Manzano Mountains caused topographic closure of the basin, and prevented drainage from the basin. This event is believed to have occurred in the late tertiary or early Pleistocene during the late stages of development of the Rio Grande rift. Gypsum and gypsiferous sandstone and limestone of the Permian Yeso Formation underlie the basin floor which is covered with valley fill (Allen & Anderson 2000). The Chinle Formation, upper Triassic in age, underlies the proposed DZs (Chronic 2003). This formation is a floodplain composite that is composed of fine grained silty sandstone, siltstone, and shale that are red, pink or brown in coloration (Chronic 2003 and Western Cordillera 2004).

Topography of the site can be described as gently rolling terrain that slopes west to east. Armijo Draw is the primary feature of the immediate area draining much of the proposed DZ areas. Elevations range from 6,875 feet to 7,025 feet above mean sea level. Slopes range from 0 to 11 percent throughout the proposed DZs.

3.7.2.2 Soils

The primary soils occurring in the proposed White Lakes DZs consist of Travessilla-Bernal fine sandy loams, Rednun loam, Penistaja fine sandy loam, La Brier loam, and Harvey-Dean loam (United States Department of Agriculture [USDA] 2004). These soils drain well and have slow to moderate permeability. Water erosion is moderate for each of these soils with wind erosion potential ranging from slight to severe.

3.8 WATER RESOURCES

3.8.1 Definition of Resource

Water resources include all surface waters and groundwater and their availability for human use. For this analysis, those water resources located within the proposed project areas and the watershed areas affected by existing and potential runoff, including an area's potential for flooding (100-year floodplains), were investigated. Surface water resources comprise lakes, rivers, and streams and are important for economic, ecological,

recreational, and human health reasons. Groundwater comprises the subsurface hydrologic resources of the physical environment and is an essential potable resource in many areas; groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater properties are often described in terms of depth to aquifer, aquifer or well capacity, water quality, and surrounding geologic composition.

Other issues relevant to water resources include watershed areas affected by existing and potential runoff and hazards associated with 100-year floodplains. Floodplains are belts of low, level ground present on one or both sides of a stream channel and are subject to periodic inundation by floodwater. Inundation dangers associated with floodplains have prompted federal, state, and local legislation that limit development in these areas largely to recreation and preservation activities.

Jurisdictional wetlands are those subject to regulatory authority under Section 404 of the Clean Water Act and EO 11990, *Protection of Wetlands*. Wetlands are defined by the United States Army Corps of Engineers (Federal Register 1982) and EPA (Federal Register 1980) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions".

3.8.2 Existing Conditions

3.8.2.1 Surface Water

Lake Estancia used to be a perennial lake which was refilled by groundwater recharge. However, desiccation of the lake occurred approximately 12,000 years ago. No major surface water features occur in the Estancia Basin, however, large playas are found in the lowest portions of the historic lake bed. For the most part, surface water in the basin consists of cattle tanks or man made impoundments, which are distributed throughout the basin. Two cattle tanks currently occur on the proposed White Lakes DZs, with two impoundments (which may or may not contain water depending on recent precipitation) found along the periphery of the proposed DZs. Surface water draining from the site either is captured in man made impoundments, lost to evaporation, or infiltrates the soil and moves to lower elevations through sub-surface flow (Allen & Anderson 2000). Armijo Draw is the primary drainage feature of the proposed White Lakes DZs.

3.8.2.2 Floodplains and Wetlands

Due to the lack of surface water, no floodplains occur in the area. Wetlands are also absent.

3.8.2.3 Groundwater

The proposed White Lakes DZs lie on the extreme eastern edge of the Estancia Underground Water Basin, with a watershed boundary measuring approximately 2,260 square miles (USDA 2002). The basin is bounded to the west by the Manzano Mountains, to the east by the Pedernal Hills and the south is demarked by the Chupadera Mesa (Allen and Anderson 2000). This basin is closed, meaning that no rivers or streams run through it. Therefore, recharge of the basin comes only in the form of precipitation that penetrates the valley fill sediment. The majority of the recharge occurs through groundwater movement toward the center of the basin. The simple hydrology of the basin has been liked to a bathtub filled with sand (Allen & Anderson 2000). Water levels in the basin range from approximately 5,900 feet in the lowest portion of the valley to over 7,500 feet along the east slope of the Manzano Mountains. Water levels surrounding the White Lakes DZs are between 6,800 and 7,000 feet (Santa Fe County 2003).

3.9 BIOLOGICAL RESOURCES

3.9.1 Definition of Resource

Biological resources include native, naturalized, or introduced plants and animals and the habitats in which they occur. Protected species are defined as those listed as threatened, endangered, proposed, or candidate for listing by the United States Fish and Wildlife Service (USFWS); New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD); and/or the New Mexico Department of Game and Fish (NMDG&F). Federal species of concern are not protected by law; however, these species could become listed, and therefore are considered when addressing biological impacts of an action on biological resources. NMEMNRD holds the responsibility for identifying and listing sensitive plant species considered in this analysis. Animal species of special concern to the NMDG&F are also considered.

Sensitive habitats include those areas designated by the USFWS as critical habitat protected by the Endangered Species Act (ESA) and sensitive ecological areas as designated by state or federal rulings. Sensitive habitats also include wetlands, plant communities that are unusual or of limited distribution, and important seasonal use areas for wildlife (e.g. migration routes, breeding areas, crucial summer/winter habitats).

3.9.2 Existing Conditions

Vegetation at the White Lakes DZs consists primarily of grassland species. Common species included blue grama (*Bouteloua gracilis*), galleta (*Pleuraphis jamesii*), Indian ricegrass (*Achnatherum hymenoides*), squirreltail (*Elymus elymoides*), milkvetch (*Astragalus spp.*), sunflowers (*Helianthus spp.),* curlycup gumweed (*Grindelia nuda*), tree cholla (*Opuntia imbricate*), broom snakeweed (*Guiterrizia sarothrae*), Great Plains yucca (*Yucca glauca*), and a few scattered one-seeded junipers (*Juiperus monosperma*).

Wildlife in the area is typical of that found in grassland ecosystems and includes American pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), badger (*Taxidea taxus*), prairie dogs (*Cynomys spp*), and blacktailed jack rabbit (*Lepus californicus*). Birds species consist of the red-tailed hawk (*Buteo jamaicensis*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), western meadow lark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), and western kingbird (*Tyrannus verticalis*). The prairie rattlesnake (*Crotalus viridis*), western terrestrial garter snake (*Thamnophis elegans*), plateau striped whiptail (*Cnemidophorus velox*), lesser earless lizard (*Holbrookia maculate*), and spadefoot toad (*Spea spp*.) are common reptiles and amphibians inhabiting these grasslands.

Table 3-5 lists federal and state listed sensitive species that could potentially be found in the grassland habitat at the proposed White Lakes DZs. Federally threatened and endangered species are legally protected under the ESA. New Mexico State listed threatened and endangered animal species are protected by the New Mexico Wildlife Act. The NMEMNRD maintains listings of state threatened and endangered plants, which are protected under the New Mexico Endangered Plant Species Act.

The New Mexican jumping mouse, southwestern willow flycatcher, whooping crane, yellow-billed cuckoo, Rio Grande silvery minnow, and the Great Plains lady's tresses orchid are all associated with wetlands, riparian areas or waterways. Since this type of habitat is not found near the Proposed Action, these species are not discussed further. The Mexican spotted owl, a species associated with old growth forest and canyons, and the black-footed ferret, a species that has long been extirpated from the county, also have been eliminated from further review. The Townsend's big-ear bat is associated with caves or old buildings which are not found in the vicinity of the Proposed Action and the northern goshawk is a forest bird, therefore these species were not addressed further. The Santa Fe cholla is only known from a few locations, none of which occur near the proposed DZs, so it was eliminated from further discussions.

A biological survey (Appendix D) was conducted in 2005 and revealed that the bald eagle, Baird's sparrow, mountain plover, gray vireo, both subspecies of peregrine falcons and the Flint Mountains milkvetch are the only listed species that have any real potential for inhabiting the proposed DZs. In addition, the western burrowing owl (*Athene cunicularia hypugaea*) a species of concern in New Mexico (Branstetter 2005) and the loggerhead shrike (*Lanius ludovicianus*), a former federal species of concern (Biota Information System of New Mexico 2004), are species that could potentially be found at the proposed White Lakes DZs.

Table 3-5. Species with Special Status, Santa Fe County

Common Name	Scientific Name	Federal Status	State Status
MAMMALS			
Townsend's big-eared bat	*Corynorhinus townsendii*	FSC	
Black-footed ferret	*Mustela nigripes*	E	
New Mexican meadow jumping mouse	*Zapus hudsonius leteus*	FSC	T
BIRDS			
Northern goshawk	*Accipiter gentilis*	FSC	
Baird's sparrow	*Ammodramus bairdii*	FSC	T
Mountain plover	*Charadrius montanus*	FSC	
Yellow-billed cuckoo	*Coccyzus americanus*	C	
Southwestern willow flycatcher	*Empidonax traillii extimus*	E	E
American peregrine falcon	*Falco peregrinus anatum*		T
Artic Peregrine falcon	*Falco peregrinus tundrius*		T
Whooping crane	*Grus americana*	E	E
Bald eagle	*Haliaeetus leucocephalus*	T	T
Mexican spotted owl	*Strix occidnetalis lucida*	T	
Gray vireo	*Vireo vicinior*		T
FISH			
Rio Grande silvery minnow	*Hybognathus amarus*	E	E
PLANTS			
Great Plains lady's tresses	*Spiranthes magnicamporum*		E
Santa Fe cholla	*Opuntia viridiflora*		E
Flint Mountains milkvetch	*Astragalus siliceus*		S

Sources: Biota Information System of New Mexico 2004, United States Fish and Wildlife Service 2005, New Mexico Natural Heritage Program 2004a, New Mexico Natural Heritage Program 2004b.
Notes: E = Endangered T = Threatened C = Candidate S = Sensitive FSC = Federal Species of Concern

3.10 CULTURAL RESOURCES

3.10.1 Definition of Resource

Significant cultural resources are classified as buildings, sites, districts, structures, or objects. A building is created to shelter any form of human activity. A structure is distinguished from a building in that it is a construction designed for purposes other than creating human shelter. Objects are constructions that are primarily artistic in nature or are relatively small and simply constructed. A site is the location of a significant event, a prehistoric or historic activity, or a building or structure whose location possesses value. A district is a concentration or linkage of sites, buildings, structures, or objects that are united historically or aesthetically by plan or development.

The criteria for establishing significance are set forth in Title 36 CFR Part 60.4. Procedures for the application of the National Register criteria for evaluation are found in various National Park Service bulletins. These bulletins provide guidelines so that decisions concerning significance, integrity, and treatment can be reliably made.

3.10.2 Existing Conditions

No cultural resource inventories or studies had been performed for the White Lakes DZs. Therefore, a cultural survey was conducted in January and February of 2005 to determine if any cultural resources occur in the area. The results of this survey revealed eight cultural sites in the area, none of which occur within the proposed DZs or access roads.

SECTION 4
ENVIRONMENTAL CONSEQUENCES

4.1 AIRSPACE MANAGEMENT

4.1.1 Methodology

The significance of potential impacts to airspace management depends on the degree to which the proposed mission change would affect the airspace environment. Significant impacts could result if the proposed action would: 1) impose major restrictions on air commerce opportunities; 2) significantly limit airspace access to a large number of users; or 3) require modifications to Air Traffic Control (ATC) systems.

4.1.2 Impacts

Impacts to airspace management are predicated on the extent to which the proposed action would affect the navigable airspace in a terminal or enroute airspace environment. Impacts could occur if an action: 1) negatively affected movement of other air traffic in the area; 2) compromised ATC systems or facilities; or 3) caused an increase in midair collision potential between military and non-participating civilian operations.

4.1.2.1 Proposed Action

Moving from Roswell Municipal Airport to the proposed White Lakes Drop Zones (DZs) for training operations would have no effect on the airspace surrounding Kirtland Air Force Base (AFB) as C-130 aircraft would continue to take off and land at the base during these training operations. However, Roswell Municipal Airport would see a minor decrease in airspace use as C-130 training operations would no longer occur there. These training operations would occur over the White Lakes DZs and result in an increase in use of that airspace (i.e. flights would occur up to three times a week for 48 weeks per year). However, this increase in airspace use over the White Lakes DZs would not be significant since it would not conflict with current users of the airspace, would only occur for the next 1-5 years, and would only occur up to three times a week. Furthermore, the Proposed Action would not impose major restrictions, limit airspace access or require modification to ATC systems because the area is Class G airspace. Conducting training operations within the White Lakes DZs airspace would allow air and ground crews to conduct realistic training not under the control of an airport tower.

4.1.2.2 No-Action Alternative

Under the No-Action Alternative, there would be no change in the airspace use at Kirtland AFB or Roswell Municipal Airport. Military pilots and ground crews would continue to train under the control of the Roswell Tower, and would not meet realistic training objectives.

