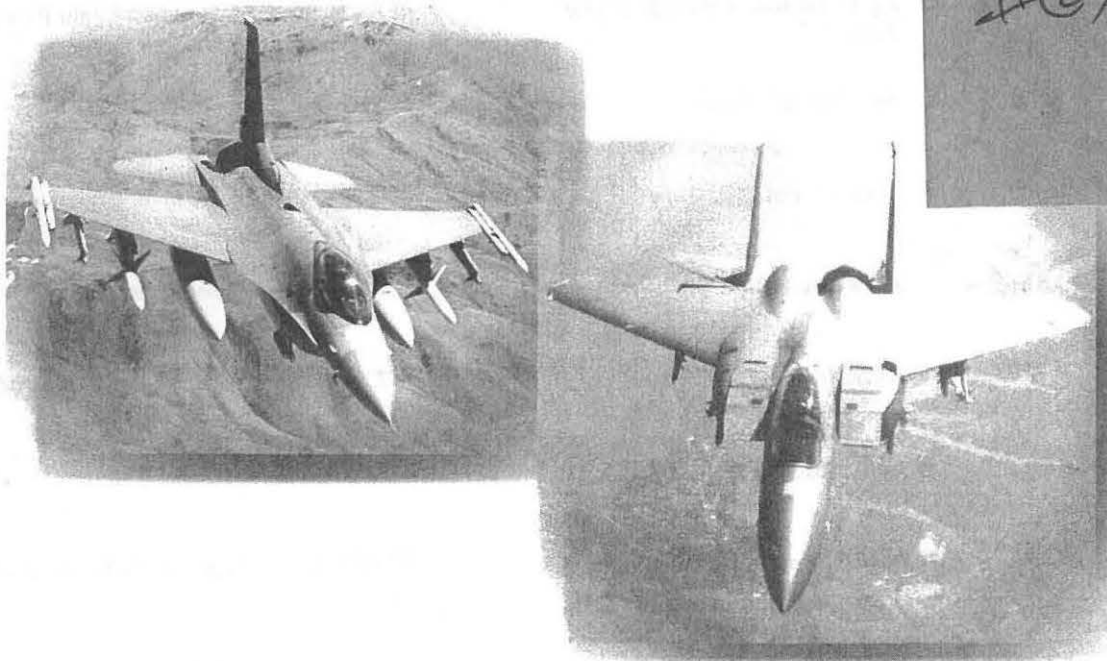


Air Installation Compatible Use Zone Study

for the
482nd Fighter Wing

FROM RICHARDS
TO ELSPS
HLNETH
#(2) OFFICE



Homestead Air Reserve Base, Florida



June 2004

Abbreviations and Acronyms

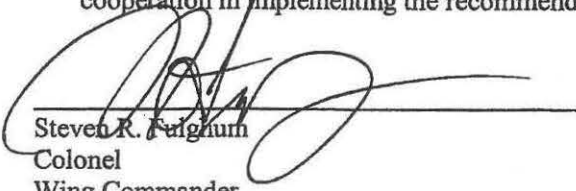
482 FW	482nd Fighter Wing	FAR	Federal Aviation Regulations
AFB	Air Force Base	FHA	Federal Housing Authority
AFCEE	Air Force Center for Environmental Excellence	FIG	Flight Inceptor Group
AFRC	Air Force Reserve Command	FY	fiscal year
AGL	above ground level	HUD	U.S. Department of Housing and Urban Development
AICUZ	Air Installation Compatible Use Zone	IFR	Instrument Flight Rules
ANG	Air National Guard	MSL	mean sea level
APZ	Accident Potential Zone	NLR	noise level reduction
ARB	Air Reserve Base	NZ	Noise Zone
ARTCC	Air Route Traffic Control Center	SLUCM	Standard Land Use Coding Manual
ATC	Air Traffic Control	SOC SOUTH	Special Operations Command South
BRAC	Base Closure and Realignment Act	TRACON	Terminal Radar Approach Control
CZ	Clear Zone	U.S.	United States
dB	decibel	USAF	United States Air Force
DNL	Day-Night Average A-Weighted Sound Level	USEPA	U.S. Environmental Protection Agency
DOD	Department of Defense	VFR	Visual Flight Rules
FAA	Federal Aviation Administration		

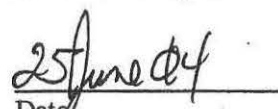
MEMORANDUM FOR AREA GOVERNMENTS

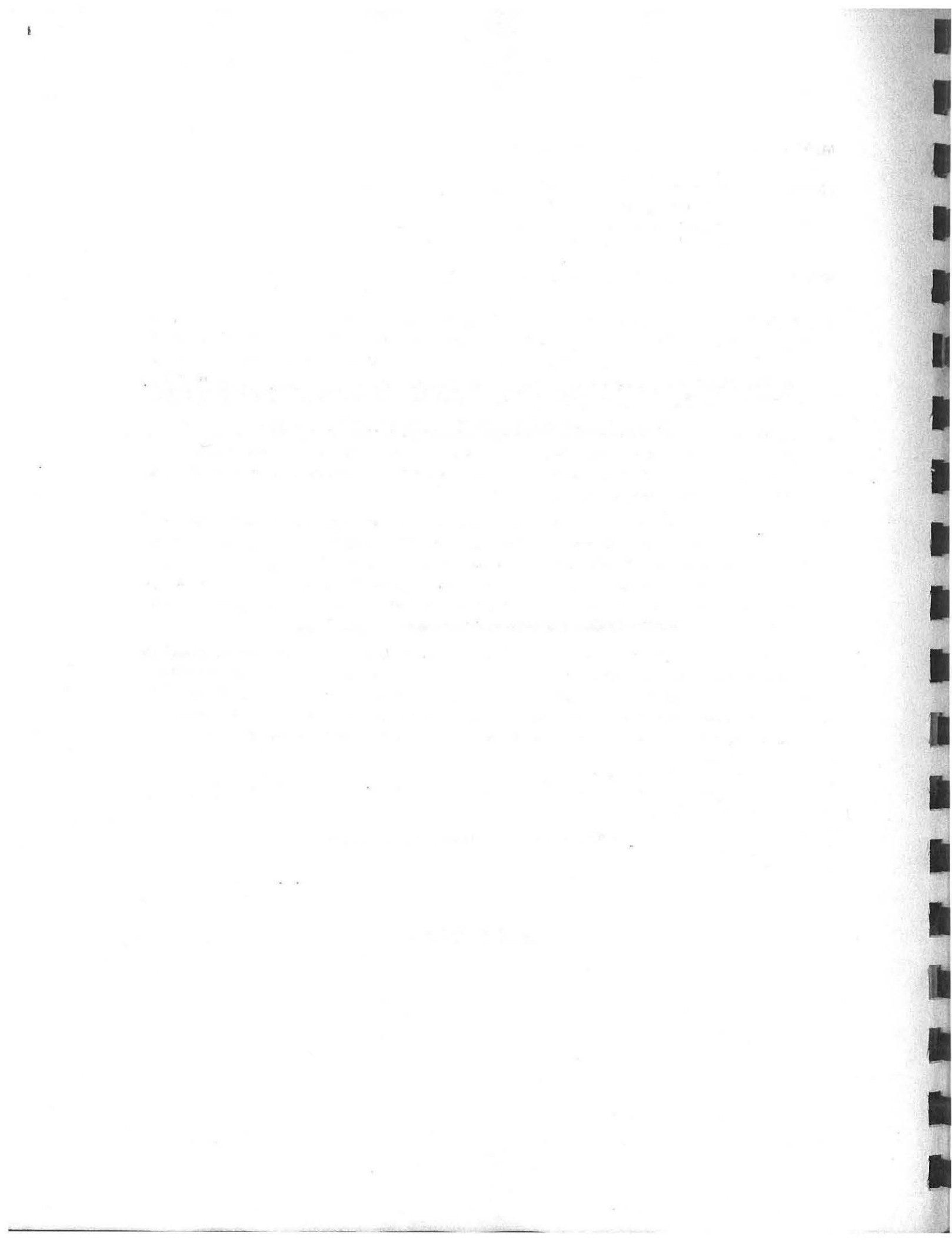
FROM: 482 FW/CC
29050 Coral Sea Boulevard
Homestead Air Force Reserve Base
Homestead, FL 33039-1299

SUBJECT: Air Installation Compatible Use Zone Study

1. The Department of Defense's Air Installation Compatible Use Zone (AICUZ) Program is intended to promote compatible land uses in non-government areas surrounding military airfields. This AICUZ Study for Homestead Air Reserve Base (ARB), located in Homestead, Florida is designed to aid in the development of local planning mechanisms that will protect public safety and health as well as preserve the operational capabilities of Homestead ARB.
2. The report outlines the location of runway clear zones, aircraft accident potential zones, and noise contours and recommends compatible land uses for areas in the vicinity of the base. It is our hope that this information will be incorporated into your community plans, zoning ordinances, subdivision regulations, building codes, and other related documents.
3. The basic objective of the AICUZ program is to achieve compatible uses of public and private lands in the vicinity of military airfields by controlling incompatible development through local actions. This AICUZ study provides Homestead ARB aircraft noise contours based upon the Day-Night Average A-weighted Sound Level (DNL) metric and it provides the information necessary to maximize beneficial use of the land surrounding Homestead ARB while minimizing the potential for degradation of the health and safety of the affected public.
4. We greatly value the positive relationship that Homestead ARB has experienced with its neighbors over the years. As a partner in the process, we have attempted to minimize noise disturbances through actions, such as limiting most flight operations and ground engine run-ups to the hours between 7:00 a.m. and 10:00 p.m. and avoiding flights over noise-sensitive locations. We solicit your cooperation in implementing the recommendation and guidelines presented in this AICUZ report.


Steven R. Fulghum
Colonel
Wing Commander

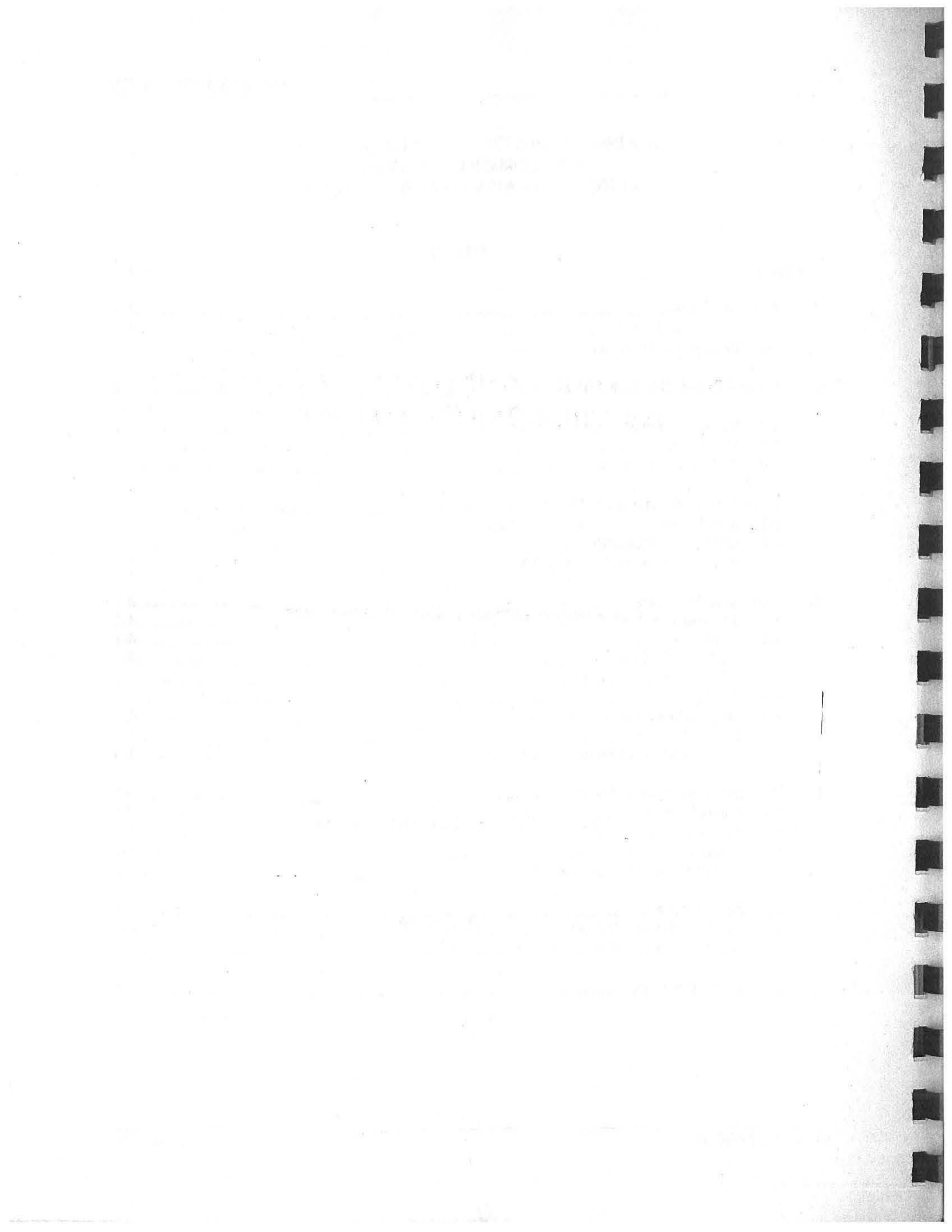

Date



**AIR INSTALLATION COMPATIBLE USE ZONE STUDY
FOR THE 482ND FIGHTER WING**

Homestead Air Reserve Base, Florida

JUNE 2004



**AIR INSTALLATION COMPATIBLE USE ZONE STUDY
FOR THE 482ND FIGHTER WING
AT HOMESTEAD AIR RESERVE BASE, FLORIDA**

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1. Introduction

This study is an update to the 1997 Homestead Air Reserve Base (ARB) Air Installation Compatible Use Zone (AICUZ) Study, hereafter referred to as the 1997 AICUZ Study. The aircraft operational analysis for this AICUZ Study was conducted in November 2002; however aircraft operations have not changed at Homestead ARB since that time. Therefore, this update documents changes to the 1997 AICUZ Study for the period from 1997 to 2004. This AICUZ Study reaffirms the United States Air Force (USAF) policy of promoting public health, safety, and general welfare in areas surrounding USAF installations. The report presents changes in flight operations at Homestead ARB since the 1997 AICUZ Study and provides current noise contours and compatible use guidelines for land areas around the Base. This information is provided to assist local communities in future planning and zoning activities.

Differences between the 1997 AICUZ Study and this Study are attributable to:

- Changes in flight operations, and the addition, elimination, or alteration of flight tracks for mission purposes; and
- Technical improvements to the NOISEMAP Program.

1.1 Purpose and Need

The purpose of the AICUZ program is to promote compatible land development in areas exposed to aircraft noise and accident potential. As the neighboring city and county prepare and modify their land use development plans, recommendations from this updated AICUZ Study should be considered in their planning process to prevent incompatibilities that may compromise Homestead ARB's ability to fulfill its mission requirements or subject city and county residents to avoidable safety hazards. Accident potential and aircraft noise should be major considerations in their planning processes.

Land use guidelines set forth in the USAF AICUZ program reflect land use recommendations for clear zones (CZs) and accident potential zones (APZ) I and II, and four noise zones (NZs). These guidelines have been established on the basis of studies prepared and sponsored by the USAF, United States (U.S.) Department of Housing and Urban Development (HUD), U.S. Environmental Protection Agency (USEPA), Federal Aviation Administration (FAA), Federal Housing Authority (FHA), and state and local agencies. The guidelines recommend land uses that are compatible with airfield operations while allowing maximum beneficial use of adjacent properties. This Study contains recommendations developed to assist local governments in determining land uses that are compatible with airport environs.

The AICUZ program uses current computer modeling technology to define noise levels in areas near USAF installations. An analysis was conducted of Homestead ARB's flying operations, including types

of aircraft, flight patterns utilized, variations in altitude, power settings, number of operations, and hours of operation. This information was used to develop the noise contours contained in this Study. The Department of Defense NOISEMAP methodology and the Day-Night Average A-Weighted Sound Level (DNL) metric were used to define the NZs for Homestead ARB.

1.2 Process and Procedure

Data collection for this document was conducted by the Air Force Center for Environmental Excellence (AFCEE) during the week of October 1-5, 2001. During the week of November 4-8, 2002, a kick-off meeting and site visit for this *Homestead ARB AICUZ Study* was conducted. The purpose of the site visit was to collect information and verify the data collected by AFCEE. In order to validate average daily operations at the airfield, aircraft operations and maintenance data were obtained by aircraft type. Data were provided according to flight track (where they fly), flight profile (how they fly), and ground run-up (engine maintenance activities).

After verification of accuracy, data were entered into the NOISEMAP 6.5 software program and converted into DNL noise contours. Flight operations were distributed on flight tracks based on a primary wind direction distribution, personnel interviews, and aircraft destination. Noise contours and AICUZ maps presented in Sections 3 and 4 of this Study are based on current mission plans.

