Air Installations Compatible Use Zones Study for NOLF Goliad

FINAL AUGUST 2015

AIR INSTALLATIONS COMPATIBLE USE ZONES STUDY
FOR
NAVY OUTLYING LANDING FIELD (NOLF) GOLIAD

FINAL – AUGUST 2015

Prepared by

UNITED STATES DEPARTMENT OF THE NAVY

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Executive Summary

This Air Installations Compatible Use Zones (AICUZ) Study has been prepared for Naval Outlying Landing Field (NOLF) Goliad, Texas, in accordance with federal regulations and guidelines and United States Department of the Navy Instruction. This AICUZ Study has been prepared in consideration of expected changes in mission, aircraft, and projected operational levels that will occur within the next 10- to 15-year planning period. The 2014 AICUZ noise contours and accident potential zones (APZs) presented in this study are based on projected flight operations for NOLF Goliad.

ES.1 Purpose of an AICUZ Study

The United States Department of Defense (DOD) initiated the AICUZ Program to assist governmental entities and communities in identifying and planning for compatible land use and development near military airfields. In the early 1970s, the DOD established the AICUZ Program in response to growing incompatible urban development around military airfields and community concerns over aircraft noise and accident potential. Today, the AICUZ Program has been implemented worldwide, and is considered a vital tool used by all branches of the military to communicate with neighboring communities, government entities, and individuals regarding compatible land use and development concerns.

This AICUZ Study provides background information on NOLF Goliad, presents the 2014 AICUZ noise contours associated with aircraft operations, establishes 2014 AICUZ APZs for aircraft, identifies areas of incompatible land use and proposed development within these zones, and recommends actions to encourage

compatible land use.

ES.2 NOLF Goliad

NOLF Goliad is located in western Goliad County, Texas, approximately 58 miles northwest of Naval Air Station (NAS) Corpus Christi. The closest cities/towns are Berclair, located 5 miles south, and the city of Goliad, located 13 miles northeast.

NAS Corpus Christi is an aviation training facility with a mission to maintain and operate facilities and to provide services and materials to support operations of aviation activities and units of operating forces of Naval Air Training Command (NATRACOM), as well as other activities and units as designated by the Chief of Naval Operations (CNO). NOLF Goliad is an outlying field of NAS Corpus Christi that supports NATRACOM's mission by increasing training capacities and alleviating airspace congestion in the vicinity of the installation and the other outlying landing fields.

NOLF Goliad is a 1,136-acre airfield equipped with two Class B runways, each measuring 150 feet wide by 8,000 feet long. Runway 17/35 runs north/south, and Runway 11/29 runs east/west. The airfield's elevation is 324 feet above mean sea level (MSL). The airfield generally operates Monday through Friday, 7:30 a.m. to 10:00 p.m., with occasional operations after 11:00 p.m. The airfield is closed on weekends.

ES.3 Aircraft Operations

NOLF Goliad serves as an outlying landing field for NAS Corpus Christi in support of NATRACOM's training requirements. The T-6A/B "Texan II" (T-6) is a fixed-wing aircraft and accounts for the majority of flight operations at NOLF Goliad. In addition to T-6 operations, the TC-12 "Huron" (TC-12) and the T-44 "Pegasus" (T-44) fixed-wing aircraft occasionally operate at NOLF Goliad. No aircraft are stationed at NOLF Goliad. As part of the typical training syllabus for flight crews, flight operations at NOLF Goliad include arrivals, touch-and-go

operations, departures, and precautionary emergency landing (PEL) approaches. Flight operations at NOLF Goliad follow the curriculum set forth by Chief of

Naval Air Training (CNATRA) for Training Air Wing (TRAWING) FOUR student aviators.

Each airfield has designated flight tracks associated with the various flight operations conducted. A flight track is a specific route an aircraft follows while conducting operations at the airfield. Flight tracks typically depict departure and arrival patterns to demonstrate how the aircraft flies in relation to the airfield. Flight tracks are geographically represented as single lines, but flights vary due to aircraft performance, pilot technique, weather conditions, and Air Traffic Control (ATC) variables. The actual flight track is most accurately represented as a band that is often a half-mile to several miles wide. The flight tracks shown in this AICUZ Study are idealized representations based on pilot and ATC input.

As a planning document, the AICUZ Study forecasts flight activity levels as far into the future as feasible (often 5, 10, or 15 years) to assess land use concerns and to plan for future compatible objectives. Projected aircraft operations help ensure that the future operational capability of the air installation is sustainable. A total of 190,000 annual flight operations are projected at NOLF Goliad (Blue Ridge Research and Consulting [BRRC] 2013). The 2014 projected flight operations at NOLF Goliad are based on training requirements and not on historic averages. The majority of flight operations at NOLF Goliad are touch and-go (approximately 70 percent of total operations). PEL low key operations account for approximately 19 percent of operations, and arrivals and departures account for approximately 11 percent of total airfield operations.

ES.4 Aircraft Noise

The main source of noise at an airfield is flight operations. In support of this AICUZ Study, a noise analysis was conducted to assess noise exposure from aircraft operations and to define noise contours at NOLF Goliad.

The noise exposure from aircraft is measured using the day-night average sound level (DNL) metric. The DNL is visually depicted as a noise contour that

connects points of equal value. NOISEMAP, a DOD-approved noise modeling

program, calculates DNL noise contours resulting from aircraft operations using such variables as power settings, aircraft model and type, maximum sound levels, and duration and flight profiles. The contours generally follow the flight paths of aircraft. The noise contours generated from the modeling program illustrate where aircraft noise occurs in and around an airfield and at what sound level. The noise contours in this document are depicted in 5-dB increments (60, 65, 70, and 75 dB).

Noise contours provide NAS Corpus Christi, local planning organizations, and the general public with maps of the modeled noise-related impacts of aircraft operations at NOLF Goliad. Noise contours, when overlaid with local land uses, can help identify areas of incompatible land uses and plan for future development around an airfield. Noise contours provided in this AICUZ Study are identified as the 2014 AICUZ noise contours, representing the year of the study's release. Projections of aircraft operations were based on data provided by NAS Corpus Christi.

ES.5 Airfield Safety

While the likelihood of an aircraft mishap occurring is remote, mishaps (i.e., accidents) can occur. The United States Navy (Navy) has designated areas of accident potential based on historic data for aircraft mishaps near military airfields to assist in land use planning. APZs identify areas where an aircraft accident is most likely to occur if an accident were to take place; however, it should be noted that APZs are not a prediction of accidents or accident frequency. APZs are designed to minimize potential harm to the public, pilots, and property if a mishap does occur by limiting incompatible uses in the designated APZ areas.

APZs follow departure, arrival, and pattern flight tracks. There are three different types of APZs: the Clear Zone, APZ I, and APZ II. AICUZ guidelines recommend that certain land uses that concentrate large numbers of people, such as apartments, churches, and schools, be avoided within the APZs. This AICUZ Study presents the 2014 APZs for NOLF Goliad.

ES.6 Land Use Compatibility Analysis

The AICUZ footprint of an airfield—the combination of noise contours and APZ—defines the minimum acceptable area in which land use control measures are recommended to protect the public's health, safety, and welfare while sustaining the Navy's flying mission. The Navy has developed guidelines for compatible development and land use within an airfield's AICUZ footprint. These guidelines are provided in the Navy's AICUZ Program Instruction (Office of the Chief of Naval Operations Instruction [OPNAVINST] 11010.36C).

The land use compatibility analysis is based on the assessment of existing land uses and proposed development near NOLF Goliad. Existing land use is assessed to determine current land use activity. Ideally, future land use plans are evaluated along with population growth projections, city and county land use data, zoning regulations, and comprehensive plans to determine how local and regional development patterns can impact future operations at the airfield. However, NOLF Goliad is located within the unincorporated area of Goliad County, and the County does not have zoning authority or a comprehensive planning process to regulate land use and guide future development near the airfield.

ES.7 Land Use Tools and Recommendations

Federal, state, and local governments, businesses, real estate professionals, and citizens, along with the Navy, all play an important role in implementing this AICUZ Study. To most effectively accomplish the goal of the AICUZ Program, all involved parties must have active participation. This AICUZ Study provides recommendations for NAS Corpus Christi and NOLF Goliad personnel, local governments and agencies, and private citizens to use in exploring, modifying, and implementing policies, plans, and regulations necessary to help ensure the goal of the AICUZ Program is met.

Federal/Navy Action Recommendations

- Maintain routine communication with local, state, and regional governments to be aware of any land use changes and to ensure the Navy's input is offered in the early stages of any long-range planning initiatives;
- Attend public hearings (meetings) and provide comments on actions that affect AICUZ planning for NOLF Goliad, including land use studies, capital improvement plans, and other land development regulation updates/amendments;
- Provide community decision makers with the information and educational materials necessary to make informed decisions regarding the impact of their actions on mission readiness;
- Develop a package of AICUZ outreach materials, including community presentations and educational brochures, on training activities and the Navy's mission;
- Provide local real estate agents with AICUZ-related materials and maps showing military training routes, Military Operations Areas (MOAs), AICUZ boundaries, and high-impact areas;
- Continue to record and assess noise complaints; and
- Work with adjacent landowners to encourage them to adequately maintain areas near the airfield that are overgrown with grass and brush to mitigate Bird/Animal Aircraft Strike Hazard (BASH) issues.

State/Regional Level Recommendations

- The Navy should work to propose state-wide regulations that prohibit the development of structures that may interfere with the use of military training routes or compromise the Navy's mission and operations.

Local Government Recommendations

- Actively inform and request input from the installation regarding land use decisions that could impact the operational integrity of NOLF Goliad;

- Establish protocols to notify NAS Corpus Christi regarding proposed

developments to ensure adequate time to comment on proposed development prior to public review;

- Prepare a Joint Land Use Study (JLUS) to develop growth management strategies that balance the interests of the community and the Navy;

- Establish a joint airport zoning board to regulate land use within the unincorporated areas surrounding NOLF Goliad and to protect the operational sustainability of the airfield;

- Evaluate and review all capital improvement projects in proximity to the airfield to determine potential direct and indirect impacts that such improvements may have on the ability to implement a successful AICUZ Program;

- Continue to monitor and/or amend building codes to require noise attenuation techniques for new construction within the AICUZ footprint; and

- Provide disclosure notification for all real estate transactions for properties surrounding NOLF Goliad.

Private Sector Recommendations

- Lending institutions should consider whether to limit financing for real estate purchases or construction that is incompatible with the AICUZ Program;

- Real estate professionals should continue to ensure that prospective buyers or lessees have all the available information concerning the noise environment and APZs prior to purchasing or leasing property near the airfield;

- Real estate agencies should provide information about the AICUZ Study on their websites and provide a link to NAS Corpus Christi's website for information on aircraft operations;

- Citizens considering purchasing, renting, or leasing properties near NOLF Goliad should ask local real estate professionals, lending

institutions, city planning personnel, county appraisal personnel, and/or a Navy representative if the property is within an APZ and/or noise zone; and

- Citizens should provide sufficient and accurate information when registering a noise complaint with NAS Corpus Christi regarding operations at NOLF Goliad.

ES.8 Appendices

Appendix A: Discussion of Noise and its Effect on the Environment
Appendix A provides a detailed discussion of the basis of sound, sound measurements, and noise effects on humans and wildlife.

Appendix B: Land Use Compatibility Recommendations Appendix B presents the comprehensive Navy Land Use Recommendations table within noise zones and APZs, as provided in OPNAVINST 11010.36C, "Air Installations Compatible Use Zones Program."

Table of Contents

1 Introduction 1-1

1.1 AICUZ Program 1-3 1.2
Purpose, Scope, and Authority 1-4 1.3
Responsibility for Compatible Land Use 1-5 1.4
Previous AICUZ Efforts 1-6 1.5
Changes that Require an AICUZ Update 1-7

2 NOLF Goliad..... 2-1

2.1 Location and History 2-1 2.2
Mission 2-3 2.2.1
Naval Aviator Training ..... 2-4 2.3 Airfield
Users ..... 2-6 2.4 Operational
Areas ..... 2-6 2.4.1 Airfield
..... 2-6 2.4.2 Airspace
..... 2-8 2.4.3 Special Use
Airspace ..... 2-9 2.5 Local Economic
Impacts..... 2-11 2.6 Regional Population
..... 2-11

3 Aircraft Operations..... 3-1

3.1 Aircraft Types 3-1
3.1.1 Fixed-Wing Aircraft ..... 3-1 3.2 Aircraft
Operations 3-3 3.2.1
Maintenance Run-Up Operations ..... 3-3 3.2.2 Types of
Flight Operations ..... 3-3 3.2.3 Annual Flight
Operations ..... 3-4 3.3 Runway and Flight Track
Utilization ..... 3-5 3.3.1 NOLF Goliad Runway
Utilization and Flight Tracks 3-6

4 Aircraft Noise 4-1

4.1 Sound/Noise Defined 4-1 4.2
Airfield Noise Sources and Noise Modeling 4-3 4.3
2014 AICUZ Noise Contours 4-4
4.3.1 NOLF Goliad 2014 AICUZ Noise Contours 4-4 4.3.2

Comparison of the NOLF Goliad 2009 and 2014 Noise Contours ..... 4-8 4.4 Noise Abatement and Noise Complaints ..... 4-10 4.4.1 Noise Abatement ..... 4-10 4.4.2 Noise Complaints 4-10

5 Accident Potential 5-1

5.1 Flight Safety ..... 5-1 5.1.1 Imaginary Surfaces ..... 5-2 5.2 Flight Hazards ..... 5-5 5.2.1 Bird/Animal Aircraft Strike Hazard (BASH) ..... 5-5 5.2.2 Electromagnetic Interference ..... 5-6 5.2.3 Lighting ..... 5-6 5.2.4 Smoke, Dust, and Steam ..... 5-7 5.2.5 Wind Farms ..... 5-7 5.3 Aircraft Mishaps ..... 5-7 5.4 Accident Potential Zones ..... 5-8 5.4.1 NOLF Goliad 2014 AICUZ APZs ..... 5-10 5.4.2 Comparison of the NOLF Goliad 2009 and 2014 APZs 5-13

6 Land Use Compatibility Analysis..... 6-1

6.1 Land Use Compatibility Guidelines and Classifications ..... 6-1 6.2 Planning Authorities ..... 6-3 6.2.1 Goliad County ..... 6-3 6.3 Land Use and Proposed Development ..... 6-4 6.3.1 Existing Land Uses ..... 6-6 6.3.2 Future Land Uses ..... 6-8 6.4 Compatibility Concerns 6-8

6.4.1 NOLF Goliad Land Use Compatibility Concerns 6-9 7

Land Use Tools and Recommendations 7-1

7.1 Federal/Navy Tools and Recommendations 7-1
7.1.1 Federal/Navy Land Use Compatibility Tools 7-2

7.1.2 Federal/Navy Action Recommendations 7-5
7.2 State/Regional Tools and Recommendations 7-8
7.2.1 State/Regional Level Tools 7-8
7.2.2 State/Regional Level Recommendations 7-9
7.3 Local Government Tools and Recommendations 7-10
7.3.1 Local Government Tools 7-10
7.3.2 Local Government Recommendations 7-13
7.4 Private Citizens/Real Estate Professionals/Businesses Tools and Recommendations... 7-15
7.4.1 Private Sector Tools..... 7-15
7.4.2 Private Sector Recommendations 7-16

8 References..... 8-1

Appendices

Appendix A: Discussion of Noise and its Effect on the Environment

Appendix B: Land Use Compatibility Recommendations

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List of Tables

Table 1-1: Roles in Compatible Land Use Development 1-6
Table 2-1: Regional Population Estimates and Projections..... 2-12
Table 3-1: Projected Annual Flight Operations at NOLF Goliad 3-5
Table 4-1: Land Area within 2009 and 2014 Noise Contours, NOLF Goliad 4-8
Table 4-2: Subjective Response to Noise 4-11
Table 5-1: Description of Imaginary Surfaces for Class B Runways 5-3

Table 5-2: Naval Aircraft Mishap Classification 5-8
Table 5-3: Land Area within 2009 and 2014 Accident Potential Zones, NOLF Goliad 5-13
Table 6-1: Land Use Classification and Compatibility Guidelines 6-2
Table 6-2: Existing Land Use within the NOLF Goliad AICUZ Footprint 6-8