4.2 SAFETY

4.2.1 Methodology

An impact to safety would be considered significant if implementation of a proposed action would substantially increase risks associated with mishap potential or safety relevant to the public or the environment.

An impact to children from environmental health risks or safety risks would be considered significant if a proposed action would result in a disproportionate adverse impact to the health or safety of children.

4.2.2 Impacts

Potential impacts to human health and safety were determined by comparing present conditions with conditions that would occur from the 58th Special Operations Wing (58 SOW) DZ operations.

Analysis of potential impacts to children includes: 1) identifying and describing hazards that could potentially affect children; 2) examining the Proposed Action and the potential effects this action may have on children; and 3) assessing the significance of potential impacts. If potential adverse impacts are identified, mitigation measures are proposed to minimize or alleviate the impacts.

4.2.2.1 Proposed Action

Although implementation of the Proposed Action would change the location of current flights and ground crews, the same safety requirements would be in place. Ground crews would arrive at the White Lakes DZs prior to drops to ensure that the area is clear of people, vehicles, and cattle, thus avoiding injury of persons or damage to private property. The 58 SOW and United States Air Force regulations and standards, as discussed in Chapter 3 of this Environmental Assessment (EA), would apply and therefore, proper protocol and safety rules would be implemented while performing the DZ operations. There would be no change in mishap rates or Bird Aircraft Strike Hazard occurrences as a result of the Proposed Action.

Children do not live or recreate in the area proposed for the White Lakes DZs. Therefore, possible disproportionate negative impacts to children identified in Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* would not occur. The same safety measures would be in place with ground crews ensuring the area is clear of people, vehicles, and cattle to void injury of persons or damage to private property.

4.2.2.2 No-Action Alternative

Selection of the No-Action Alternative would result in continued use of Roswell Municipal Airport for DZ training and operations. There would be no change to current conditions of safety or risks to children.

4.3 AIR QUALITY

4.3.1 Methodology

The 1990 amendments to the Clean Air Act require federal agencies to conform to the affected State Implementation Plan (SIP) with respect to achieving and maintaining attainment of National Ambient Air Quality Standards (NAAQS) and addressing air quality impacts. An air quality impact resulting from a proposed action would be significant if it would: (1) increase concentrations of ambient criteria pollutants or ozone precursors to levels exceeding NAAQS, (2) increase concentrations of pollutants already at non-attainment levels, (3) lead to establishment of a new non-attainment area by the governor of the state or the Environmental Protection Agency, or (4) delay achievement of attainment in accordance with the SIP.

4.3.2 Impacts

4.3.2.1 Proposed Action

Table 4-1 shows estimated emissions from operation of C-130s in the DZ areas based on the number of training flights per year (i.e. flights would occur up to three times a week for 48 weeks per year). Emissions from operation of the C-130 and DZ trainings were calculated using the Multiple-Aircraft Instantaneous Line Source Dispersion Model, ESL-TR-89-59 (Liebsch 1990). Altitudes at the DZs would range from 150-800 feet, and a 400-foot average release altitude was used for calculation purposes. Average airspeed for the C-130 would be 240 miles-per-hour and the inversion height would be at 5,000 feet. Emissions would be negligible and not constitute any impact to air quality in the DZ areas.

Table 4-1. Estimated Annual Emissions from C-130s at the White Lakes Drop Zones

Pollutant	Averaging Time	*Emissions (micrograms per cubic meter [µg/m^3])	NAAQS (µg/m^3)
Carbon monoxide	8-hour	.0104	10
	1-hour	.1255	40
Nitrogen dioxide	Annual	.0008	100
	24-hour	--	--
Sulfur dioxide	Annual	.0000859	80
	24-hour	.0011	365
	3-hour	.0087	1,300
Particulate matter equal to or less than 10 micrometers in diameter	Annual	.0000438	50
	24-hour	.0006	150

Source: *Liebsch 1990.
Notes: µg/m^3 = milligrams per cubic meter NAAQS = National Ambient Air Quality Standards

4.3.2.2 No-Action Alternative

Under the No-Action Alternative, the Roswell Municipal Airport would continue to be used therefore, no changes to current air quality would occur.

4.4 NOISE

4.4.1 Methodology

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from implementation of a proposed action. Potential changes in the noise environment can be beneficial (i.e. if they reduce the number of sensitive receptors exposed to unacceptable noise levels), negligible (i.e. if the number of sensitive receptors exposed to unacceptable noise levels is essentially unchanged), or adverse (i.e. if they result in increased exposure of sensitive receptors to unacceptable noise levels). Noise impacts would be considered significant if there would be significant change from baseline conditions, if health and safety standards were violated, if sensitive receptors were disproportionately affected, or if damage resulted to personal property. Land use guidelines established by the US Department of Housing and Urban Development and based on findings of the Federal Interagency Committee on Noise recommend acceptable levels of noise exposure for various types of land uses.

4.4.2 Impacts

Projected noise impacts from the Proposed Action and alternatives were evaluated quantitatively against acceptable noise levels per the US Department of Housing and Urban Development Land Use Guidelines.

4.4.2.1 Proposed Action

Noise would be generated by aircraft and would be noticeable when aircraft fly at the drop altitude between 150-800 feet above ground level (AGL). Table 4-2 shows noise levels for the C-130 at various altitudes AGL. Aircraft would be at these altitudes for a maximum period of three minutes. Eighty percent of the airdrops would occur during the day. The DZs are in a sparsely populated area. The nearest residence is 2 miles to the southeast. Clines Corner, the nearest community, is 7.5 miles south and has a population of 161. The aircraft noise at Clines Corner is expected to be below 65 day-night average sound level.

Aircraft noise would be temporary and brief and would result in a minor increase in noise levels for short periods of time in the area of the DZs. Noise would be consistent with the established guidelines for this type of land use based on the day-night average sound level.

Noise impacts on wildlife and livestock from aircraft overflights are discussed in Section 4.9.2.1 of this EA (see also Appendix E).

Table 4-2. C-130 Sound Exposure Level Values

Altitude (AFL)	C-130H
125	105.7
200	102.7
250	101.2
315	99.7
500	96.5
1000	91.4
2000	85.8
3150	81.7
5000	77.3

Source: United States Air Force 1995.
Note: Based on steady, level flight and using Omega 108 data from actual overflight noise measurements.

4.4.2.2 No-Action Alternative

Under the No-Action Alternative, there would be no changes to the current DZ operations at Roswell Municipal Airport; therefore, no changes to the noise environment in the Proposed Action area would occur.

4.5 LAND USE AND VISUAL RESOURCES

4.5.1 Methodology

Potential impacts to land use from a proposed action are evaluated by determining if an action is compatible with existing land use and in compliance with adopted land use plans and 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.

Methodologies for determining the impacts to visual resources are based on the level of visual sensitivity in an area.

4.5.2 Impacts

Potential land use impacts were analyzed by: (1) identifying and describing land uses that could affect or be affected by the project, (2) examining the effects this action may have on the resource, (3) assessing the significance of potential impacts, and (4) providing measures to mitigate potentially significant impacts.

After assessing the visual character and relative sensitivity of the affected setting, changes to the landscape associated with the Proposed Action and alternatives were analyzed in terms of their potential to noticeably alter existing view sheds.

4.5.2.1 Proposed Action

The use of the proposed White Lakes DZs would not conflict with current land use; cattle grazing would continue to be the primary land use. As a result, economic impacts to the rancher are not expected to occur since DZ use would only occur in areas where cattle are absent. Short-term changes to visual resources would occur while DZ training operations are in progress. C-130 aircraft could be viewed from the highway and cargo/personnel drops would also be observable. However, once training operations were completed, visual resources would return to prior conditions. Furthermore, no construction or changes to the landscape would occur under the Proposed Action, therefore long-term impacts to visual resources would not occur.

4.5.2.2 No-Action Alternative

Under the No-Action Alternative DZ operations would continue to occur at the Roswell Municipal Airport. Continued use of this alternative would be compatible with existing land uses and visual resources.

4.6 TRANSPORTATION AND CIRCULATION

4.6.1 Methodology

Impacts to transportation and circulation are assessed by determining an action's potential to change current transportation patterns, systems, service, and safety. Impacts may arise from physical changes to circulation (e.g. closing, rerouting, or creating roads), construction activity disrupting existing local-area traffic patterns, or changes in daily or peak-hour traffic volumes created by workforce and population changes related to installation activities. An impact on roadway capacities would be considered significant if a road with no history of over-capacity traffic volumes were forced to operate at or beyond its design capability. An impact also would be considered significant if the action would increase traffic on roads already experiencing traffic problems.

4.6.2 Impacts

Potential impacts to transportation and circulation from the Proposed Action and alternative were analyzed by: (1) identifying and describing transportation and circulation that could affect or be affected by the project, (2) examining the effects the action may have on the resource, (3) assessing the significance of potential impacts, and (4) providing measures to mitigate potentially significant impacts.

4.6.2.1 Proposed Action

One to two crews consisting of 2-4 people would travel in pickup trucks to pick up sandbags, rubber ballast, or personnel. The vehicles would travel I-40 to US 285. Access to the site would require the use of existing dirt roads. If the cargo could not be reached using dirt roads, crews would travel by foot to recover dropped items.

Impacts to regional transportation would not occur as only one or two vehicles would be added to the traffic volumes on I-40 and US 285 and these vehicles would only be on the roads a maximum of three times a week. The dirt roads used to access the proposed DZs are infrequently used and restricted by locked gates.

4.6.2.2 No-Action Alternative

Selection of the No-Action Alternative would result in no change to current transportation and circulation conditions in the DZ operations area at Roswell Municipal Airport.

4.7 GEOLOGICAL RESOURCES

4.7.1 Methodology

An impact to geological resources would be considered significant if implementation of a proposed action would violate a federal, state, or local law or regulation protecting geological resources (e.g., impacted unique landforms or rock formations), or result in uncontrolled erosion over a larger area than that allowed by regulations protecting soil resources.

4.7.2 Impacts

Protection of unique geologic features and minimization of soil erosion are considered when evaluating impacts of a proposed action on geological resources. Generally, such impacts are not considered significant if proper construction techniques and erosion control measures can be implemented to minimize short- and long-term disturbance to soils and overcome limitations imposed by earth resources.

4.7.2.1 Proposed Action

Implementation of the Proposed Action would result in no significant negative impacts to regional geological resources. Dropping 15 pound (lb) sandbags, 45 lb rubber ballast, and personnel from C-130 aircraft would result in minor erosion caused by impact, but would be less than that caused by cattle grazing in the area. Furthermore, vehicles would remain on designated roads and only foot traffic would be allowed for recovery efforts. In the event that the roads or ground becomes too muddy and use of the DZs would degrade the pastures, DZ activities would be shut down until such time as the soil is dry enough to resume training operations.

4.7.2.2 No-Action Alternative

Selection of the No-Action Alternative would result in no change to current geological resource conditions at the proposed White Lakes DZs or the Roswell Municipal Airport.

4.8 WATER RESOURCES

4.8.1 Methodology

Criteria for determining the significance of impacts to water resources is based on water availability, quality, and use; existence of floodplains and wetlands; and applicable regulations. An impact to water resources would be considered significant if it would: (1) reduce or interfere with water availability to existing users, (2) create or contribute to overdraft of groundwater basins, (3) exceed safe annual yield of water supply sources, (4) adversely affect water quality or otherwise endanger public health, (5) threaten or damage unique hydrologic characteristics, or (6) violate established laws or regulations

that have been adopted to protect or manage water resources. Impacts to floodplains would be considered significant if a proposed action would alter flow within a floodplain.

4.8.2 Impacts

Potential impacts to water resources resulting from the Proposed Action and alternative were analyzed by: (1) identifying and describing the effects this action may have on the resource, (2) assessing the significance of potential impacts, and (3) providing measures to mitigate potentially significant impacts.

Determination of the significance of wetland impacts is based on: (1) the function and value of the wetland, (2) the proportion of the wetland that would be affected relative to the occurrence of similar wetlands in the region, (3) the sensitivity of the wetland to proposed activities, and (4) the duration of ecological ramifications. Impacts to wetland resources are considered significant if high value wetlands would be adversely affected.

4.8.2.1 Proposed Action

No significant impacts to water resources would occur from implementation of the Proposed Action. The only surface water in the area consists of cattle tanks and impoundments. None of the materials proposed for use on the DZs are hazardous and all materials would be recovered and removed from site once the training operation was completed. Since no construction or hazardous materials would be used, impacts to groundwater would not occur. Floodplains and wetlands do not occur in the area, therefore these resources would not be impacted.

4.8.2.2 No-Action Alternative

Under the No-Action Alternative, there would be no changes to current water resources at the proposed White Lakes DZs.

4.9 BIOLOGICAL RESOURCES

4.9.1 Methodology

Determination of the significance of impacts to biological resources is based on: (1) the importance (legal, commercial, recreational, ecological, or scientific) of the resource; (2) the proportion of the resource that would be affected relative to its occurrence in the region; (3) the sensitivity of the resource to proposed activities; and (4) the duration of ecological ramifications. Impacts to biological resources are considered significant if species or habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of special concern.