An AICUZ Study may also address noise contours and AICUZ maps associated with potential future missions. When identified, these mission activities are presented in Section 5 of the AICUZ Study. In the case of Homestead ARB, no future missions have been identified; thus, there are no proposed changes to the current flying mission or related flight activity. Any such proposal would be subject to the Environmental Impact Analysis Process and would be assessed in an Environmental Assessment or Environmental Impact Statement. Appendix A contains detailed information about the AICUZ program.

2. Installation Description

2.1 Mission

Homestead ARB comprises approximately 1,940 acres within Miami-Dade County, Florida, within five miles of the cities of Homestead and Florida City. Figure 2-1 shows the location of Homestead ARB. Homestead ARB is one of eleven U.S. Reserve host installations in the world. Homestead ARB was established as an active military installation after the Homestead Air Force Base (AFB) was destroyed by Hurricane Andrew and subsequently closed through a realignment action related to the Base Closure and Realignment Act (BRAC). As a result of BRAC, the original acreage of Homestead ARB was 852 acres. The total with the land transfer is now 1,943.44 acres. The Base currently supports several military units: the 482nd Fighter Wing (482 FW), the Flight Inceptor Group (FIG) of the Florida Air National Guard (ANG), and the Special Operations Command South (SOCSOUTH). It also supports the U.S. Coast Guard, the Miami Aviation Branch of the U.S. Customs Service, the Florida ANG Headquarters 50th Area Support Group, and the Army Air Force Exchange Service. The Base's primary mission is to recruit, organize, and train reservists to be prepared for active duty in time of war or national emergency, and to maintain national security. Homestead ARB is also utilized as a staging area for aircraft and troops in times of political or military unrest in the Caribbean and Latin America. The Base also serves as a warm-weather training site for other units and as an intermediate staging and aviation support area for Caribbean operations of different U.S. government agencies.

As the host unit at Homestead ARB, the 482 FW maintains the Base facilities by providing civil engineering, security, and air operations support in cooperation with the Florida ANG. The 482 FW conducts attack missions in the F-16 "Fighting Falcon" aircraft. The Florida ANG detachment provides interdiction and security support utilizing the F-15 "Eagle" aircraft.

2.2 Economic Impact

In 1992, Hurricane Andrew struck the City of Homestead, devastating much of the city's infrastructure, residences, and businesses. Homestead ARB also suffered extensive damage, compounding the economic toll the hurricane inflicted on the city and surrounding region. Hurricane Andrew resulted in a reduced personnel contingent and a reduction in the operations at Homestead ARB. The hurricane destroyed approximately 55 percent of Base facilities, with 33 percent being severely damaged, and the other 22 percent sustaining moderate damage.

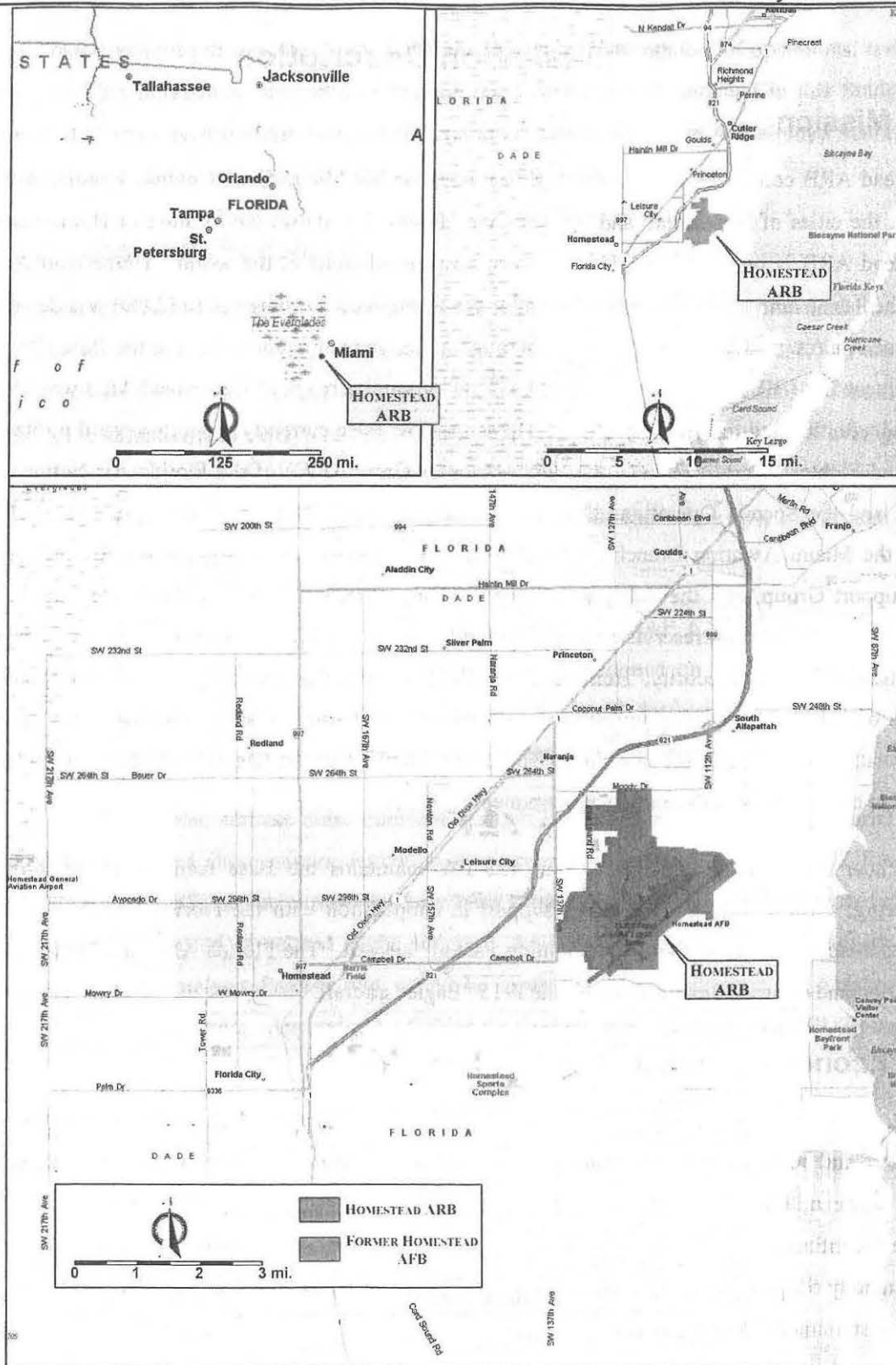


Figure 2-1. Location of Homestead ARB

In 1994, the operations and personnel at Homestead ARB were further reduced under BRAC. Even with the reduction in personnel and operations brought about by Hurricane Andrew and BRAC, Homestead ARB plays a prominent role in the area's economy. Over 2,100 personnel are employed at Homestead ARB (see Table 2-1). The total annual payroll for employees at Homestead ARB was \$55.8 million in fiscal year (FY) 2002. Total expenditures, in addition to payroll, added up to approximately \$77.9 million in expenditures in FY 2002 (see Table 2-2). It is estimated that Homestead ARB's total economic impact on the City of Homestead and surrounding area amounts to well over \$100 million annually.

Table 2-1. Homestead ARB Personnel

Personnel Category	Number of Personnel
Active Duty	122
Air Guard Reserve	1
Non-extended Active Duty Reserve	1,311
General Schedule Civilians	348
Federal Wage Board Civilians	217
Non-appropriated Fund Civilians	71
Base Exchange Civilians	83
Other Civilians	6
Total	2,159

Source: 482 FW 2002

Table 2-2. FY 2002 Economic Impact of Homestead ARB on the Local Area

Category	Annual Amount (millions of dollars)
Military Payroll	18.2M
Government Civilian Payroll	34.7M
Contract Civilians	2.9M
Payroll Total	55.8M
Construction and Services	2.1M
Service Contracts	1.9M
Other Services, Education, and Champus	18.0M
Other Expenditures Total	22.1M
Estimated Value of Jobs Created	28.5M
Grand Total Economic Impact	106.4M

Source: 482 FW 2002

2.3 Flying Activity

To describe the relationship between aircraft operations and land use, it is necessary to evaluate the exact nature of flying activities. An inventory was compiled of the types of aircraft based at Homestead ARB, where those aircraft fly, how high they fly, how many times they fly over a given area, and at what time of day they operate.

Homestead ARB is located in the southern portion of Miami-Dade County, adjacent to the City of Homestead and approximately 5 miles from Florida City. The Miami Approach Control Area encompasses the airspace within 30 nautical miles of Miami International Airport at altitudes ranging from the surface to 16,000 feet above mean sea level (MSL). The regional Miami Air Route Traffic Control Center (ARTCC) delegates this approach area to the Terminal Radar Approach Control (TRACON) facility at Miami International Airport. They provide air traffic control (ATC) services to air traffic operating within the area. The airfield is encompassed by Class D airspace, and is surrounded by Class E airspace. ATC services within the Homestead ARB Class D airspace are provided by the Homestead ARB control tower. The only special use airspace near Homestead ARB is Alert Area A-291D, which is 12.5 nautical miles west of Homestead ARB, and extends from the surface to 3,900 feet MSL. This airspace is active for military flights between 6:00 a.m. and midnight (USAF 2000).

with Biscayne National Park

The site visit conducted during January 2002 determined that there were a total of 27,562 annual airfield operations at Homestead ARB. F-16 and F-15 aircraft accounted for 13,435 and 2,600 respectively of the 27,562 annual airfield operations (AFCEE 2002). Table 2-3 lists January 2002 validated flying activity for aircraft operating at Homestead ARB. This table depicts the estimated number of daily aircraft operations for various aircraft operating at Homestead ARB.

2.4 Airfield Planning

Airfield planning considers three primary aircraft operational/land use determinants: (1) accident potential to land users; (2) aircraft noise; and (3) hazards to operations from land uses (e.g., height obstructions). Each of these concerns is addressed in conjunction with mission requirements and safe aircraft operations to determine the optimum flight track for each aircraft type. The tracks depicted for Homestead ARB, Figures 2-2, 2-3, and 2-4 are the result of such planning. These flight tracks have been configured to implement practicable mitigation measures to reduce noise impacts to the local community while maintaining flight safety standards.

Table 2-3. Summary of Homestead ARB Airfield Operations

Based Aircraft Operations ¹						
Aircraft Type	Engine Type	Number of Aircraft ²	Average Busy Day Operations			Total Daily Operations ³
			Departures	Arrivals	Closed Patterns	
Military Aircraft						
F-16C	F110-GE-100	17	12.24	12.24	14.63	53.74
F-15A	F100-PW-100	3	5.20	5.20	0	10.40
U.S. Customs Aircraft						
HH-60	F700-GE-400/404	2	2.00	2.00	0.14	4.28
AS-350	Turbomecca	2	2.00	2.00	0	4.00
Beech King Air	PT6A-41	3	5.00	5.00	0.36	10.72
Cessna 550	JT-15D-4	5	5.00	5.00	0.36	10.72
Transient Aircraft Operations ⁴						
Aircraft Type ⁵	Departures per Day	Arrivals per Day	Closed Patterns Per Day	Total Daily Operations ⁶		
C-12	0.17	0.17	0.06	0.46		
C-130H/N/P	0.47	0.47	0.00	0.94		
F-18	0.14	0.14	0.00	0.28		
C-17	0.11	0.11	0.00	0.22		
Boeing 707	0.23	0.23	0.00	0.46		
C-23	0.24	0.24	0.00	0.48		
C-5	0.14	0.14	0.00	0.28		
T-38	0.11	0.11	0.00	0.22		
P-3C	0.07	0.07	0.66	1.46		
KC-135R	0.07	0.07	0.66	1.46		
Falcon 20	0.50	0.50	1.80	4.60		
1-engine Piston	0.18	0.18	0.00	0.36		
Helicopters	0.08	0.08	0.00	0.16		
Total Daily	2.51	2.51	3.18	11.38		

¹Based Aircraft Operations are calculated using 250 flying days per year.²Number of Aircraft used in calculating the daily operations.³Total Daily Operations = Departures + Arrivals + (2 x Closed Patterns)⁴Transient Aircraft Operations are calculated using 360 flying days per year.⁵Transient aircraft are usually grouped with similar aircraft in an appropriate category, if its daily operations are less than 0.50.⁶Total Daily Operations = Arrivals + Departures + (2 x Closed Patterns)