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List of Figures

Figure 2-1: Regional Location Map of NOLF Goliad, Texas 2-2
Figure 2-2: Pilot Training Pipeline 2-5
Figure 2-3: NOLF Goliad 2-7
Figure 2-4: General Airspace Classification 2-8
Figure 2-5: Airspace Classification, NOLF Goliad 2-10
Figure 3-1: Arrival Flight Tracks, NOLF Goliad 3-7

Figure 3-2: Departure Flight Tracks, NOLF Goliad 3-8
Figure 3-3: Touch-and-Go Pattern Flight Tracks, NOLF Goliad 3-9
Figure 3-4: Precautionary Emergency Landing (PEL) Low Key Flight Tracks, NOLF Goliad..... 3-10
Figure 4-1: 2014 AICUZ Noise Contours, NOLF Goliad 4-6
Figure 4-2: 2014 AICUZ Noise Gradient, NOLF Goliad 4-7
Figure 4-3: Comparison of the 2009 and 2014 AICUZ Noise Contours, NOLF Goliad 4-9
Figure 5-1: Imaginary Surfaces and Transition Planes for Class B Fixed-Wing Runways 5-2
Figure 5-2: Imaginary Surfaces and Transition Planes, NOLF Goliad 5-4
Figure 5-3: Accident Potential Zones 5-10
Figure 5-4: Clear Zones for Airfields with Converging Runways 5-11
Figure 5-5: 2014 AICUZ Accident Potential Zones, NOLF Goliad 5-12
Figure 5-6: Comparison of the 2009 and 2014 AICUZ Accident Potential Zones, NOLF Goliad .. 5-14
Figure 6-1: 2014 Composite AICUZ Map, NOLF Goliad 6-5
Figure 6-2: 2014 Composite AICUZ Map with Existing Land Use, NOLF Goliad 6-7

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Acronyms and Abbreviations

– A –

AICUZ Air Installations Compatible Use Zones

APZ Accident Potential Zone

ATC Air Traffic Control

– B –

BASH Bird/Animal Aircraft Strike Hazard

BRAC Base Closure and Realignment

BRRC Blue Ridge Research and Consulting

– C –

CIP Capital Improvements Program

CNATRA Chief of Naval Air Training

CNEL Community Noise Equivalent Level

CNO Chief of Naval Operations

CPLO Community Plans and Liaison Officer

– D –

dB Decibel(s)

dBA A-weighted Decibel(s)

DNL Day-Night Average Sound Level

DOD United States Department of Defense

– E –

EMI Electromagnetic Interference

ETJ Extra-Territorial Jurisdiction

– F –

FAA Federal Aviation Administration FCLP Field Carrier Landing Practice

– G –

GCRPC Golden Crescent Regional Planning Commission

– H –

HUD Housing and Urban Development

– I –

ICO Installation Commanding Officer IFR Instrument Flight Rules

– J –

JLUS Joint Land Use Study

JPATS Joint Primary Aircraft Training System

– M –

MOA Military Operations Area

MSA Metropolitan Statistical Area

MSL Mean Sea Level

– N –

NALF Naval Auxiliary Landing Field NAS Naval Air Station

NATRACOM Naval Air Training Command

NAVFAC Naval Facilities Engineering Command Navy United States Navy

NOLF Naval Outlying Landing Field

– O –

OPNAVINST Office of the Chief of Naval Operations Instruction

– P –

PAO Public Affairs Officer

PDR Purchase of Development Rights

PEL Precautionary Emergency Landing

– R –

RDO Runway Duty Officer

– S –

SNA Student Naval Aviator

SUA Special Use Airspace

– T –

TCC Texas Commanders Council

TDR Transfer of Development Rights

TMPC Texas Military Preparedness Commission

TRAWING Training Air Wing

TSDC Texas State Data Center

– U –

U.S.C. United States Code

– V –

VFR Visual Flight Rules

VMC Visual Meteorological Condition

VT Fixed-Wing Training Squadron

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Introduction

Military airfields often experience population growth and increased development near their fence lines. This development can be in the form of residential construction that allows an installation's military and civilian personnel to live closer to their employer, or businesses that are established to take advantage of increased financial opportunities created by these communities and the installation. Residential and commercial development in proximity to air installations can result in land uses that are incompatible with noise levels, accident potential, and obstruction clearance criteria, thereby impacting the public's health, safety, and welfare, and potentially degrading the operational capabilities of the air installation in meeting national security responsibilities.

The United States Department of Defense (DOD) initiated the Air Installations Compatible Use Zones (AICUZ) Program to assist government entities and communities in identifying and planning for compatible land use and development near military installations. The goal of this program is to protect the health, safety, and welfare of the public while also protecting military operational capabilities.

The AICUZ Program guidelines recommend that noise contours, accident potential zones (APZs), height and obstruction requirements, and associated land use recommendations be incorporated into local community planning to minimize impacts to the mission and the residents in the surrounding community (Navy 2008). Two-way communication between airfields and neighboring communities serves to increase public awareness of the importance of airfields and the need to address mission requirements and associated noise and risk factors. As the communities that surround airfields grow and develop, the United States Department of the Navy has the responsibility to communicate and collaborate with local governments regarding land use planning, zoning, and mission impacts.

This AICUZ Study has been prepared for Naval Outlying Landing Field (NOLF) Goliad, which is a Special Area to Naval Air Station (NAS) Corpus Christi, Texas. This 2015 AICUZ Study updates information on aircraft operations since the release of the 2009 NAS Corpus Christi AICUZ Study[1]. The 2014 AICUZ noise contours and APZs presented in this study are based on projected flight operations for T-6A/B "Texan II" (T-6) training requirements.

This study has been prepared in consideration of expected changes in mission, aircraft, and projected operational levels that will occur within the next 10- to 15-year planning period. This 2015 AICUZ Study is comprised of the following chapters, as described below:

- **Chapter 1:** Provides background information on the AICUZ Program and changes that require an AICUZ Update.
- **Chapter 2:** Describes the location and history of the airfield, users, and airspace.
- **Chapter 3:** Provides information on aircraft types, flight operations, and flight tracks for NOLF Goliad.
- **Chapter 4:** Provides the updated noise contours for NOLF Goliad, outlines the methodology for determining noise contours, and discusses the changes in noise contours and what measures the United States Navy (Navy) has implemented to mitigate any community noise concerns.
- **Chapter 5:** Discusses aircraft safety issues and the development of APZs for NOLF Goliad.
- **Chapter 6:** Evaluates the compatibility of both current and proposed surrounding land uses with aircraft operations.
- **Chapter 7:** Provides recommendations for promoting land use compatibility consistent with the goals of the AICUZ Program.
- **Chapter 8:** Presents a list of references used in this study.
- **Appendix A:** Summarizes the effects of noise on the environment.

[1] An AICUZ Study was completed for NOLF Goliad (formerly known as the Goliad County Industrial Airpark) and included as an addendum to the 2009 NAS Corpus Christi AICUZ Study.

▪ **Appendix B:** Contains a matrix of compatible land use recommendations for development within AICUZ noise zones and APZs adapted from the Navy's (2008) AICUZ Program Instruction (Office of the Chief of Naval Operations Instruction [OPNAVINST] 11010.36C).

1.1 AICUZ Program

In 1973, the DOD established the AICUZ Program in response to increasing incompatible urban development around military airfields and community concerns regarding aircraft noise and accident potential. The Navy's AICUZ Program Instruction (OPNAVINST 11010.36C) currently governs the AICUZ Program. The objectives of the AICUZ Program, according to OPNAVINST 11010.36C, are as follows:

▪ To protect the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations;

▪ To protect Navy and Marine Corps installation investments by safeguarding the installations' operational capabilities;

▪ To reduce noise impacts caused by aircraft operations, while meeting operational, training, and flight safety requirements, both on and in the vicinity of air installations and airfields; and

▪ To inform the public about the AICUZ Program and seek cooperative efforts to minimize noise and aircraft accident potential impacts by promoting compatible development in the vicinity of military air installations and airfields.

The Federal Aviation Administration (FAA) and the DOD have developed guidance (Title 14 Code of Federal Regulations [CFR] Part 77, "Objects Affecting Navigable Airspace") to encourage local communities to restrict development or land uses that could endanger aircraft, including: lighting (direct or reflected) that would impair pilot vision; towers, tall structures, and vegetation that penetrate navigable airspace or are constructed near the airfield; uses that generate smoke, steam, or dust; uses that attract birds, especially waterfowl; and electromagnetic interference (EMI) sources that may adversely affect aircraft communication, navigation, or other electrical systems. Hazards to pilot safety and flight operations are discussed in detail in Section 5.2, "Flight Hazards."

1.2 Purpose, Scope, and Authority

The purpose of the AICUZ Program is to achieve compatibility between air installations and neighboring communities. To satisfy this purpose, the Navy works with the local community to promote compatible development in the vicinity of military airfields. As development increases near an airfield, more people may be exposed to noise and accident potential associated with aircraft operations. AICUZ studies analyze community development trends, land use tools, and mission requirements to develop a recommended strategy to promote compatible land development near military airfields. AICUZ recommendations are based on the impacts of noise and accident potential. Implementation of the AICUZ Program requires cooperation between the Installation Commanding Officer (ICO) and the local government.

The scope of this AICUZ Study includes: an assessment of projected aircraft operations; aircraft noise zones and APZs for future-year forecasts; noise abatement measures; an analysis of existing and projected land use conditions within the aircraft noise zones and APZs; and possible solutions to existing and potential incompatible land use problems.

The authority for the establishment and implementation of the AICUZ Program, as well as guidance on facility requirements, are derived from:

- DOD Instruction 4165.57, "Air Installations Compatible Use Zones," dated May 2, 2011 (DOD 2011);
- OPNAVINST 11010.36C, "Air Installations Compatible Use Zones Program," dated October 9, 2008 (Navy 2008);
- Unified Facilities Criteria 3-260-01, "Airfield and Heliport Planning and Design," dated November 17, 2008 (Air Force Civil Engineer Support Agency 2008);

- Naval Facilities Engineering Command (NAVFAC) P-80.3, "Facilities Planning Factor Criteria for Navy and USMC Shore Installations: Airfield Safety Clearances," dated January 1982 (NAVFAC 1982); and
- United States Department of Transportation, FAA Regulations, 14 CFR 77, "Objects Affecting Navigable Airspace" (United States Department of Transportation 2006).

1.3 Responsibility for Compatible Land Use

Ensuring land use compatibility within the AICUZ footprint is a cooperative effort of many organizations, including the DOD and the Navy, the local NAS command, local planning and zoning agencies, real estate agencies, residents, developers, and builders. Military installations can provide recommendations or advise community decision makers; however, ultimately, local governments have the planning and zoning authority to preserve land use compatibility near military airfields. Cooperative action by all parties is essential to prevent land use incompatibility.

A discussion of the Navy's compatible land use management measures is provided in Chapter 7, "Land Use Tools and Recommendations." Table 1-1 identifies some roles for various community stakeholders.

Table 1-1: Roles in Compatible Land Use Development

Navy	▪ Examine air mission for operation changes that could reduce impacts. ▪ Conduct noise and APZ studies. ▪ Develop AICUZ maps. ▪ Examine local land uses and growth trends. ▪ Make land use recommendations. ▪ Release an AICUZ Study. ▪ Work with local governments and private citizens. ▪ Monitor operations and noise complaints. ▪ Update AICUZ studies, as required.
Local Government	▪ Incorporate AICUZ guidelines into a comprehensive development plan and zoning ordinance. ▪ Regulate height and obstruction concerns through an airport ordinance. ▪ Regulate acoustical treatment in new construction. ▪ Require fair disclosure in real estate for all buyers, renters, lessees, and developers.
Private Citizens	▪ Educate oneself on the importance of the installation's AICUZ Program. ▪ Identify AICUZ considerations in all property transactions. ▪ Understand AICUZ effects before buying, renting, leasing, or developing property.
Real Estate Professionals	▪ Ensure potential buyers and lessees receive and understand AICUZ information on affected properties. ▪ When working with builders/developers, ensure an understanding and evaluation of the AICUZ Program. ▪ Ensure fair disclosure in real estate for all buyers, renters, lessees, and developers.
Builders/Developers	▪ Develop properties in a manner that appropriately protects the health, safety, and welfare of the civilian population by constructing facilities that are compatible with aircraft operations (e.g., sound attenuation features, densities, and occupations).

1.4 Previous AICUZ Efforts

The first AICUZ Study was completed for NOLF Goliad in 1976, when the airfield was an outlying landing field for the former NAS Chase Field in Beeville, Texas. The airfield closed in 1992, and Goliad County later purchased the airfield. No AICUZ studies were completed while the airfield was under the ownership of Goliad County (then known as the Goliad County Industrial Airpark). In 2009, the Navy initiated the process of acquiring the Goliad County

AICUZ Update

AICUZ studies should be updated when an airfield has a significant change in aircraft operations (i.e., the number of takeoffs and landings), a change in the type of aircraft stationed and operating at the installation or its airfields, or changes in flight paths or procedures. Since publication of the 2009 AICUZ Study for NOLF Goliad, changes have occurred for runway usage, flight characteristics and procedures, and published flight tracks, as described below.

The flight operations used to model the 2009 AICUZ noise contours and APZs at NOLF Goliad were based on prospective conditions for Training Air Wing (TRAWING) FOUR's expected transition to the T-6. In 2009, approximately 238,000 annual operations were projected for NOLF Goliad. The total of projected annual operations has declined since the release of the 2009 AICUZ Study. The 2009 annual operations also accounted for civil general aviation use; however, the airfield no longer supports civilian flight operations. Additionally, left- and right-hand patterns are now conducted on runway pairs 17/35 and 11/29 to meet T-6 training requirements. More information on projected annual operations, runway utilization, and flight procedures is provided in Chapter 3.

Industrial Airpark as an additional outlying landing field to accommodate basing of the new T-6 aircraft and the implementation of the Joint Primary Aircraft Training System (JPATS) training program at NAS Corpus Christi. Consequently, an AICUZ Study was completed for the former Goliad County Industrial Airpark, now known as NOLF Goliad. The AICUZ Study was included as an addendum to the 2009 AICUZ Study for NAS Corpus Christi.

1.5 Changes that Require an

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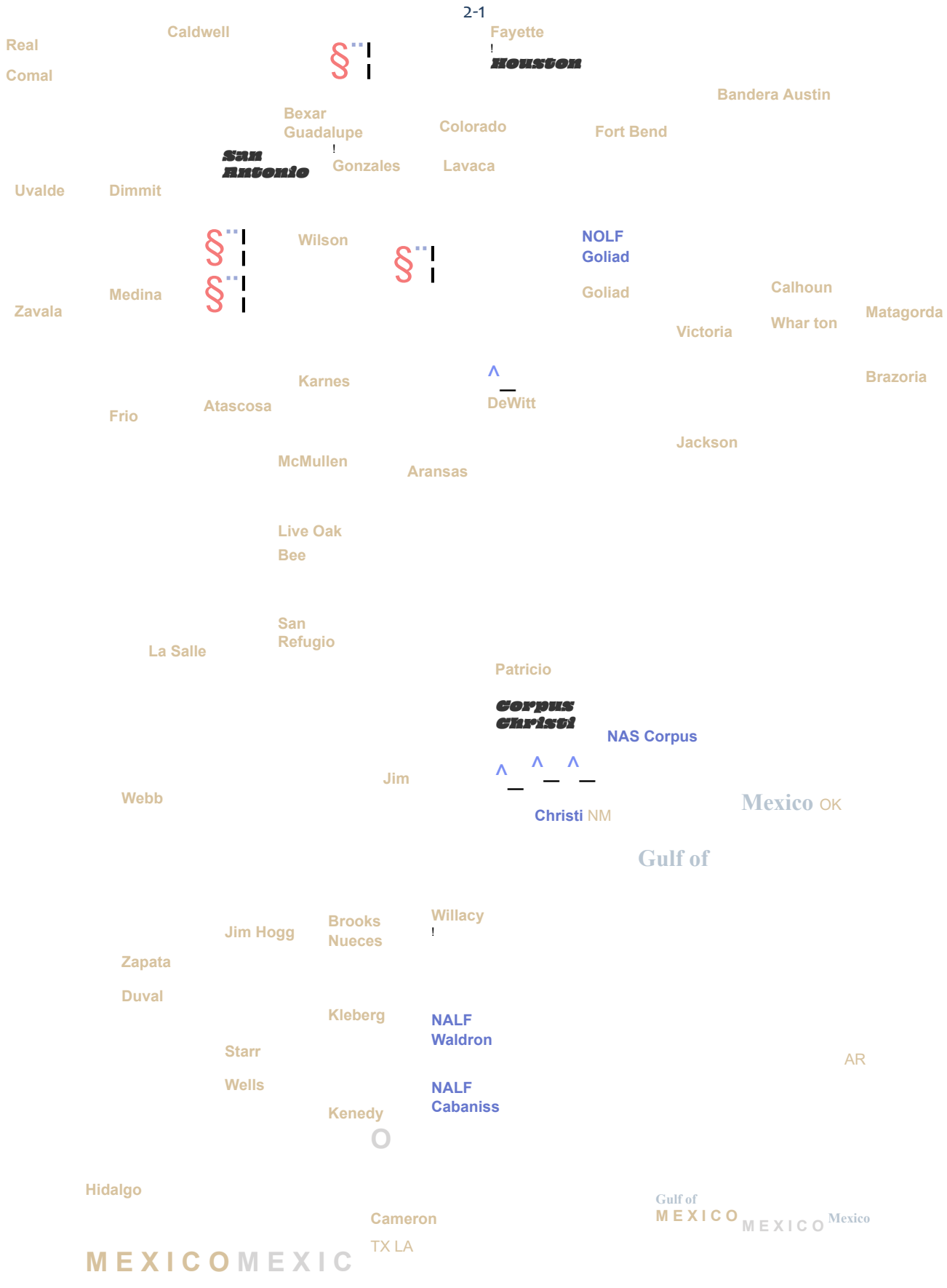
NOLF Goliad

2.1 Location and History

NOLF Goliad is located in the western portion of Goliad County, Texas approximately 58 miles northwest of NAS Corpus Christi (Figure 2-1). The airfield is located within the unincorporated area of the county. The closest cities/towns are Berclair, located 5 miles south, and the city of Goliad, located 13 miles northeast.