4.9.2 Impacts

Sensitive species or habitats in the vicinity of the project sites were identified and potential impacts to biological resources, such as habitat loss and noise, resulting from implementation of the Proposed Action were evaluated.

4.9.2.1 Proposed Action

No significant impacts would occur to biological resources from the operation and use of the White Lakes DZs. Some vegetation would be crushed from personnel, sandbag, and rubber ballast drops, as well as pedestrian recovery of dropped bundles. Impacts to vegetation would be similar to the ongoing trampling that occurs from cattle. The area is heavily dominated by perennial grasses (e.g. blue grama grass), which tolerate these types of disturbances. Although less likely, wildlife could potentially be killed due to these activities. Loss of wildlife would be very limited and likely consist of small mammals, birds, and reptiles. Larger wildlife such as coyotes, deer, and pronghorn are unlikely to be killed by DZ activities as these animals are much more mobile and would tend to keep their distance from ground personnel that would be present during drop operations. Impacts to cattle would not occur as ground personnel would ensure that no drops would take place if cattle were present. In the event that cattle were present at a select DZ location, ground personnel would move to a different DZ where livestock were absent. Noise impacts to wildlife from C-130s would not be significant. Many noise studies have shown that wildlife disturbed by aircraft noise return to pre-noise activities (i.e. bedding, foraging, and walking) shortly after (usually within a few seconds and generally less than 1 minute), the disturbance has finished (North Atlantic Treaty Organization 2000).

The bald eagle could potentially be found flying over the site but, since no large water bodies or prairie dog colonies (prairie dogs are often preyed upon during winter months) were found in the area during a pedestrian survey, the bald eagle would only occur as a migrating transient. Additionally, the Baird's sparrow, gray vireo, and American and artic peregrine falcons could also be found in the area during migration, but are not expected to nest in the area based on habitat and historical occurrences. Mountain plovers nest in areas that are characterized by flat terrain with short vegetation (i.e. 2 inches or less). The Proposed Action lies on rolling terrain and vegetation averages from 8-18 inches, so mountain plovers are unlikely to use the site for nesting. However, they may use the area during migration. The western burrowing owl and loggerhead shrike may inhabit the proposed White Lakes DZs, since some suitable habitat exists for these species. Significant impacts to any of these bird species are unlikely since many of them would only fly over the area during migration. Birds that may potentially nest in the area, such as the western burrowing owl, are very unlikely to be impacted by DZ activities. In general, birds would likely flush as parachute cargo drops approach their nesting area. Furthermore, incidental take of any of these bird species is very unlikely since none of them have been observed in any of the DZs.

During a sensitive species habitat assessment survey (Appendix D) an unidentified species of milkvetch was found throughout the proposed White Lakes DZs. Although it was not identified to the species level, it was determined not to be the Flint Mountains milkvetch based on where it was found and on its physical characteristics (the stems and leaves were much too large). The Flint Mountains milkvetch is found on calcareous and rocky knolls in shortgrass prairies (New Mexico Rare Plant Technical Council 1999). Calcareous soils are found in the southern portion of the DZs located in Section 36, but no milkvetch plants were observed in this area. An exposed rocky knoll occurs in the northern portion of the proposed DZ located in Section 26, but no *Astragalus* plant species were found. State sensitive species receive no regulatory protection but the survey was done to determine species potential for occurrence.

4.9.2.2 No-Action Alternative

Under the No-Action Alternative, there would be no changes to biological resources.

4.10 CULTURAL RESOURCES

4.10.1 Methodology

The National Historic Preservation Act of 1966, as amended, establishes the National Register of Historic Places and Title 36 Code of Federal Regulations Section 60.4 defines the criteria used to establish significance and eligibility to the National Register as follows:

"The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and,

- That are associated with events that have made a significant contribution to the broad patterns of our history; or
- That are associated with the lives of persons significant in our past; or
- That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- That have yielded, or may be likely to yield, information important in prehistory or history."

4.10.2 Impacts

Analysis of potential impacts to significant cultural resources considers both direct and indirect impacts. Impacts may occur by:

- Physically altering, damaging, or destroying all or part of a resource;

- Altering the characteristics of the surrounding environment that contribute to resource significance;
- Introducing visual, audible, or atmospheric elements that are out of character with the property or alter its setting; or
- Neglecting the resource to the extent that it is deteriorating or destroyed.

Impacts were assessed by identifying the types and locations of the Proposed Action and determining the exact locations of cultural resources that could be affected.

4.10.2.1 Proposed Action

Based on the results of the 2005 cultural survey, the proposed White Lakes DZs were located to avoid all known cultural resource sites. Consultation with the State Historic Preservation Office was also conducted. Additionally, all roads that would be used for recovery of dropped bundles were surveyed, and no cultural resources were found. Since all cultural resource sites would be avoided and personnel would only use existing two-track roads that are clear of any cultural resources, impacts to this resource would not occur from implementation of the Proposed Action.

4.10.2.2 No Action Alternative

Under the No-Action Alternative, there would be no changes to cultural resources.

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This report was prepared for and under the direction of the Air Force Special Operations Command and the 58th Special Operations Wing at Kirtland Air Force Base by the LOPEZGARCIA GROUP. The members of the professional staff of the LOPEZGARCIA GROUP who participated in the development and technical review of this document are listed below.

Preparers	Education	Environmental Experience
Walter L. Moore Manager Colorado/ New Mexico Operations	*B.S., Zoology*	*25 years*
Robert D. Frei Environmental Scientist/ Biologist	*B.S., Biology*	*6 years*
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Rebecca L. Klundt Document Editor and Preparer	*Document Manager*	*18 years*
Deirdre Stites Technical Illustrator	*A.S., Geology*	23 years

SECTION 7
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APPENDIX A

INTERAGENCY AND INTERGOVERNMENTAL COORDINATION FOR ENVIRONMENTAL PLANNING CORRESPONDENCE

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
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Mr. Robert M. White
City Attorney
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Dear Mr. White:

A Draft Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts that could result from the proposed use of State Lands for three drop zones near White Lakes in the vicinity of Clines Corners, New Mexico. The 58th Special Operations Wing (58 SOW), a unit of Air Education and Training Command, and Kirtland Air Force Base, a unit of the Air Force Materiel Command, are the proponents of this action.

The State Land Office has agreed to grant access to its properties (Right of Entry Permit Contract No. 875), though it is understood that use of these lands by 58 SOW cannot start until the appropriate environmental and real estate issues are addressed.

In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs* (Section 1), we request that you review the attached Draft Finding of No Significant Impact and Environmental Assessment of the Proposed White Lakes Drop Zone for Kirtland Air Force Base and provide comments regarding any issues or concerns you have associated with the proposed action. If there are any additional agencies you feel should review and comment on the proposed action, please include them in your distribution of these materials.

Please review this information and respond with comments within 15 days. If you have any questions, contact Scott Wilson (505) 853-3452. Please send your written comments to our NEPA contractor, Mr. Walt Moore at 7011 Campus Drive, Suite 210, Colorado Springs, Colorado 80920. If you prefer, you can transmit your comments to him electronically at wmoore@lggroupinc.com. Thank you for your assistance.

Sincerely,

Cynthia Gooch, GS-12
Chief, Environmental Quality
Environmental Management Branch

Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

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To Whom It May Concern:

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In accordance with Executive Order 12372, *Intergovernmental Review of Federal Programs* (Section 1), we request that you review the attached Draft Finding of No Significant Impact and Environmental Assessment of the Proposed White Lakes Drop Zone for Kirtland Air Force Base and provide comments regarding any issues or concerns you have associated with the proposed action. If there are any additional agencies you feel should review and comment on the proposed action, please include them in your distribution of these materials.

Please review this information and respond with comments within 15 days. If you have any questions, contact Scott Wilson (505) 853-3452. Please send your written comments to our NEPA contractor, Mr. Walt Moore at 7011 Campus Drive, Suite 210, Colorado Springs, Colorado 80920. If you prefer, you can transmit your comments to him electronically at wmoore@lggroupinc.com. Thank you for your assistance.

Sincerely,

Cynthia Gooch, GS-12
Chief, Environmental Quality
Environmental Management Branch

Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
377 MSG/CEV
2050 Wyoming Blvd SE, Suite 126
Kirtland AFB NM 87117-5270

US Forest Service
Sandia Ranger District
Cibola National Forest
11776 Highway 337
Tijeras, NM 87509

To Whom It May Concern:

A Draft Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts that could result from the proposed use of State Lands for three drop zones near White Lakes in the vicinity of Clines Corners, New Mexico. The 58th Special Operations Wing (58 SOW), a unit of Air Education and Training Command, and Kirtland Air Force Base, a unit of the Air Force Materiel Command, are the proponents of this action.

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DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
377 MSG/CEV
2050 Wyoming Blvd SE, Suite 126
Kirtland AFB NM 87117-5270

Mr. Rayo McCollough
Information Coordinator
Natural Heritage New Mexico
UNM Biology Department
MSC03 2020
1 University of New Mexico
Albuquerque, NM 87131-0001

Dear Mr. McCollough:

A Draft Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts that could result from the proposed use of State Lands for three drop zones near White Lakes in the vicinity of Clines Corners, New Mexico. The 58th Special Operations Wing (58 SOW), a unit of Air Education and Training Command, and Kirtland Air Force Base, a unit of the Air Force Materiel Command, are the proponents of this action.

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Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
377 MSG/CEV
2050 Wyoming Blvd SE, Suite 126
Kirtland AFB NM 87117-5270

Ms. Joy E. Nicholopoulos
State Administrator
US Fish and Wildlife Service
NM Ecological Services State Office
2105 Osuna NE
Albuquerque, NM 87113

Dear Ms. Nicholopoulos:

A Draft Finding of No Significant Impact (FONSI) Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts that could result from the proposed use of State Lands for three drop zones near White Lakes in the vicinity of Clines Corners, New Mexico. The 58th Special Operations Wing (58 SOW), a unit of Air Education and Training Command, and Kirtland Air Force Base, a unit of the Air Force Materiel Command, are the proponents of this action.

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Sincerely,

Cynthia Gooch, GS-12
Chief, Environmental Quality
Environmental Management Branch

Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
377 MSG/CEV
2050 Wyoming Blvd SE, Suite 126
Kirtland AFB NM 87117-5270

Mr. Jim Norton
Director
New Mexico Environment Dept.
P.O. Box 26110
Santa Fe, NM 87502-0110

Dear Mr. Norton:

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Chief, Environmental Quality
Environmental Management Branch

Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
377 MSG/CEV
2050 Wyoming Blvd SE, Suite 126
Kirtland AFB NM 87117-5270

Mr. Mike Rice
Sunport Aviation Director
2200 Sunport Blvd., SE
Albuquerque, NM 87106

Dear Mr. Rice:

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Chief, Environmental Quality
Environmental Management Branch

Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
377 MSG/CEV
2050 Wyoming Blvd SE, Suite 126
Kirtland AFB NM 87117-5270

Ms. Katherine Slick
Director
State Historic Preservation Officer
Department of Cultural Affairs
Historic Preservation Division
228 East Palace Ave., Room 320
Santa Fe, NM 87501

Dear Ms. Slick:

A Draft Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts that could result from the proposed use of State Lands for three drop zones near White Lakes in the vicinity of Clines Corners, New Mexico. The 58th Special Operations Wing (58 SOW), a unit of Air Education and Training Command, and Kirtland Air Force Base, a unit of the Air Force Materiel Command, are the proponents of this action.

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Cynthia Gooch, GS-12
Chief, Environmental Quality
Environmental Management Branch

Attachment: Draft EA

DEPARTMENT OF THE AIR FORCE
377th Civil Engineer Division (AFMC)

15 April 2005

Cynthia Gooch
377 MSG/CEV
2050 Wyoming Blvd SE, Suite 126
Kirtland AFB NM 87117-5270

Mr. Bruce Thompson
Director
NM Department of Game and Fish
P.O. Box 25112
Santa Fe, NM 87504

Dear Mr. Thompson:

A Draft Finding of No Significant Impact (FONSI) and Environmental Assessment (EA) has been prepared to evaluate the potential environmental impacts that could result from the proposed use of State Lands for three drop zones near White Lakes in the vicinity of Clines Corners, New Mexico. The 58th Special Operations Wing (58 SOW), a unit of Air Education and Training Command, and Kirtland Air Force Base, a unit of the Air Force Materiel Command, are the proponents of this action.

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Sincerely,

Cynthia Gooch, GS-12
Chief, Environmental Quality
Environmental Management Branch

Attachment: Draft EA

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

BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

January 24, 2005

Dr. Evelyn Watkins
377 MSG/CEVQ, 2050
Wyoming Blvd. SE, Suite 125
Kirtland AFB
New Mexico 87117-5270

Dear Dr. Watkins:

RE: DESCRIPTIONS OF PROPOSED ACTIONS AND ALTERNATIVES OF PROPOSED WHITE LAKES DROP ZONES FOR KAFB (November 2004)

The New Mexico Environment Department (NMED) staff reviewed the information on the above-referenced project included in your December 21, 2004 correspondence to the Department. The following comments are based on that information.