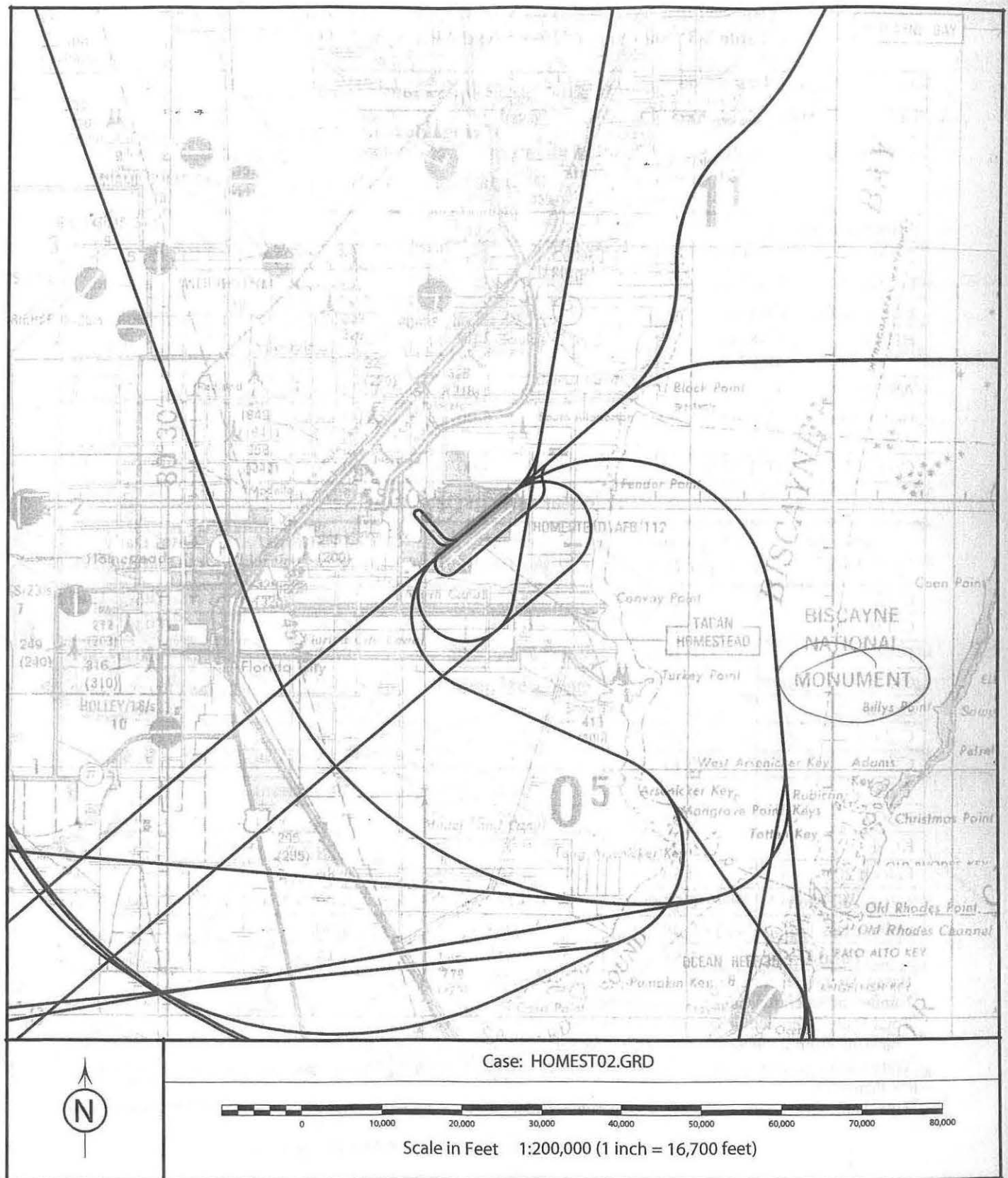


Figure 2-2. Homestead ARB Flight Tracks: Departures

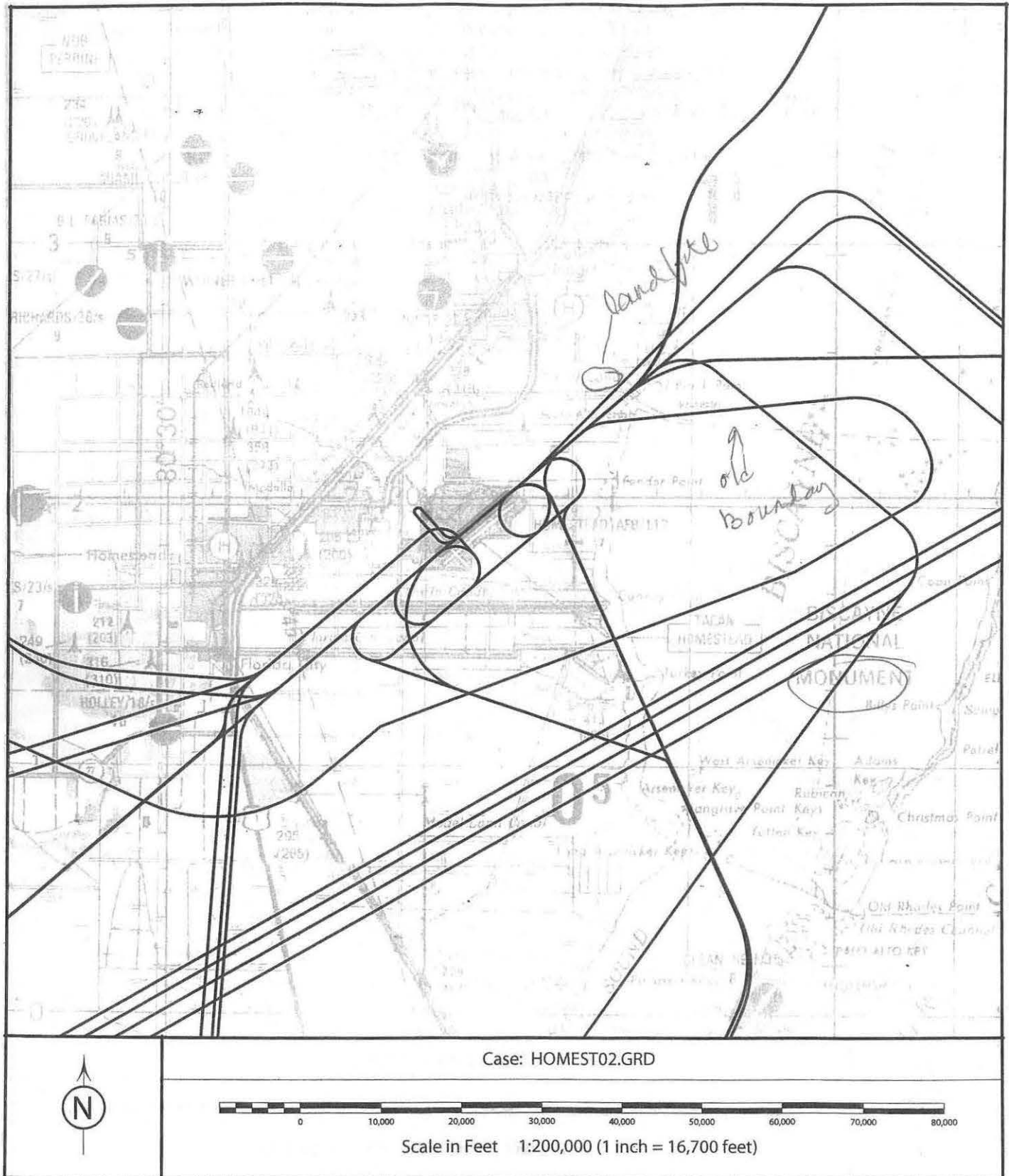


Figure 2-3. Homestead ARB Flight Tracks: Arrivals

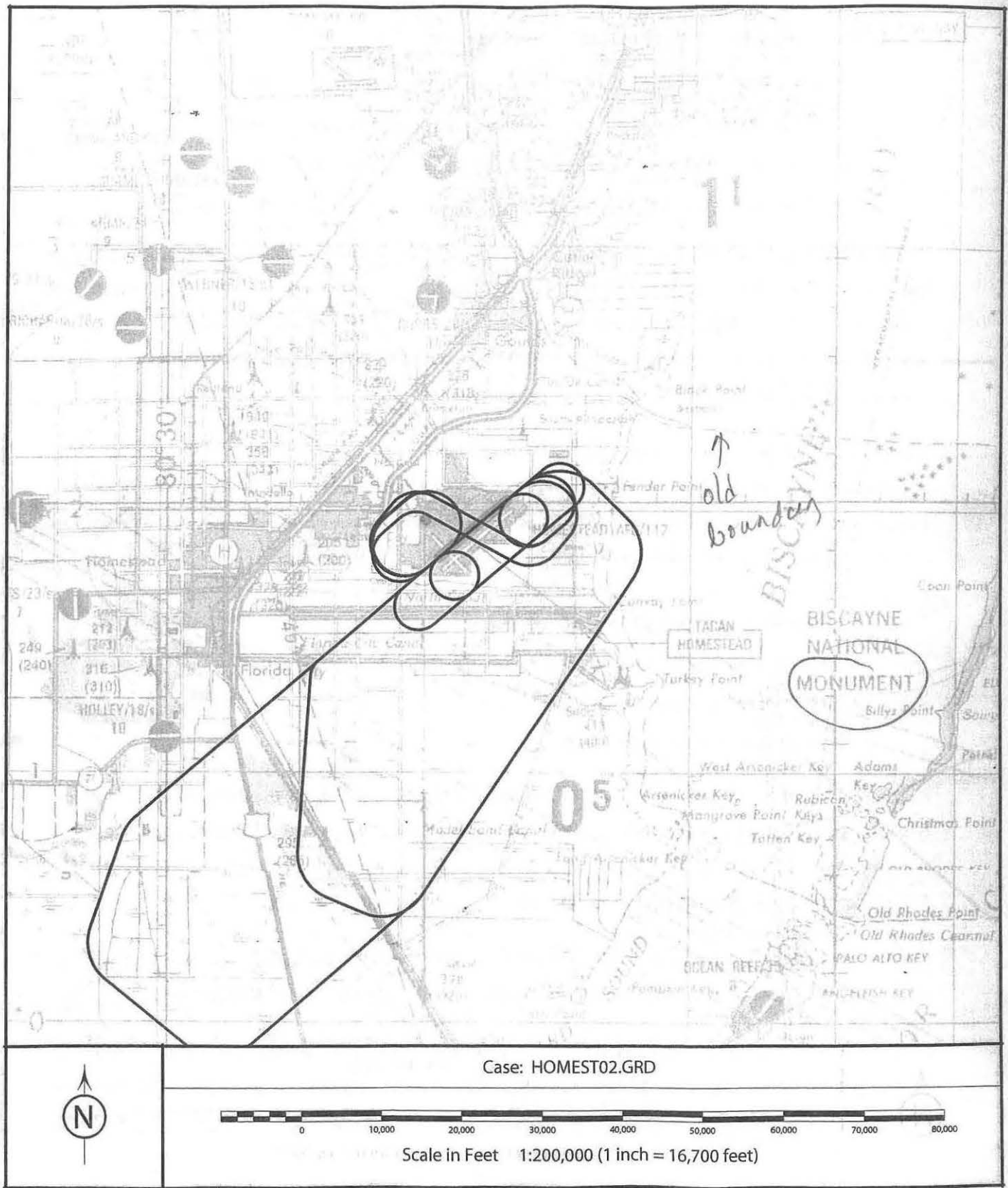


Figure 2-4. Homestead ARB Flight Tracks: Closed Patterns

Homestead ARB, FL

June 2004

Flight track configuration results from the following considerations:

- Takeoff patterns routed to avoid heavily populated areas when possible;
- USAF criteria governing the aircraft speed, rate of climb, and turning radius;
- Efforts to control and schedule missions to keep noise levels low, especially at night; and
- Coordination with the FAA to minimize conflict with civilian aircraft operations.

Most procedures governing aircraft operations and airspace use distinguish between two types of flight rules—visual and instrument—that dictate how and where a pilot can operate. Pilot qualifications, certifications, and the type of flight aviation generally dictate which rules must be used. For instance, general aviation pilots who possess only a private license and fly light aircraft normally operate under Visual Flight Rules (VFR).

There are two categories of airspace, or airspace areas: regulatory and non-regulatory. The vast majority of airspace within the U.S. is regulatory airspace, subject to regulations of the FAA. Within these two categories, further classifications include: controlled, uncontrolled, special use airspace, and airspace for special use. The categories and types of airspace are dictated by the following:

How do these differ?

- Complexity or density of aircraft movement;
- Nature of the operations conducted within the airspace;
- Level of safety required; and
- National and public interest in the airspace.

Controlled Airspace. Controlled airspace is a generic term that encompasses the different classifications (Class A, B, C, D, and E) of regulatory airspace and defines dimensions within which air traffic control service is provided to flights under instrument flight rules (IFR), and to flights under VFR (see Figure 2-5). All military and civilian aircraft are subject to Federal Aviation Regulations (FARs).

Class A airspace includes all operating altitudes of 18,000 feet MSL and above. Class A airspace is frequently utilized by commercial aircraft using altitudes between 18,000 and 45,000 feet MSL.

Class B airspace typically comprises contiguous cylinders of airspace, stacked one upon another and extending from the surface up to 10,000 feet MSL. To operate in Class B airspace, pilots must contact appropriate controlling agencies and receive clearance to enter the airspace.

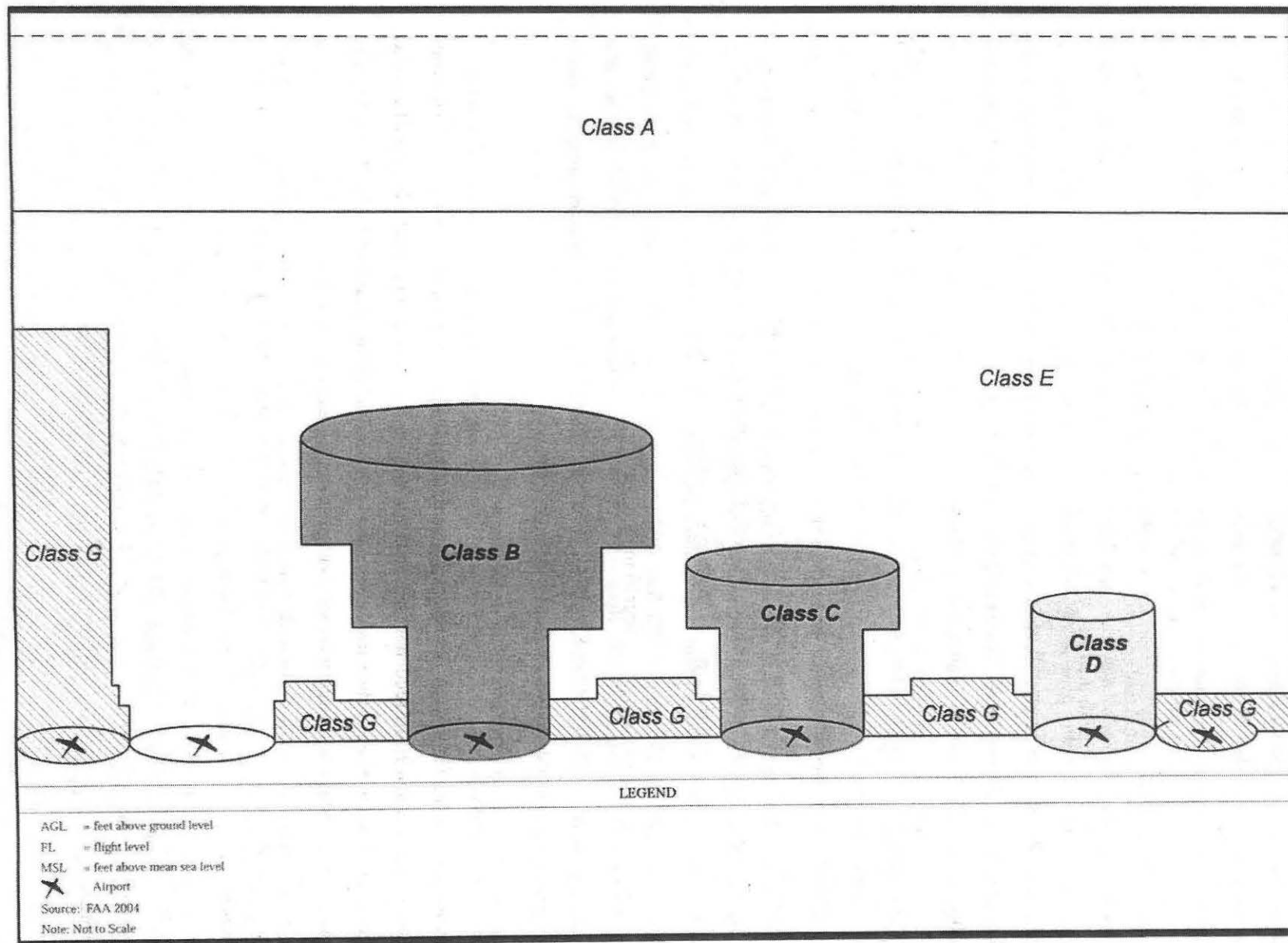


Figure 2-5. Federal Aviation Administration Controlled Airspace Classifications

Additionally, aircraft operating within Class B airspace must be equipped with specialized electronics that allow air traffic controllers to accurately track aircraft speed, altitude, and position. Class B airspace is typically associated with major airport complexes such as Miami International Airport, Florida.

Class C airspace can generally be described as controlled airspace that extends from the surface or a given altitude to a specified higher altitude, normally 4,000 feet above ground level (AGL). Class C airspace is designed and implemented to provide additional air traffic control in to and out of primary airports that have an operational control tower, radar approach control capability, and where aircraft operations are periodically at high-density levels. All aircraft operating within Class C airspace are required to maintain two-way radio communication with local ATC facilities.

Class D airspace encompasses a five statute mile radius of airports with an operational control tower. It extends from the ground to 2,500 feet AGL or higher. All aircraft operating within Class D airspace must be in two-way communication with the ATC facility.

Class E airspace can be described as general controlled airspace. It includes designated Federal airways consisting of the high altitude (J or "Jet" Route) system and low altitude (V or "Victor" Route) system. Federal airways have a width of four statute miles on either side of the airway centerline, and can be structured between the altitudes of 700 feet AGL and 18,000 feet MSL. These airways frequently intersect approach and departure paths from both military and civilian airfields. Class E airspace may range from ground level at non-towered airfields up to 18,000 feet MSL. More stringent airspace control has not been established throughout the majority of Class E airspace.

Uncontrolled Airspace. Uncontrolled airspace (Class G) is not subject to restrictions that apply to controlled airspace and falls under the non-regulatory airspace category. Limits of uncontrolled airspace typically extend from the surface to 700 feet AGL in urban areas, and from the surface to 1,200 feet AGL in rural areas. Uncontrolled airspace can extend above these altitudes to as high as 14,500 feet MSL if no other types of controlled airspace have been assigned. ATC does not have authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general aviation aircraft operating under VFR.

Local Airspace. Homestead ARB is located in the southern portion of Miami-Dade County, Florida, adjacent to the City of Homestead and approximately five miles from Florida City. The airfield is encompassed by Class D airspace up to 10,000 feet MSL. Homestead ARB has its own ATC personnel to provide flight tracking and aircraft separation services for IFR and VFR aircraft in the vicinity of Homestead ARB. In certain situations, aircraft separation requirements may necessitate different routing than the flight tracks shown in Figures 2-2 through 2-4.

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3. Land Use Compatibility Guidelines

3.1 Introduction

The Department of Defense (DOD) developed the AICUZ program for military airfields in 1973. Using this program, DOD works to protect aircraft operational capabilities at its installations and to assist local government officials in protecting and promoting public health, safety, and quality of life. The primary goal of the AICUZ program is to promote compatible land use and development around military airfields by providing information on aircraft noise exposure, height restrictions, and accident potential.

This AICUZ Study describes three basic types of constraints that affect, or result from, flight operations. The first constraint involves areas the FAA and DOD have identified for height restrictions (see "Height Obstruction Criteria," Appendix D). USAF obstruction criteria are based on those contained in FAR Part 77, Subpart C. The height restrictions are to prevent man-made structures from being built in the flight path of aircraft using airports. Aircraft approach and depart from airports on a diagonal line that gets farther from the ground as distance from the airport increases. The height obstruction criteria reflect this principle, and permit the placement of taller structures as distance from the airport increases.

The second constraint involves NZs produced by the computerized DNL and DOD NOISEMAP methodologies. The USAF NOISEMAP 6.5 software program, which is similar to FAA's Integrated Noise Model, but is specific to military aircraft, produces contours showing the noise levels generated by aircraft operations. This AICUZ Study contains noise contours plotted in increments of 5 decibels (dB), ranging from DNL of 65 to 80. Figure 3-1 shows noise contours based on current operations at Homestead ARB. Additional information on noise methodology is contained in Appendix C of this report.

The third constraint involves APZs based on a statistical analysis of past aircraft accidents. DOD analysis has determined that the areas immediately beyond the ends of the runways and along the approach and departure flight paths have the highest potential for aircraft accidents. Based on this analysis, DOD developed three zones that have a relative potential for accidents.