NOLF Goliad, originally known as Berclair Naval Auxiliary Landing Field (NALF), was built in 1967 to support the naval missions of NAS Chase Field in Beeville, Texas. In 1991, as part of the Base Closure and Realignment (BRAC) Program, the airfield was disestablished, along with NAS Chase Field. In 2000, the Navy sold the airfield to Goliad County to enhance economic development in the region (Navy 2009). The airfield was owned and managed by the County's Economic Development Board and became the Goliad County Industrial Airpark.

In 2011, the Navy reacquired the airfield and updated the infrastructure and facilities to support T-6 operations as part of the JPATS program. The airfield currently supports training operations for TRAWING FOUR aircraft from NAS Corpus Christi, but no military aircraft are based at NOLF Goliad.


2-1
Caldwell
Fayette
Real
Comal
Houston
Bandera Austin
Bexar
Guadalupe
Colorado
Fort Bend
San Antonio
Gonzales
Lavaca
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Dimmit
Wilson
NOLF
Goliad
Medina
Goliad
Calhoun
Zavala
Victoria
Whar ton
Matagorda
Karnes
Brazoria
DeWitt
Atascosa
Frio
Jackson
McMullen
Aransas
Live Oak
Bee
San
Refugio
La Salle
Patricio
Corpus
Christi
NAS Corpus
Jim
Webb
Christi NM
Mexico OK
Gulf of
Jim Hogg
Brooks
Nueces
Willacy
Zapata
Duval
Kleberg
NALF
Waldron
Starr
AR
Wells
NALF
Cabaniss
Kenedy
Hidalgo
Cameron
TX LA
Gulf of
MEXICO
MEXICO
Mexico
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Legend **Figure 2-1 Regional Location Map**

GRC 2011.

Interstate Highway

of NOLF Goliad Texas

SCALE

0 20 40 Miles **SOURCE**: ESRI 2012; NAVFAC SE

^ Military Airfield ! City

County Boundary

of NAS Corpus Christi that supports NATRACOM's mission by increasing training capacities and alleviating airspace congestion in the vicinity of the installation and the other outlying landing fields.

NAS Corpus Christi was one of three U.S. Naval bases selected to accept and deploy the JPATS. The JPATS program provides primary training for entry-level student aviators and modernizing training aircraft and support facilities that meet both Navy and Air Force flight training program requirements. Under the JPATS program, the T-6 turboprop trainer will replace all shore-based T-34C "Turbo Mentor" (T-34C) aircraft during a three year transitioning period. Since 2012, aircraft have been replaced on a one-to-one basis and, by 2015, an estimated 98 T-6 aircraft will be stationed at NAS Corpus Christi (Chief of Naval Air Training [CNATRA] 2012).

2.2 Mission

NAS Corpus Christi is an aviation training facility with a mission to maintain and operate facilities and to provide services and material to support operations of aviation activities and units of operating forces of Naval Air Training Command (NATRACOM), as well as other activities and units as designated by the Chief of Naval Operations (CNO). NOLF Goliad is as an outlying field

Today, NAS Corpus Christi is one of CNATRA's primary pilot training bases. CNATRA, which is headquartered at NAS Corpus Christi, is responsible for the coordination of pilot training operations and the administration of NATRACOM. NATRACOM is comprised of five TRAWINGs located on naval air stations in Florida, Mississippi, and Texas. NATRACOM is responsible for

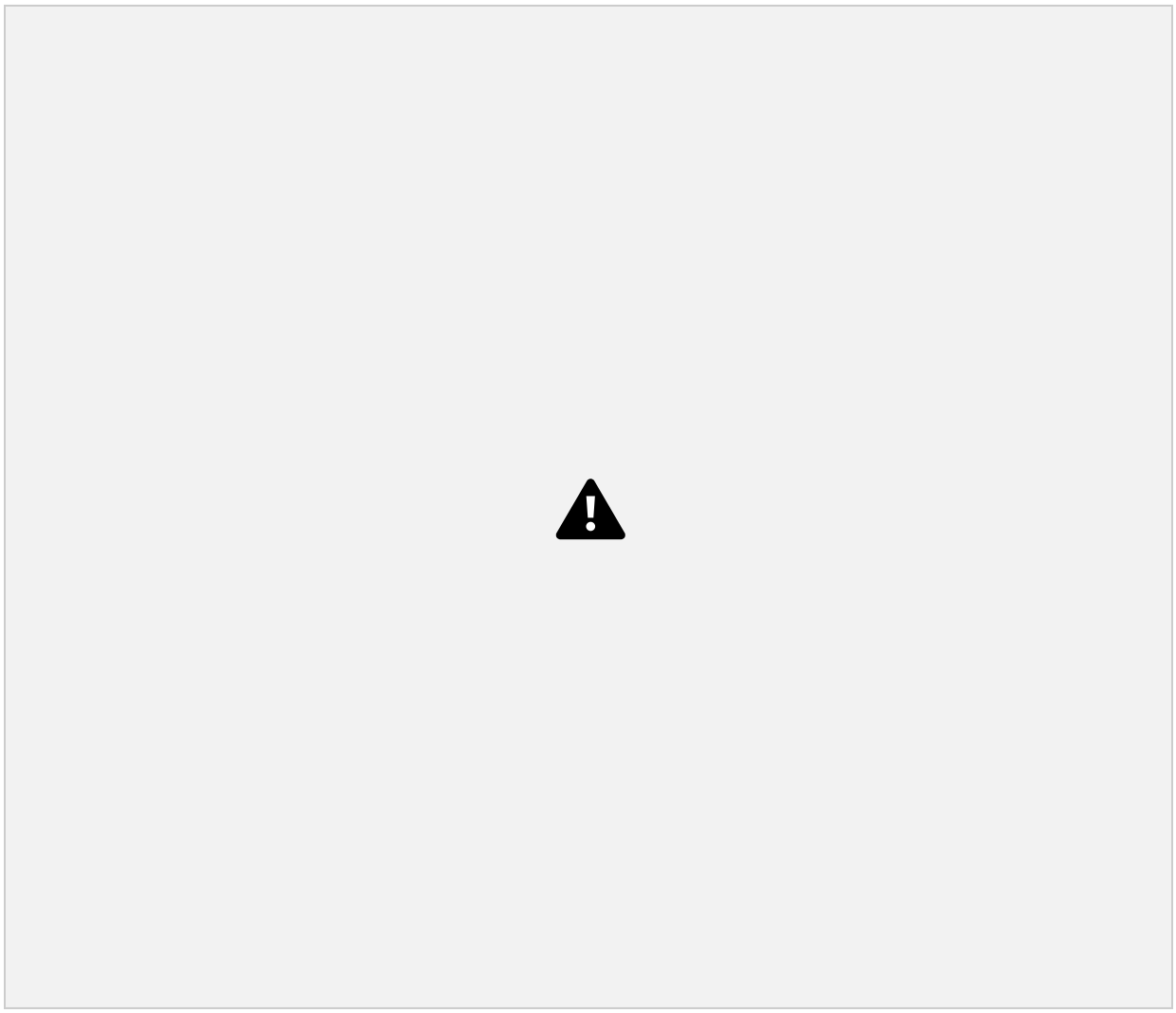
training combat-quality aviation professionals and delivering these aviators to fleet training squadrons precisely as needed and when needed.

2.2.1 Naval Aviator Training

When flight students complete Aviation Preflight Indoctrination at Naval Aviation Schools Command, they begin to advance through their individual pilot training pipelines. All Student Naval Aviators (SNAs) complete their primary flight training in either T-34C or the T-6 aircraft at NAS Whiting Field, NAS Corpus Christi, or Vance Air Force Base. Upon completion of primary flight training, SNAs are selected for a specific aviation pipeline, which determines the types of aircraft they will fly.

The location of a SNA's intermediate and advanced phases of flight training depends upon the type of aircraft the student has been selected to fly. CNATRA offers six different training pipelines for SNAs (Figure 2-2). SNAs are think selected for maritime (multi-engine prop), E-2 "Hawkeye" (E-2)/C-2 "Greyhound" (C-2) (twin-turboprop), rotary (helicopters), strike (jets), TC-12 "Huron" (TC-12) (tilt-rotor), and the E-6 "Mercury" (E-6) aircraft. Pilots continue intermediate and advanced training at NAS Corpus Christi for maritime, E-2/C-2, multi-engine, and tilt-rotor pipelines in the T-44 "Pegasus" (T-44) and TC-12 aircraft.

Figure 2-2: Pilot Training Pipeline



2-5
Air Installations Compatible Use Zones Study 2. NOLF Goliad NOLF Goliad

2.3 Airfield Users

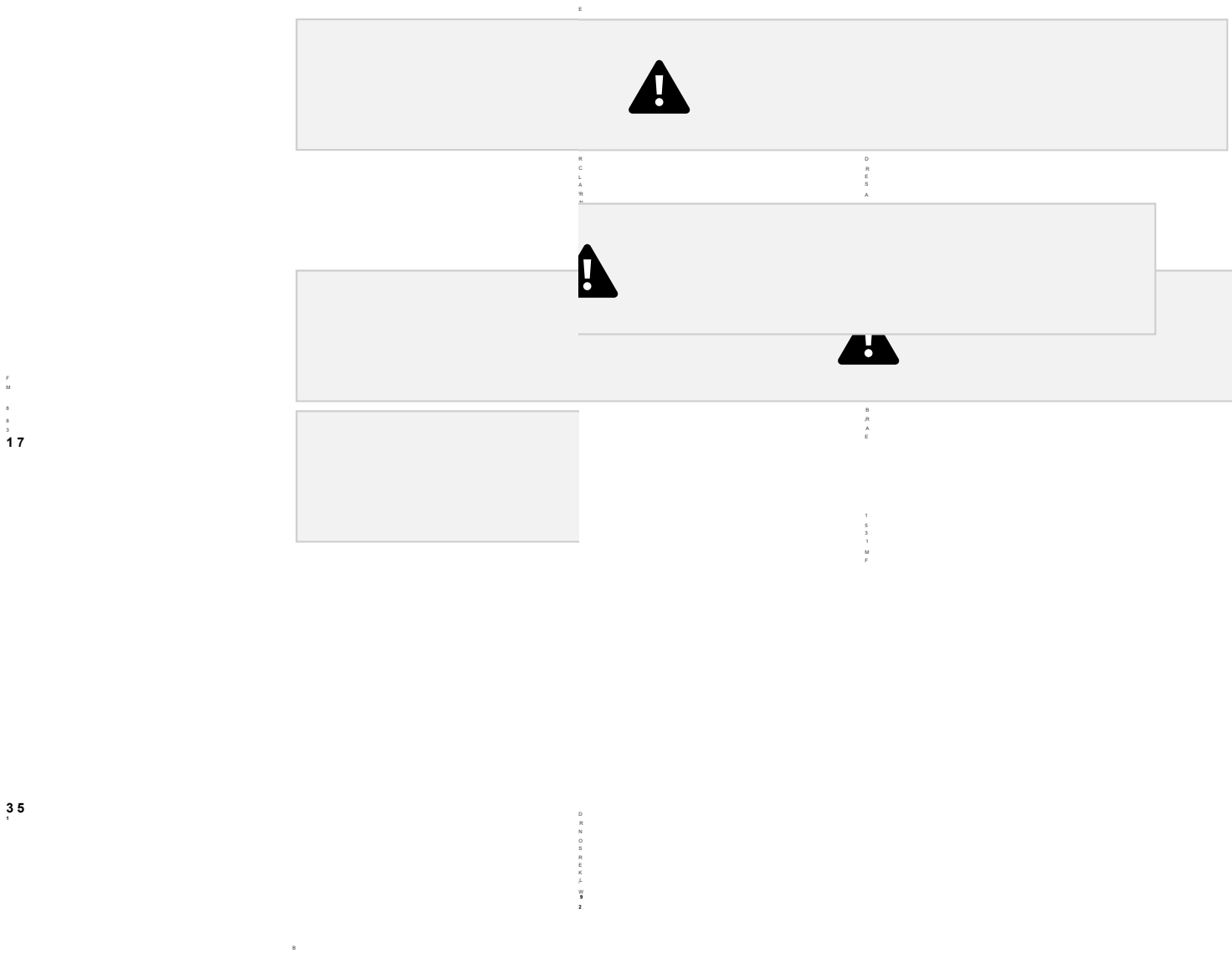
TRAWING FOUR is responsible for aviator training at NAS Corpus Christi, and is the primary user of NOLF Goliad. TRAWING FOUR is one of the five NATRACOM TRAWINGs under the command of CNATRA. TRAWING FOUR consists of four training squadrons that provide both basic and advanced flight training to SNAs: Training Squadrons TWENTY-SEVEN (VT-27), TWENTY-EIGHT (VT-28), THIRTY-ONE (VT-31), and THIRTY-FIVE (VT-35). VT-27 and VT-28 are basic flight training units and conduct primary and intermediate training operations in the T-34C and the T-6 training aircraft. VT-31 and VT-35 are advanced

multi-engine aircraft training units. VT-31 conducts visual navigation training and advanced turbo-prop aircraft training in the T-44. VT-35 conducts fixed-wing multi-engine transition training in the TC-12 (CNATRA 2012). The primary aircraft utilized for training at NOLF Goliad is the T-6. In addition to the T-6 operations, TC-12 and T-44 aircraft occasionally operate at NOLF Goliad.

2.4 Operational Areas

2.4.1 Airfield

NOLF Goliad is a 1,136-acre airfield equipped with two Class B runways, each measuring 150 feet wide by 8,000 feet long. Runway 17/35 runs north/south, and Runway 11/29 runs east/west (Figure 2-3). The airfield's elevation is 324 feet above mean sea level (MSL). The airfield generally operates Monday through Friday, 7:30 a.m. to 10:00 p.m., with occasional operations after 11:00 p.m. The airfield is closed on weekends.



Legend Figure 2-3

Street

Airfield Pavement NOLF Goliad

NOLF Goliad Goliad County, Texas

SCALE

0 0.25 0.5 Miles

SOURCE: ESRI 2012; NAVFAC SE GRC 2011 .

Major Road

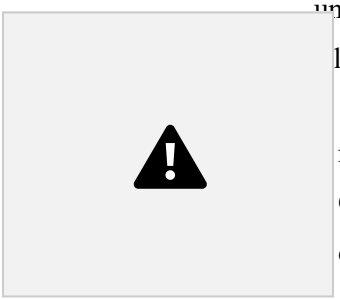
Airfield improvements include airfield lighting, resurfaced runways, a

new firehouse, and a new perimeter fence with a security gate. NOLF Goliad does not have a control tower. Runway Duty Officer (RDO) carts are equipped with radios to communicate with pilots in place of an Air Traffic Control (ATC) tower. In the absence of an ATC tower, the RDO may temporarily close the airfield in consideration of landing area conditions, crash crew equipment availability, status of navigational aids, and severe weather conditions. In the interest of safety, no operations are conducted without an RDO present.