Air Quality

The proposed implementation of the White Lakes area as Drop Zones for Kirtland Air Force Base training of Special Operations aircrews does not conflict with New Mexico's laws and regulations pertaining to air quality.

The proposed White Lakes Drop Zones, consisting of three separate 320-acre sites, are located in a rural area in southeastern New Mexico. These areas are currently in attainment for all national ambient air quality standards (NAAQS).

The training activities are exempt from New Mexico air quality permitting requirements in accordance with 20.2.72.202 NMAC, which states:
" Government military activities such as field exercises, explosions, weapons testing and demolition to the extent that such activities (a) do not result in visible emissions entering publicly accessible areas; or are not subject to NSPS (New Source Performance Standards) or NESHAP (National Emissions Standards for Hazardous Air Pollutants)".

Applicable local or county regulations requiring noise and/or dust control must be followed; if none are in effect, controlling related air quality impacts during the field exercises should be considered to reduce impact to community members of fugitive dust or noise. Air quality impacts from ground disturbances during the training exercises should be discussed along with any mitigating measures for additional dust impacts.

Military personnel are requested to take care that wind blown dust from military activities does not obscure visibility on roadways adjacent to the project activities.

Surface Water Quality

Considering the title of the document, the following review was completed with the potential for environmental impacts on lakes and surface waters in mind.

"White Lakes" is a local term referring to a former settlement area (currently a ranching area) of southern Santa Fe County, along US 285, approximately 15 miles NW of Clines Corners. The geography of the area is characterized by an extensive low topographic basin centered in T.11N., R.11E., that hosts a cluster of intermittent shallow lakes. The lakes (probable pans or playa lakes) occur along the northern margin of HUC 13050001 (the Estancia Basin, a closed basin watershed), immediately south of the drainage divide with HUC 13020201, an area that would drain to the north and northwest via tributaries to Galisteo Creek. The map that was provided (Fig. 2-2) indicates the USAF's (Air Force's) drop and retrieve training activities will be concentrated on State Land sections 25, 26 and 36 of the same T&R, approximately 5 miles south of the mapped location of most of those local intermittent lakes.

If these activities were proposed right on or directly at the intermittent lake areas, there would be considerably more concern on the Surface Water Quality Bureau's part regarding potential introduction of pollutants to the subsurface via seasonal lake accumulation and infiltration that occurs in playa lake settings. The actual proposed drop areas are deemed to be free of any live (perennial or intermittent) streams or tributaries, permanent wetlands, or lakes that can serve as fisheries, therefore the drop-and-retrieve activities by USAF training units is not seen as any concern to water quality standards or designated uses by the Surface Water Quality Bureau. Nearby (1 mile distant) stock and wildlife watering tanks are the only features observed where any impact to surface water (of direct concern to the State) is even envisioned, and it would certainly be the SLO's and their local rancher's / leasee's right and responsibility to negotiate with the USAF to see that no degradation occurs in those areas.

Comment is provided here to remind the applicant of the necessity to implement all necessary planning and operations measures in order to prevent leaking or spillage of fuels, fluids, petroleum products, etc., in any area where transport, aircraft, and fueling support vehicles will be operating. Even in areas lacking the live water setting discussed above, careless practices can impact soils, vegetation, and shallow groundwater, or contaminate sheet runoff if these considerations are not made a priority.

We appreciate the opportunity to comment on this project.

Sincerely,

Gedi Cibas, Ph.D.
Environmental Impact Review Coordinator

NMED File No. 2008ER

United States Department of the Interior

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

MAY 17 2005

Cons. # 2-22-05-I-371

Cynthia Gooch, Chief Environmental Quality
ATTN: Mr. Walt Moore
7011 Campus Drive, Suite 210
Colorado Springs, Colorado 80920

Dear Ms. Gooch:

Thank you for your April 15, 2005, letter requesting our review of the draft Environmental Assessment (EA) for the Kirtland Air Force Base White Lakes Drop Zones (DZs). The EA analyzes the impacts of developing three DZs in the White Lakes area north of Clines Corners, Santa Fe County, New Mexico. The proposed DZs would be used by the 58th Special Operations Wing to train aircrews in dropping cargo and personnel from fixed-wing aircraft. Cargo drops would occur from multiple directions and altitudes ranging from 150 to 800 feet above ground level (AGL). Cargo releases would include simulated training bundles and simulated rescue bundles/kits weighing approximately 15 and 45 pounds respectively. Personnel drops would occur no lower than 800 feet AGL.

Based on our review of the EA, we agree with your determination that the proposed DZs and associated training activities would result in minimal, individual and/or cumulative impacts to fish and wildlife resources. However, during our review of the EA we noticed a few inaccuracies that we recommend correcting before finalizing the document. Pages 3-16 and 4-10 of the EA include statements that the western burrowing owl is a former Federal species of concern. We still consider the western burrowing owl a species of concern in New Mexico and have enclosed for your reference the current Federal species list for Santa Fe County. Page 4-10 of the EA also includes a statement that no specific regulatory protection exists for either the loggerhead shrike or western burrowing owl. Both of these species are protected under the Migratory Bird Treaty Act.

Thank you for your concern for New Mexico's wildlife and their habitats. In future correspondence regarding this project, please refer to consultation # 2-22-05-I-371. If you have any questions about the information in this letter, please contact John Branstetter at the letterhead address or at (505) 346-2525, ext. 4753.

Sincerely,

Brian Hamlon

for Susan MacMullin
Field Supervisor

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

FEDERAL ENDANGERED, THREATENED,
PROPOSED, AND CANDIDATE SPECIES
AND SPECIES OF CONCERN IN NEW MEXICO
Consultation Number 2-22-05-I-371
May 13, 2005

Santa Fe County

ENDANGERED

Black-footed ferret (*Mustela nigripes*)**
Southwestern willow flycatcher (*Empidonax traillii extimus*) with proposed critical habitat

THREATENED

Bald eagle (*Haliaeetus leucocephalus*)
Mexican spotted owl (*Strix occidentalis lucida*) with critical habitat

CANDIDATE

Yellow-billed cuckoo (*Coccyzus americanus*)

SPECIES OF CONCERN

New Mexican meadow jumping mouse (*Zapus hudsonius luteus*)
Townsend's big-eared bat (*Corynorhinus townsendii*)
American peregrine falcon (*Falco peregrinus anatum*)
Arctic peregrine falcon (*Falco peregrinus tundrius*)
Baird's sparrow (*Ammodramus bairdii*)
Mountain plover (*Charadrius montanus*)
Northern goshawk (*Accipiter gentilis*)
Western burrowing owl (*Athene cunicularia hypugea*)
Rio Grande sucker (*Catostomus plebeius*)
Santa Fe cholla (*Opuntia viridiflora*)

Index

Endangered = Any species which is in danger of extinction throughout all or a significant portion of its range.

Threatened = Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Candidate = Candidate Species (taxa for which the Service has sufficient information to propose that they be added to list of endangered and threatened species, but the listing action has been precluded by other higher priority listing activities).

Species of Concern = Taxa for which further biological research and field study are needed to resolve their conservation status OR are considered sensitive, rare, or declining on lists maintained by Natural Heritage Programs, State wildlife agencies, other Federal agencies, or professional/academic scientific societies. Species of Concern are included for planning purposes only.

GOVERNOR
Bill Richardson

DIRECTOR AND SECRETARY
TO THE COMMISSION
Bruce C. Thompson

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way
Post Office Box 25112
Santa Fe, NM 87504
Phone: (505) 476-8008
Fax: (505) 476-8128

Visit our website at www.wildlife.state.nm.us
For basic information or to order free publications: 1-800-862-9310

May 23, 2005

Mr. Walt Moore
7011 Campus Drive, Suite 210
Colorado Springs, CO 80920

Re: White Lakes Drop Zones for Kirtland Air Force Base Draft Environmental Assessment
NMGF Doc. No. 10066

Dear Mr. Moore:

The New Mexico Department of Game and Fish has reviewed the proposed White Lakes Drop Zones Draft Environmental Assessment (DEA). The DEA proposes to designate three areas of approximately 320 acres each in southeastern Santa Fe County just east of U.S. 285 as training drop zones for Kirtland Air Force Base. According to the DEA, these three drop zones would be used for the next one to five years "...until a long-term solution could be implemented." Airdrops would be conducted by C-130 aircraft up to three times a week, during both day and night. Air drops would require multiple passes by a single C-130 from multiple directions at altitudes from 150-800 feet above ground level. Airdrops would consist of personnel drops, simulated airdrop training bundles (each weighing approximately 15 pounds), and simulated rescue bundles/kit (each weighing approximately 45 pounds). Only existing roads of jeep trails would be used for recovery of dropped bundles, therefore no construction or terrain modification would be required.

The White Lakes area is a known nesting area for mountain plovers (*Charadrius montanus*), long-billed curlews (*Numenias americanus*), and burrowing owls (*Athene cunicularia*). The mountain plover was proposed as Threatened under the Endangered Species Act by U.S. Fish and Wildlife Service, the long billed curlew is a species of highest concern on the Watchlist for national Partners in Flight, and the burrowing owl is a BLM sensitive species, and has been in decline within some military bases in New Mexico, including Kirtland AFB. All three species are designated as Species of Greatest Conservation Need (SGCN) by the Department in our Comprehensive Wildlife Conservation Strategy, currently under development. The DEA states that biological surveys were conducted from 18th to 20th January 2005. These surveys were not conducted during grassland bird nesting periods, so were not sufficient to detect the presence of these three SGCN.

On 5 May 2005, Mark Watson, Habitat Specialist of my staff conducted a field inspection of the proposed drop zones with Valerie Renner and Carol Finley of Kirtland Air Force Base Natural Resources Section. Efforts were made to locate burrowing owls using tape recordings, although systematic survey protocols were not conducted. No burrowing owls or prairie dog colonies were observed at the project site. Although no mountain plovers or long-billed curlews were observed, and because systematic surveys have not been conducted, it is not known whether these species nest within the proposed drop zones. Therefore, the Department recommends that efforts be made to initiate formal surveys for these species before cargo drops occur. If either species if found to be nesting within any of the three drop zones, we recommend that those localized areas of 0.25 miles around the nest sites be avoided during drops. Nesting seasons should be considered as 1 April through July 31.

Page 4-10 incorrectly states, with regard to the western burrowing owl and loggerhead shrike, "...no specific regulatory protection exists for either bird species". Both of these species, as well as the mountain plover and long-billed curlew are protected from direct killing by the Migratory Bird Treaty Act.

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

Lisa Kirkpatrick, Chief
Conservation Services Division

LK/MLW

CC: Susan MacMullin (Ecological Services Field Supervisor, USFWS)
Brian Gleadle (Northwest Area Operations Supervisor, NMGF)
Steve Anderson (Northwest Area Habitat Specialist, NMGF)
Mark Watson (Conservation Services Habitat Specialist, NMGF)

APPENDIX B

RIGHT OF ENTRY PERMIT

`NEW MEXICO STATE LAND OFFICE
Patrick H. Lyons, Commissioner of Public Lands
New Mexico State Land Office Building
P.O. Box 1148, Santa Fe, NM 87504-1148

RIGHT OF ENTRY PERMIT
CONTRACT NO. ROE- 2007

1. RIGHT OF ENTRY PERMIT

This permit is issued under the authority of NMSA 1978, Section 19-1-2. In consideration of and subject to the terms, covenants, conditions, agreements, obligations and reservations contained in the permit and all other existing rights and regulations, the Commissioner of Public Lands, New Mexico State Land Office, State of New Mexico, hereinafter called "COMMISSIONER," grants to **Kirtland AFB, Department of the Airforce**, whose address is **4249 Hercules Way SE, Kirtland AFB, NM 87117-5861, hereinafter** called "PERMITTEE," permission to enter upon the specific tract(s) of State Trust Land described in this permit only for the term, and only for the permitted use, described in this permit.

2. TERM AND LAND DESCRIPTION

Right of entry is granted for a term of **365 Days**, commencing **May 1, 2005** and ending **May 1, 2006** to the following State Trust Lands.

Section 25, Township 11 North, Range 11 East
Section 26, Township 11 North, Range 11 East
Section 36, Township 11 North, Range 11 East

3. FEE.

No Fee (Additional charge may be associated at a later term)

4. PERMITTED USE, PERSONNEL, EQUIPMENT AND MATERIALS

Permitted use is for the purpose of: To be used for Rescue/Special Operations airdrop training.

Personnel, equipment and materials to be present on State Trust Lands:

The granting of this permit does not allow access across private lands.

5. IMPROVEMENTS

No improvements shall be placed on the premises without the prior written consent of the Commissioner.

6. RESERVATIONS

Commissioner reserves the right to execute leases, rights of way, easements, permits, exchange agreements, sale agreements, permits and other lawful rights on or across the land covered by this permit, including but not limited to any such rights for mining purposes and for the extraction of oil, gas, salt, geothermal resources, and other mineral deposits therefrom and the right to go upon, explore for, mine, remove and sell same.