Figure 3-1. Homestead ARB Noise Zones and Accident Potential Zones

The CZs, areas closest to the runway ends, are the most hazardous since the potential for accidents is the highest. The overall risk is such that DOD generally acquires the land through purchase or easement to prevent development. APZ I is an area beyond the CZ, which possesses a high potential for accidents. APZ II is an area beyond APZ I having measurable potential for accidents. While the aircraft accident potential in APZs I and II does not necessarily warrant acquisition by the Air Force Reserve Command (AFRC), land use planning and controls are strongly encouraged for the protection of the public. Compatible land uses are specified for these zones.

The Homestead ARB CZs encompass an area 3,000 feet wide by 3,000 feet long. APZ I is 3,000 feet wide by 5,000 feet long and APZ II is 3,000 feet wide by 7,000 feet long. CZs and APZs for Homestead ARB are shown in Figure 3-1. Additional information on APZs is contained in Appendix B of this report.

3.2 Land Use Compatibility

Each AICUZ report contains general land use guidelines related to safety and noise associated with aircraft operations. Table 3-1 lists land uses that are compatible or incompatible with various combinations of noise exposure and accident potential. Noise guidelines are essentially the same as those published by the Federal Interagency Committee on Urban Noise in the June 1980 publication, *Guidelines for Considering Noise in Land Use Planning Control*. The *Standard Land Use Coding Manual (SLUCM)* published by the U.S. Department of Transportation, FHA, has been used for identifying and coding land use activities (FICUN 1980).

3.3 Participation in the Planning Process

As local communities prepare their land use plans, AFRC must be ready to provide input. Air Force Instruction 32-7063, *Air Installation Compatible Use Zone Program*, and Air Force Handbook 32-7084, *AICUZ Program Manager's Guide*, give broad AICUZ responsibilities to the Civil Engineer of the Major Command responsible for a base. Responsibility for representation of the installation's interests to local communities is usually delegated to the installation. At Homestead ARB, Mr. Michael Andrejko has been designated as the official liaison for local communities on planning matters related to the AICUZ Study. Mr. Andrejko can be reached at (305) 224-7344.

Table 3-1. Land Use Compatibility

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	CZ	APZ I	APZ II	65-69 dB	70-74 dB	75-79 dB	80+ dB
10	Residential							
11	Household units							
11.11	Single units; detached	N	N	Y ¹	A ¹¹	B ¹¹	N	N
11.12	Single units; semidetached	N	N	N	A ¹¹	B ¹¹	N	N
11.13	Single units; attached row	N	N	N	A ¹¹	B ¹¹	N	N
11.21	Two units; side-by-side	N	N	N	A ¹¹	B ¹¹	N	N
11.22	Two units; one above the other	N	N	N	A ¹¹	B ¹¹	N	N
11.31	Apartments; walk-up	N	N	N	A ¹¹	B ¹¹	N	N
11.32	Apartments; elevator	N	N	N	A ¹¹	B ¹¹	N	N
12	Group quarters	N	N	N	A ¹¹	B ¹¹	N	N
13	Residential hotels	N	N	N	A ¹¹	B ¹¹	N	N
14	Mobile home parks or courts	N	N	N	N	N	N	N
15	Transient lodgings	N	N	N	A ¹¹	B ¹¹	C ¹¹	N
16	Other residential	N	N	N ¹	A ¹¹	B ¹¹	N	N
20	Manufacturing							
21	Food & kindred products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
22	Textile mill products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
23	Apparel and other finished products made from fabrics, leather, and similar materials; manufacturing	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
24	Lumber and wood products (except furniture); manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
25	Furniture and fixtures; manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
26	Paper & allied products; manufacturing	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
27	Printing, publishing, and allied industries	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
28	Chemicals and allied products; manufacturing	N	N	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
29	Petroleum refining and related industries	N	N	N	Y	Y ¹²	Y ¹³	Y ¹⁴
30	Manufacturing							
31	Rubber and misc. plastic products; manufacturing	N	N ²	N ²	Y	Y ¹²	Y ¹³	Y ¹⁴
32	Stone, clay and glass products manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
33	Primary metal industries	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
34	Fabricated metal products; manufacturing	N	N ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴

Table 3-1. Land Use Compatibility (continued)

Land Use		Accident Potential Zones			Noise Zones			
SLUCM No.	Name	CZ	APZ I	APZ II	65-69 dB	70-74 dB	75-79 dB	80+ dB
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks; manufacturing	N	N	N ²	Y	A	B	N
39	Miscellaneous manufacturing	N	Y ²	Y ²	Y	Y ¹²	Y ¹³	Y ¹⁴
40	Transportation, communications and utilities							
41	Railroad, rapid rail transit and, street railroad transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
42	Motor vehicle transportation	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
43	Aircraft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
44	Marine craft transportation	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
45	Highway and street right-of-way	N ³	Y	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
46	Automobile parking	N ³	Y ⁴	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
47	Communications	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
48	Utilities	N ³	Y ⁴	Y	Y	Y	Y ¹²	Y ¹³
49	Other transportation communications and utilities	N ³	Y ⁴	Y	Y	A ¹⁵	B ¹⁵	N
50	Trade							
51	Wholesale trade	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
52	Retail trade-building materials, hardware and farm equipment	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
53	Retail trade-general merchandise	N	N ²	Y ²	Y	A	B	N
54	Retail trade-food	N	N ²	Y ²	Y	A	B	N
55	Retail trade-automotive, marine craft, aircraft and accessories	N	Y ²	Y ²	Y	A	B	N
56	Retail trade-apparel and accessories	N	N ²	Y ²	Y	A	B	N
57	Retail trade-furniture, home furnishings and equipment	N	N ²	Y ²	Y	A	B	N
58	Retail trade-eating and drinking establishments	N	N	N ²	Y	A	B	N
59	Other retail trade	N	N ²	Y ²	Y	A	B	N
60	Services							
61	Finance, insurance and real estate services	N	N	Y ⁶	Y	A	B	N
62	Personal services	N	N	Y ⁶	Y	A	B	N
62.4	Cemeteries	N	Y ⁷	Y ⁷	Y	Y ¹²	Y ¹³	Y ^{14,21}
63	Business services	N	Y ⁸	Y ⁸	Y	A	B	N
64	Repair services	N	Y ²	Y	Y	Y ¹²	Y ¹³	Y ¹⁴
65	Professional services	N	N	Y ⁶	Y	A	B	N

Table 3-1. Land Use Compatibility (continued)

Land Use		Accident Potential Zones			Noise Levels			
SLUCM No.	Name	CZ	APZ I	APZ II	65-69 dB	70-74 dB	75-79 dB	80+ dB
65.1	Hospitals, nursing homes	N	N	N	A*	B*	N	N
65.1	Other medical facilities	N	N	N	Y	A	B	N
66	Contract construction services	N	Y ⁶	Y	Y	A	B	N
67	Governmental services	N	N	Y ⁶	Y*	A*	B*	N
68	Educational services	N	N	N	A*	B*	N	N
69	Miscellaneous services	N	N ²	Y ²	Y	A	B	N
70	Cultural, entertainment and recreational							
71	Cultural activities (including churches)	N	N	N ²	A*	B*	N	N
71.2	Nature exhibits	N	Y ²	Y	Y*	N	N	N
72	Public assembly	N	N	N	Y	N	N	N
72.1	Auditoriums, concert halls	N	N	N	A	B	N	N
72.11	Outdoor music shell, amphitheaters	N	N	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	N	N	N	Y ¹⁷	Y ¹⁷	N	N
73	Amusements	N	N	Y ⁸	Y	Y	N	N
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y ^{8,9,10}	Y	Y*	A*	B*	N
75	Resorts and group camps	N	N	N	Y*	Y*	N	N
76	Parks	N	Y ⁸	Y ⁸	Y*	Y*	N	N
79	Other cultural, entertainment and recreation	N	Y ⁹	Y ⁹	Y*	Y*	N	N
80	Resources production and extraction							
81	Agriculture (except livestock)	Y ¹⁶	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20,21}
81.5 to 81.7	Livestock farming and animal breeding	N	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20,21}
82	Agricultural related activities	N	Y ⁵	Y	Y ¹⁸	Y ¹⁹	N	N
83	Forestry activities and related services	N ⁵	Y	Y	Y ¹⁸	Y ¹⁹	Y ²⁰	Y ^{20,21}
84	Fishing activities and related services	N ⁵	Y ⁵	Y	Y	Y	Y	Y
85	Mining activities and related services	N	Y ⁵	Y	Y	Y	Y	Y
89	Other resources production and extraction	N	Y ⁵	Y	Y	Y	Y	Y

LEGEND

SLUCM – Standard Land Use Coding Manual, U.S. Department of Transportation.

Y – (Yes) – Land uses and related structures are compatible without restriction.

N – (No) – Land use and related structures are not compatible and should be prohibited.

Y^x – (yes with restrictions) – Land use and related structures generally compatible; see notes indicated by the superscript.

N^x – (no with exceptions) – See notes indicated by the superscript.

NLR – Noise Level Reduction (NLR) (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C – Land use and related structures generally compatible; measures to achieve NLR for A (DNL / 65-69), B (DNL / 70-74), C (DNL / 75-79), need to be incorporated into the design and construction of structures.

A*, B*, and C* – Land use generally compatible with NLR; however, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate notes below.

* – The designation of these uses as "compatible" in this zone reflects individual federal agencies' and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

NOTES

1. Suggested maximum density of 1-2 dwelling units per acre, possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.
2. Within each land use category, uses exist where further deliberating by local authorities may be needed due to the variation of densities in people and structures. Shopping malls and shopping centers are considered incompatible use in any accident potential zone (CZ, APZ I, or APZ II).
3. The placement of structures, buildings, or aboveground utility lines in the CZ is subject to severe restrictions. In a majority of the CZs, these items are prohibited. See Air Force Instruction 32-7060, *Interagency and Intergovernmental Coordination for Environmental Planning*, and Air Force Joint Manual 32-8008, *Airfield and Heliport Planning Criteria*, for specific guidance.
4. No passenger terminals and no major aboveground transmission lines in APZ I.
5. Factors to be considered: labor intensity, structural coverage, explosive characteristics, and air pollution.
6. Low-intensity office uses only. Meeting places, auditoriums, etc. are not recommended.
7. Excludes chapels.
8. Facilities must be low intensity.
9. Clubhouse not recommended.
10. Areas for gatherings of people are not recommended.
11.
 - a) Although local conditions may require residential use, it is discouraged in DNL 65-69 dB and strongly discouraged in DNL 70-74 dB. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.
 - b) Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor NLR for DNL 65-69 dB and DNL 70-74 dB should be incorporated into building codes and considered in individual approvals.
 - c) NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, and design and use of berms and barriers can help mitigate outdoor exposure, particularly from near ground level sources. Measures that reduce outdoor noise should be used whenever practical in preference to measures which only protect interior spaces.
12. Measures to achieve the same NLR as required for facilities in DNL 65-69 dB range 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.
13. Measures to achieve the same NLR as required for facilities in DNL 70-74 dB range 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.
14. Measures to achieve the same NLR as required for facilities in DNL 75-79 dB range 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.
15. If noise sensitive, use indicated NLR; if not, the use is compatible.
16. No buildings.
17. Land use is compatible provided special sound reinforcement systems are installed.

18. Residential buildings require the same NLR as required for facilities in DNL 65-69 dB range.
19. Residential buildings require the same NLR as required for facilities in DNL 70-74 dB range.
20. Residential buildings are not permitted.
21. Land use is not recommended. If the community decides the use is necessary, personnel should wear hearing protection devices.

4. Land Use Analysis

4.1 Introduction

Land use planning and control is a dynamic process. The specific characteristics of land use determinants will always reflect, to some degree, the changing conditions of the economic, social, and physical environment of a community, as well as changing public concern. The planning process works to accommodate this fluidity, in that many decisions are not based solely on boundary lines, but rather on more generalized area designations.

4.2 Land Use

Homestead ARB is located in Miami-Dade County, adjacent to the City of Homestead and approximately five miles from Florida City. The Base is bordered to the north by S.W. 288th Street, to the west by S.W. 137th Avenue, and to the south by the C-103 canal. S.W. 107th Avenue does not border the Base to the east, but lies within a quarter-mile of its boundary. The population of Miami-Dade County is approximately 2,253,362 (U.S. Bureau of Census 2000). The population density of Miami-Dade County varies based on the land use type of that area.

4.2.1 2000 Land Use

The most recent consolidated existing land use data was provided by Miami-Dade County Department of Planning and Zoning, Research Department. Figure 4-1 presents the NZs and APZs overlaid on the 2000 land use data. As shown in Figure 4-1, most of the land surrounding Homestead ARB to the west, south, east, and northeast is primarily agriculture with intermixed areas of Single-Family; Two-Family (Duplexes); Airports/Ports; Communications, Utilities, Terminals, Plants; and Parks, Preserves, Cemeteries, and Conservation. To the north of Homestead ARB, the land use areas were identified in 2000 as primarily Airports/Ports; Vacant, Government Owned; Vacant, Protected, Privately Owned; Vacant Unprotected; and Institutional with some residential land uses to the northwest.

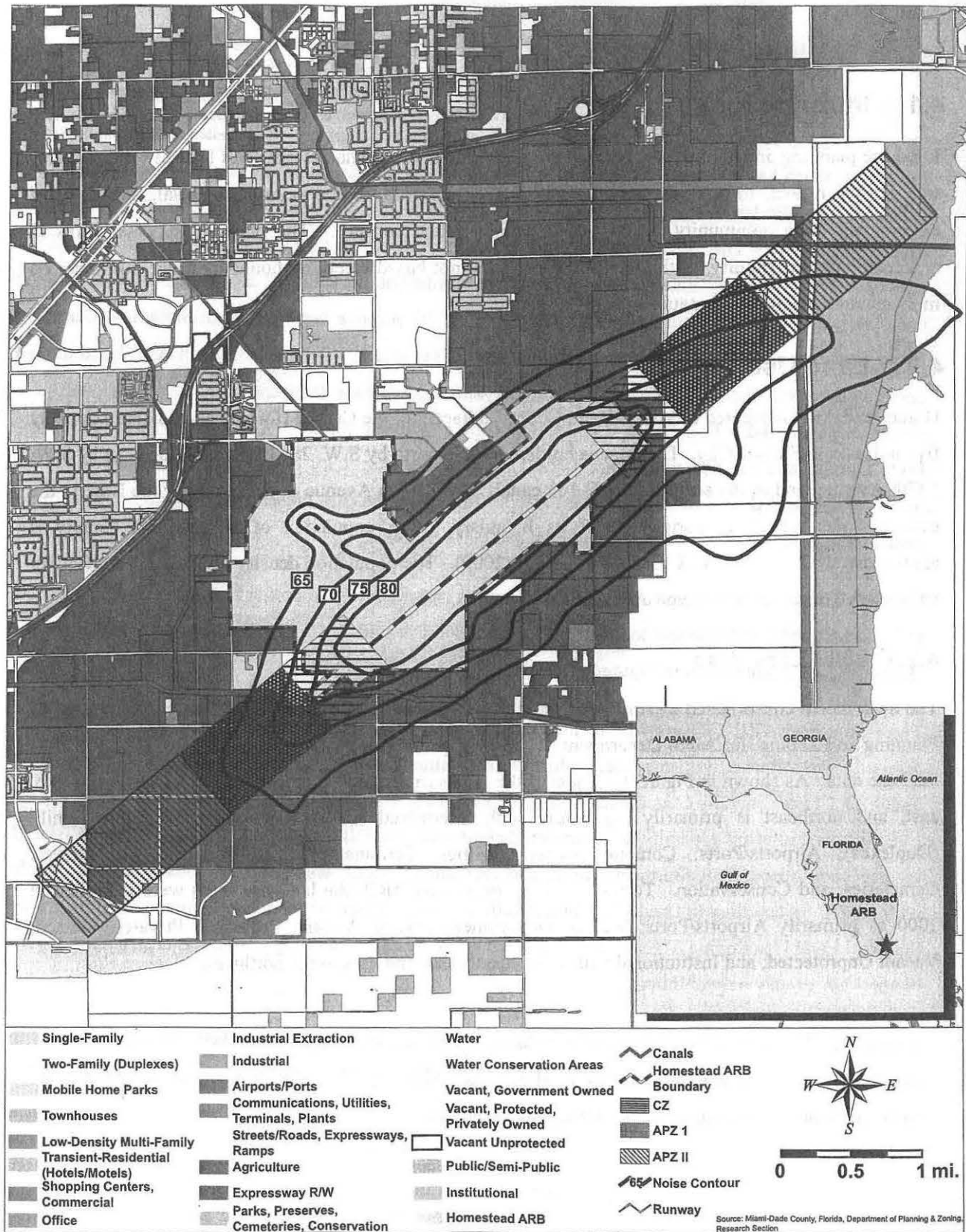


Figure 4-1. Homestead ARB Miami-Dade County 2000 Land Use

4.2.2 Existing Land Use

Since 2000, the land uses in the vicinity of Homestead ARB have changed. The amount of vacant and open spaces has decreased as more residential land uses have been established. The land to the west and northwest which has historically been used for agriculture is rapidly being developed into residential and public/semi-public land uses. Residential density surrounding Homestead ARB is primarily one to five dwellings per acre. The areas northwest and west of the base along Florida's Turnpike and toward the City of Homestead are characterized by a variety of residential, agricultural, and public/semi public land uses. A group of dwelling units located along S.W. 137th Avenue between 314th Street and Campbell Drive serve as residential units for migrant workers. This area is partially located in APZ I and almost completely within the DNL 65-70 dB contour. Existing off-base land uses for Homestead ARB are shown in Figure 4-2. This figure was developed by combining the 2000 Land Use Map from Miami-Dade County and the undated Future Land Use Map from the City of Homestead and adjusting the resulting map based on a field verification effort. Therefore, the data presented in Figure 4-2 provides a visual representation of what the existing land use looks like today.