2.4.2 Airspace

The use of airspace over NOLF Goliad is approved by the FAA, which manages the National Airspace System. The National Airspace System seeks to ensure the safe, orderly, and efficient flow of commercial, private, and military aircraft. NOLF Goliad airspace is controlled by the FAA Houston Air Route Traffic Control Center.

There are two categories of airspace: regulatory and non-regulatory. Within these two categories, there are four types of airspace: controlled, uncontrolled, special use, and other airspace. Controlled airspace, designated lass A through Class E, includes the airspace within which ATC clearance is



required. Uncontrolled airspace is the portion of the airspace not designated as Class A through Class E within which ATC has no authority or responsibility to control air traffic (FAA 2008) (Figure 2-4).

Figure 2-4: General Airspace Classification

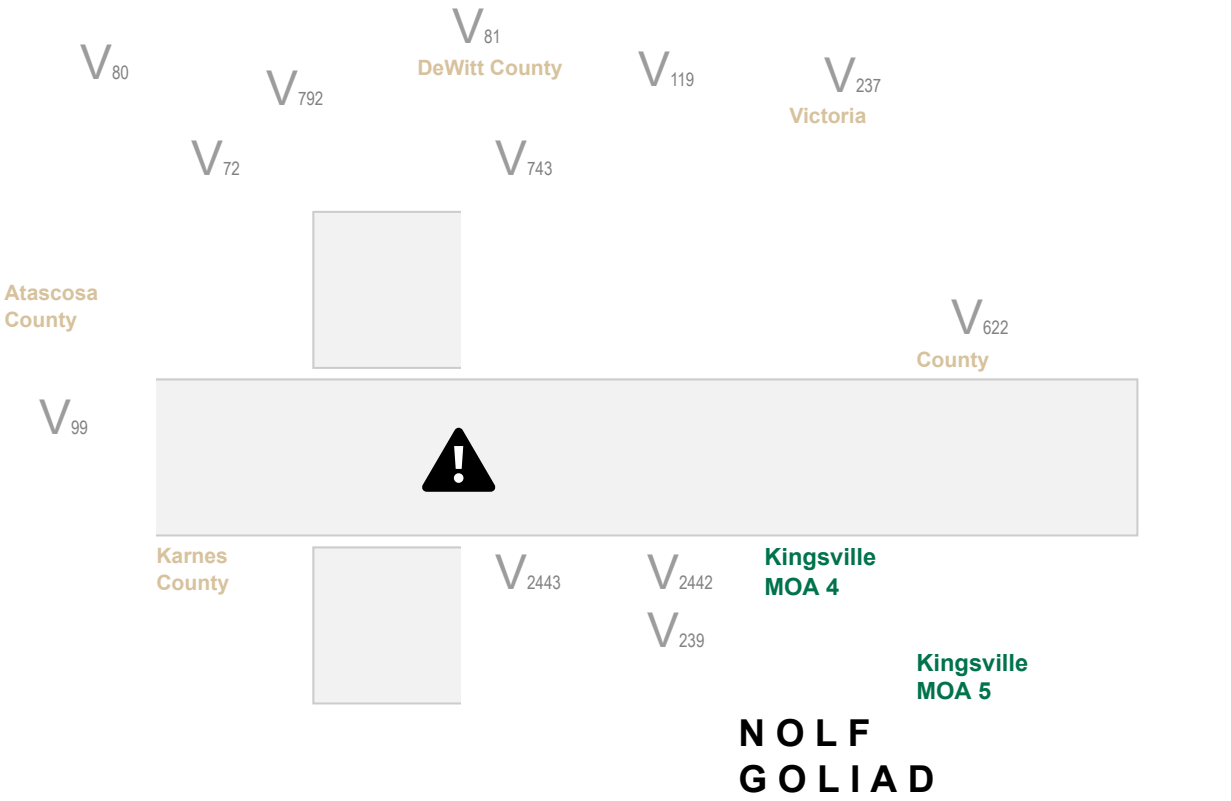
NOLF Goliad airspace is classified as Class E airspace (Figure 2-5). Generally, controlled airspace that is not otherwise designated as Class A, B, C, or D, is classified as Class E airspace. Class E airspace can extend upward from above ground level (for non-towered airports) or a designated altitude to, but not including, 18,000 feet above MSL.

Aircraft approaching NOLF Goliad must establish two-way radio communication with the RDO prior to entering the airspace and maintain communication while flying within the airspace. On return to NAS Corpus Christi, pilots will climb to 2,100 feet, contact Corpus Christi Approach, and follow Corpus Christi arrival procedures.

2.4.3 Special Use Airspace

Special use airspace (SUA) is the designation of airspace in which certain activities must be confined or where limitations may be imposed on aircraft operations that are not part of those activities. The SUA dimensions are defined so that military activities can operate and have boundaries that limit access by non-participating aircraft.

NOLF Goliad is located within Kingsville Military Operations Area (MOA) 4. MOAs are airspace with defined vertical and lateral limits to segregate certain non-hazardous military activities from instrument flight rules (IFR) traffic and to identify visual flight rules (VFR) traffic where military activities are conducted. TRAWING FOUR at NAS Corpus Christi is the primary user and schedules use of Kingsville MOA-4.


V 81
V 80
DeWitt County
V 792
V 119
V 237
Victoria
V 72
V 743
Atascosa
County
V 622
County
V 99
Karnes
County
V 2443
V 2442
Kingsville
MOA 4
V 239
Kingsville
MOA 5
NOLF
GOLIAD


V 623
V 673
59
Goliad
V 1358
V 799
County
V 2441
181
183
V 516
V 351


V 202
V 774
V 3024
Refugio
County
V 888
V 2678
Live Oak
County
V 796
Bee
281
77

V534 V136

V359

A632D

Legend Figure 2-5
Airspace Classification

NOLF Goliad

Alert Area

Military Operating Area (MOA)

Class E Airspace

NOLF Goliad Goliad County, Texas

SCALE

0 5 10 Miles

SOURCE: ESRI 2012; NAVFAC SE GRC 2011; NGA 2010.

Interstate

Major Road

2.5 Local Economic Impacts

The military provides direct, indirect, and induced economic benefits to the regional and local communities through jobs and wages. Benefits include employment opportunities and increases in local business revenue, property sales, and tax revenue. In 2011, the DOD provided an economic output of $143 billion in the state of Texas, including $55 billion in disposable income and an $83 billion contribution to gross domestic product (Office of the Governor 2012).

The economic impact of a military installation is based on annual payroll (jobs and salaries), local procurement, and contracts (expenditures). The military also contributes to the economic development of the communities through increased demand for local goods and services and increased household spending by military and civilian employees. Counties and communities in south Texas are significantly impacted by NAS Corpus Christi and NAS Kingsville. In 2011, these military facilities collectively provided over 14,400 jobs and an economic output of $6.54 billion (Office of the Governor 2012).

2.6 Regional Population

Goliad County is sparsely populated, with a density of 8.50 residents per square mile. The 2010 Census reported a county population of 7,210 persons, including 2,868 households and 2,061 families (U.S. Census Bureau 2010a). Goliad County's population has increased four percent since the 2000 Census, and projections indicate nominal, yet continuous, growth through 2025 (Texas State Data Center [TSDC] 2013). Goliad County is part of the greater Victoria Metropolitan Statistical Area (MSA). The Victoria MSA has a population of 94,003 persons, and the area is projected to grow by more than 14% by 2030, to a

population of 107,804 persons (TSDC 2013). Table 2-1 provides the decennial population estimates and additional projections for Goliad County and the Victoria MSA from 2000 through 2030.

Table 2-1: Regional Population Estimates and Projections

Goliad County	6,928	7,210	7,209	7,272	7,326	7,314
Victoria MSA	N/A	94,003	97,513	101,304	104,639	107,804

Sources: TSDC 2013; U.S. Census Bureau 2010b; Texas Association of Counties 2013.

Note: Victoria MSA for 2000 is delineated differently than 2010–2030. The 2000 Census delineation includes Victoria, Goliad, and Calhoun counties. Delineations starting in 2010 only include Victoria and Goliad counties.

Aircraft Operations

NOLF Goliad serves as an outlying landing field for NAS Corpus Christi in support of NATRACOM's training requirements. Air operations are conducted by fixed-wing, turboprop aircraft from active duty squadrons. This chapter discusses aircraft used at NOLF Goliad, the types and quantities of operations conducted at the airfield, and the runways and flight tracks used to conduct the operations.

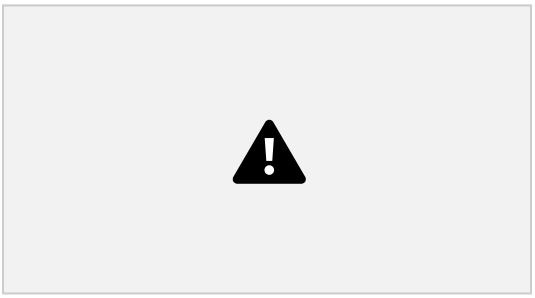
3.1 Aircraft Types

There are two basic types of aircraft: fixed-wing (propeller-driven or jet propulsion) and rotary-wing (helicopters). NOLF Goliad supports fixed-wing operations; no rotary-wing operations are conducted at the airfield. The T-6 is a propeller-driven, fixed-wing aircraft and accounts for the majority of flight operations at NOLF Goliad. In addition to the T-6 operations, TC-12 and T-44 propeller-driven, fixed-wing aircraft will occasionally operate at NOLF Goliad. No aircraft are stationed at NOLF Goliad.

3.1.1 Fixed-Wing Aircraft

3.1.1.1 T-6 "Texan II"

The T-6 is a tandem-seat turboprop trainer with an all-glass cockpit and an integrated avionics computer system. The T-6 is a component of the JPATS under which the Navy is replacing ground-based training systems and T-34 aircraft with the T-6 and associated training management systems. The T-6 is faster than the T-34, has jet-like handling characteristics, and offers improved training capabilities. The aircraft is powered by one Pratt & Whitney 1,600-shaft-horsepower engine. The aircraft's length is approximately 33.3 feet, with a height of 10.8 feet, and a wingspan of 33.4 feet. The aircraft has a maximum gross take-off weight of 6,900 pounds. Speeds of 270 knots can be reached, and the aircraft has a maximum range of 900 nautical miles. Pilots at NAS Corpus Christi fly the T-6B variant of the "Texan II," which has upgraded avionics.



3.1.1.2 TC-12 "Huron"

The TC-12 is a passenger and cargo transport aircraft. This aircraft is powered by two Pratt & Whitney PT-6A-42 engines that produce 850-shaft-horsepower each. The TC-12 is 44 feet long, with a height of 15 feet, and a wingspan of 54.6 feet. The aircraft has a maximum gross take-off weight of 15,000 pounds. The maximum range of the aircraft is approximately 1,974 nautical miles. The TC-12 can reach airspeeds of 294 knots.

3.1.1.3 T-44 "Pegasus"

The T-44 is a twin-engine, pressurized, Beechcraft King Air B90 aircraft. This aircraft is powered by two 550-shaft horsepower PT6A-34B turboprop engines. The primary mission of the T-44 is to provide advanced maritime flight training for SNAs in Corpus Christi, Texas. The aircraft is approximately 35.5 feet long, over 14 feet in height, and has a wingspan of over 50 feet. The aircraft's maximum gross take-off weight is 9,650 pounds. The T-44 has a maximum range of 1,300 nautical miles, and can reach airspeeds of 245 knots.

3.2 Aircraft Operations

3.2.1 Maintenance Run-Up Operations

No pre-flight or engine maintenance run-up operations are performed at NOLF Goliad; therefore, this airfield does not have designated run-up locations. Run-up locations are designated areas at an airfield where pilots or mechanics can conduct last minute engine checks without obstructing ground traffic.

3.2.2 Types of Flight Operations

As part of the typical training syllabus for flight crews, flight operations at NOLF Goliad include arrivals, touch-and-go operations, departures, and precautionary emergency landing (PEL) approaches. Flight operations at NOLF Goliad follow the curriculum set forth by CNATRA for TRAWING FOUR student aviators. No fleet squadrons are stationed at NAS Corpus Christi, and all flight operations at NOLF Goliad are for training purposes. Basic flight maneuvers, as well as intermediate and advanced operations, are conducted at NOLF Goliad. Basic flight operations include the following:

- **Departures:** An aircraft takes off to a training area or as part of a training maneuver (i.e., touch-and-go).
- **Arrivals:** An aircraft returns from a local or non-local training area or from a training maneuver (e.g., touch-and-go) and lands.
  - **Straight-In Arrival:** An aircraft lines up on the runway centerline, descends gradually, lands, comes to a full stop, and then taxis off the runway.
  - **Overhead Break Arrival:** An expeditious arrival procedure conducted under VFR and in visual meteorological conditions (VMCs). An aircraft approaches the runway 500 feet above the altitude of the landing pattern. Approximately halfway down the runway, the aircraft performs a 180-degree turn to enter the landing pattern. Once established in the pattern, the aircraft lowers landing

gear and flaps and performs a 180-degree descending turn to land on the runway.

- **Patterns:** Pattern work refers to traffic pattern training in which the pilot performs takeoffs and landings in quick succession by taking off, flying the pattern, and then making a touch-and-go landing.
  - **Touch-and-Go:** An aircraft lands and takes off on a runway without coming to a full stop. After touching down, the pilot immediately goes to full power and takes off again. The touch-and-go is counted as two operations—the landing is counted as one operation, and the takeoff is counted as another.
  - **Precautionary Emergency Landing:** A practice procedure taught to SNAs to ensure safe landing in the event of engine failure or questionable engine reliability.
  - **Low Key Approach:** A low approach to a runway during which the pilot does not make contact with the runway but, instead, increases altitude and departs the airfield's airspace.

3.2.3 Annual Flight Operations

A total of 190,000 annual flight operations are projected at NOLF Goliad (Blue Ridge Research and Consulting [BRRC] 2013). Projected flight operations at NOLF Goliad are based on training requirements and not on historic averages. Because NOLF Goliad is a newly re-acquired airfield with a new purpose and need, historical annual flight averages are not applicable. Table 3-1 presents the 2014 projected flight operations for the T-6, the T-44, and the TC-12 by operation type at NOLF Goliad.

Table 3-1: Projected Annual Flight Operations at NOLF Goliad

Arrivals	9,878	39	39
Departures	9,878	39	39
Touch-and-Gos	128,523	2,422	2,422
PEL Low Key	36,721	0	0
Total	**185,000**	**2,500**	**2,500**

Source: BRRC 2013.

The T-6 aircraft accounts for over 97 percent of all projected operations conducted at NOLF Goliad (BRRC 2013). The majority of flight operations at NOLF Goliad are touch-and-go (approximately 70 percent of total operations), and 96 percent of those are T-6 touch-and-go operations. PEL low key operations account for approximately 19 percent of operations, and arrivals and departures account for approximately 11 percent of total airfield operations.