7. COMPLIANCE WITH LAWS

Permittee shall at its own expense comply fully with and be subject to all applicable regulations, rules, ordinances, and requirements of law or of the Commissioner, including but not limited to the regulations of the State Land Office; Chapter 19 NMSA governing State Trust Lands; federal and state environmental laws and regulations; and the New Mexico Cultural Properties Act, NMSA 1978 Sections 18-6-1 through 18-6-23. It is illegal for any person or his agent to appropriate, excavate, injure, or destroy any historic, or prehistoric ruin or monument, or any object of historical, archaeological, architectural, or scientific value situated on lands owned or controlled by the State Land Office without a valid permit issued by the Cultural Properties Review Committee and approved by the Commissioner of Public Lands.

8. HOLD HARMLESS AND INDEMNIFICATION

Permittee shall save, hold harmless, indemnify and defend Commissioner, the State Land Office, the State of New Mexico, and any of their officers, employees or agents, in their official and individual capacities, of and from any and all liability, claims, losses, damages, costs, and fees arising out of or alleged to arise out of, or directly or indirectly connected with, the operations of Permittee under this permit on or off State Trust Lands or arising out of the presence on State Trust Lands of any equipment, material, agent, invitee, contractor or subcontractor of Permittee. This Hold Harmless and Indemnification clause covers any claim, including any brought in any court or before any administrative agency, of any loss or alleged loss, and any damages or alleged damages asserted with respect to any violation or alleged violation of any state, federal or local law or regulation, including but not limited to any environmental law or regulation, any cultural properties law (including the New Mexico Cultural Properties Act, cited above) or regulation, and any alleged damage to the property, rights or interests of any State Land Office lessee, right-of-way holder, or other permittee.

9. AMENDMENT

This permit shall not be altered, changed or amended except by an instrument in writing executed by Commissioner and Permittee.

10. WITHDRAWAL

Commissioner reserves the right to withdraw any or all of the land authorized for use under this permit. If applicable, Permittee shall vacate the acreage specified within 30 days after receipt of

written notification of withdrawal from the Commissioner.

11. CANCELLATION

The violation by Permittee of any of the terms, conditions or covenants of this permit or the nonpayment by Permittee of the fees due under this permit shall at the option of the Commissioner be considered a default and shall cause the cancellation of this permit 30 days after Permittee has been sent written notice of such.

12. PRESERVE AND PROTECT

The Permittee agrees to preserve and protect the natural environmental conditions of the land encompassed in this permit, and to take those reclamation or corrective actions that are accepted soil and water conservation practices and that are deemed necessary by the Commissioner to protect the land from pollution, erosion, or other environmental degradation. The Permittee further agrees not to injure the property of, or interfere with the operations or rights of, any State Land Office lessee, right-of-way holder, easement holder or other permittee who has rights to use the State Trust Land subject to this permit.

13. RECLAMATION, REMOVAL OF EQUIPMENT, MATERIALS, AND WASTE

The Permittee agrees to reclaim those areas that may be damaged by activities conducted thereon.

The Permittee agrees to remove from the State Trust Lands, no later than the end of the term of this permit, all equipment and materials it has placed or brought upon the land and to clean up and remove from the land any trash, waste, effluent, or other products used or brought upon the land in connection with this permit.

14. SPECIAL INSTRUCTIONS AND/OR RESTRICTIONS

1. No off road traffic allowed.

2. No wood collection or tree cutting allowed.

3. Disturbing, dislodging, damaging, defacing, destroying or removing historical archaeological, paleontological or cultural sites or artifacts is prohibited.

4. Disturbing, dislodging, damaging, defacing, destroying any improvement, fixture, item, object or thing placed or located in, under or upon the land is prohibited.

5. This permit does not grant a right to enter State Trust Lands to which there is no public access.

6. Any uses or activities not within the scope of this permit are not allowed unless prior written approval from the Commissioner of Public Lands is granted.

7. OTHER:

WITNESS the hands and seals of PERMITTEE and COMMISSIONER on the day(s) and year entered below.

_____ Telephone:_____
PERMITTEE

ACKNOWLEDGMENT

STATE OF NEW MEXICO)
)
COUNTY OF _____)

The foregoing instrument was acknowledged before me this_____ day of _____, 20 ____.

My Commission Expires:_____ _____
NOTARY PUBLIC

_____ DATE: _____
COMMISSIONER OF PUBLIC LANDS

ROE-2007

APPENDIX C

AIRSPACE DEFINITIONS

APPENDIX C
AIRSPACE DEFINITIONS

CONTROLLED AIRSPACE

Class A Airspace

Class A airspace includes flight operating altitudes from 18,000 feet above mean sea level (MSL) up to and including 60,000 feet MSL. 14 Code of Federal Regulations (CFR) 71.33 lists exclusions in this airspace. Class A airspace usually consists of jets and airliners traveling long distances. This airspace also includes airspace over waters within 12 nautical miles (NM) of the coast including the 48 contiguous states and Alaska. Any aircraft operating in Class A airspace must operate under Instrument Flight Rule (IFR). Subpart A Federal Aviation Administration (FAA) Order 7400.9L identifies airspace areas for Class A airspace.

Class B Airspace

Class B airspace is airspace that surrounds the United State's busiest airports for IFR operations. This airspace starts at ground level and extends up to 10,000 feet MSL. Air Traffic Control (ATC) clearance is required for all pilots prior to entering Class B airspace. The outer limit of this airspace can extend 30 NM from the primary airport. All aircraft operating in this airspace must be equipped with specialized electronics that allow air traffic controllers to accurately track aircraft speed, altitude, and position (14 CFR 91.131), including maintaining two-way radio communication with the ATC facility. Designated airspace areas are listed in Subpart B FAA Order 7400.9L for Class B airspace. Visual Flight Rule (VFR) is allowed in this airspace as long as pilots maintain "clear of clouds" with 3 miles visibility.

Class C Airspace

Class C airspace includes airspace from the surface to 4,000 feet MSL above the airport elevation. Class C airspace includes the airspace surrounding airports that have an operational control tower, radar approach control and have IFR operations or passenger enplanements. It consists primarily of busy airports with large commercial flight operations and some military airports. ATC clearance is not required in this airspace, but all aircraft are required to maintain two-way radio communication with the ATC facility, and other operating and equipment requirements (14 CFR 91.130). This airspace will usually have a 5 NM inner radius core from the surface up to, but not including 4,000 feet MSL above airport elevation. The outer radius is 10 NM and extends from 1,200 feet to 4,000 feet above ground level (AGL). A third outer area exists with a 20 NM radius where ATC provides traffic separation services for VFR aircraft requesting this service. Subpart C of FAA Order 7400.9L lists the airspace areas designated for Class C airspace.

Class D Airspace

Class D airspace is airspace surrounding airports with operation control towers. It includes a 5 NM radius surrounding the operational control tower from the surface extending to 2,500 feet AGL. All aircraft within this airspace are required to maintain two-way radio communication with the ATC facility before entering this airspace, and other operating and equipment requirements (14 CFR 91.129). This airspace usually includes a high volume of civilian and military flight training. Where there is radar service available, separation services are provided for participating VFR aircraft. Subpart D of FAA Order 7400.9L lists the airspace areas designated for Class D airspace.

Class E Airspace

Class E airspace is considered all other controlled airspace not encompassing A, B, C, or D including airspace overlying the waters within 12 NM of the coast of the 48 contiguous states and Alaska. The altitudes for this airspace extend from 14,500 feet MSL up to, but not including 18,000 feet MSL. 14 CFR 71.71 lists the exclusions for this airspace. Aircraft operating in this airspace must comply with 14 CFR 91.127, operation and equipment requirements. This airspace may include federal airways, surface area designated for an airport, extension to surface area, enroute domestic areas, and offshore/control airspace areas. The altitudes for this airspace for the federal airways are 700 feet AGL or 1,200 feet AGL up to, but not including 18,000 feet MSL. These airways frequently intersect approach and departure paths of both military and civilian airfields. Subpart E of FAA Order 7400.9L lists the airspace areas designated for Class E airspace.

UNCONTROLLED AIRSPACE

Class G Airspace

Class G airspace is uncontrolled airspace and is not subject to restrictions that apply to controlled airspace. However, aircraft operating in this airspace need to comply with 14 CFR 91.126. There are no ATC services provided with only certain visibility and cloud clearance required. This airspace is mostly found in the western United States and Alaska. Class G airspace is regulated by the "see and avoid" principal (Interagency Airspace Coordination 2003).

SPECIAL USE AND OTHER AIRSPACE

Special Use Airspace is airspace established by the FAA and is confined to airspace where certain activities occur that may include military activity, flight hazards, and national security needs. There are six categories of Special Use Airspaces and include Prohibited Areas, Restricted Areas, Military Operations Areas, Alert Areas, Warning Areas, and Controlled Firing Areas. Except for Controlled Firing Areas, Special Use Airspace is depicted on charted sectionals, IFR enroute charts and terminal area charts and include; altitudes, days and hours of operation, and controlling agencies. All special

use airspace descriptions are contained in the FAA Handbook 7400.2. The Department of Defense information guide to Special Use Airspace is contained in Air Force Publication 1A.

Prohibited and Restricted Areas are regulatory Special Use Airspaces and are established in 14 CFR Part 73 through the rule-making process. Warning Areas, Military Operations Areas, Alert Areas, and Controlled Firing Areas are non-regulatory special use airspace.

Other airspace types include: Airport Advisory Areas and IFR and VFR Military Training Routes; Slow Routes, Low Altitude Navigation Areas; local flying areas; as well as Temporary Flight Restrictions. Additional types of other airspace include: Aerial Refueling Routes; Temporary Special Use Airspace; Cruise Missile Routes; National Security Areas; and Air Defense Identification Zones.

APPENDIX D

BIOLOGICAL SURVEY

APPENDIX D
BIOLOGICAL SURVEY

Habitat Assessment for Sensitive Species

for the

Proposed 58th Special Operations Wing White Lakes Drop Zones

January 24, 2005

Purpose: A survey identifying the habitat or habitats occurring on the proposed White Lakes Drop Zones (DZs) was necessary in order to identify and assess potential impacts to sensitive species that may occur on the subject property.

Methods: A request for sensitive species data was made to the New Mexico Natural Heritage Program (NMNHP). The NMNHP indicated that the Flint Mountains milkvetch was the only species known to occur near the proposed DZs, although not known to occur on site. A search of the NMNHP and the United States Fish and Wildlife website revealed a total of five species that have a potential to be found at the proposed DZs. Table D-1 lists these species.

Table D-1. Potential Sensitive Species Occurring at the Proposed White Lakes Drop Zones

Common Name	Scientific Name	Federal and State Status
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	FE, SE
Bald Eagle	*Haliaeetus leucocephalus*	FT, ST
Gray Vireo	*Vireo vicinior*	ST
Great Plains lady's tresses	*Spiranthes magnicamporum*	SE
Flint Mountains milkvetch	*Astragalus siliceous*	SS

Notes: FE: Federally Endangered SE: State Endangered SS: State Sensitive
FT: Federally Threatened ST: State Threatened

On January 18th, 2005 Rob Frei and Walt Moore of LOPEZGARCIA GROUP surveyed Section 36 and a small portion of Section 35 of the White Lakes DZs. On January 19th and 20th, 2005 Rob Frei surveyed Sections 25 and Section 26 of the White Lakes DZs. Approximately 1,150 acres were surveyed. Surveys consisted of walking through the property, identifying plant and animal species, taking photos of the site, and noting current conditions. Due to the time of year (i.e. middle of winter), many plant species were unidentifiable and many animal species had either migrated from the area or were in hibernation. Therefore, this survey focused on habitat capable of supporting these species.

Results: Habitat consisted entirely of shortgrass prairie with a few small junipers and other shrubs interspersed. Plant and animal species identified during the survey are listed in Table D-2. No wetland habitats were found at the site. A few water impoundments

occur adjacent to the proposed DZs, but wetland vegetation was not present, likely due to cattle grazing and trampling the surrounding vegetation.

Both the southwestern willow flycatcher and the Great Plains lady's tresses orchid need wetland or riparian habitats. As this habitat is not present on or near the subject property, no impacts are expected to occur to these species. Additionally, the gray vireo is not expected to occur as their preferred habitat of open juniper woodlands does not occur at the site. The bald eagle could potentially be found flying over the site, but since no large water bodies or prairie dog colonies (prairie dogs are often preyed upon during winter months) were found in the area, the bald eagle would only be found as a migrating transient.

An unidentified species of milkvetch was found throughout the proposed White Lakes DZs. Although it was not identified to the species level, it was determined not to be the Flint Mountains milkvetch based on where it was found and on its physical characteristics (the stems and leaves were much too large). The Flint Mountains milkvetch is found on calcareous and rocky knolls in shortgrass prairies. Calcareous soils are found in the southern portion of the DZ located in Section 36, but no milkvetch plants were observed in this area. An exposed rocky knoll occurs in the northern portion of the proposed DZ located in Section 26, but no *Astragalus* plant species were found.