For each runway at Homestead ARB, CZs encompass an area 3,000 feet wide by 3,000 feet long. APZ I is 3,000 feet wide by 5,000 feet long and APZ II is 3,000 feet wide by 7,000 feet long. CZs and APZs for Homestead ARB are shown in Figure 3-1.

The Homestead ARB CZs are free of incompatible land uses. Land use within the CZs and APZ I is primarily agriculture and open space. Industrial, agricultural, recreation, and vacant land uses also found under APZ I are generally considered compatible land uses. Some residential use is in southwestern APZ I. Residential uses are generally not considered compatible land uses in APZ I. Land uses within APZ II include open space, agriculture, industrial, and recreation. These land uses are considered compatible with APZ II. According to Land Use Compatibility, which is based on land use categories outlined in the Standard Land Use Coding Manual, the placement of structures or buildings in the CZ is subject to severe restrictions, or may be prohibited.

Figure 4-2 also shows DNL noise contours based on aircraft operations at Homestead ARB, along with the APZs associated with the runway at Homestead ARB: 05/23. The noise contours are plotted in increments of five dB, ranging from DNL of 65 to 80 dB.

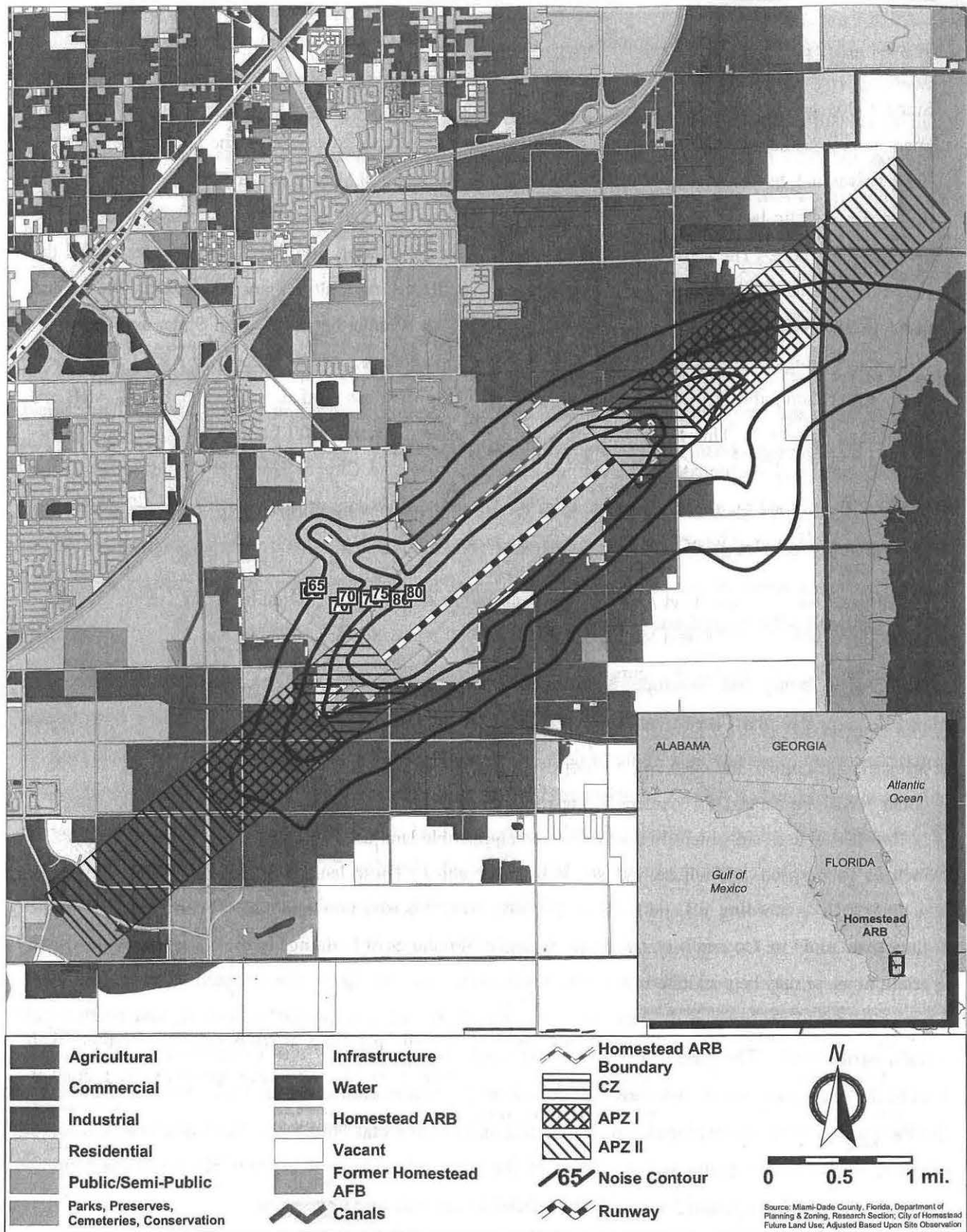


Figure 4-2. Homestead ARB Existing Land Use

The local governments around Homestead ARB are interested in protecting the base mission and in preventing any future encroachments into the area surrounding the base. There are several plans and policies related to land use near Homestead ARB including: the *Air Installation Compatible Use Zone Program*, the *1997 Miami-Dade County Comprehensive Development Master Plan*, the *1995 Homestead Comprehensive Plan*, and the *1995 Homestead Base Reuse Plan* (USAF 2000). The *Homestead Base Reuse Plan* and the *Homestead Comprehensive Plan* specifically address land use issues associated with Homestead ARB.

4.3 Zoning

Zoning refers to the division of a municipality into districts and establishment of regulations to govern the use, placement, and size of lots and structures. The exact zoning designation of any parcel of land should be determined through consultation with local planning agencies.

Land use restrictions in the Homestead ARB environs involve a combination of conventional zoning, airfield overlay district zoning, and building and construction standards for noise attenuation. These restrictions are a result of the community's willingness to guide development in a manner compatible with Homestead ARB operations.

Miami-Dade County has developed a *Comprehensive Development Master Plan*, which defines the current zoning and plans for future development. However this data was not available in a consolidated graphical format to present as a figure in this document. According to the current land use maps, the area surrounding Homestead ARB is largely agricultural, but is rapidly being rezoned so that these areas can be developed and utilized as residential and commercial land uses. Further to the south and southeast are vacant parcels. These vacant parcels are both protected, meaning no development will occur on them, and unprotected, meaning that they are in private ownership and could be developed. There are a few commercial plots to the north of the base, some residential to the south of the base, and several small residential developments to the north and northwest. According to the adopted 2005-2015 County Comprehensive Development Master Plan, the land to the east, northeast, southeast, and south would remain agricultural. The land to the southwest would be agricultural with some commercial use. The land to the north, northwest, and west would be low to medium density residential. Areas to the south of the Base are also being developed into residential and commercial land uses. Because most of the noise contours extend to the south and southeast of the base, adoption and implementation of the land use guidelines outlined in Section 3 would be beneficial to the base and its mission.

The Homestead ARB environs are an ideal example of how communities neighboring an air base have cooperated with the USAF to insure incompatible land uses will be minimized in the environs. The local

governments around Homestead ARB are interested in protecting the Base mission and in preventing any future encroachments into the area surrounding the Base. As Homestead ARB looks to the future, its local planning jurisdictions must continue to take an extremely proactive stance on land use restrictions and guidelines in an effort to insure continued airbase viability.

A brief description of the current land use for each affected jurisdiction is given below. Each political jurisdiction surrounding Homestead ARB is empowered to establish its own land use goals and plans and to administer zoning regulations. Table 4-1 summarizes the generalized land use acreage in the vicinity of Homestead ARB by category and NZ as depicted in Figure 4-1. Table 4-2 summarizes the generalized land use acreage in the vicinity of Homestead ARB by category within CZs and APZs.

Table 4-1. Land Use Acreage within Homestead ARB Noise Zones

Land Use	Noise Level (DNL)			
	65-69	70-74	75-79	80
Agriculture	781	340	129	8
Public and Semi-public	278	300	289	682
Industrial	12	30	0	0
Residential	26	0	0	0
Commercial	0	0	0	0
Vacant and Open Space	956	445	175	29
Infrastructure	97	59	23	33
Subtotal	2,150	1,174	616	752
Total	4,692			

For a graphical presentation, existing land use classifications have been combined into the following categories:

- **Agricultural:** Areas used for production of crops or raising livestock.
- **Public and Semi-Public:** Areas and the facilities they contain, that are owned or utilized in the public interest (*e.g.*, publicly owned lands and/or lands to which the public has access, including parks, schools, and hospitals).
- **Industrial:** Areas and the facilities they contain, that are owned or utilized for industrial purposes (*i.e.*, manufacturing).

- **Residential:** This category includes areas that contain a single, detached structure providing housing for one or two households; and multiple-family housing, areas that contain one or more structures, each providing housing for three or more households.
- **Commercial:** Areas and the facilities they contain, that are owned or utilized for retail.
- **Infrastructure:** This category refers to roadways, power company lands, canals, and utilities.
- **Vacant and Open Space:** Unused lands in both urbanized and undeveloped areas (e.g., woodlands, abandoned land, and water bodies).

Table 4-2. Land Use Acreage within Homestead ARB CZs and APZs

Land Use	Noise Level (DNL)					
	North			South		
	CZ	APZ I	APZ II	CZ	APZ I	APZ II
Agriculture	60	5	6	45	284	312
Public and Semi-public	83	0	0	91	1	0
Industrial	0	0	0	0	0	1
Residential	0	38	5	0	0	0
Commercial	0	0	0	0	9	0
Vacant and Open Space	53	293	427	58	31	123
Infrastructure	11	8	44	13	19	46
Subtotal	207	344	482	207	344	482

4.4 Incompatible Land Use

4.4.1 Noise Zones

DOD and other Federal agencies use DNL 65 dB as a land use planning threshold. Additional details of the methodologies used to produce the noise contours are presented in Appendix A. One incompatibility exists around the Homestead ARB as a result of noise exposure. A migrant worker camp, located southwest of the base at Speedway Blvd. (SW 137 Avenue) and Campbell Drive (SW 312 Street), is located within the DNL 65-70 dB contour, partially within APZ I.

CZ: There are no incompatibilities within the CZs.

APZ I: Residential development within the northern APZ I is incompatible with USAF recommendations. A migrant worker camp, located southwest of the base at Speedway Blvd. (SW 137 Avenue) and

Campbell Drive (SW 312 Street), is located within the DNL 65-70 dB contour, partially within APZ I. According to SLUCM guidelines, a residential unit with the DNL 65-70 dB contour is generally considered compatible, however, no residential development is compatible within APZ I.

APZ II: Within APZ II, residential development may be compatible providing it does not exceed USAF density recommendations of one dwelling unit per acre. There are no incompatible uses within APZ II.

4.4.2 Planning Considerations

AICUZ noise contours describe the noise characteristics of a specific operational environment and, as such, will change if a significant operational change is made. Should a new mission be established at Homestead ARB, adding a larger number of airplanes or different aircraft types, the AICUZ would be amended.

Additionally, DOD recommends that AICUZ data be utilized with all other planning data. Therefore, specific land use control decisions should not be based solely on AICUZ boundaries. Homestead ARB has provided flight track, APZ, and noise contour information in this report that reflects the most current and accurate picture of aircraft activities.

5. Potential Future Missions

The USAF actively studies areas around Homestead ARB subject to aircraft noise and potential hazards of aircraft accidents. The AICUZ program was developed to describe current air operations and, in some cases, possible future operations scenarios.

5.1 Future Missions

No new future missions have been identified; therefore, there are no proposed changes to the current flying mission or related flight activity. Any such proposal would be subject to the Environmental Impact Analysis Process and would be assessed in an Environmental Assessment or Environmental Impact Statement.

5.2 Land Use Controls

Three types of land use controls have been developed in order to minimize conflicts between military and civilian airfields and nearby communities. The three types of controls that local planners and zoning commissions can employ to prevent further encroachment by incompatible development and future conflicts with aircraft activities include: compatible zoning, building code modifications, and aviation easements. Homestead ARB is an important contributor to adjacent communities' economic well-being and support from local communities is critical to the airfield's continued operation.

5.3 Compatible Zoning

Zoning changes can control future land use. Zoning can ensure that the land uses of a community are properly situated in relation to each other, and it is the most commonly used legal device for implementing land use plans. Zoning changes can assist airport compatibility by directing new growth into compatible areas preventing the future development of noise sensitive land uses in noise-impacted areas. Noise impacted areas that currently contain incompatible uses such as residences can be rezoned to more compatible categories, such as commercial, industrial, or transitional businesses.

Owing to the relative impermanence of zoning regulations, continuous monitoring is necessary to preclude the encroachment of incompatible development into undeveloped noise-impacted areas. Zoning that achieves compatibility will be subject to continued pressure for change. Zoning changes can increase the value of land within noise-affected areas, promote compatibility and leave land in private ownership on the tax rolls for an economically productive community.

5.4 Building Code Modifications

Building codes can ensure that the structural requirements for a safe building are met. Local codes can address the noise levels to which the structures are subjected. The general objective is to achieve a maximum interior noise level of 45 decibels. Codes can include acoustical treatment standards for new or modified noise sensitive structures and sound-attenuating construction techniques. Building code modifications can also establish sound insulation standards, such as wall insulation, double-pane windows, and roof insulation.

Local jurisdictions are responsible for modifying community building codes or adopting a state building code that includes provisions for soundproofing structures impacted by aircraft noise. Provisions for building code modifications, to include sound insulation of exterior noise sources, require local legislation and implementation by building inspectors. Additional sound insulation does slightly increase the cost of the construction.

Building standards and zoning within the Homestead ARB environs appropriately address AICUZ development concerns with regard to the 1997 AICUZ Study noise contours. Zoning and building standards require the incorporation of noise level reduction measures within construction impacted by AICUZ noise contours and limit the types of land uses in areas impacted by noise and accident potential, as previously described. Adoption and strict enforcement of these ordinances by the local government has limited and is expected to continue to effectively limit incompatible land uses. Land use density restrictions also should curtail incompatible development within Homestead ARB CZs and APZs.

6. Implementation

Implementation of the AICUZ Study must be a joint effort between the USAF and adjacent communities. The USAF's role is to minimize the impact of Homestead ARB operations on local communities. The role of the communities is to ensure that development is compatible with accepted planning and development principles and practices.

6.1 Air Force Responsibilities

In general, USAF perceives its AICUZ responsibilities as encompassing the areas of flying safety, noise abatement, and participation in the land use planning process.

Well-maintained aircraft and well-trained aircrews do much to ensure that aircraft accidents are avoided; however, history demonstrates that accidents do occur. It is imperative that flights be routed over sparsely populated areas whenever possible to reduce the exposure of lives and property to a potential accident.

USAF regulations require commanders to periodically review existing traffic patterns, instrument approaches, minimum weather conditions under which aircraft can use the airfield (*i.e.*, visibility, ceiling), and operating practices, and to evaluate these factors in terms of their potential to affect populated areas and other local situations. In order to satisfy this requirement, all AICUZ studies must include an analysis of flying and flying-related activities designed to reduce and control the effects of such operations on surrounding land areas.

Homestead ARB is sensitive to community concerns with regard to noise exposure and has implemented an aircraft noise complaint program. In an effort to reduce the noise effects of Homestead ARB operations on surrounding communities, the base restricts nighttime flying activities and has routed flight tracks to avoid populated areas. Practice takeoffs and landings and instrument approaches are conducted at times when residents in surrounding communities are normally awake (*i.e.*, these activities are not scheduled between the hours of 10:00 p.m. and 7:00 a.m.). During nighttime hours, only mission-essential aircraft arrivals and departures are conducted. Whenever possible, traffic patterns are located away from population centers, both on and off base. Aircraft engine maintenance run-up activities are not performed between 10:00 p.m. and 7:00 a.m., except for high-priority mission requirements.