3.3 Runway and Flight Track Utilization

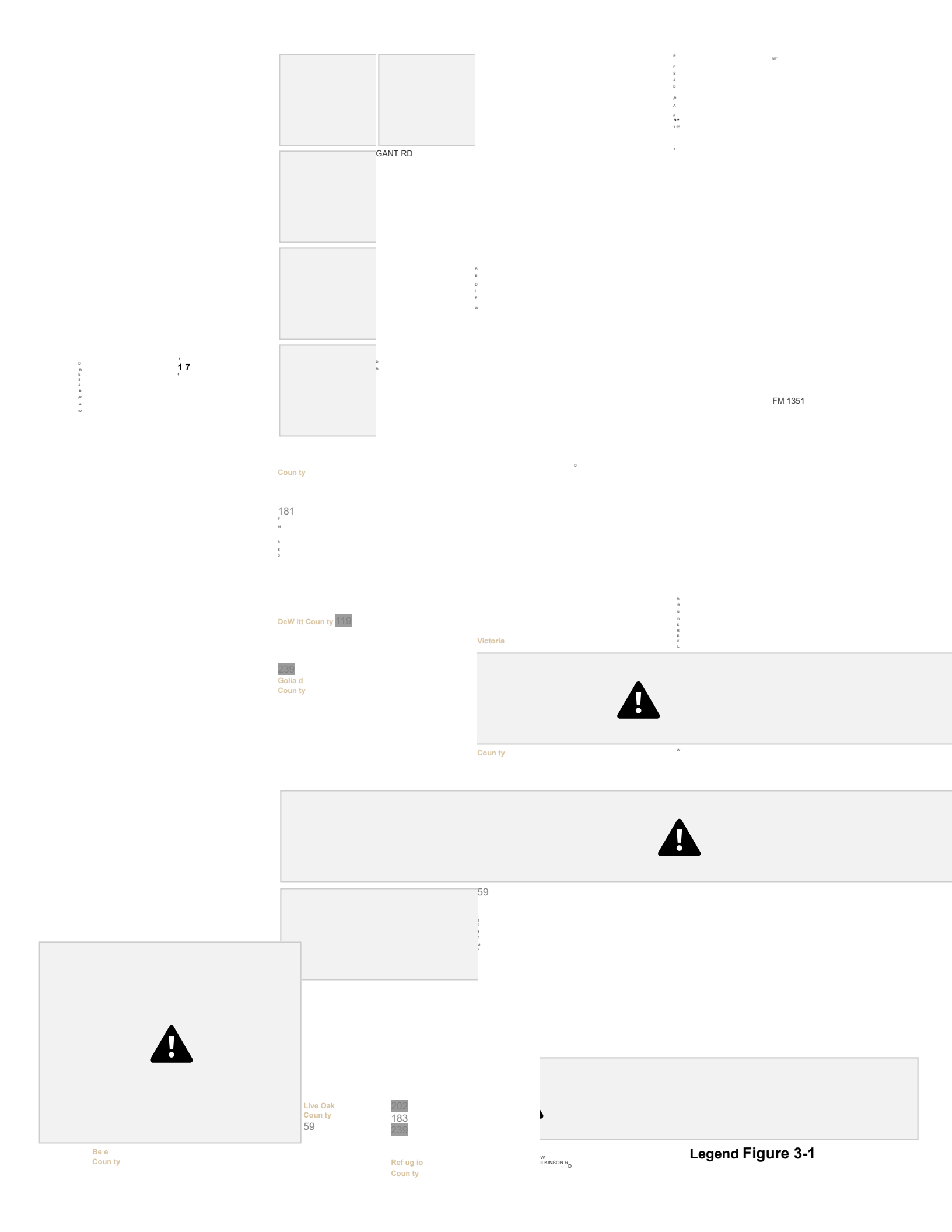
Each airfield has designated flight tracks associated with the various flight operations conducted. A flight track is a specific route an aircraft follows while conducting operations at the airfield. Flight tracks typically depict departure and arrival patterns to demonstrate how the aircraft flies in relation to the airfield. Flight tracks are geographically represented as single lines, but flights vary due to aircraft performance, pilot technique, weather conditions, and ATC variables. The actual flight track is most accurately represented as a band that is often a half-mile to several miles wide. The flight tracks shown in this AICUZ Study are idealized representations based on pilot and ATC input.

Each flight track is identified and numbered according to runway, flight operation, and numerical sequence for multiple flight tracks. Flight operations are abbreviated as: Departure (D), Straight-In-Arrival (A), Overhead Break Arrival (O), Closed Patterns (C), such as touch-and-go operations, and Precautionary Emergency Landing Arrivals (P). For example, flight track 11A1 at NOLF Goliad is interpreted as:

- Utilized Runway: 11
- Type of Flight Operation: Arrival
- Flight Track Departure Sequence: First

3.3.1 NOLF Goliad Runway Utilization and Flight Tracks

Runway usage at NOLF Goliad predominantly occurs on Runway 11 (40 percent) and Runway 17 (40 percent); the remaining runway use is divided between Runway 35 (15 percent) and Runway 29 (5 percent). Runway utilization is based on wind direction. Figures 3-1 through 3-4 illustrate the arrival, departure, and pattern flight tracks for NOLF Goliad, respectively.


GANT RD
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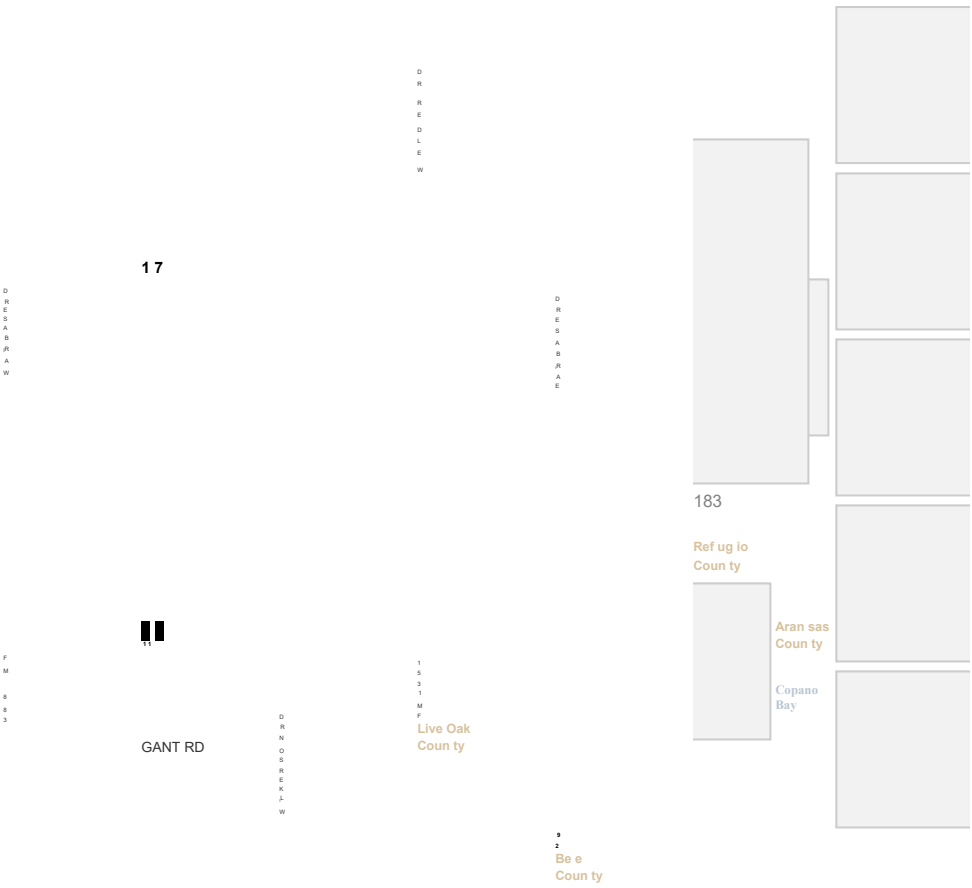
Legend Figure 3-1



SCALE

0 0.5 1 Miles

SOURCE: ESRI 2012; NAVFAC SE GRC 2011; BRRC 2013.

NOLF Goliad

Airfield Pavement Urban Area

County Boundary

Street

Major Road

Arrival Flight Operations

Overhead

Overhead with

PEL Arrival

Straight-in Arrival

All Arrival Flight Tracks (Inset)

Arrival Flight Tracks NOLF Goliad

Goliad County, Texas

Legend Figure 3-2

SCALE

0 0.5 1 Miles

SOURCE: ESRI 2012; NAVFAC SE GRC 2011; BRRC 2013.

Major Road

NOLF Goliad

Airfield Pavement Urban Area

County Boundary

Street

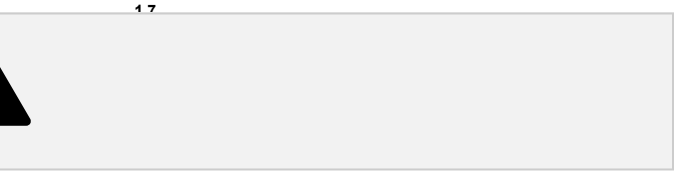
Departure Flight Operations

Departure

Departure Flight Tracks NOLF Goliad

Goliad County, Texas

FM 1351



Legend Figure 3-3
and Go

Touch-and-Go Pattern Flight Tracks NOLF Goliad

Goliad County, Texas

Major Road

NOLF Goliad

Airfield Pavement

Pattern Flight Operations VFR
Touch and Go
with Extended Upwind VFR Touch

Street

SOURCE: ESRI 2012; NAVFAC SE GRC 2011; BRRC 2013.

SCALE

0 0.5 1 Miles

GANT RD

Legend Figure 3-4

Key Pattern

Street

Major Road

NOLF Goliad

Airfield Pavement

Pattern Flight Operations PEL Low

Precautionary Emergency Landing (PEL) Low Key Flight Tracks NOLF Goliad

Goliad County, Texas

SCALE

0 0.5 1 Miles

SOURCE: ESRI 2012; NAVFAC SE GRC 2011; BRRC 2013.

ircraft Noise

The potential for aircraft noise exposure is a critical factor that should be considered in the planning of future land use near air facilities, as how an airfield manages aircraft noise can play a significant role in shaping the airfield's relationship with the community. The Navy has defined noise zones for the areas surrounding each airfield using the guidance provided in the AICUZ Instruction. These noise zones provide the community with a tool to plan for compatible development near airfields.

4.1 Sound/Noise Defined

Sound is produced by vibrations in the air that can be generated by a multitude of sources. When sound is deemed as unwanted or invasive to a listener, it becomes noise. Some sources of noise include roadway traffic, recreational activities, railway activities, and aircraft operations. Further discussion of noise and its effects on people and the environment is provided in Appendix A.

In this AICUZ Study, all sound or noise levels are measured in A-weighted decibels (dBA), which represents sound pressure adjusted to the range of human hearing. When the use of A-weighting is understood, the adjective "A-weighted" is often omitted and the measurements are expressed as decibels (dB). In this AICUZ Study, dB units refer to A-weighted sound levels. On an A-weighted scale, barely audible sound is set at 0 dB, and normal speech has a sound level of approximately 60 to 65 dB. Generally, a sound level above 120 dB will begin to cause discomfort to a listener, and the threshold of pain is 140 dB (Berglund and Lindvall 1995).

The noise exposure from aircraft is measured using the day-night average sound level (DNL) metric. The DNL metric, established in 1980 by the Federal

0 dB Threshold of Hearing
20 dB Ticking Watch 45 dB Bird Calls (distant)
60 dB Normal Conversation
70 dB Vacuum Cleaner (3 feet)
80 dB Alarm Clock (2 feet)
90 dB Motorcycle (25 feet)
100 dB Ambulance Siren (100 feet)
110 dB Chain Saw
120 dB Rock Concert 130 dB Jackhammer 140 dB Threshold of Pain

Interagency Committee on Urban Noise, presents a reliable measure of community sensitivity to aircraft noise and has become the standard metric used in the United States (except California, which uses a similar metric, Community Noise Equivalent Level [CNEL]). DNL averages the sound energy from aircraft operations at a location over a 24-hour period. DNL also adds an additional 10 dB to events occurring between 10:00 p.m. and 7:00 a.m. This 10-dB "nighttime penalty" represents the added intrusiveness of sounds due to the increased sensitivity to noise when ambient sound levels are low.

By combining factors most noticeable about noise annoyance— maximum noise levels, duration, the number of events over a 24-hour period, and the nighttime penalty—DNL provides a single measure of overall noise impact. The use of DNL to evaluate community noise is supported by a number of scientific studies and social surveys that have found a high correlation between the percentage of groups of people highly annoyed and the level of average noise exposure measured in DNL (Federal Interagency Committee on Urban Noise 1980; U.S. Environmental Protection Agency 1982; American National Standards Institute 1990; Federal Interagency Committee on Noise 1992). Although DNL provides a single measure of overall noise impact, it does not provide specific information on the number of noise events or the individual sound levels that occur during the day. For example, a day-night average sound level of 65 dB could result from a few noisy events or a large number of less noisy events.

The DNL is visually depicted as a noise contour that connects points of equal value. Calculated noise contours do not represent exact measurements. Noise levels inside a contour may be similar to those outside a contour line. When the contour lines are close, the change in noise level is greater. When the contour lines are far apart, the change in noise level is gradual.

The noise contours in this AICUZ Study are depicted in 5-dB increments (60, 65, 70, and 75 dB). The area between two noise contours is known as a noise zone. The AICUZ Program generally divides noise exposure areas into three noise zones for land use planning purposes:

- **Noise Zone 1:** 64 dB DNL and below, area of low or no noise impact;
- **Noise Zone 2:** 65 to 75 dB DNL, area of moderate impact where some land use controls measures are needed; and
- **Noise Zone 3:** 76 dB DNL and above, most severely impacted area that requires the greatest degree of compatible land use control.

4.2 Airfield Noise Sources and Noise Modeling

The Navy conducts noise studies, as needed, to assess the potential for noise impacts from aircraft operations. In support of this AICUZ Study, a noise analysis was conducted to define noise contours at NOLF Goliad. This analysis uses NOISEMAP, a widely accepted computer-based modeling program that projects DNL sound levels around military airfields to determine noise exposure.

As part of this AICUZ Study, data regarding operations at NOLF Goliad were collected from tenants at NAS Corpus Christi and incorporated into the noise model to generate noise contours. The input data incorporated into the NOISEMAP computer model include:

- Type of operation (i.e., arrival, departure, and pattern);
- Number of operations per day;
- Time of operation;
- Flight track;
- Aircraft power settings, speeds, and altitudes;
- Numbers and duration of preflight and maintenance run-ups; ▪ Terrain (surface type); and
- Environmental data (temperature and humidity).

The noise contours generated from the modeling program illustrate where aircraft noise occurs in and around an airfield and at what sound level. The noise modeling results were verified, approved, and provided to the Navy under a separate submittal as the NOLF Goliad 2014 Noise Study.

4.3 2014 AICUZ Noise Contours

Noise contours represent the footprint of modeled noise-related impacts of aircraft operations. Noise contours, when overlaid with local land uses, can help identify areas of incompatible land uses and aid in planning for future development around an airfield.

Noise contours provided in this AICUZ Study are identified as the 2014 AICUZ noise contours, representing the year of the study's release. Noise contours were modeled using projected annual operations based on training requirements for JPATS. As a planning document, an AICUZ Study forecasts flight activity levels as far into the future as feasible (often 5, 10, or 15 years) to assess land use concerns and to plan for future compatible objectives. Projected aircraft operations also help ensure that the future operational capability of the airfield is sustainable.

4.3.1 NOLF Goliad 2014 AICUZ Noise Contours

The 2014 AICUZ noise contours align with the runways and follow the dominant flight tracks for arrivals, departures, and patterns; noise propagates outward from those paths. As expected, the highest noise levels are concentrated over the airfield and along the runways.

Touch-and-go patterns and departures have the greatest effect on the shape of noise contours. Departures and the ascending portion of pattern operations require a greater power setting, which generates greater noise and influences the shape of the contours. Touch-and-go patterns are conducted on both runway pairs and are the most common flight operation at NOLF Goliad, accounting for approximately 70 percent of operations.

NOLF Goliad's 2014 AICUZ noise contours range from 60 dB to 75 dB DNL and form a 'V', similar to the configuration of the runways (Figure 4-1). The noise contours at NOLF Goliad are small in comparison to other practice fields utilized by the Navy because of the relatively low noise levels of the T-6

aircraft compared to jet trainers and tactical jet fighters. The 65-dB DNL contour remains within approximately 1,000 feet of the runway centerlines, with the maximum separation occurring at the midpoint of the runway. Since more operations are conducted on runway pair 17/35, the noise contours extend slightly further than the contours on runway pair 11/29. The 65-dB DNL noise contour extends further south on runway 17/35, approximately 600 feet beyond the runway threshold, in comparison to the 65-dB DNL contour along Runway 11/29, which ends at the Runway 29 threshold. Moreover, the T-6 does not generate significant noise levels underneath the downwind portion of its patterns, which helps concentrate noise levels closer along the runway.

The contour shapes are somewhat different at the southern and northern ends of the airfield runways. The noise contours are wider toward the north end of the airfield where noise is concentrated over the runways due to the confluence of operations. The noise contours taper at the southern ends of Runways 35 and 29 because operations do not overlap at these ends of the runway.