Table D-2. Species Observed at the Proposed White Lakes Drop Zones

Common Name	Scientific Name
MAMMALS	
Black-tailed jack rabbit	*Lepus californicus*
Coyote (tracks and scat)	*Canis latrans*
Pronghorn (tracks and scat)	*Antilocapra americana*
Kangaroo rat (burrows)	*Dipodomys spp.*
BIRDS	
Horned lark	*Eremophila alpestris*
American kestrel	*Falco sparverius*
Raven	*Corvus spp.*
Western meadow lark	*Sturnella neglecta*
PLANTS	
Blue grama	*Bouteloua gracilis*
Dropseed	*Sporobolus spp.*
Russian thistle	*Salsola tragus*
Tansy mustard	*Descurainia sophia*
Tree cholla	*Opuntia imbricata*
Carruth's sagewort	*Artemisia carruthii*
Broom snakeweed	*Gutierrezia sarothrae*
One-seeded juniper	*Juniperus monosperma*
Plains yucca	*Yucca glauca*

Table D-2. Species Observed at the Proposed White Lakes Drop Zones

Common Name	Scientific Name
Dog cholla	*Opuntia clavata*
Green rabbitbrush	*Chrysothamnus viridis*
Bigelow sage	*Artemisia bigelow*
Indian ricegrass	*Achnatherum humenoides*
Sand sagebrush	*Artemisia filifolia*
Three-awn	*Aristida spp.*
Buckwheat	*Eriogonum spp.*
Cactus	*Mammillaria spp.*
Plain prickly pear cactus	*Opuntia polycantha*
Bottlebrush squirreltail	*Elymus elymoides*
Bush muhly	*Muhlenbergia porteri*
Slender wheatgrass	*Agropyron pauciflorum*
Milkvetch	*Astragalus spp.*
Pinyon pine	*Pinus edulis*
Sunflower	*Helianthus spp.*
Ring muhly	*Muhlenbergia torreyi*
Hog potato	*Hoffmanseggia flauca*
Scorpion weed	*Phacelia spp.*

Left: Typical shortgrass habitat found at the Proposed White Lakes Drop Zones.

Below: Rocky knoll located in the northern portion of the proposed Drop Zone located in Section 26.

APPENDIX E

NOISE

APPENDIX E
NOISE

AIRCRAFT NOISE ANALYSIS

Noise is generally described as unwanted sound. Unwanted sound can be based on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (community annoyance). Noise analysis thus requires a combination of physical measurement of sound, physical and physiological effects, plus psycho- and socioacoustic effects.

Section E.1.0 of this Appendix describes how sound is measured, and summarizes noise impact in terms of community acceptability and land use compatibility. Section E.2.0 gives detailed descriptions of the effects of noise which lead to the impact guidelines presented in Section E.1.0. Section E.3.0 provides a description of the specific methods used to predict aircraft noise.

E.1.0 NOISE DESCRIPTORS AND IMPACT

The aircraft noise assessed in this document is the continuous sound generated by aircraft engines and also by air flowing over the aircraft itself. Section E.1.1 describes the characteristics, which are used to quantify sound. Section E.1.2 describes the specific noise metrics used for noise impact analysis. Section E.1.3 describes how environmental impact and land use compatibility are judged in terms of these quantities.

E.1.1 QUANTIFYING SOUND

Measurement and perception of sound involve two basic physical characteristics: amplitude and frequency. Amplitude is a measure of the strength of the sound and is directly measured in terms of the pressure of a sound wave. Because sound pressure varies in time, various types of pressure averages are usually used. Frequency, commonly perceived as pitch, is the number of times per second the sound causes air molecules to oscillate. Frequency is measured in units of cycles per second, or Hertz (Hz).

Amplitude

The loudest sounds the human ear can comfortably hear have acoustic energy one trillion times the acoustic energy of sounds the ear can barely detect. Because of this vast range, attempts to represent sound amplitude by pressure are generally unwieldy. Sound is therefore usually represented on a logarithmic scale with a unit called the decibel (dB). Sound on the decibel scale is referred to as a sound level. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

Because of the logarithmic nature of the decibel scale, sound levels do not add and subtract directly and are somewhat cumbersome to handle mathematically. However,

some simple rules of thumb are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example:

60 dB + 60 dB = 63 dB, and
80 dB + 80 dB = 83 dB.

The total sound level produced by two sounds of different levels is usually only slightly more than the higher of the two. For example:

60.0 dB + 70.0 dB = 70.4 dB.

Because the addition of sound levels behaves differently than that of ordinary numbers, such addition is often referred to as "decibel addition" or "energy addition." The latter term arises from the fact that combination of decibel values consists of first converting each decibel value to its corresponding acoustic energy, then adding the energies using the normal rules of addition, and finally converting the total energy back to its decibel equivalent.

The difference in dB between two sounds represents the ratio of the amplitudes of those two sounds. Because human senses tend to be proportional (i.e., detect whether one sound is twice as big as another) rather than absolute (i.e., detect whether one sound is a given number of pressure units bigger than another), the dB scale correlates well with human response.

Under laboratory conditions, differences in sound level of 1 dB can be detected by the human ear. Under more normal background conditions, the smallest change in average noise level that can be detected is about 3 dB. An increase in sound level of about 10 dB is usually perceived by the average person as a doubling of the sound's loudness; this relationship holds true for both loud and quiet sounds. A decrease in sound level of 10 dB actually represents a 90 percent decrease in sound intensity but only a 50 percent decrease in perceived loudness because of the nonlinear response of the human ear (similar to most human senses).

Frequency

The normal human ear can hear frequencies from about 20 Hz to about 20,000 Hz. It is most sensitive to sounds in the 1,000 to 4,000 Hz range. When measuring community response to noise, it is common to adjust the frequency content of the measured sound to correspond to the frequency sensitivity of the human ear. This adjustment is called A-weighting (American National Standards Institute [ANSI] 1988). Sound levels that have been so adjusted are referred to as A-weighted sound levels. The amplitude of A-weighted sound levels is measured in dB. It is common for some noise analysts to denote the unit of A-weighted sounds by dBA or dB(A). As long as the use of A-weighting is understood, there is no difference between dB, dBA or dB(A). It is only important that the use of A-weighting be made clear. In this study, sound levels are reported in dB and are A-weighted unless otherwise specified.

Time Averaging

Sound pressure of a continuous sound varies greatly with time, so it is customary to deal with sound levels that represent averages over time. Levels presented as instantaneous (i.e., as might be read from the dial of a sound level meter), are based on averages of sound energy over either 1/8 second (fast) or one second (slow). The formal definitions of fast and slow levels are somewhat complex, with details that are important to makers and users of instrumentation. They may, however, be thought of as levels corresponding to the root-mean-square sound pressure measured over the 1/8-second or 1-second periods. The most common uses of the fast or slow sound level in environmental analysis are in the discussion of the maximum sound level that occurs from an event, and in discussions of typical sound levels. Figure E-1 is a chart of A-weighted sound levels of typical sounds. Some (air conditioner, vacuum cleaner) are continuous sounds whose levels are constant for some time. Some (automobile, heavy truck) are the maximum sound during a passing vehicle. Some (urban daytime, urban nighttime) are averages over some extended period. A variety of noise metrics have been developed to describe noise over different time periods. These are described in Section E.1.2.

E.1.2 NOISE METRICS

E.1.2.1 Maximum Sound Level

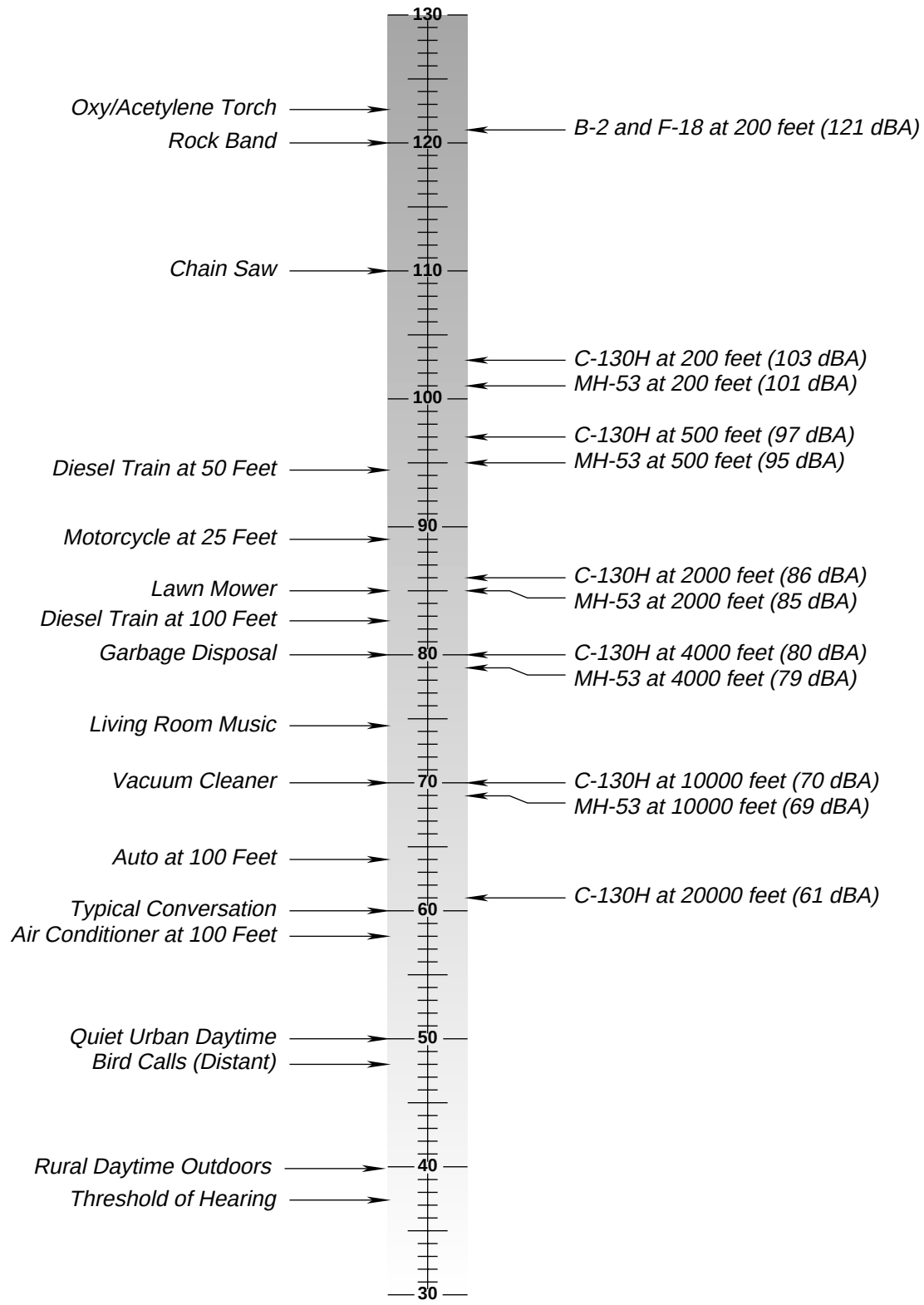
The highest A-weighted sound level measured during a single event in which the sound level changes as time goes on (e.g. an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level, for short. It is abbreviated by ALM, Lmax or LAmax. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities.

E.1.2.2 Peak Sound Level

For impulsive sounds, the true instantaneous sound pressure is of interest. For sonic booms, this is the peak pressure of the shock wave. This pressure is usually presented in physical units of pounds per square foot. Sometimes it is represented on the decibel scale with the symbol Lpk. Peak sound levels do not use A-weighting.

E.1.2.3 Sound Exposure Level

Individual time-varying noise events have two main characteristics: (a) a sound level which changes throughout the event, and (b) a period of time during which the event is heard. Although the maximum sound level, described above, provides some measure of the intrusiveness of the event, it alone does not completely describe the total event. The period of time during which the sound is heard is also significant. The Sound Exposure Level (SEL) (or LAE for A-weighted sounds) combines both of these characteristics into a single metric.



Source: FICON 1992.

SEP 2005

FIGURE

EA

Typical A-Weighted Sound Levels

E-1

SEL is a composite metric which represents both the intensity of a sound and its duration. Mathematically, the mean square sound pressure is computed over the duration of the event, then multiplied by the duration in seconds, and the resultant product is turned into a sound level. It does not directly represent the sound level heard at any given time, but rather provides a measure of the net impact of the entire acoustic event. It has been well established in the scientific community that SEL measures this impact much more reliably than just the maximum sound level.

Because the SEL and the maximum sound level are both used to describe single events, there is sometimes confusion between the two, so the specific metric used should be clearly stated.

E.1.2.4 Equivalent Sound Level

For longer periods of time, total sound is represented by the equivalent continuous sound pressure level (Leq). Leq is the average sound level over some time period (often an hour or a day, but any explicit time span can be specified), with the averaging being done on the same energy basis as used for SEL. SEL and Leq are closely related, differing by: (a) whether they are applied over a specific time period or over an event, and (b) whether the duration of the event is included or divided out.