At Homestead ARB, operations are evaluated continuously to maintain noise levels at a minimum, both on and off base, in areas such as those developed for housing and education. Noise abatement procedures implemented at Homestead ARB have restricted flying and maintenance activities during nighttime hours.

The preparation and presentation of this Homestead ARB AICUZ Study is one phase of USAF's continuing participation in the local planning process. It is recognized that as local communities update their land use plans, USAF must be ready to provide additional input.

The AICUZ program will be an ongoing activity even after compatible development plans are adopted and implemented. Base personnel are prepared to participate in the continuing discussion of zoning and other land use matters as they may affect, or may be affected by, Homestead ARB operations. Base personnel also will be available to provide information, criteria, and guidelines to state, regional and local planning bodies, civic associations, and similar groups.

6.2 Local Community Responsibilities

The residents of Miami-Dade County have a long history of working with personnel at Homestead ARB. Adoption of the following recommendations will strengthen this relationship, increase the health and safety of the public, and help protect the integrity of the Base's flying mission.

- Ensure that the comprehensive plans of Miami-Dade County incorporate AICUZ policies and guidelines. Use overlay maps of the AICUZ noise contours and USAF Land Use Compatibility Guidelines to evaluate existing and future land use proposals.
- Modify existing zoning ordinances to support compatible land uses outlined in this study.
- Ensure height and obstruction ordinances reflect current USAF and FAR Part 77 requirements.
- Modify building codes to ensure that new construction within the AICUZ project area has recommended NLR measures incorporated into the design and construction of these facilities.
- Continue to inform Homestead ARB of planning and zoning actions that have the potential to affect base operations. Develop a working group to include city planners, county planners, and the Homestead ARB Air Field Manager to discuss AICUZ concerns and major development proposals that could affect airfield operations.

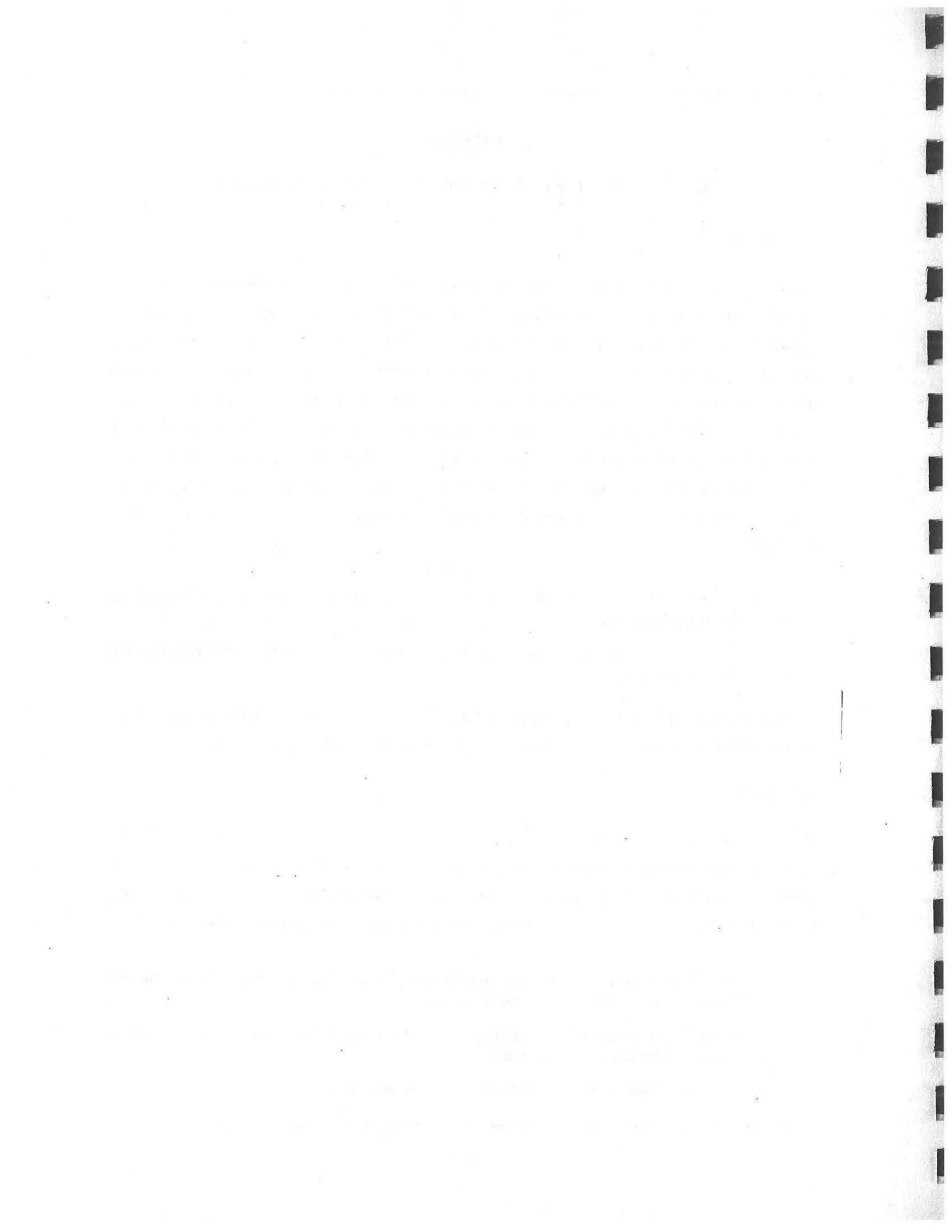
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APPENDIX A

AICUZ CONCEPT, PROGRAM, METHODOLOGY, AND POLICIES



APPENDIX A

AICUZ CONCEPT, PROGRAM, METHODOLOGY, AND POLICIES

A.1 Concept

Federal legislation, national sentiment, and other external forces, which directly affect the U.S. Air Force (USAF), have served to greatly increase the USAF's role in environmental and planning issues. Problems of airfield encroachment from incompatible land uses surrounding installations, as well as air and water pollution and socioeconomic impact, require continued and intensified USAF involvement. The natures of these problems dictate direct USAF participation in comprehensive community and land use planning. Effective, coordinated planning that bridges the gap between the federal government and the local communities requires the establishment of good working relationships with local citizens, local planning officials, and state and federal officials. This planning depends upon creating an atmosphere of mutual trust and helpfulness. The Air Installation Compatible Use Zone (AICUZ) concept has been developed in an effort to:

- Protect local citizens from the noise exposure and accident potential associated with flying activities; and
- Prevent degradation of the USAF capability to achieve its mission by promoting compatible land use planning.

The land use guidelines in this document are a composite of a number of other land use compatibility studies that have been refined to fit the Homestead Air Reserve Base (ARB) aviation environment.

A.2 Program

Installation commanders establish and maintain active programs to achieve the maximum feasible land use compatibility between air installations and neighboring communities. The program requires that all appropriate government bodies and citizens be fully informed whenever AICUZ or other planning matters affecting the installation are under consideration. This includes continuous programs designed to:

- Provide information, criteria, and guidelines to federal, state, regional, and local planning bodies, civic associations, and similar groups;
- Inform such groups of the requirements of the flying activity, noise exposure, aircraft accident potential, and AICUZ plans;
- Describe the noise reduction measures that are being used; and

-
- Ensure that all reasonable, economical, and practical measures are taken to reduce or control the impact of noise-producing activities. These measures include such considerations as proper location of engine test facilities, provision of sound suppressors where necessary, and adjustment of flight patterns and/or techniques to minimize the noise impact on populated areas. This must be done without jeopardizing safety or operational effectiveness.

A.3 Methodology

The AICUZ program analyzes land areas upon which certain land uses may obstruct airspace use or otherwise be hazardous to aircraft operations; and land areas, which are exposed to the safety hazards of aircraft operations. The AICUZ Study includes:

- A depiction of accident potential zones (APZs) and clear zones (CZs) based on past USAF aircraft accidents and installation operational data (Appendix B);
- Noise zones (NZs) developed using NOISEMAP modeling program, which depicts NZs in terms of Day-Night Average A-Weighted Sound Level (DNL) metric (Appendix C); and
- The area designated by the Federal Aviation Administration (FAA) and the USAF for height limitations in approach and departure zones of the base (Appendix D).

The APZs, CZs, and NZs are the basic building blocks for land use planning in the AICUZ Study process. Compatible land uses are specified for these zones in Sections A.6 Accident Potential and A.7 Noise Zones.

As part of the AICUZ program, the only real property acquisition for which the USAF has requested congressional authorization and the base and major commands request appropriation are the areas designated as the CZs. Land use within the CZs, which extend off base on to private property controlled by Homestead ARB via perpetual easements, thereby ensuring compatible uses. Compatible land use controls for the remaining airfield environs should be accomplished through the community land use planning process.

A.4 AICUZ Land Use Development Policies

The basis for any effective land use control system is the development of, and subsequent adherence to, policies that serve as the evaluation standard for all land use planning and control actions. Homestead ARB recommends the following policies be considered for incorporation into the comprehensive plans of agencies in the vicinity of the Base.

A.4.1 Policy 1. In order to promote the public health, safety, peace, comfort, convenience, and general welfare of the inhabitants of the airfield:

-
- Guide, control, and regulate future growth and development;
 - Promote orderly and appropriate use of land;
 - Protect the character and stability of existing land uses;
 - Prevent the destruction or impairment of the airfield and the public investment therein;
 - Enhance the quality of living in the areas affected; and
 - Protect the general economic welfare by restricting incompatible land use.

A.4.2 Policy 2. In furtherance of Policy 1, it is appropriate to:

- Establish guidelines of land use compatibility;
- Restrict or prohibit incompatible land use;
- Prevent establishment of any land use that would unreasonably endanger aircraft operations and the continued use of the airfield;
- Incorporate the AICUZ concept into community land use plans, modifying them when necessary; and
- Adopt appropriate ordinances to implement airfield environs land use plans.

A.4.3 Policy 3. Within the boundaries of the AICUZ, certain land uses are inherently incompatible. The following land uses are not in the public's interest and must be restricted or prohibited:

- Uses that release into the air any substance, such as steam, dust, or smoke that would impair visibility or otherwise interfere with the operation of aircraft;
- Uses that produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision;
- Uses that produce electrical emissions that would interfere with aircraft communication systems or navigation equipment;
- Uses that attract birds or waterfowl, such as operation of sanitary landfills, maintenance or feeding stations, or growth of certain vegetation; and
- Uses that provide for structures within 10 feet of aircraft approach-departure and/or transitional surfaces.

A.4.4 Policy 4. Certain noise levels of varying duration and frequency create hazards to both physical and mental health. A limited, though definite, danger to life exists in certain areas adjacent to airfields. Where these conditions are sufficiently severe, it is not consistent with public health, safety, and welfare to allow the following land uses:

-
- Residential;
 - Retail business;
 - Office buildings;
 - Public buildings (schools, churches); and
 - Recreation buildings and structures.

A.4.5 Policy 5. Land areas below takeoff and final approach flight paths are exposed to significant danger of aircraft accidents. The density of development and intensity of use must be limited in such areas.

A.4.6 Policy 6. Different land uses have different sensitivities to noise. Standards of land use acceptability should be adopted based on these noise sensitivities. In addition, a system of Noise Level Reduction guidelines for new construction should be implemented to permit certain uses where they would otherwise be prohibited.

A.4.7 Policy 7. Land use planning and zoning in the airfield environs cannot be based solely on aircraft-generated effects. Allocation of land used within the AICUZ should be further refined by consideration of:

- Physiographic factors;
- Climate and hydrology;
- Vegetation;
- Surface geology;
- Soil characteristics;
- Intrinsic land use capabilities and constraints;
- Existing land use;
- Land ownership patterns and values;
- Economic and social demands;
- Cost and availability of public utilities, transportation, and community facilities; and
- Other noise sources.

Compatibility guidelines must not be considered inflexible standards. They are the framework within which land use compatibility questions can be addressed and resolved. In each case, full consideration must be given to local conditions:

- Previous community experience with aircraft accidents and noise;
- Local building construction and development practices;
- Existing noise due to other urban or transportation noise sources;
- Time period of aircraft operations and land use activities;
- Specific site analysis; and
- Noise buffers, including topography.

Although these basic guidelines cannot resolve all land use compatibility issues, they offer a reasonable framework within which to work.

A.5 Basic Land Use Compatibility

The runway end at Homestead ARB has a 3,000-foot by 3,000-foot CZ and two APZs (Appendix B). Accident potential on or adjacent to the runway or within the CZ is so high that the necessary land use restrictions would prohibit reasonable economic use of land. If necessary to control incompatible land uses within the CZs, it is USAF policy to request Congress to authorize and appropriate funds for acquisition of the necessary real property interests in CZs to prevent incompatible land uses. Control of CZs has been acquired through perpetual easement at Homestead ARB.

APZ I is less critical than the CZ, but still possesses a significant risk factor. This 3,000-foot by 5,000-foot area has land use compatibility guidelines that are sufficiently flexible to allow reasonable economic use of the land, such as industrial/manufacturing, transportation, communication/utilities, wholesale trade, open space, recreation, and agriculture; however, uses that concentrate people in small areas are not recommended.

APZ II is less critical than APZ I, but still possesses potential for accidents. APZ II, is 3,000 feet wide by 7,000 feet long, extending to 15,000 feet from the runway threshold when added to the CZ and APZ I. Acceptable uses in APZ II include those of APZ I, as well as low density single family residential and personal and business services, and commercial/retail trade uses of low intensity or scale of operation. High-density functions such as multistory buildings, places of assembly (*e.g.*, theaters, churches, schools, restaurants), and high-density office uses are not considered appropriate.

High densities of people should be limited to the maximum extent possible. The optimum density recommended for residential usage (where it does not conflict with noise criteria) in APZ II is one dwelling per acre. For most nonresidential usage, buildings should be limited to one story and the lot coverage should not exceed 20 percent.

A.6 Accident Potential

Land use guidelines in the airfield vicinity are based on a hazard index system that compares the relationship of accident occurrence for five areas:

- On or adjacent to the runway;
- Within the CZ;
- In APZ I;
- In APZ II; and
- In all other areas within a 10 nautical mile radius of the runway.

Accident potential on or adjacent to the runway or within the CZ is so high that few uses are acceptable. The risk outside APZ I and APZ II, but within the 10 nautical mile radius area, is significant, but is acceptable if sound planning practices are followed.

Land use guidelines for APZs I and II have been developed. The main objective is to restrict all people-intensive uses because there is greater risk in these areas. The basic guidelines aim to prevent land uses with certain characteristics:

- High residential density characteristics;
- High labor intensity;
- Involve above-ground explosive, fire, toxic, corrosive, or other hazardous characteristics;
- Promote population concentrations;
- Involve utilities and services required for area-wide populations where disruption would have an adverse impact (*e.g.*, telephone, gas);
- Concentrate people who are unable to respond to emergency situations (*e.g.*, such as children, elderly, handicapped); and
- Pose hazards to aircraft operations.

There is no question that these guidelines are relative. Ideally, there should be no people-intensive uses in APZ I or II; however, free market and private property systems prevent this where there is land development demand. To go beyond these guidelines, however, substantially increases risk by placing more people in areas where there may ultimately be an aircraft accident.

A.7 Noise Zones

Nearly all studies analyzing aircraft noise and residential compatibility recommend no residential uses in NZs above DNL 75 decibels (dB). Usually, no restrictions are recommended below NZ DNL 65 dB. Between DNL 65-74 dB there is currently no consensus. These areas may not qualify for federal mortgage insurance in residential categories according to U.S. Department of Housing and Urban Development (HUD) Regulation 24 Code of Federal Regulations (CFR) Section 51B. In many cases, HUD approval requires noise attenuation measures, the Regional Administrator's concurrence, and an Environmental Impact Statement. The Department of Veterans Affairs also has airfield noise and accident restrictions, which apply to their home loan guarantee program. USAF land use recommendations also state that whenever possible residential land use should be located below DNL 65 dB.

Most *industrial/manufacturing* uses are compatible in the airfield environs. Exceptions are uses such as research or scientific activities, which require lower noise levels. Noise attenuation measures are recommended for portions of buildings devoted to office use, receiving the public, or where there is a requirement for low background noise levels.

Transportation, communications, and utility categories have higher noise level compatibility because they generally are not people-intensive. When people use land for these purposes, the use is generally very short in duration; however, when buildings are required for these uses, additional evaluation is warranted.

The *commercial/retail trade and personal and business services* categories are compatible without restriction up to DNL 70 dB; however, they are generally incompatible above DNL 80 dB. Between DNL 70-80 dB, noise level reduction measures should be included in the design and construction of buildings.

The nature of most uses in the *public and quasi-public services* category requires a quieter environment, and attempts should be made to locate these uses below DNL 65 dB (an USAF land use recommendation), or else provide adequate noise level reduction.