Figure 4-2 is a DNL color-gradient map that provides a simulated view of the noise propagating from the airfield outside the confines of the noise contours. Noise contours show the extent of a certain DNL, while the color gradient shows the fluidity of noise, which does not stop at the contour lines depicted on maps and figures. The highest noise levels are concentrated within the airfield's boundaries and decrease to much lower levels into the surrounding community. The figure also depicts the noise outside the 65-dB DNL noise contour to the 55-dB DNL contour, which is considered an ambient or background noise level.

Legend Figure 4-1

DNL) 60 dB

65 dB

70 dB

75 dB

Major Road

Street

2014 AICUZ Noise Contour (dB

SCALE

0 0.25 0.5 Miles

SOURCE: ESRI 2012; NAVFAC SE GRC 2011; USDA NAIP 2012; BRRC 2013.

Airfield Pavement NOLF Goliad

2014 AICUZ Noise Contours NOLF Goliad

Goliad County, Texas

GANT RD

65

65

75

75
65

65

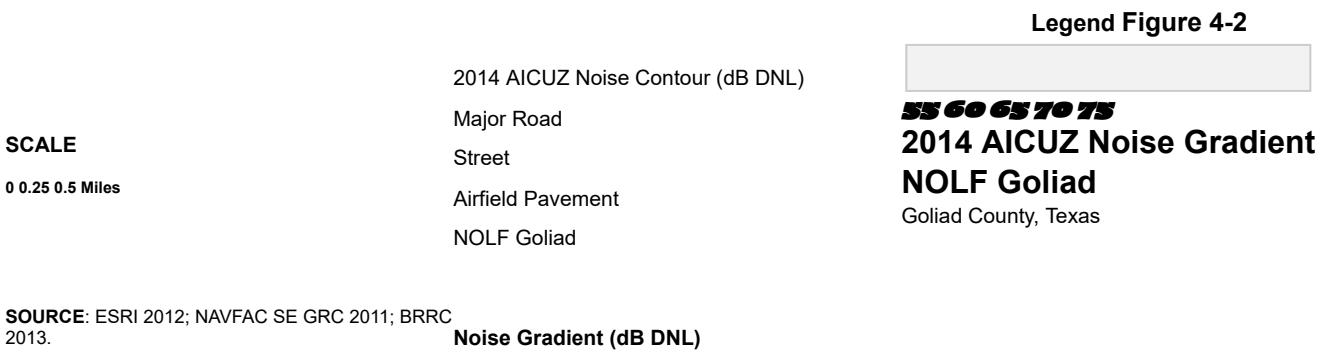
70

60

60
70

60

70



Air Installations Compatible Use Zones Study 4. Aircraft Noise NOLF Goliad

4.3.2 Comparison of the NOLF Goliad 2009 and 2014 Noise Contours

The geographic extent and the distribution of the 2014 AICUZ noise contours have changed since the development of the 2009 AICUZ noise contours, with a decrease in overall size from 2009 to 2014 (Figure 4-3). The difference in the geographic extent of the noise contours is attributed to a decrease in annual operations of approximately 20 percent from the 2009 projected annual operations, changes in runway utilization, and modified flight tracks.

Projected annual operations for the 2009 noise contours were concentrated on Runway 17/35 (formerly 16/34) and, consequently, higher noise exposure was generated on that runway pair. The current 2014 AICUZ noise contours reflect a more even distribution of the operations on runway pairs. Additionally, the 2014 projected operations include both left- and right-handed patterns; therefore, noise exposure is on the inboard and outboard side of the runways and does not extend as far from the airfield as the 2009 AICUZ noise contours. The 2014 AICUZ noise contours are also modeled with extended operations. Although these operations are performed further from the airfield, the noise contours remain near the runways due to the sound level of the T-6 aircraft being lower on the extended portion of operations.

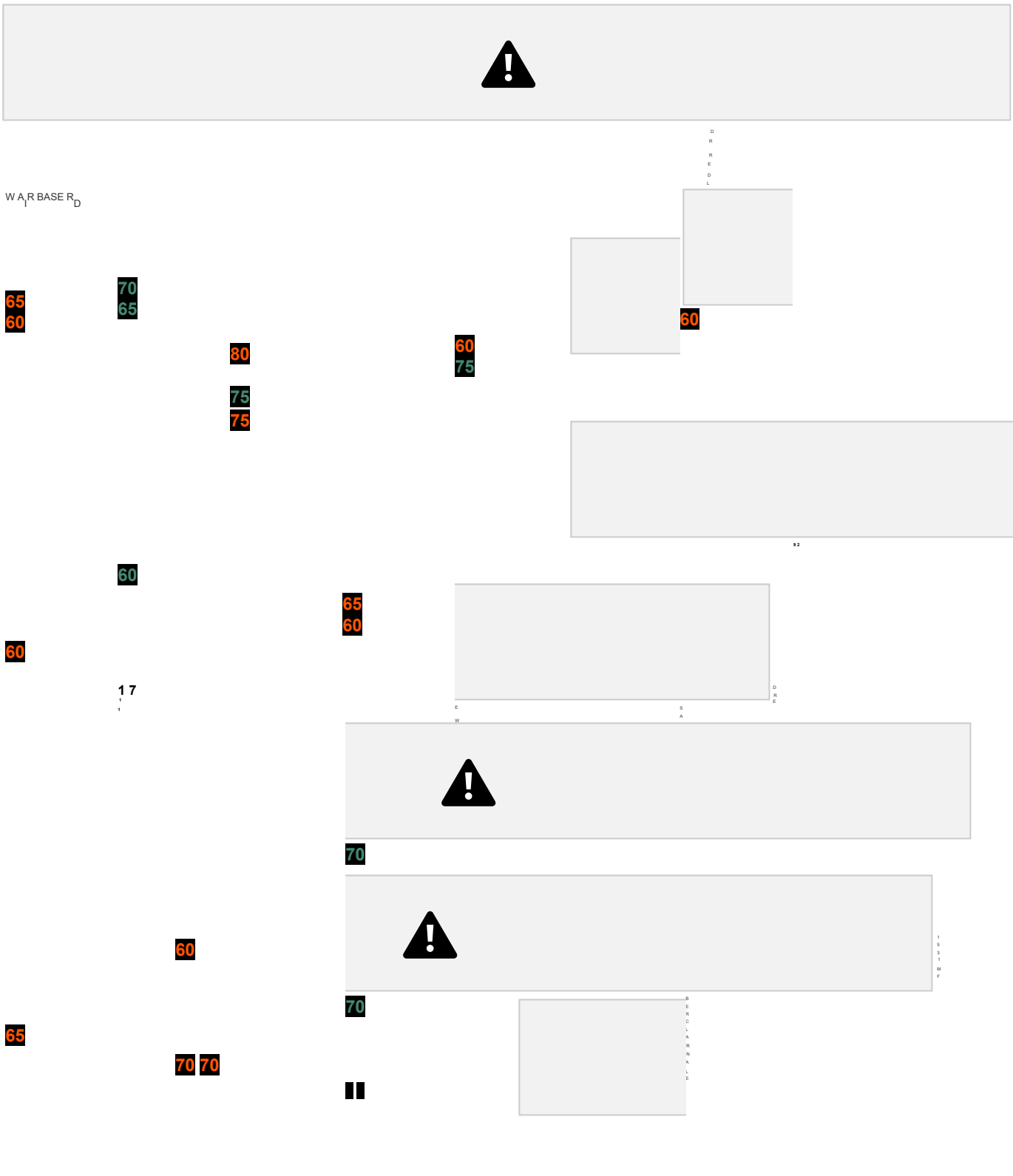
Table 4-1 compares the total land area within NOLF Goliad's 2014 and 2009 AICUZ noise zones. Because the 2014 AICUZ noise contours have decreased in size and extent, the total land area of the 2014 AICUZ noise contours is less than the total area of the 2009 AICUZ noise contours.

Table 4-1: Land Area within 2009 and 2014 Noise Contours, NOLF Goliad

APZs	2009 AICUZ Noise Contours (acres)	2014 AICUZ Noise Contours (acres)
60-65 dB DNL	1,194	687
65-70 dB DNL	578	354

70-75 dB DNL	246	189
75+	89	43
Total Area	**2,107**	**1,273**

Sources: BRRC 2013; Wyle Laboratories, Inc. 2008.



Legend Figure 4-3

Comparison of the 2009 and 2014 AICUZ Noise Contours NOLF Goliad
Goliad County, Texas

SCALE

0 0.25 0.5 Miles

2011; USDA NAIP 2012; BRRC 2013; Wyle 2008.

2009 AICUZ Noise Contour (dB DNL)

2014 AICUZ Noise Contour (dB DNL) 60 dB

65 dB

70 dB

75 dB

Major Road

Street

Airfield Pavement NOLF Goliad

SOURCE: ESRI 2012; NAVFAC SE GRC

4.4 Noise Abatement and Noise Complaints

Aircraft noise from operations at NOLF Goliad may impact off-station areas, with areas in proximity to the airfield experiencing greater impacts. NAS Corpus Christi is aware of land uses surrounding NOLF Goliad and makes every effort to reduce impacts to noise-sensitive areas; however, given the training requirements and high level of activity at the airfield, residents may occasionally file noise complaints. NAS Corpus Christi has instituted noise abatement procedures to minimize noise in recognition of community response to aircraft noise at NOLF Goliad.

4.4.1 Noise Abatement

NAS Corpus Christi actively pursues operational measures to minimize aircraft noise at NOLF Goliad. Noise abatement procedures at NOLF Goliad are implemented under the NAS Corpus Christi Air Operations Manual. The Air Operations Officer is responsible for addressing aircraft noise complaints and communicating complaints to the ICO.

The Navy cannot alter critical portions of flight patterns to accommodate noise complaints without increasing safety risks; however, other measures are currently implemented to reduce off-station noise impacts. The primary noise abatement procedure at NOLF Goliad is for pilots to avoid flying directly over the cities of Berclair and Goliad.

4.4.2 Noise Complaints

The origin and nature of noise complaints within the geographic region is

often a tangible barometer of the success or failure of noise abatement procedures. Complaints can arise outside the areas depicted by noise contours. This is frequently due to a single event that is unusual, such as aircraft flying over an area not commonly overflown or new aircraft operating in a region. In general, an individual's response to noise levels varies and is influenced by factors, including:

- The activity the individual is engaged in at the time of the noise event;
- The individual's general sensitivity to noise;
- The time of day or night;
- The length of time an individual is exposed to noise;
- The predictability of noise; and
- Weather conditions.

Land use recommendations are based on average annoyance responses of a population, but some people have greater noise sensitivity than others. A small increase in noise level generally will not be notable, but as the change in noise level increases, individual perception is greater, as shown in Table 4-2.

Table 4-2: Subjective Response to Noise

1 decibel	Requires close attention to notice
3 decibels	Barely noticeable
5 decibels	Quite noticeable
10 decibels	Dramatic – twice or half as loud
20 decibels	Striking – fourfold change

The Air Operations Officer at NAS Corpus Christi is responsible for addressing aircraft noise complaints. The Aircraft Operations Duty Officer/Flight Planning Supervisor is charged with identifying the source of the noise complaint and delivering the findings to the Air Operations Officer. In the event that TRAWING FOUR is the source of the noise complaint, the Commander of the WING will be notified. The Public Affairs Officer (PAO) will provide a public

notice for events or training activities that are expected to generate unusual or unexpected noise.

Noise complaints associated with NOLF Goliad can be received by either letter or telephone. Citizens are encouraged to contact the NAS Corpus Christi noise complaint phone line to officially log complaints related to aircraft noise near NOLF Goliad. Information regarding the noise complaint phone line is provided on the NAS Corpus Christi website at: http://www.cnic.navy.mil/regions/cnrse/installations/nas_corpus_christi.html.

Accident Potential

Safety is paramount to the Navy, and airfield safety is a shared responsibility between the Navy and the surrounding communities, with each playing a vital role in its success. As development increases near an airfield, more people may be exposed to accident potential associated with aircraft operations. Identifying safety issues and areas of accident potential can assist the community in land use compatibility planning for airfield operations. Cooperation between the Navy and the community results in strategic and effective land use planning and development around naval airfields.

The Navy establishes APZs based on historic data for aircraft mishaps near airfields. APZs provide a means for the Navy to define their impact areas within local communities by mapping accident potential areas, and ultimately allowing the military to identify and assess land use compatibility. This AICUZ Study presents the 2014 APZs for NOLF Goliad.

5.1 Flight Safety

While the likelihood of an aircraft mishap is remote, mishaps can still occur. Flight safety includes measures to ensure both pilot safety during aircraft operations and the safety of those in the community who live and work in the vicinity of an air station or airfield.

Aviation safety programs set forth policies and measures to prevent damage or injuries by controlling or eliminating the cause of hazards. The basic elements of flight safety include hazard identification, risk management, and education and awareness. The FAA and the military define flight safety zones (imaginary surfaces) below aircraft arrival and departure flight tracks around the airfield to restrict obstructions of navigable airspace. The flight safety zones are designed to reduce the hazards that can cause an aircraft mishap.

5.1.1 Imaginary Surfaces

The Navy, the FAA, and federal aviation regulations identify a complex series of imaginary planes and transition surfaces that define the airspace that needs to remain free of obstructions to ensure safe flight approaches, departures, and pattern operations. Obstructions include natural terrain and manmade features such as buildings, towers, poles, wind turbines, railroads, and other vertical obstructions to airspace navigation.

In general, aboveground structures are not permitted in the primary surface of Clear Zones, and height restrictions apply to transitional surfaces and approach and departure surfaces. These height restrictions are more stringent when approaching the runway.

Fixed-wing runways and rotary-wing runways/helipads have different imaginary surfaces. All runways at NOLF Goliad are classified as Class B (fixed wing) runways, and the imaginary surfaces Class B runways are illustrated on Figure 5-1 and brief discussions are provided in Table 5-1.

Figure 5-1: Imaginary Surfaces and Transition Planes for Class B Fixed-Wing Runways

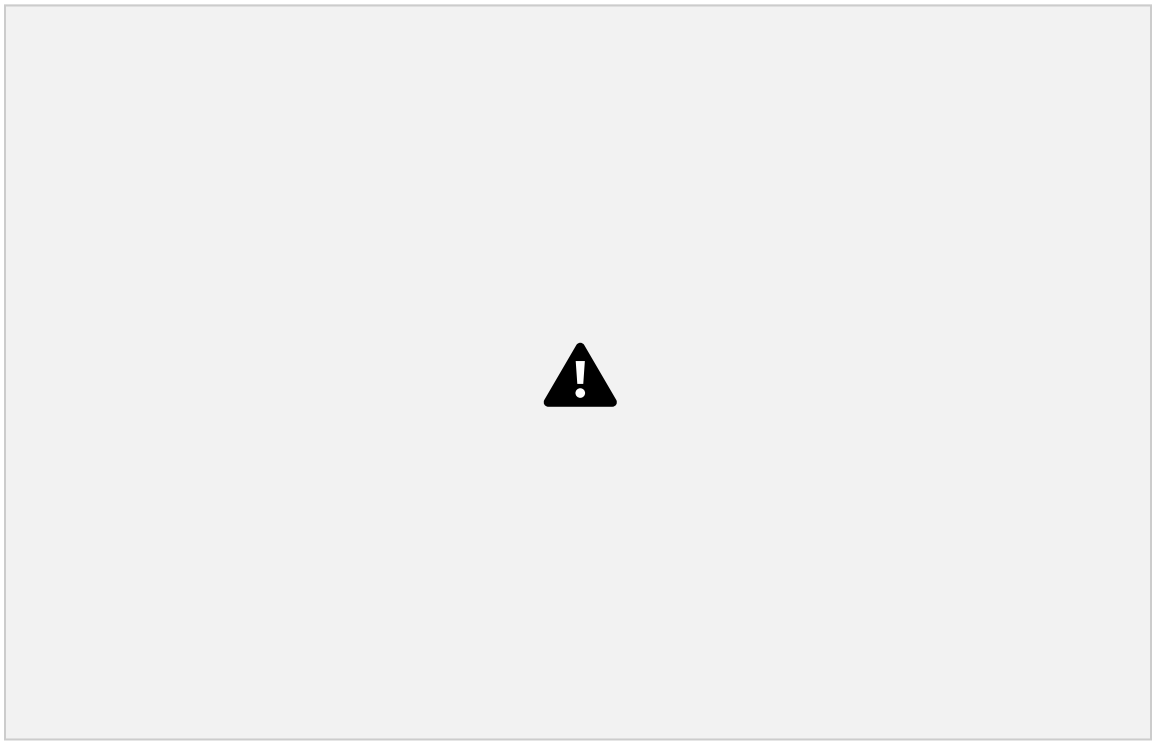


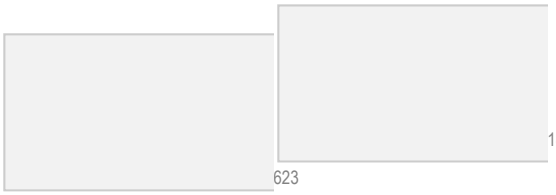
Table 5-1: Description of Imaginary Surfaces for Class B Runways

Primary Surface	Surface area centered lengthwise on runway and extending 200 feet beyond either end of the runway. The width is 1,500 feet.
Clear Zone Surface	Areas beginning at the end of the runway and extending 3,000 feet beyond the end of the runway; 1,500 feet wide and flaring out to 2,284 feet wide.
Approach-Departure Clearance Surface	An inclined or combination inclined and horizontal plane, symmetrical about the runway centerline. The slope of the surface is 50:1 until an elevation of 500 feet and continues horizontally 50,000 feet from the beginning. The outer width is 16,000 feet.