Just as SEL has proven to be a good measure of the noise impact of a single event, Leq has been established to be a good measure of the impact of a series of events during a given time period. Also, while Leq is defined as an average, it is effectively a sum over that time period and is thus a measure of the cumulative impact of noise.

E.1.2.5 Day-Night Average Sound Level

Noise tends to be more intrusive at night than during the day. This effect is accounted for by applying a 10 dB penalty to events that occur after 10 p.m. and before 7 a.m. If Leq is computed over a 24-hour period with this nighttime penalty applied, the result is the day-night average sound level (DNL or Ldn). DNL is the community noise metric recommended by the United States Environmental Protection Agency (EPA) (EPA 1972) and has been adopted by most federal agencies (Federal Interagency Committee on Noise 1992). It has been well established that DNL correlates well with community response to noise (Schultz 1978; Finegold et al. 1994). This correlation is presented in Section E.1.3.

While DNL carries the nomenclature “average,” it incorporates all of the noise at a given location. For this reason, DNL is often referred to as a “cumulative” metric. It accounts for the total, or cumulative, noise impact.

E.1.2.6 Onset-Adjusted Monthly Day-Night Average Sound Level

Aircraft operations in military airspaces generate a noise environment somewhat different from other community noise environments. Overflights are sporadic, occurring at random times and varying from day to day and week to week. This situation differs from most community noise environments, in which noise tends to be continuous or patterned. Individual military overflight events also differ from typical community noise events: noise from a low-altitude, high-airspeed flyover can have a rather sudden onset.

To represent these differences, the conventional DNL metric is adjusted to account for the "surprise" effect of the sudden onset of aircraft noise events on humans. For aircraft exhibiting a rate of increase in sound level (called onset rate) of 15 to 150 dB per second, an adjustment or penalty ranging from 0 to 11 dB is added to the normal SEL. Onset rates above 150 dB per second require an 11 dB penalty, while onset rates below 15 dB per second require no adjustment. The DNL is then determined in the same manner as for conventional aircraft noise events and is designated as Onset-Rate Adjusted Day-Night Average Sound Level (Ldnmr). Because of the irregular occurrences of aircraft operations, the number of average daily operations is determined by using the calendar month with the highest number of operations. The monthly average is denoted Ldnmr.

E.1.3 NOISE IMPACT

E.1.3.1 Community Reaction

Studies of community annoyance resulting from numerous types of environmental noise show that DNL correlates well with impact. Schultz (1978) showed a consistent relationship between DNL and annoyance. Figure E-2 shows Shultz's original curve fit. This result shows that there is a remarkable consistency in results of attitudinal surveys which relate the percentages of groups of people who express various degrees of annoyance when exposed to different DNLs.

A more recent study has reaffirmed this relationship (Fidell et al. 1991). Figure E-3 (Federal Interagency Committee on Noise 1992) shows an updated form of the curve fit (Finegold et al. 1994) in comparison with the original. The updated fit, which does not differ substantially from the original, is the current preferred form. In general, correlation coefficients of 0.85 to 0.95 are found between the percentages of groups of people highly annoyed and the level of average noise exposure. The correlation coefficients for the annoyance of individuals are relatively low, however, on the order of 0.5 or less. This is not surprising, considering the varying personal factors which influence the manner in which individuals react to noise. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.

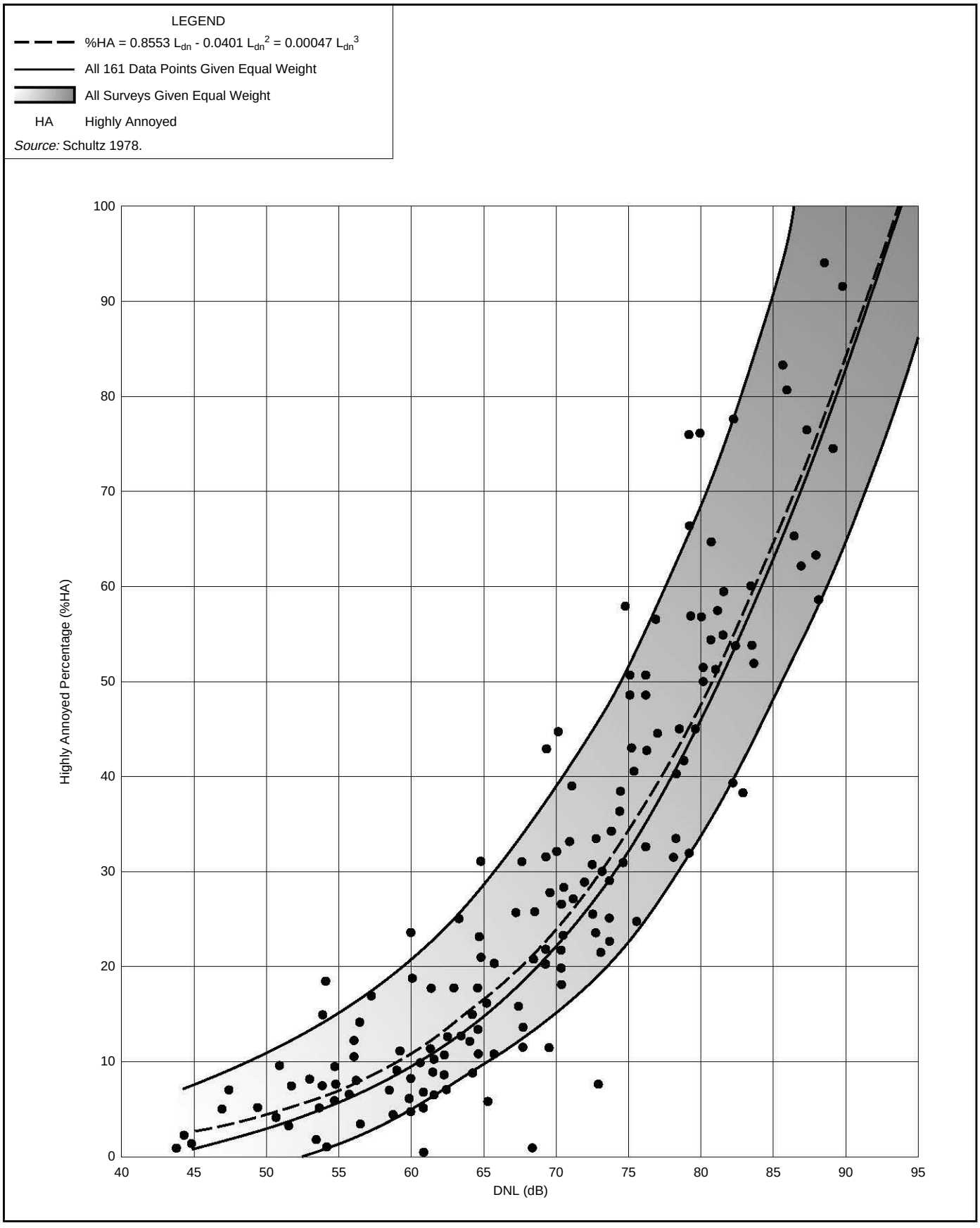


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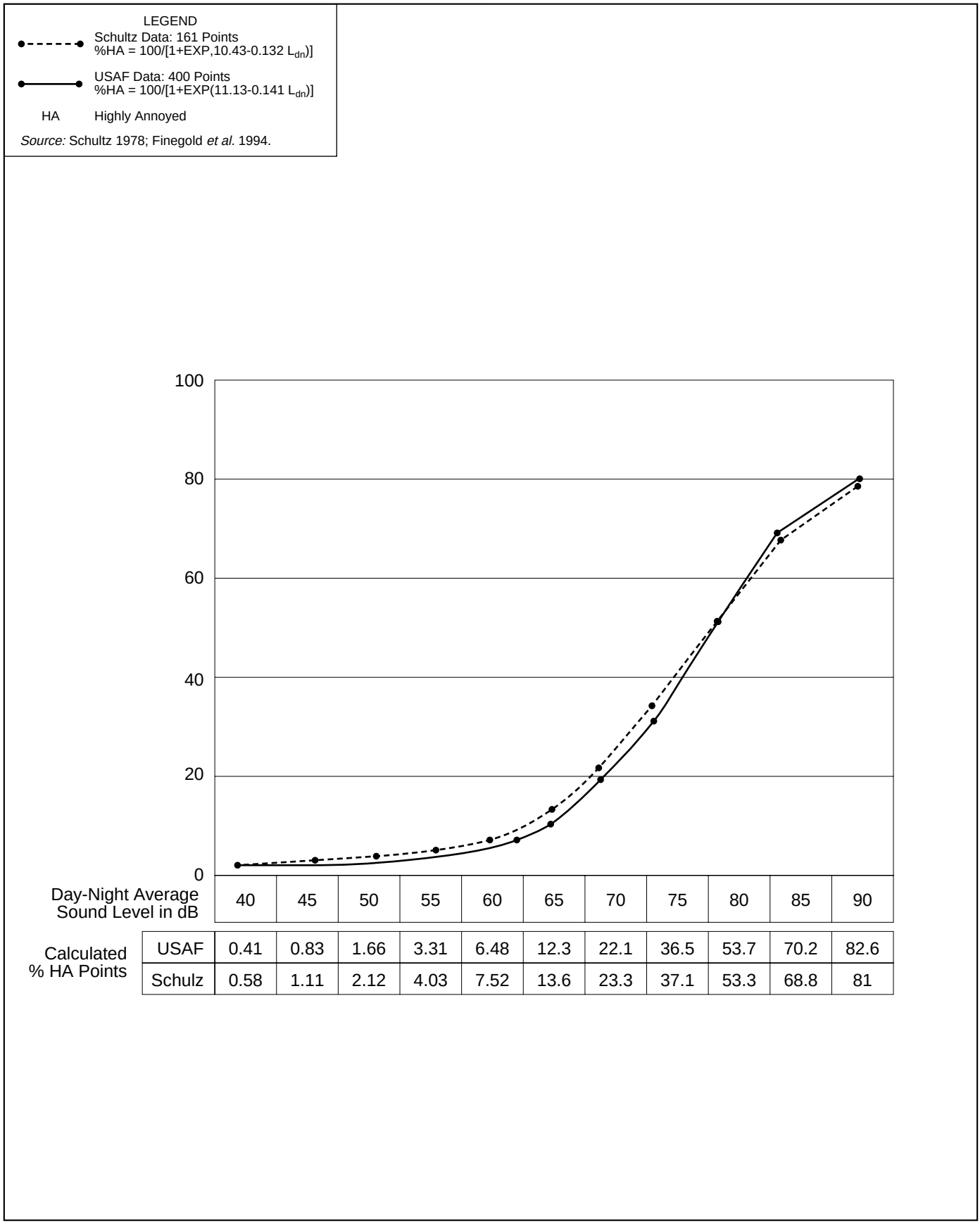
FIGURE

EA

Community Surveys of Noise Annoyance

E-2



Day-Night Average Sound Level in dB	40	45	50	55	60	65	70	75	80	85	90
Calculated % HA Points: USAF	0.41	0.83	1.66	3.31	6.48	12.3	22.1	36.5	53.7	70.2	82.6
Schulz	0.58	1.11	2.12	4.03	7.52	13.6	23.3	37.1	53.3	68.8	81

SEP 2005

FIGURE

EA

Response of Communities to Noise
Comparison of Original and Current Curve Fits

E-3

As noted earlier for SEL, DNL does not represent the sound level heard at any particular time, but rather represents the total sound exposure. It accounts for the sound level of individual noise events, the duration of those events, and the number of events. Its use is endorsed by the scientific community (ANSI, 1988; ANSI, 1980; Federal Interagency Committee on Noise 1992; Federal Interagency Committee on Urban Noise [FICUN] 1980; EPA 1972).

While DNL is the best metric for quantitatively assessing cumulative noise impact, it does not lend itself to intuitive interpretation by non-experts. Accordingly, it is common for environmental noise analyses to include other metrics for illustrative purposes. A general indication of the noise environment can be presented by noting the maximum sound levels which can occur and the number of times per day noise events will be loud enough to be heard. Use of other metrics as supplements to DNL, such as Ldnmr, has been endorsed by federal agencies (Federal Interagency Committee on Noise 1992).

There are several points of interest in the noise-annoyance relation. The first is DNL of 65 dB. This is a level most commonly used for noise planning purposes, and represents a compromise between community impact and the need for activities like aviation which do cause noise. Areas exposed to DNL above 65 dB are generally not considered suitable for residential use. The second is DNL of 55 dB, which was identified by EPA as a level below which there is effectively no adverse impact (EPA 1972). The third is DNL of 75 dB. This is the lowest level at which adverse health effects could be credible (EPA 1972). Additionally, very high annoyance levels make areas that experience DNLs over 75 dB unsuitable for residential land use.

E.1.3.2 Land Use Compatibility

As noted above, the inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, when a community is considered as a whole, its overall reaction to noise can be represented with a high degree of confidence. As described above, the best noise exposure metric for this correlation is the DNL or Ldnmr for military overflights.

