# 1. INTRODUCTION

This document is an update to the Dyess Air Force Base (AFB) Air Installation Compatible Use Zone (AICUZ) Study last completed in 2000. This AICUZ Study presents a description of the current noise environment surrounding Dyess AFB. It reaffirms U.S. Air Force (USAF) policy of promoting public health, safety, and general welfare in areas surrounding USAF installations. This study identifies changes in flight operations that have occurred since the last study, and provides current noise zones and compatible use guidelines for land areas surrounding the installation. It is provided to assist local communities by serving as a tool for future planning and zoning activities.

*As the host unit at Dyess AFB, part of the 7th Bomb Wing's mission is to train B-1B crews.*

The changes in the AICUZ are attributed to the following:

- Changes in assigned and transient aircraft operations and profiles since the 2000 AICUZ Study, which includes a reduction in closed- pattern flying activities (see **Section 2.5**).
- Radio towers and wind turbines are present on the bluffs south of the installation since 2002. These developments have the potential to adversely affect the current and future mission capability of Dyess AFB. This AICUZ Study provides a detailed analysis in **Section 3.1** of the encroachment of these objects.
- Advances in Geographic Information System (GIS) technology have resulted in the ability to more accurately analyze and display geographic information. GIS technology now provides a more detailed land use analysis than what was presented in the 2000 AICUZ Study. The land use analysis for this AICUZ Study is presented in **Section 4**.
- Since 2000, development has occurred to the east and north of the installation. Encroachment issues are discussed in detail in **Sections 3.1.2** and **4.4**.
- Modifications to the Department of Defense- (DOD) approved NOISEMAP software program (USAF undated)* made subsequent to the release of the 2000 AICUZ Study.

## 1.1 Purpose of the AICUZ Study

The purpose of the AICUZ Program is to promote compatible land development in areas subject to aircraft noise and accident potential due to aircraft overflight operations. The program was initiated to protect the public's health, safety, and welfare as well as to protect military airfields from encroachment by incompatible uses and structures.

*This AICUZ Study provides current noise zones and compatible use guidelines for areas surrounding the installation.*

Dyess AFB is within the city limits of the City of Abilene and is adjacent to the City of Tye in north-central Texas. Guidelines for recommended land uses are presented in **Section 3**. These guidelines should be considered in

* The complete reference for this short citation is provided in the reference list in **Section 6**.

the various planning processes to prevent incompatibility that might compromise the ability of Dyess AFB to fulfill its mission requirements. Accident potential and aircraft noise in the vicinity of military airfields should be major considerations in all planning processes.

## 1.2 Process and Procedure

This AICUZ Study was prepared using the guidelines established by the USAF and described in Air Force Instruction (AFI) 32-7063, *Air Installation Compatible Use Zone Program*, 13 September 2005 (USAF 2005) and Air Force Handbook (AFH) 32-7084, *AICUZ Program Manager's Guide*, 1 March 1999 (USAF 1999). The DOD Instruction 4165.57 describes the procedures by which the AICUZ Program can be defined, including the land use compatibility guidelines for the Accident Potential Zones (APZs). DOD Instruction 4165.57 also gave the AICUZ Program the authority to seek real estate interests in order to control the height of structures to ensure that they do not become a hazard to flight operations. Please see **Section 3.1** for more information on airspace controlled for height restrictions. **Appendix A** provides additional information on the USAF AICUZ Program. AFI 32–7063 implemented the policies set forth in DOD Instruction 4165.57. Land use guidelines set forth in AFI 32-7063 reflect recommended compatible land use classifications or coding for those areas impacted by aircraft noise and potential aircraft safety concerns.

The human ear can normally hear frequencies from about 20 Hertz (Hz) to about 20,000 Hz. It is most sensitive to sounds in the 1,000 to 4,000 Hz range. When measuring community response to noise, it is common to adjust the frequency content of the measured sound to correspond to the frequency sensitivity of the human ear. This adjustment is called A–weighting. Sound levels that have been so adjusted are referred to as A–weighted sound levels.