Inner Horizontal Surface	An oval-shaped plane 150 feet above the established airfield elevation. Constructed by scribing an arc with a radius of 7,500 feet around the centerline of the runway.
Outer Horizontal Surface	A horizontal plane located 500 feet above the established airfield elevation, extending outward from the conical surface for 30,000 feet.
Conical Surface	An inclined plane extending from the inner horizontal surface outward and upward at a 20:1 slope and extending for 7,000 feet and to a height of 500 feet above the established airfield elevation.
Transitional Surface	An inclined plane that connects the primary surface and the approach-departure clearance surface to the inner horizontal surface, conical surface, and outer horizontal surface. These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7:1 from the sides of the primary surface and from the sides of the approach surfaces.

Source: Adapted from DOD Unified Facilities Criteria 3-260-01.

Imaginary surfaces are applied to each runway; thus, imaginary surfaces are applied to both of the runways at NOLF Goliad. Imaginary surfaces at NOLF Goliad are depicted on Figure 5-2. The figure shows the imaginary surfaces for the airfield's individual runways, as well as the airfield's composite of imaginary surfaces and transition planes.



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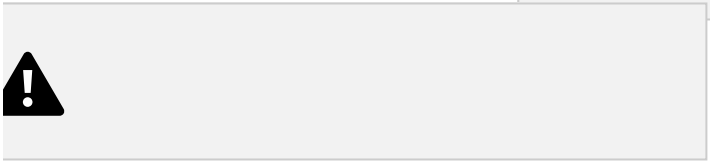

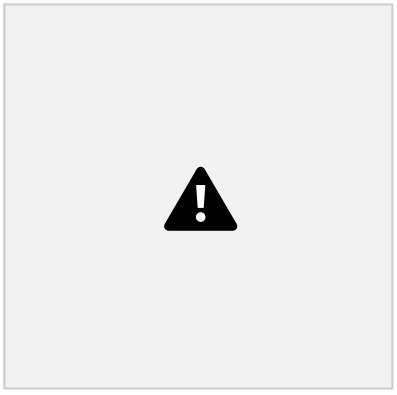

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516

3355 888

351 799

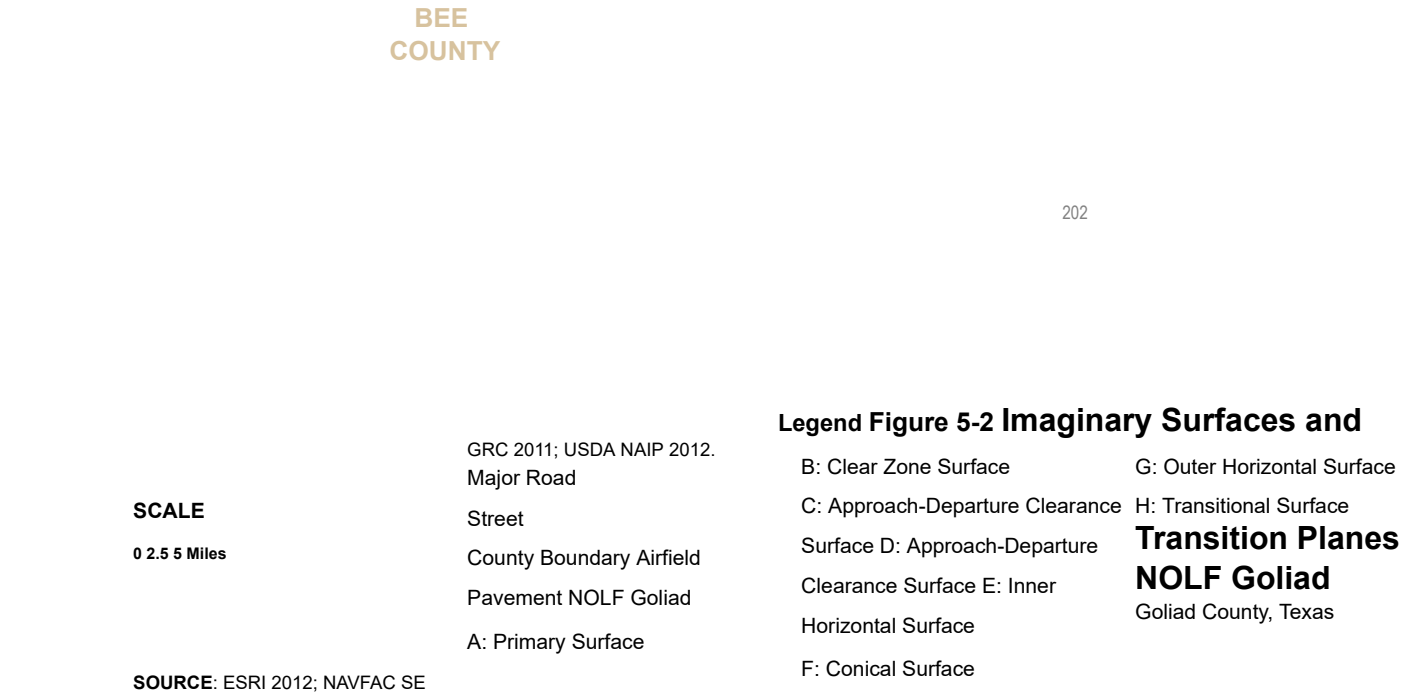


Figure 5-2 Imaginary Surfaces and Transition Planes NOLF Goliad
Goliad County, Texas

5.2 Flight Hazards

Flight hazards around an airfield can obstruct or interfere with aircraft arrivals and departures, pilot vision, communications, or aircraft electronics. Evaluating and addressing the causes of flight hazards before mishaps occur will help eliminate these sources prevent future mishaps.

5.2.1 Bird/Animal Aircraft Strike Hazard (BASH)

Wildlife can represent a significant hazard to flight operations. Birds, in particular, are drawn to different habitat types found in the airfield environment, including hedges, grass, brush, forest, water, and even the warm pavement of the runways.

Most collisions with wildlife occur when the aircraft is at an elevation of less than 1,000 feet, and due to the speed of the aircraft, these collisions can

happen with considerable force. Although most bird/animal aircraft strikes do not result in a total loss of aircraft, they can cause structural and mechanical damage to aircraft, as well as loss of flight time.

To reduce the potential of a bird/animal aircraft strike hazard (BASH), the FAA and the military recommend that land uses that attract birds be located at least 5 miles from the airfield's most active movement areas. These land uses include transfer stations, landfills, golf courses, wetlands, stormwater ponds, and dredge disposal sites.

NOLF Goliad is located along the central flyway, thereby increasing the threat of bird-aircraft strike during bird migration season. Various hydrological features and agriculture lands that may attract avian species surround the airfield. A manmade pond with a 50-foot buffer of vegetation is located in the center of airfield between the runways. The pond and vegetation provide substrate for nesting, roosting, and foraging, thus attracting birds and creating severe BASH conditions for flight approaches. Wetlands on the property and the creeks (Live Oak Creek and Millers Creek) bordering the northern and southern ends of the airfield provide water sources for migratory and nesting species. Crops grown on

surrounding properties are a favorable food source for wildlife and birds and raise the potential for BASH occurrences.

NAS Corpus Christi has a full-time BASH Coordinator to develop management guidelines and determine actions to reduce bird densities at their airfields, including NOLF Goliad. BASH management strategies focus on reducing favorable habitat and initiating bird avoidance behavior from specified areas. Flight operations are scheduled and adjusted to avoid known bird migration patterns and reduce the potential for bird/animal aircraft strikes. The BASH Coordinator also conducts public outreach to the local community to promote public awareness of BASH concerns.

5.2.2 Electromagnetic Interference

EMI is defined by the American National Standards Institute as any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment (American National Standards Institute 1992). EMI may be caused by atmospheric

phenomena, such as lightning or precipitation static, and by non telecommunications equipment, such as vehicles and industrial machinery. New generations of military aircraft are highly dependent on complex electronic systems for navigation and critical flight and mission-related functions. Consequently, care should be taken in siting any activities that create EMI. Electronic devices, such as cell phones, FM radios, television reception, and garage door openers, can also generate EMI. Many of these sources are low-level emitters of EMI; however, when multiple sources are combined, they have an additive quality.

5.2.3 Lighting

Bright lights, either direct or reflected, in the airfield vicinity can impair a pilot's vision, especially at night. A sudden flash from a bright light causes a spot or "halo" to remain at the center of the visual field for a few seconds or more, rendering a person virtually blind to all other visual input. This is particularly dangerous at night when the flash can diminish the eye's adaption to

darkness. Partial recovery of this adaptation is usually achieved in minutes, but full adaptation typically requires 40 to 45 minutes.

5.2.4 Smoke, Dust, and Steam

NOLF Goliad is located adjacent to an industrial plant and near agriculture and ranch lands. Industrial or agricultural sources of smoke, dust, or steam in the airfield vicinity can obstruct the pilot's vision during takeoff, landing, or other periods of low-altitude flight.

5.2.5 Wind Farms

While no wind farms are currently located or proposed near NOLF Goliad, Texas is ranked first in the United States for wind resources and leads the nation in wind energy development, with over 12,000 megawatts installed (American Wind Energy Association 2014). Wind turbines may restrict training operations, reduce the quality of training, and compromise pilot safety if sited near military airfields and in the direct course of low-level training routes. Wind turbines may significantly impact the effectiveness of military air defense radar systems, navigation systems, weather radar systems, and ATC radar systems, while compromising security, aviation safety, and military readiness. Factors

contributing to radar interference include the radar cross-section of a wind turbine, the number of turbines and their configuration, and Doppler-shift.

5.3 Aircraft Mishaps

The Navy categorizes aircraft mishaps into one of three classes based on the severity of the injury to individuals involved and the total property damage: Class A (most severe mishap classification); Class B; or Class C (least severe mishap classification). Table 5-2 summarizes the Navy classifications. To date, no aircraft mishaps have been recorded or reported at NOLF Goliad since the Navy reacquired the airfield in 2011.

C	$50,000 or more, but less than $500,000

Source: Naval Safety Center 2014.

5.4 Accident Potential Zones

In the 1970s and 1980s, military services conducted various accident hazard studies based on historical ta in order to support APZs at airfields. The studies aircraft mishaps occur on or near the runway, diminishing in likelihood with distance from the runway. Further analysis was initiated to identify patterns of accident occurrence and to define specific zones that exhibit the highest concentration of accidents within the smallest area.

Table 5-2: Naval Aircraft Mishap Classification

A	$2,000,000 or aircraft destro
B	$500,000 or m than $2,000,0

Based on these studies, the DOD has identified three accident potential areas—Clear Zones, APZ I, and APZ II—as areas where an aircraft accident is most likely to occur if an accident were to take place; however, it should be noted that APZs are not a prediction of accidents or accident frequency.

APZs are, in part, based on the number of operations conducted at an airfield and, more specifically, the number of operations conducted on specific flight tracks.

APZs are modeled for flight tracks with at least 5,000 annual fixed wing operations, departures or approaches, but not both combined.

The DOD uses two classes of fixed-wing runways (Class A and Class B) to define APZs. Class A runways are primarily used by light aircraft and do not have the potential for intensive use by heavy or high-performance aircraft. Class B runways are all other fixed-wing runways. As stated previously, all runways at NOLF Goliad are classified as Class B runways.

The components of standard APZs for Class B runways are identified in Figure 5-3 and are defined in the AICUZ Instruction as follows:

- **Clear Zone:** The Clear Zone is a trapezoidal area lying immediately beyond the end of the runway and outward along the extended runway centerline for a distance of 3,000 feet. The Clear Zone measures 1,500 feet in width at the runway threshold and 2,284 feet in width at the outer edge. A Clear Zone is required for all active runways and should remain undeveloped.

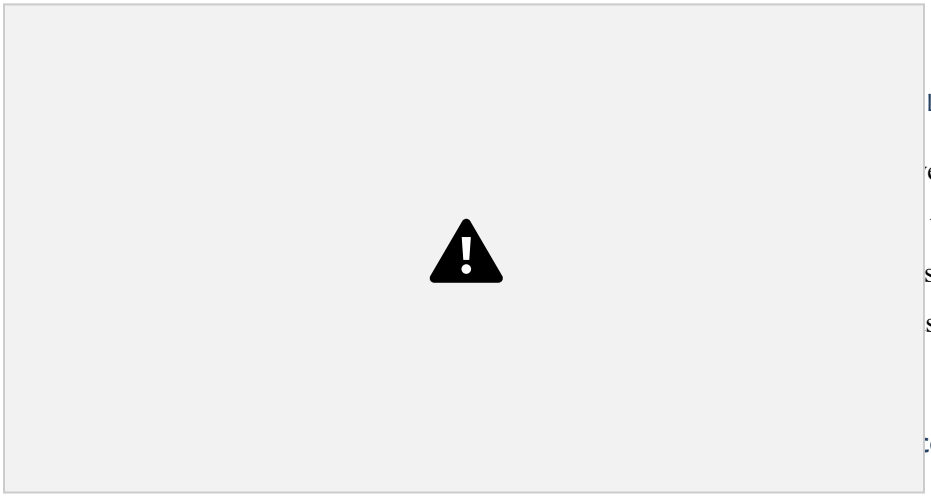
- **APZ I:** APZ I is the rectangular area beyond the Clear Zone. APZ I is provided under flight tracks that experience 5,000 or more annual operations (departures or approaches, but not both combined). APZ I is typically 3,000 feet in width and 5,000 feet in length and may be rectangular or curved to conform to the shape of the predominant flight track.

- **APZ II:** APZ II is the rectangular area beyond APZ I. APZ II is typically 3,000 feet in width by 7,000 feet in length and, as with APZ I, may be curved to correspond with the predominant flight track. When Field Carrier Landing Practices (FCLPs) are an active aspect of aircraft operations at an airfield, APZ II extends the entire FCLP track beyond APZ I, creating a closed-loop configuration.

APZs follow departure, arrival, and pattern flight tracks. APZs extend from the end of the runway, but apply to the predominant arrival and departure flight tracks used

by the aircraft. Therefore, if an airfield has more than one predominant flight track to or from the runway, APZs can extend in the direction of each flight track, as shown on Figure 5-3.