In June 1980, an ad hoc FICUN published guidelines (FICUN 1980) relating DNL to compatible land uses. This committee was composed of representatives from the United States Departments of Defense, Transportation, and Housing and Urban Development; the EPA; and the Veterans Administration. Since the issuance of these guidelines, federal agencies have generally adopted these guidelines for their noise analyses.

Following the lead of the committee, the Department of Defense and the Federal Aviation Administration (FAA) adopted the concept of land-use compatibility as the accepted measure of aircraft noise effect. The FAA included the committee's guidelines in the Federal Aviation Regulations. These regulations are reprinted in Table E-1, along with the explanatory notes included in the regulation. Although these guidelines are not mandatory (note the footnote "*" in the table), they provide the best means for determining noise impact in airport communities. In general, residential land uses

normally are not compatible with outdoor DNL values above 65 dB, and the extent of land areas and populations exposed to DNL of 65 dB and higher provides the best means for assessing the noise impacts of alternative aircraft actions.

E.2.0 NOISE EFFECTS

The discussion in Section E.1.3 presents the global effect of noise on communities. The following sections describe particular noise effects.

E.2.1 HEARING LOSS

Noise-induced hearing loss is probably the best defined of the potential effects of human exposure to excessive noise. Federal work place standards for protection from hearing loss allow a time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. Even the most protective criterion (no measurable hearing loss for the most sensitive portion of the population at the ear's most sensitive frequency, 4,000 Hz, after a 40-year exposure) suggests a time-average sound level of 70 dB over a 24-hour period (EPA 1972).

E.2.2 NONAUDITORY HEALTH EFFECTS

Nonauditory health effects of long-term noise exposure, where noise may act as a risk factor, have not been found to occur at levels below those protective against noise-induced hearing loss, described above. Most studies attempting to clarify such health effects have found that noise exposure levels established for hearing protection will also protect against any potential nonauditory health effects, at least in work place conditions. The best scientific summary of these findings is contained in the lead paper at the National Institutes of Health Conference on Noise and Hearing Loss held on 22 to 24 January 1990 in Washington, D.C. This lead paper stated the following: "The nonauditory effects of chronic noise exposure, when noise is suspected to act as one of the risk factors in the development of hypertension, cardiovascular disease, and other nervous disorders, have never been proven to occur as chronic manifestations at levels below these criteria (an average of 75 dBA for complete protection against hearing loss for an eight-hour day). At the 1988 International Congress on Noise as a Public Health Problem, most studies attempting to clarify such health effects did not find them at levels below the criteria protective of noise-induced hearing loss, and even above these criteria, results regarding such health effects were ambiguous. Consequently, it can be concluded that establishing and enforcing exposure levels protecting against noise-induced hearing loss would not only solve the noise-induced hearing loss problem but also any potential nonauditory health effects in the work place." (von Gierke 1990; parenthetical wording added for clarification).

Table E-1. Land-Use Compatibility With Yearly Day-Night Average Sound Levels

Land Use	Yearly DNLs in Decibels					
	Below 65	65-70	70-75	75-80	80-85	Over 85
Residential						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
Public Use						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoria, and concert halls	Y	25	30	N	N	N
Government services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
Commercial Use						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail – building materials, hardware, and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade – general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
Manufacturing and Production						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(7)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(7)	Y(7)	N	N	N
Mining and fishing, resource production and extraction	Y	Y	Y	Y	Y	Y
Recreational						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts, and camps	Y	Y	Y	N	N	N
Golf courses, riding stables, and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to notes.

* The designations contained in this table do not constitute a federal determination that any use of land covered by the program is acceptable or unacceptable under federal, state, or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise-compatible land uses.

KEY TO TABLE B-1

SLUCM = Standard Land-Use Coding Manual

Y (YES) = Land Use and related structures compatible without restrictions

N (No) = Land Use and related structures are not compatible and should be prohibited

NLR = Noise Level Reduction (NLR) (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and contruction of the structure.

25, 30, or 35 = Land Use and related structures generally compatible; measures to achieve NLR of 25, 30, or 35 dB must be incorporated into design and construction of structures.

NOTES FOR TABLE B-1

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor-to-indoor NLR of at least 25 dB and 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide an NLR of 20 dB; thus the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year-round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(3) Measures to achieve NLR 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(4) Measures to achieve NLR 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise-sensitive areas, or where the normal noise level is low.

(5) Land-use compatible provided special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

Although these findings were directed specifically at noise effects in the work place, they are equally applicable to aircraft noise effects in the community environment. Research studies regarding the nonauditory health effects of aircraft noise are ambiguous at best, and often contradictory. Yet, even those studies which purport to find such health effects use time-average noise levels of 75 dB and higher for their research.

For example, in an often-quoted paper, two University of California at Los Angeles (UCLA) researchers found a relation between aircraft noise levels under the approach path to Los Angeles International Airport (LAX) and increased mortality rates among the exposed residents by using an average noise exposure level greater than 75 dB for the "noise-exposed" population (Meecham and Shaw 1979). Nevertheless, three other UCLA professors analyzed those same data and found no relation between noise exposure and mortality rates.

As a second example, two other UCLA researchers used this same population near LAX to show a higher rate of birth defects during the period of 1970 to 1972 when compared with a control group residing away from the airport. Based on this report, a separate group at the US Centers for Disease Control performed a more thorough study of populations near Atlanta's Hartsfield International Airport for 1970 to 1972 and found no relation in their study of 17 identified categories of birth defects to aircraft noise levels above 65 dB (Edmonds 1979).

A review of health effects, prepared by a Committee of the Health Council of the Netherlands (1996) reviewed currently available published information on this topic. They concluded that the threshold for possible long-term health effects was a 16-hour (0600 to 2200) Leq of 70 dB. Projecting this to 24 hours and applying the 10 dB nighttime penalty used with DNL, this corresponds to DNL of about 75 dB. The study also affirmed the risk threshold for hearing loss, as discussed earlier.

In summary, there is no scientific basis for a claim that potential health effects exist for aircraft time-average sound levels below 75 dB.

E.2.3 ANNOYANCE

The primary effect of aircraft noise on exposed communities is one of annoyance. Noise annoyance is defined by the EPA as any negative subjective reaction on the part of an individual or group (EPA 1972). As noted in the discussion of DNL above, community annoyance is best measured by that metric.

Because the EPA Levels Document (EPA 1972) identified DNL of 55 dB as "requisite to protect public health and welfare with an adequate margin of safety," it is commonly assumed that 55 dB should be adopted as a criterion for community noise analysis. From a noise exposure perspective, that would be an ideal selection. However, financial and technical resources are generally not available to achieve that goal. Most agencies have identified DNL of 65 dB as a criterion which protects those most impacted by noise, and which can often be achieved on a practical basis (Federal Interagency Committee on

Noise 1992). This corresponds to about 12 percent of the exposed population being highly annoyed. Although DNL of 65 dB is widely used as a benchmark for significant noise impact, and is often an acceptable compromise, it is not a statutory limit and it is appropriate to consider other thresholds in particular cases.

E.2.4 SPEECH INTERFERENCE

Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. The disruption of routine activities such as radio or television listening, telephone use, or family conversation gives rise to frustration and irritation. The quality of speech communication is also important in classrooms, offices, and industrial settings and can cause fatigue and vocal strain in those who attempt to communicate over the noise. Research has shown that the use of the SEL metric will measure speech interference successfully, and that a SEL exceeding 65 dB will begin to interfere with speech communication.

E.2.5 SLEEP INTERFERENCE

Sleep interference is another source of annoyance associated with aircraft noise. This is especially true because of the intermittent nature and content of aircraft noise, which is more disturbing than continuous noise of equal energy and neutral meaning. Sleep interference may be measured in either of two ways. "Arousal" represents actual awakening from sleep, while a change in "sleep stage" represents a shift from one of four sleep stages to another stage of lighter sleep without actual awakening. In general, arousal requires a somewhat higher noise level than does a change in sleep stage.

An analysis sponsored by the United States Air Force summarized 21 published studies concerning the effects of noise on sleep (Pearsons et al. 1989). The analysis concluded that a lack of reliable in-home studies, combined with large differences among the results from the various laboratory studies, did not permit development of an acceptably accurate assessment procedure. The noise events used in the laboratory studies and in contrived in-home studies were presented at much higher rates of occurrence than would normally be experienced. None of the laboratory studies were of sufficiently long duration to determine any effects of habituation, such as that which would occur under normal community conditions. A recent extensive study of sleep interference in people's own homes (Ollerhead 1992) showed very little disturbance from aircraft noise.

There is some controversy associated with the recent studies, so a conservative approach should be taken in judging sleep interference. Based on older data, the EPA identified an indoor DNL of 45 dB as necessary to protect against sleep interference (EPA 1972). Assuming a very conservative structural noise insulation of 20 dB for typical dwelling units, this corresponds to an outdoor DNL of 65 dB as minimizing sleep interference.

A 1984 publication reviewed the probability of arousal or behavioral awakening in terms of SEL (Kryter 1984). Figure E-4, extracted from Figure 10.37 of Kryter (1984), indicates that an indoor SEL of 65 dB or lower should awaken less than 5 percent of

those exposed. These results do not include any habituation over time by sleeping subjects. Nevertheless, this provides a reasonable guideline for assessing sleep interference and corresponds to similar guidance for speech interference, as noted above.

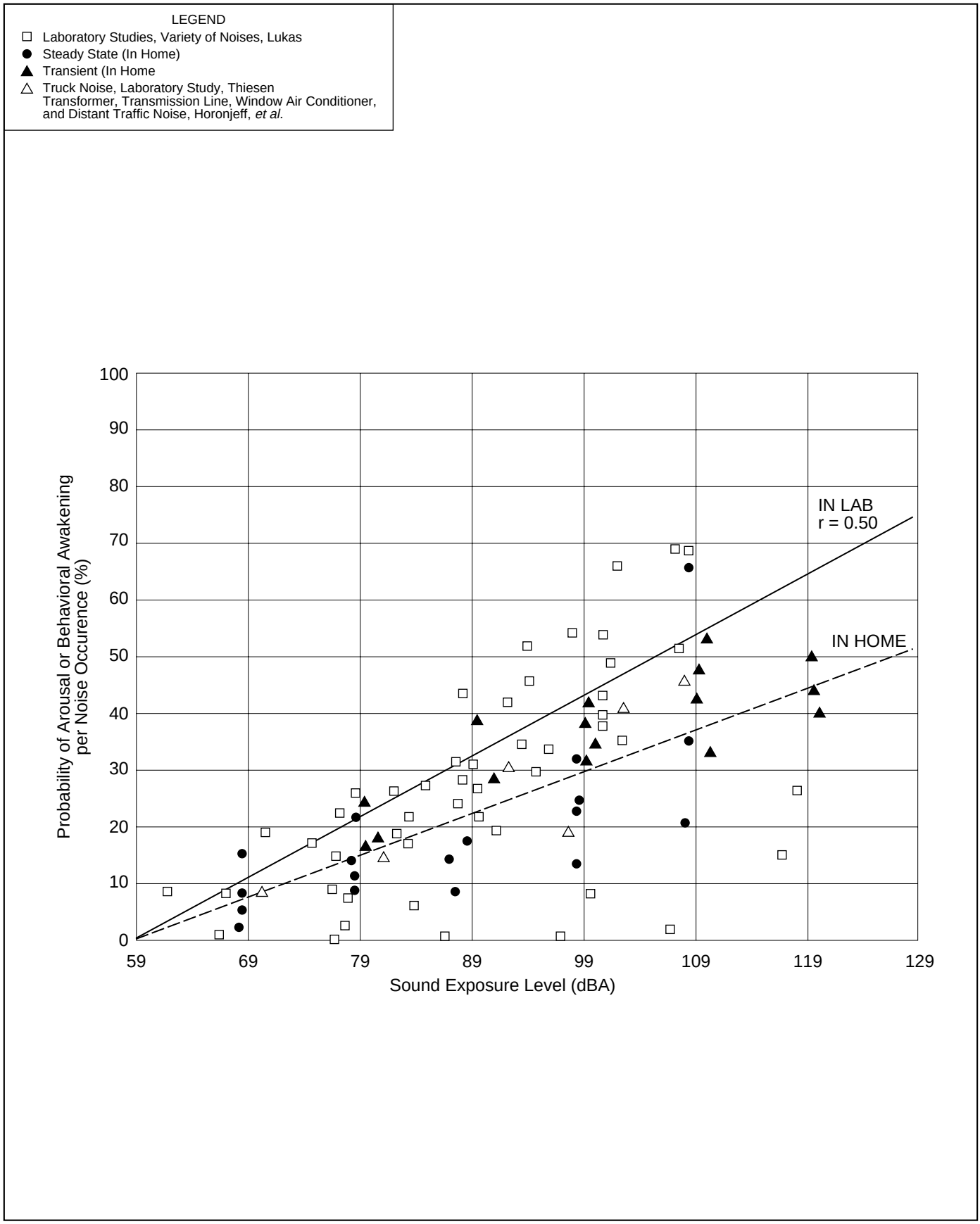


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FIGURE

EA

Probability of Arousal or Behavioral Awakening in Terms of Sound Exposure Level

E-4