Cumulative noise levels, resulting from multiple single events, are used to characterize effects from aircraft operations. The cumulative Day-Night Average A-weighted Sound Level (DNL) is expressed in A-weighted decibels (dBA) and presented in the form of noise contours. The DNL metric is calculated using the computerized noise model, NOISEMAP. This noise metric incorporates a "penalty" for nighttime noise events to account for increased annoyance. DNL is the energy-averaged sound level measured over a 24-hour period, with a 10-dBA penalty assigned to noise events occurring between 10:00 p.m. and 7:00 a.m. DNL values are obtained by averaging sound exposure level values over a given 24-hour period.

*The DNL noise metric incorporates a penalty for late night (10 p.m. to 7 a.m.) noise events to account for increased annoyance.*

DNL is a time-averaged noise metric, which takes into account both the noise levels of individual events that occur during a 24-hour period and the number of times those events occur. The logarithmic nature of the decibel unit causes the noise levels of the loudest events to control the 24-hour average. For an example of this characteristic using an aircraft flyover, consider a case in which one flyover occurs during daytime hours creating a sound level of 100 dBA for 1 second. The DNL for this 24-hour period would be 50.6 dBA. If there were 30 flyovers at 100 dBA for 1 second each, the DNL for

this 24-hour period would be 65.5 dBA. The averaging of noise over a 24–hour period does not ignore the louder single events and tends to emphasize both the sound levels and number of events. This is the basic concept of a time-averaged sound metric, and specifically the DNL. The actual sound levels that a person hears fluctuate throughout the 24-hour period. DNL is the preferred noise metric of the Federal Aviation Administration (FAA), U.S. Department of Housing and Urban Development (HUD), U.S. Environmental Protection Agency (USEPA), and the DOD for determining land use compatibility in the airport environment.

This updated AICUZ Study contains guidelines for recommended compatible land uses in relation to APZs (i.e., Clear Zones [CZ] and APZs I and II) and four noise exposure zones (also referred to as "noise zones") as listed in the following:

- DNL of 65–69 dBA
- DNL of 70–74 dBA
- DNL of 75–79 dBA
- DNL of 80+ dBA.

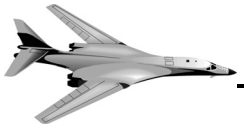
A description of these zones is provided in **Section 3** and **Appendix A**. In addition to providing the recommended guidelines, a detailed land use compatibility analysis is provided in **Section 4** to assist the cities of Abilene and Tye and the counties of Taylor and Jones in determining land uses that are compatible with the local noise environment proximate to Dyess AFB.

The DOD-approved NOISEMAP software program (Version 7.3) was used to generate the noise zones presented in this AICUZ Study. The USAF has adopted the NOISEMAP software program, and uses it in predicting noise exposure that would result from aircraft operations in the vicinity of an airfield.

*DNL noise levels are depicted visually as noise contours that connect points of equal value. The area encompassed by a noise contour is known as a noise zone.*

AICUZ land use guidelines reflect land use recommendations for CZs, APZs I and II, and four noise zones. The USAF has no desire to recommend land use regulations that render property economically useless. It does, however, have an obligation to the inhabitants of the Dyess AFB environs and to the citizens of the United States to identify ways to protect the people in adjacent areas, as well as the public investment in the installation.

This AICUZ Study was prepared using guidelines established as part of the continuing USAF participation in the local planning process. It is recognized that, as local communities prepare land use plans and zoning ordinances, the USAF has the responsibility of providing input on its activities relating to the community. To support that responsibility, a companion document called a Citizen's Brochure was created to support public dissemination of the information presented in this AICUZ Study. The Citizen's Brochure provides a synopsis of this AICUZ Study and offers the local community the opportunity to learn about the AICUZ Program. **Appendices A** through **E** of this AICUZ Study contain detailed information about the AICUZ Program.



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