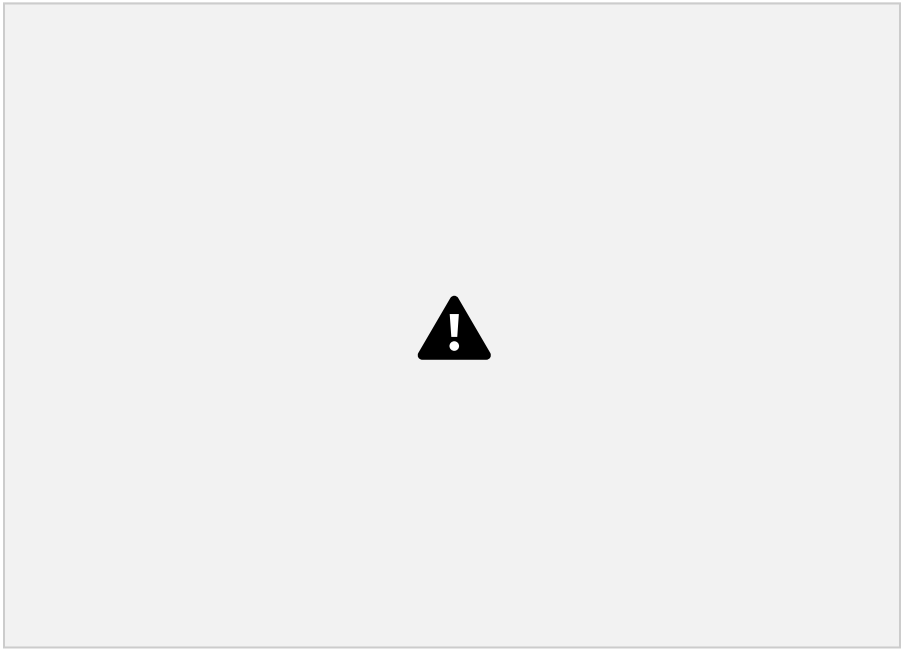
Within the Clear Zone, most uses are incompatible with military flight operations. For this reason, the Navy's policy, where possible, is to acquire real property interests in land within the Clear Zone to ensure incompatible development does not occur. Within APZ I and APZ II, a variety of land uses are



LF Goliad

e uses (e.g., schools, apartments, churches, the greater safety risk in these areas. Land sing incompatibility issues within APZs for ssed in Chapter 6, "Land Use Compatibility

cident Potential Zones



5.4.1 NOLF Goliad 2014 AICUZ APZs

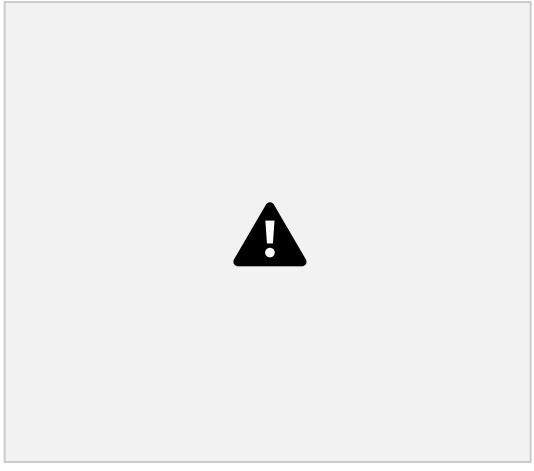
The 2014 AICUZ APZs for NOLF Goliad represent a reasonable

reflection of the training mission at NOLF Goliad, as well as dominant flight tracks currently flown (refer to Figures 3-1 through 3-4).

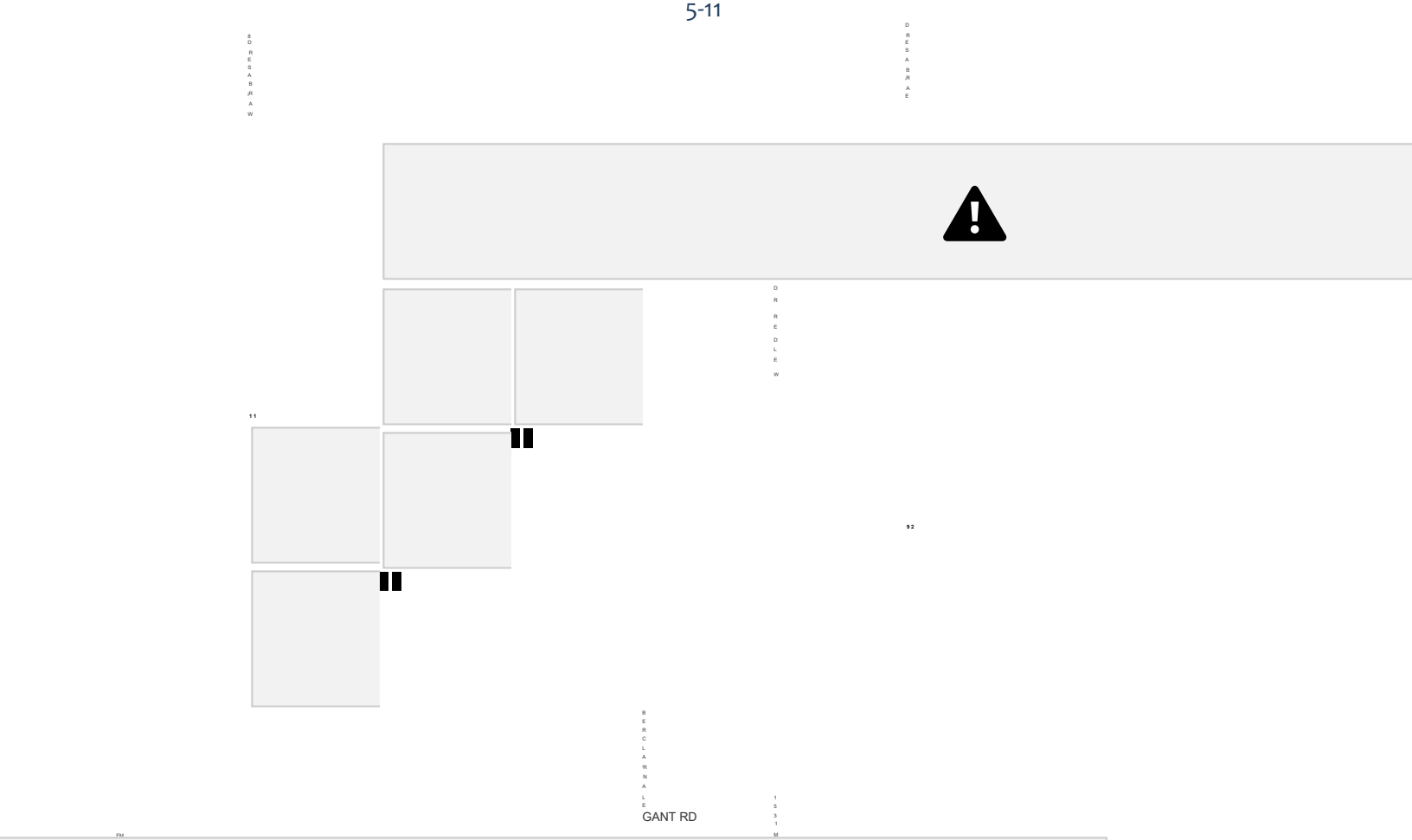
The 2014 NOLF Goliad APZ footprint was enlarged from the minimum APZ geometry and standards in the AICUZ Instruction to better reflect the airfield's training mission. APZs are typically modeled for flight tracks with at least 5,000 annual operations. Due to the SNA training environment at NOLF Goliad, APZs were maintained for flight tracks with annual operations slightly below the operational threshold (5,000 annual operations). For example, the annual operations for departures on Runways 17 and 11 and touch-and-go patterns on Runway 35 (right and left) were slightly below the threshold, but were included as part of the 2014 AICUZ APZs.

APZs were modeled for departures on Runways 17 and 11 and touch and-go operations were modeled for departures on Runways 17, 11, and 35. The APZs for touch-and-go operations on Runways 11, 17, and 35 are closed, which is typical for FCLPs. Although pilots do not conduct FCLPs at NOLF Goliad, the total length dimensions of Clear Zones, APZ I, and APZ II, as provided in the AICUZ Instruction (15,000 feet), is greater than the length of the track between the runways; therefore, the APZs form a closed-loop configuration. The extended flight tracks for these touch-and-go patterns create the open-ended "hooks" at the south ends of the runways. All closed-pattern operations at NOLF Goliad are 50 percent left-hand and 50 percent right-hand turns on each runway, which provides the closed APZs on both sides of the runways for inboard and outboard patterns.

Figure 5-4: Clear Zones for Airfields with Converging Runways



The Clear Zones for Runways 17 and 11 overlap due to the converging runways. Because of this overlap, the individual Clear Zones for each runway pair appear to be one Clear Zone. Figure 5-4 illustrates overlapping Clear Zones. Figure 5-5 illustrates the 2014 AICUZ APZs generated for NOLF Goliad.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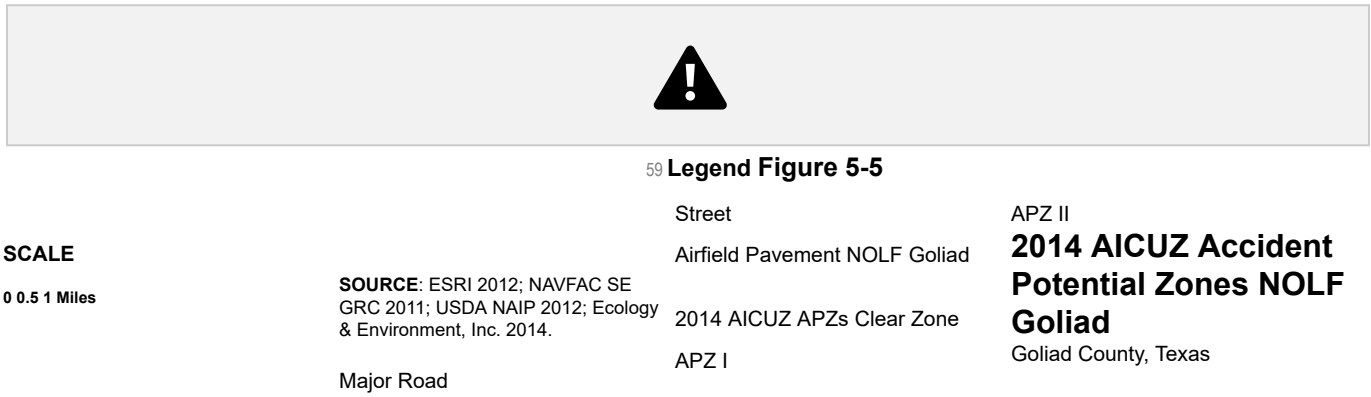


5.4.2 Comparison of the NOLF Goliad 2009 and 2014 APZs

The 2014 AICUZ APZs for NOLF Goliad were developed to reflect the changes in runway use, annual operations, and flight tracks since the 2009 AICUZ Study. New APZs are warranted for departures on Runway 11 and touch and-go operations on Runways 11 and 35. Figure 5-6 compares the 2009 AICUZ APZs with the 2014 AICUZ APZs.

The difference in the 2009 and 2014 AICUZ APZs is attributed to changes in flight patterns to include both left- and right-hand turns for touch-and go patterns and the addition of extended flight tracks. Additionally, the 2014 APZs represent a shift in runway utilization. The 2009 APZs reflect a greater use of Runway 17 (78 percent), while the majority of annual operations for the 2014 APZs is distributed on Runways 17 (40 percent) and 11 (40 percent).

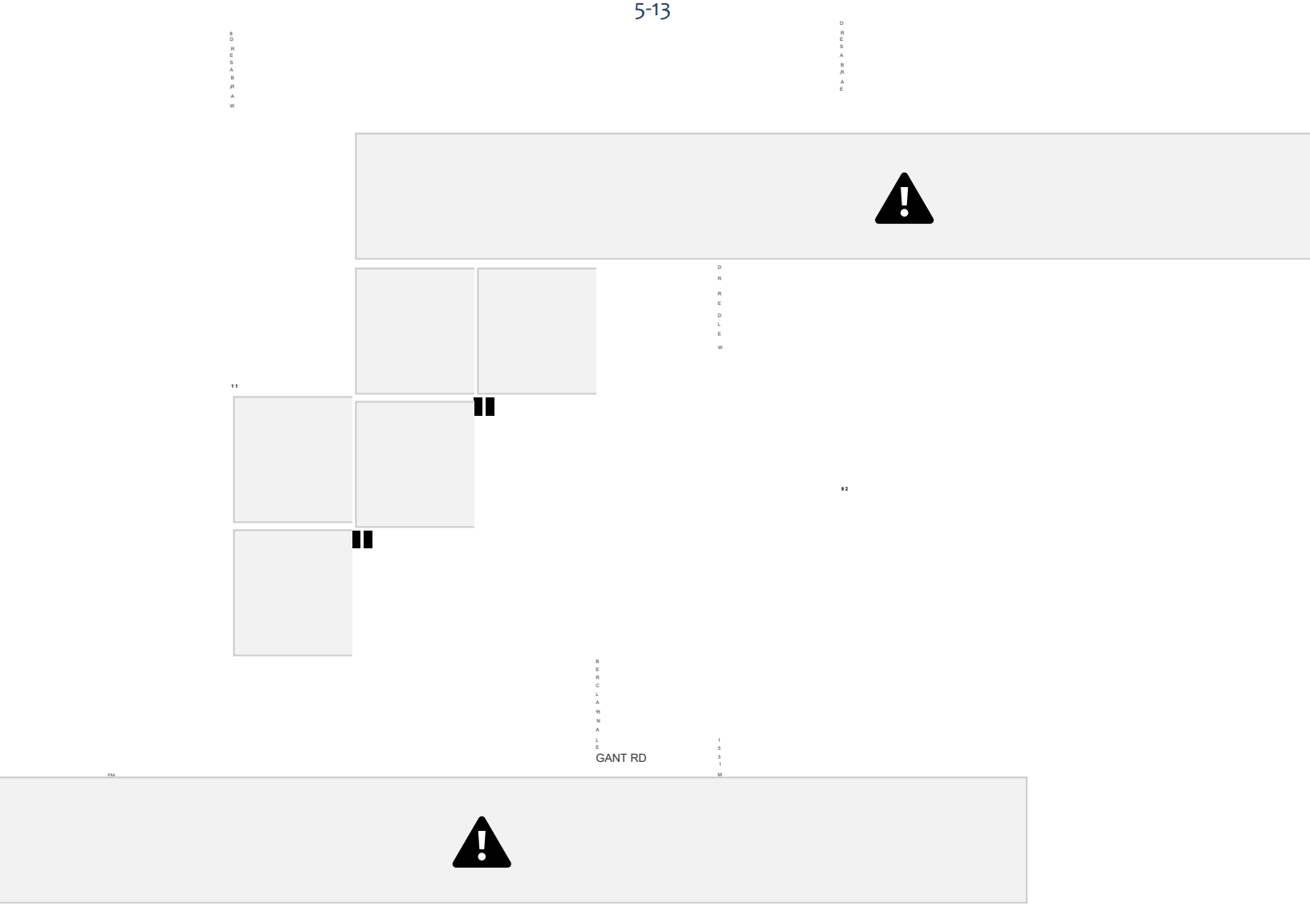
As shown in Table 5-3, the land area within APZs I and II for 2014 has increased significantly in comparison to the 2009 AICUZ Study. The larger 2014 APZ footprint is due to application of APZs for all runways. The land area within the 2014 Clear Zones has decreased in comparison to the 2009 Clear Zones. The difference in the Clear Zone areas is due to the different guidelines used to develop the Clear Zones for each study. The 2009 Clear Zones were based on the 2008 Unified Facilities Criteria 3-260-01 guidelines for Class B runways, which require 2,000-foot-wide Clear Zones flaring out to 2,840 feet. The 2014 Clear Zones were based on the 2008 AICUZ Instruction guidelines for Class B runways, which require 1,500-foot-wide Clear Zones flaring out to 2,284 feet.

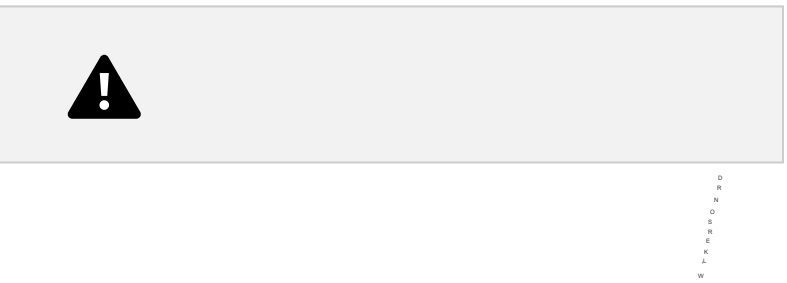
Table 5-3: Land Area within 2009 and 2014 Accident Potential Zones, NOLF Goliad

APZs	2009 AICUZ APZs (acres)	2014 AICUZ APZs (acres)

Clear Zones	489	417
APZ I	1,673	3,910
APZ II	1,094	4,259
Total Area	**3,256**	**8,586**

Sources: Ecology and Environment, Inc. 2009 and 2014.





SOURCE: ESRI 2014; NAVFAC SE GRC 2011; USDA NAIP 2012; Ecology & Environment, Inc. 2009, 2014.

NOLF Goliad
APZ II
APZ II