Although *recreational* use has often been recommended as compatible with high noise levels, recent research has resulted in a more conservative view. Above DNL 75 dB, noise becomes a factor, which limits the ability to enjoy such uses. Where the requirement to hear is a function of the use (i.e., music shell, etc.), compatibility is limited. Buildings associated with golf courses and similar uses should be noise attenuated.

Forestry activities, livestock farming, uses in the resources production, extraction, and open space categories are compatible almost without restrictions within all NZs.

APPENDIX B

CLEAR ZONES AND ACCIDENT POTENTIAL ZONES

APPENDIX B

CLEAR ZONES AND ACCIDENT POTENTIAL ZONES

B.1 Guidelines for Accident Potential

Urban areas around airports are exposed to the possibility of aircraft accidents even with well-maintained aircraft and highly trained aircrews. Despite stringent maintenance requirements and countless hours of training, history makes it clear that accidents are going to occur.

When the Air Installation Compatible Use Zone (AICUZ) Program began there were no current comprehensive studies on accident potential. In support of the program, the U.S. Air Force (USAF) completed a study of USAF accidents that occurred between 1968 and 1972 within 10 nautical miles of airfields. The study of 369 accidents revealed that 75 percent of the accidents occurred on or adjacent to the runway (1,000 feet to each side of the runway centerline) and in a corridor 3,000 feet wide (1,500 feet on either side of the runway centerline), extending from the runway threshold along the extended runway centerline for a distance of 15,000 feet.

Three zones were established based on crash patterns: The clear zone (CZ), accident potential zone (APZ) I, and APZ II. Each zone is 3,000 feet wide and extends outward from the end of all active runway surfaces. The CZ starts at the end of the runway and extends outward 3,000 feet. It has the highest accident potential of the three zones. The USAF has adopted a policy of acquiring property rights to areas designated as CZs because of the high accident potential. APZ I extends from the CZ an additional 5,000 feet. It includes an area of reduced accident potential. APZ II extends from APZ I an additional 7,000 feet to include an area of further reduced, although still significant, accident potential.

The USAF's research work in accident potential was the first significant effort in this subject area since 1952 when the President's Airport Commission published "The Airport and Its Neighbors," better known as the "Doolittle Report." The recommendations of this earlier report were influential in the formulation of the APZ concept.

The risk to people on the ground of being killed or injured by aircraft accidents is small. However, an aircraft accident is a high consequence event and when a crash does occur, the result is often catastrophic. Because of this, the USAF does not attempt to base its safety standards on accident probabilities. Instead, the USAF approaches this safety issue from a land use planning perspective.

feet, where it levels off rapidly. The location analysis also indicates that the optimum width of the safety zones, designed to include the maximum percentage of accidents in the smallest area, is 3,000 feet.

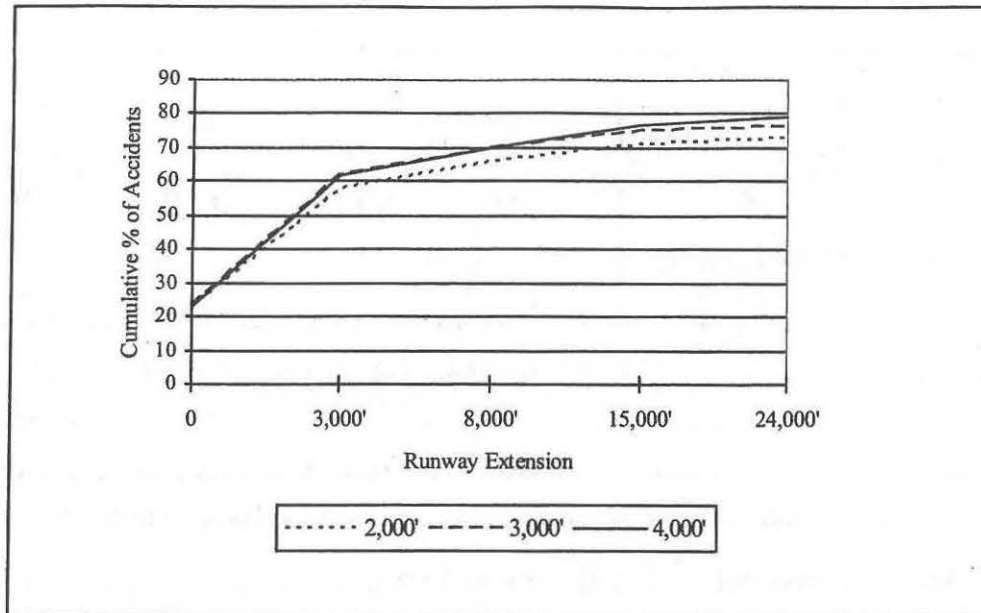


Figure B-1. Distribution of USAF Aircraft Accidents (369 Accidents, 1968-1972)

Using the optimum runway extension width (3,000 feet), and the cumulative distribution of accidents from the end of the runway, zones were established that minimized the land area included and maximized the percentage of accidents included. The zone dimensions and accidents statistics for the 1968-1972 study are shown in Figure B-2.

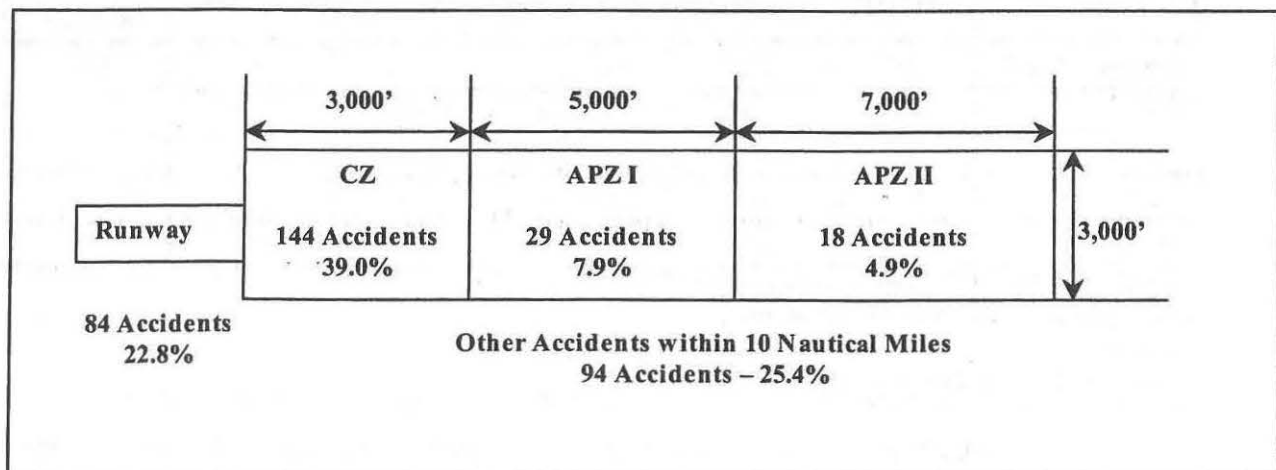


Figure B-2. USAF Aircraft Accident Data (369 Accidents, 1968-1972)

The original study has been updated to include accidents through July 1995. The updated study now includes 838 accidents during the 1968-1995 time frame. The accident statistics of the updated study are shown in Figure B-3.

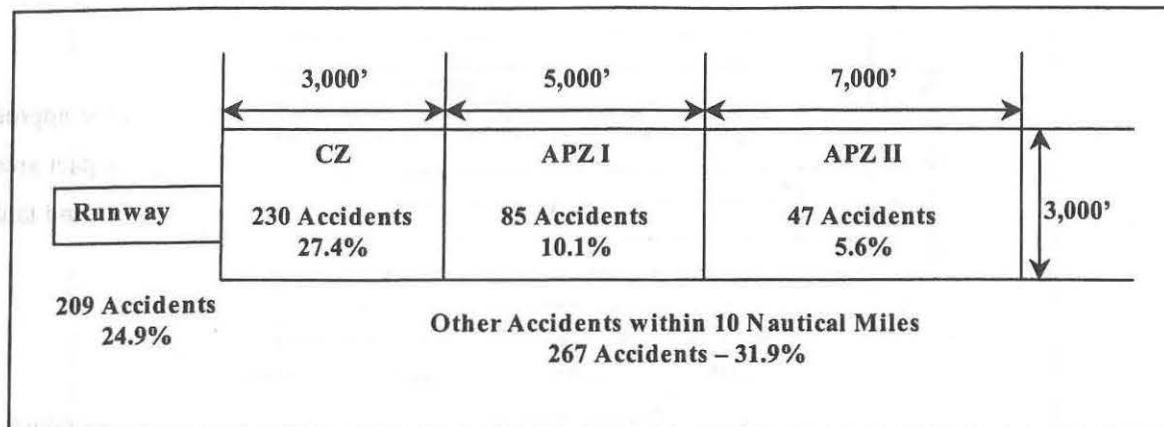


Figure B-3. USAF Aircraft Accident Data (838 Accidents 1968-1995)

Using the designated zones and accident data, it is possible to calculate a ratio of percentage of accidents to area. These ratios indicate the CZ, with the smallest area and the highest number of accidents, has the highest ratio, followed by the runway itself, APZ I, and then APZ II (Table B-2).

Table B-2. Ratio of Percentage of Accidents to Percentage of Area
(USAF Accident Data 1968 - 1995)

	Area (acres) ¹	Number of Accidents ²	Accident per Acre	% Total Area	% Total Accidents	Ratio: Accidents to Area ³
Runway Area ⁴	487	209	1 per 2.3	0.183	24.9	136.
CZ	413	230	1 per 1.8	0.155	27.4	177.
APZ I	689	85	1 per 8.1	0.258	10.1	39.
APZ II	964	47	1 per 20.5	0.362	5.6	16.
Other	264,053	267	1 per 989.	99.042	31.9	0.3

¹Area includes land within 10 nautical miles of runway (266,606 acres).

²Total number of accidents is 838 (through 1995).

³Percent total accidents divided by percent total area.

⁴Runway dimension is 2,000' x 10,600'.

B.3 Definable Debris Impact Areas

The USAF also determined which accidents had definable debris impact areas, and in what phase of flight the accident occurred. Overall, 75 percent of the accidents had definable debris impact areas, although they varied in size by type of accident.

The USAF study used weighted averages of impact areas, for accidents occurring only in the approach and departure phase, to determine the following average impact areas: the overall average impact area is 5.06 acres, the fighter, trainer, and miscellaneous aircraft is 2.73 acres, and the heavy bomber and tanker aircraft is 8.73 acres.

B.4 Findings

Designation of safety zones around the airfield and restriction of incompatible land uses can reduce the public's exposure to safety hazards.

USAF accident studies have found that aircraft accidents near USAF installations occurred in the following patterns:

- 61 percent were related to landing operations;
- 39 percent were related to takeoff operations;
- 70 percent occurred in daylight;
- 80 percent were related to fighter and training aircraft operations;
- 27 percent occurred on the runway or within an area extending 1,000 feet out from each side of the runway;
- 29 percent occurred in an area extending from the end of the runway to 3,000 feet along the extended centerline and 3,000 feet wide, centered on the extended centerline; and
- 13 percent occurred in an area between 3,000 and 15,000 feet along the extended runway centerline and 3,000 feet wide, centered on the extended centerline.

USAF aircraft accident statistics found 75 percent of aircraft accidents resulted in definable impact areas:

- 5.1 acres overall average;
- 2.7 acres for fighters and trainers; and
- 8.7 acres for heavy bombers and tankers.

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APPENDIX C

DESCRIPTION OF THE NOISE ENVIRONMENT

APPENDIX C

DESCRIPTION OF THE NOISE ENVIRONMENT

C.1 Noise Environment Descriptor

The noise contour methodology used herein is the Day-Night Average A-Weighted Sound Level (DNL) metric of describing the noise environment. Efforts to provide a national uniform standard for noise assessment have resulted in adoption by the USEPA of DNL as the standard noise descriptor. The U.S. Air Force (USAF) uses the DNL descriptor in assessing the amount of aircraft noise exposure, and as a metric for community response to the various levels of exposure. The DNL values used for planning purposes are 65, 70, 75, and 80 decibels (dB). Land use guidelines are based on the compatibility of various land uses with these noise exposure levels.

It is generally recognized that a noise environment descriptor should consider, in addition to the annoyance of a single event, the effect of repetition of such events and the time of day in which these events occur. DNL begins with a single event descriptor and adds corrections for the number of events and the time of day. Since the primary development concern is residential, nighttime events are considered more annoying than daytime events and are weighted accordingly. DNL values are computed from the single event noise descriptor, plus corrections for number of flights and time of day (Figure C-1).

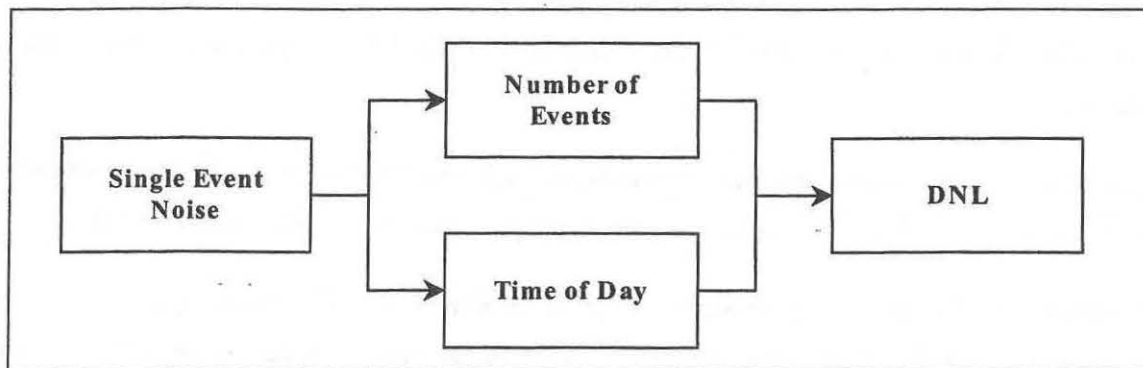


Figure C-1. Day-Night Average A-Weighted Sound Level

Noise is represented by a variety of quantities or "metrics." Each noise metric was developed to account for the type of noise and the nature of what may be exposed to the noise. Human hearing is more sensitive to medium and high frequencies than to low and very high frequencies, so it is common to use "A-weighted" metrics, which account for this.

As part of the extensive data collection process, detailed information is gathered on the type of aircraft, the number of operations, and time of day of flying operations for each flight track during a typical day. This information is used in conjunction with the single event noise descriptor to produce DNL values. These values are combined on an energy summation basis to provide single DNL values for the mix of aircraft operations at the base. Equal value points are connected to form contour lines that encompass and depict areas exposed to a range of noise levels.

C.2 Noise Event Descriptor

The single event noise descriptor used in the DNL system is the Sound Exposure Level (SEL). The SEL measure is an integration of DNL over the period of a single event such as an aircraft flyover, measured in dB.

Frequency, magnitude, and duration vary according to aircraft type, engine type, and power setting. Therefore, individual aircraft noise data are collected for various types of aircraft/engines at different power settings and phases of flight. Figure C-2 shows the relationship of the single event noise descriptor to the source sound energy.

SEL versus slant-range values are derived from noise measurements made according to a source noise data acquisition plan developed by Bolt, Beranek, and Newman, Inc., in conjunction with and carried out by the USAF Armstrong Laboratory. These standard day sea level values form the basis for individual event noise descriptors at any location. These values are adjusted to the location by applying appropriate corrections for temperature, humidity, and variations from standard profiles and power settings of each aircraft.

Ground-to-ground sound propagation characteristics are used for altitudes up to 500 feet with linear transition between 500 and 700 feet and air-to-ground propagation characteristics above 700 feet.

In addition to the assessment of aircraft flight operations, the DNL system also incorporates noise resulting from engine/aircraft maintenance checks on the ground. Ground run up or test position data concerning the orientation of the noise source, type of aircraft or engine, number of test runs on a typical day, power settings used and their duration, and use of suppression devices are collected. This information is processed and the noise contribution added (on an energy summation basis) to the noise generated by flying operations to produce noise contours reflecting the overall noise environment with respect to aircraft air and ground operations.

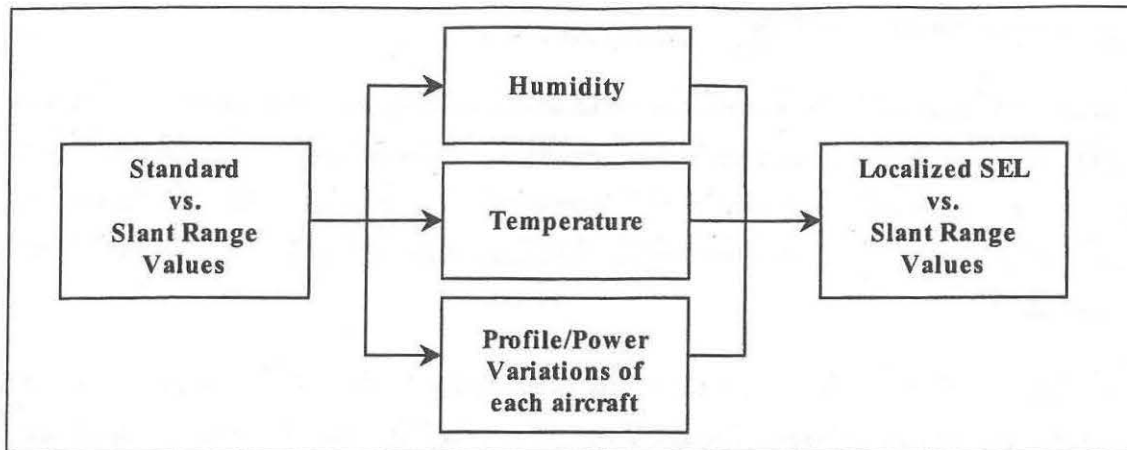


Figure C-2. Sound Exposure Level

C.3 Noise Contour Production

Each individual USAF base assembles data describing flight track distances and turns, altitudes, airspeeds, power settings, flight track operational utilization, maintenance locations, ground run-up engine power settings, and number and duration of runs by type of aircraft/engine. The data is screened by the Major Command (MAJCOM) and the AICUZ Group of the Air Force Center for Environment Excellence (HQ AFCEE/ECC). Trained personnel process the data for input into a central computer. Flight tracks are generated for verification and approval by the Base/MAJCOM. After any required changes have been incorporated, DNL noise contours are generated by the computer using the supplied data and standard source data corrected to local weather conditions. These contours are plotted and prepared for photographic reproduction. A set of these contours is provided in the body of the report.

C.4 Technical Information

Additional technical information on the DNL procedures is available in the following publications:

- Community Noise Exposure Resulting from Aircraft Operations: Applications Guide for Predictive Procedure. AMRL-TR-73-105, November, 1974, from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151
- Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with Adequate Margin of Safety, USEPA Report 550/9-74-004, March, 1974, from Superintendent of Documents, US Government Printing Office, Washington, DC 20402.
- Adopted Noise Regulations for California Airports, Title 4, Register 70, No. 48-11-28-70, Subchapter 6, Noise Standards.

B.2 Accident Potential Analysis

Military aircraft accidents differ from commercial air carrier and general aviation accidents because of the variety of aircraft used, mission type, and the number of training flights. In 1973 the USAF performed a service-wide aircraft accident hazard study in order to identify land near airfields with significant accident potential. Accidents studied occurred within 10 nautical miles of airfields and were airfield-related in-flight mishaps.

The study reviewed the 369 major USAF accidents during 1968-1972, and found 61 percent of the accidents were related to landing operations and 39 percent were takeoff related. It also found that 70 percent occurred in daylight, and fighter and/or training aircraft accounted for 80 percent of the accidents.

Since the purpose of the study was to identify accident hazards, the study plotted each of the 369 accidents in relation to the airfield. This plotting found the accidents clustered along the runway and its extended centerline. To further refine this clustering, a tabulation was prepared that described the cumulative frequency of accidents as a function of distance from the runway centerline along the extended centerline. This analysis was done for areas with widths of 2,000, 3,000, and 4,000 total feet (see Table B-1).

Table B-1. Accident Location Analysis

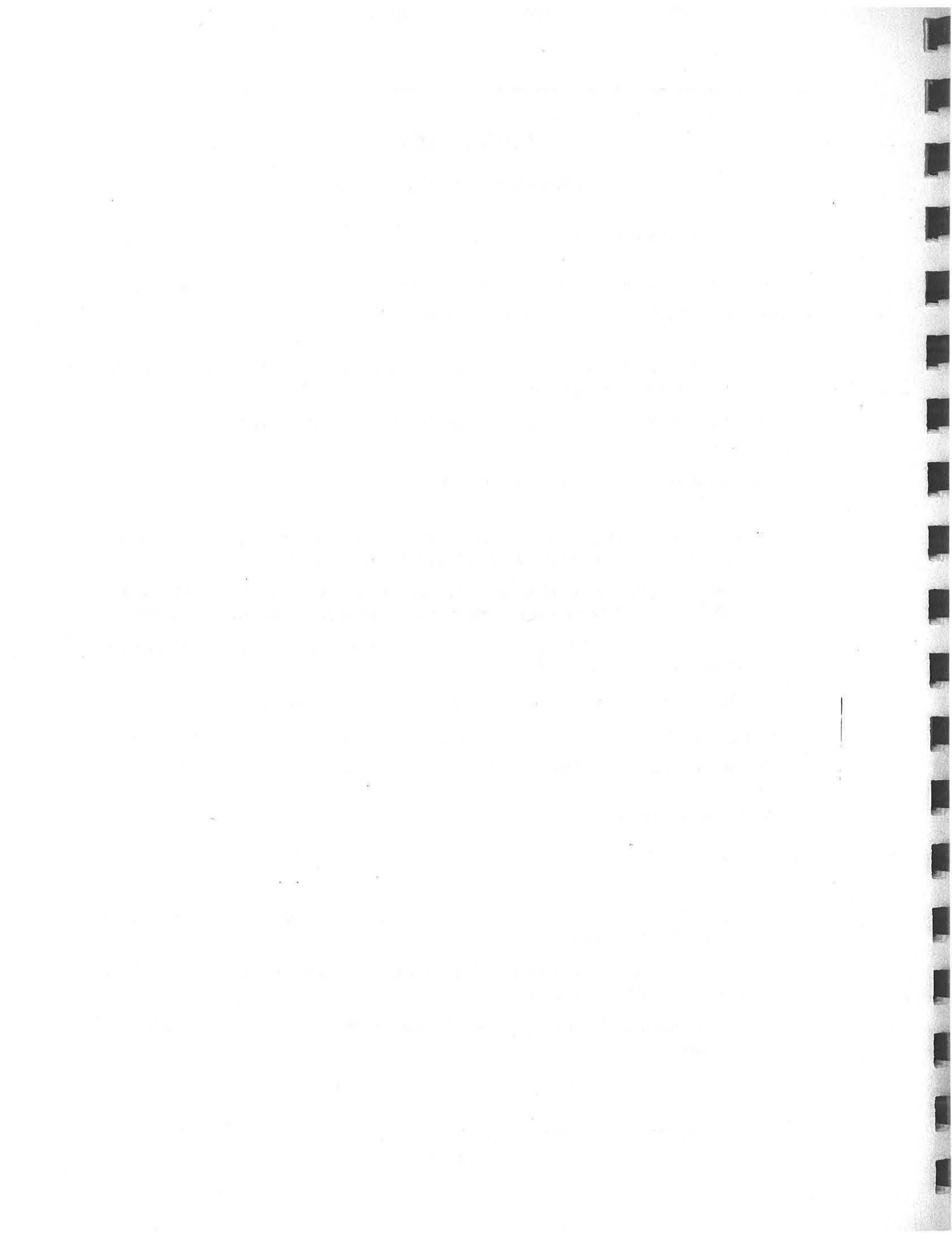
Length From Both Ends of Runway (feet)	Width of Runway Extension (feet)		
	2000	3000	4000
Percent of Accidents			
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000	35	39	39
3,000 to 8,000	8	8	8
8,000 to 15,000	5	5	7
Cumulative Percent of Accidents			
On or adjacent to runway (1,000 feet to each side of runway centerline)	23	23	23
0 to 3,000	58	62	62
3,000 to 8,000	66	70	70
8,000 to 15,000	71	75	77

Figure B-1 indicates that the cumulative number of accidents rises rapidly from the end of the runway to 3,000 feet, rises more gradually to 8,000 feet, then continues at about the same rate of increase to 15,000

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APPENDIX D

HEIGHT OBSTRUCTION CRITERIA



APPENDIX D

HEIGHT OBSTRUCTION CRITERIA

D.1 Height Obstruction Criteria

D.1.1 General. This section establishes criteria for determining whether an object or structure is an obstruction to air navigation. Obstructions to air navigation are considered to be:

- Natural objects or man-made structures that protrude above the planes or surfaces as defined in the following paragraphs; and
- Man-made objects that extend more than 500 feet above the ground at the site of the structure.

D.1.2 Explanation of Terms. The following will apply (Figure D-1):

- Controlling Elevation. Whenever surfaces or planes within the obstruction criteria overlap, the controlling (or governing) elevation becomes that of the lowest surface or plane.
- Runway Length. Homestead Air Reserve Base (ARB) has one runway, Runway 05/23 with a paved length of 11,200 feet designed and built for sustained aircraft landings and takeoffs.
- Established Airfield Elevation. The established elevation, in feet above mean sea level (MSL) for Homestead ARB, is 7 feet.
- Dimensions. All dimensions are measured horizontally unless otherwise noted.

For a more complete description of airspace and control surfaces for Class A and Class B runways, Federal Aviation Regulation (FAR) Part 77, Subpart C, or Air Force Instruction 32-1026.

D.1.3 Planes and Surfaces. Definitions are as follows:

Primary Surface

- This surface defines the limits of the obstruction clearance requirements in the immediate vicinity of the landing area.
- Comprises surfaces of the runway, runway shoulders, and lateral safety zones and extends 200 feet beyond the runway end.
- For a single class "B" runway, is 2,000 feet wide, or 1,000 feet on each side of the runway centerline.

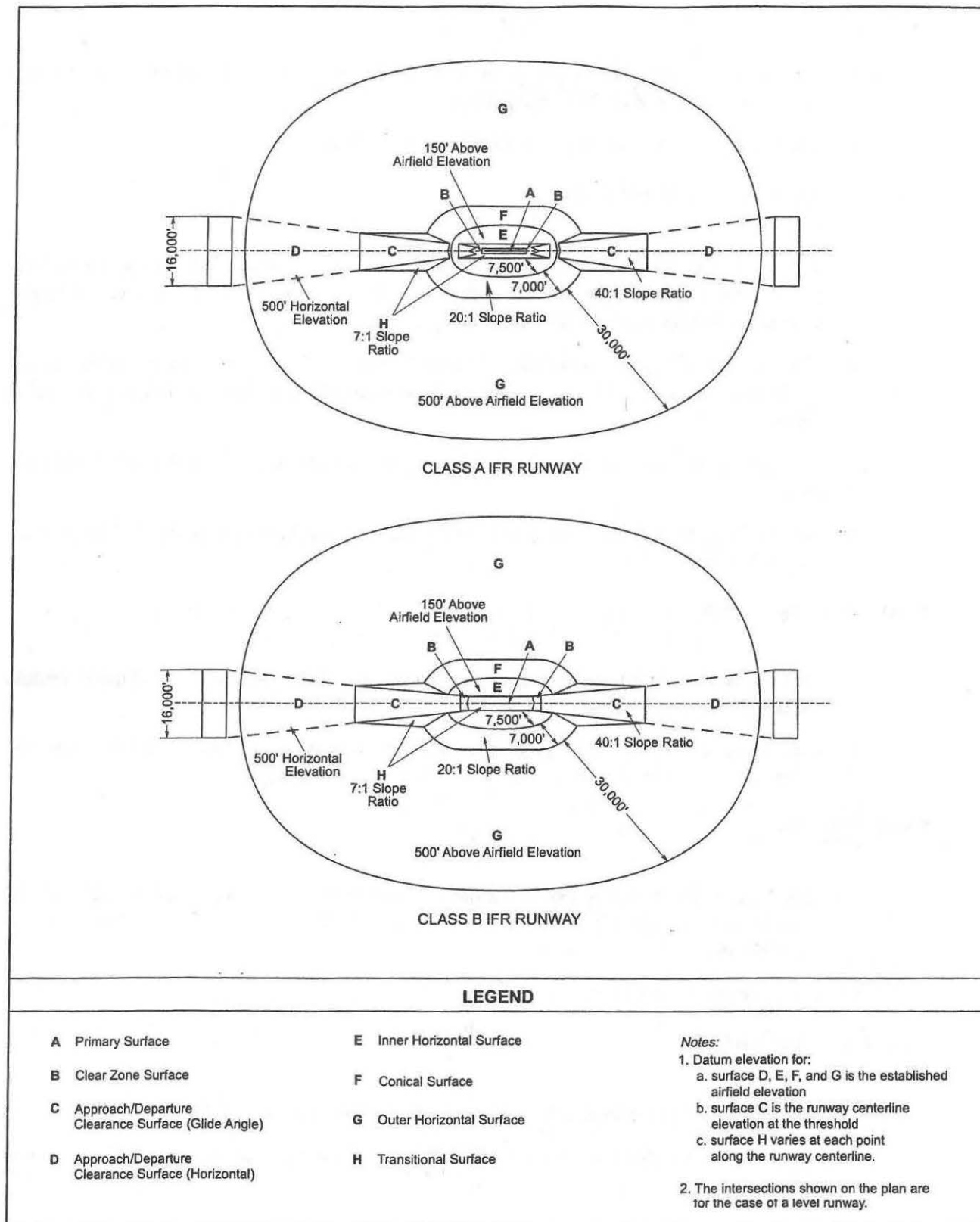


Figure D-1. Airspace Control Surface Plan

Clear Zone (CZ) Surface

- This surface defines the limits of the obstruction clearance requirements in the vicinity contiguous to the end of the primary surface.
- For a single runway end, measures 3,000 feet by 3,000 feet.

Approach-Departure Clearance Surface

- This surface is symmetrical from the extended runway centerline, it begins as an inclined plane (glide angle) 200 feet beyond each runway end, and extends for 50,000 feet; it begins with the centerline elevation of the runway end.
- The slope of the approach-departure clearance surface is 50:1 along the extended runway (glide angle) centerline until it reaches an elevation of 500 feet above the established airfield elevation.
- It then continues horizontally at this elevation to a point 50,000 feet from the start of the glide angle.
- The width of this surface at the runway end is 2,000 feet; it flares uniformly, and the width at 50,000 feet is 16,000 feet.

Inner Horizontal Surface

- This surface is a plane, oval in shape at a height of 150 feet above the established airfield elevation.
- This surface is constructed by scribing an arc with a radius of 7,500 feet above the centerline at the end of the runway and interconnecting these arcs with tangents.

Conical Surface

- This is an inclined surface extending outward and upward from the outer periphery of the inner horizontal surface for a horizontal distance of 7,000 feet to a height of 500 feet above the established airfield elevation.
- The slope of the conical surface is 20:1.

Outer Horizontal Surface

- This surface is a plane located 500 feet above the established airfield elevation.
- It extends for a horizontal distance of 30,000 feet from the outer periphery of the conical surface.

Transitional Surfaces

- These surfaces connect the primary surfaces, CZ surfaces, and approach-departure clearance surfaces to the outer horizontal surface, conical surface, other horizontal surface, or other transitional surfaces.
- The slope of the transitional surface is 7:1 outward and upward at right angles to the runway centerline.
- To determine the elevation for the beginning of the transitional surface slope at any point along the lateral boundary of the primary surface, including the CZ, draw a line from this point to the runway centerline.
- This line will be at right angles to the runway axis.
- The elevation at the runway centerline is the elevation for the beginning of the 7:1 slope.

The land areas outlined by these criteria should be regulated to prevent uses that might otherwise be hazardous to aircraft operations. The following uses should be restricted and/or prohibited:

- Uses that release any substance into the air which would impair visibility or otherwise interfere with the operation of aircraft (i.e., steam, dust, or smoke).
- Produce light emissions, either direct or indirect (reflective), that would interfere with pilot vision.
- Produce electrical emissions that would interfere with aircraft communications systems or navigational equipment.
- Uses that would attract birds or waterfowl, including but not limited to, operation of sanitary landfills, maintenance of feeding stations, sand and gravel dredging operations, storm water retention ponds, created wetland areas, or the growing of certain vegetation.
- Uses that provide for structures within 10 feet of aircraft approach-departure and/or transitional surfaces.

D.2 Height Restrictions

City/County/Township agencies involved with approvals of permits for construction should require developers to submit calculations that show that projects meet the height restriction criteria of FAR Part 77 as described, in part, by the information contained in this section. Airfield elevation and runway coordinates for Homestead ARB are listed below.

Homestead ARB, Florida
Airfield Coordinates

Airfield Elevation: 7 feet MSL
Runway 05/23 Coordinates:

25 Degrees	28 Minutes	42.50 Seconds	North Latitude
80 Degrees	23 Minutes	47.22 Seconds	West Longitude
25 Degrees	29 Minutes	54.82 Seconds	North Latitude
80 Degrees	22 Minutes	14.51 Seconds	West Longitude

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APPENDIX E

NOISE LEVEL REDUCTION GUIDELINES

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NOISE LEVEL REDUCTION GUIDELINES

A study, which provides in-depth, state-of-the-art noise level reduction guidelines, was completed for the Naval Facilities Engineering Command and the Federal Aviation Administration by Wyle Laboratories in November 1989. The study is entitled, *Guidelines for the Sound Insulation of Residences Exposed to Aircraft Operations*, Wyle Research Report WR 89-7. Copies of this study are available for review, upon request, from the Environmental Office at Homestead Air Reserve Base.