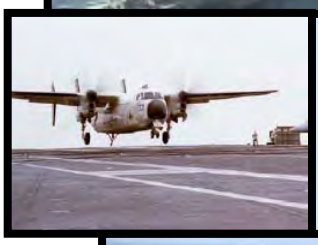
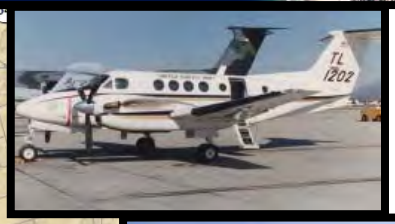
Air Installation Compatible Use Zones (AICUZ) Update





Naval Air Station North Island and Naval Outlying Landing Field Imperial Beach, California

2011

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AICUZ Study Update for

Naval Air Station North Island and Naval Outlying Landing Field Imperial Beach, California

Final Submission

2011

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The AICUZ Program

The primary goal of the Department of Defense's (DOD) Air Installations Compatible Use Zones (AICUZ) Program is to protect the health, safety, and welfare of those living on and near a military airfield while preserving the operational capability of the airfield. This AICUZ study update includes Naval Air Station (NAS) North Island and its Naval Outlying Landing Field (NOLF) Imperial Beach in San Diego County, California. These two airfields are part of the Naval Base Coronado (NBC) installation. The last AICUZ studies were prepared for NAS North Island in 1984 and for NOLF Imperial Beach in 1989. This study updates the AICUZ studies for these two airfields. By the mid-to-late 1980s, when the last AICUZ studies were prepared, the off-base areas in these airfields' environs were essentially fully developed and remain so today.

During the intervening quarter century since the previous AICUZ studies were published, numerous changes have occurred in aircraft platforms flown in the Navy, the science of noise modeling has advanced, and noise models used by DOD have improved. This update reflects the phase-out of numerous platforms from the Navy inventory, the introduction of operations of the H-60 aircraft, and potential future implications of updates in transient aircraft operations at NAS North Island. These changes are reflected in the updated noise contours and Accident Potential Zones (APZs) included in this study.

Installation, Mission, and Operations

NAS North Island is the anchor base of Naval Base Coronado and is home to Commander, Naval Air Forces (CNAF), who is responsible for equipping and training all naval aviation units in the U.S. Navy. NAS North Island is the homeport for three nuclear powered aircraft carriers, the USS NIMITZ (CVN 68), the USS RONALD REAGAN (CVN 76), and the USS CARL VINSON (CVN 70). Numerous aviation units and aircraft are assigned to NAS North Island. NOLF Imperial Beach is the site of much of the Navy's West Coast helicopter training. Helicopters stationed at NAS North Island routinely fly to NOLF Imperial Beach to conduct training and practice.

A diverse set of missions are flown by stationed and transient aircraft at NAS North Island and NOLF Imperial Beach. Aircraft operations involving deployment to and from ships, post-Naval Aviation Depot (NADEP) maintenance check flights, fleet replacement training, operational support flights, transient operations, and pilot currency are routinely flown in the area.

Noise

There were interim noise studies prepared in 1996 and 1997 for NAS North Island. These studies indicated that fixed-wing based and transient jet aircraft were the dominant factors in the CNEL contours reflected in these studies.

Two scenarios were used for modeling the Community Noise Equivalent Level (CNEL) contours for NAS North Island in this AICUZ update, a baseline and prospective future scenario. The baseline scenario uses a 7-year average (Calendar year [CY] 2003 through CY 2009) of the total flight operations for NAS North Island to model the baseline noise contours. A prospective (circa CY2020) scenario is also included and is the basis for the updated AICUZ footprint. The prospective future conditions for NAS North Island reflect the transition of the S-3 and H-46 out of the Navy inventory; a proposed future Helicopter Wings Realignment and MH-60R/S helicopter transition; the future transition in transient platforms supported by NAS North Island (i.e. EA-6B to the EA-18G); the future transition of the P-3C to the new P-8A, as well as the potential implications at NAS North Island of the homeporting of a 3rd carrier. This study also takes into account potential transient operations at NAS North Island of the F-35

Lightning II (also called the Joint Strike Fighter) after its introduction into the Navy inventory on the West Coast. The updated AICUZ for NAS North Island based on this prospective scenario is shown in Figure ES-1.

Similarly, two scenarios were used for modeling the CNEL contours for NOLF Imperial Beach, a baseline and prospective future scenario. The baseline scenario uses a 7-year average (CY 2003 through CY 2009) of the total flight operations for NOLF Imperial Beach to model noise the baseline noise contours. The prospective future conditions (circa 2020) at NOLF Imperial Beach include increased helicopter operations that would result from the proposed Helicopter Wings Realignment and MH-60R/S helicopter transition. The prospective CNEL contours at NOLF Imperial Beach reflect a slight increase in the baseline CNEL contours. While increases in operations at NOLF Imperial Beach can be perceived as a change in single event overflights by some listeners, the updated noise contours are smaller than those modeled in the current 1989 AICUZ.

Safety

The AICUZ study also depicts APZs for the runways at NAS North Island and NOLF Imperial Beach as generated by the operational levels used in noise modeling. The APZs remain the same in all scenarios. All active runways have Clear Zones (CZs) per Navy criteria. At NAS North Island, APZs I and II are shown at the approach end of Runway 29. Although Runway 18 departures would appear to require an APZ, this area would be completely over water, and current Navy policy does not designate APZs over water areas. Analysis of the intensity of operations indicates that operational levels at other runways at NAS North Island would not have APZs.

The study also depicts the CZs and APZs for operations at NOLF Imperial Beach. CZ and APZ I are reflected for Helipads 1 through 5 at the airfield. Due to the intensity of operations in the traffic pattern and the nature of pattern operations, including flight with external loads, an oval area shadowing the traffic pattern is also designated as APZ I. In addition, the number of operations completed to Runway 27, including instrument approaches and autorotations, suggests additional protection would be required. Therefore, a helicopter CZ and APZ I are established at both ends of Runway 27.

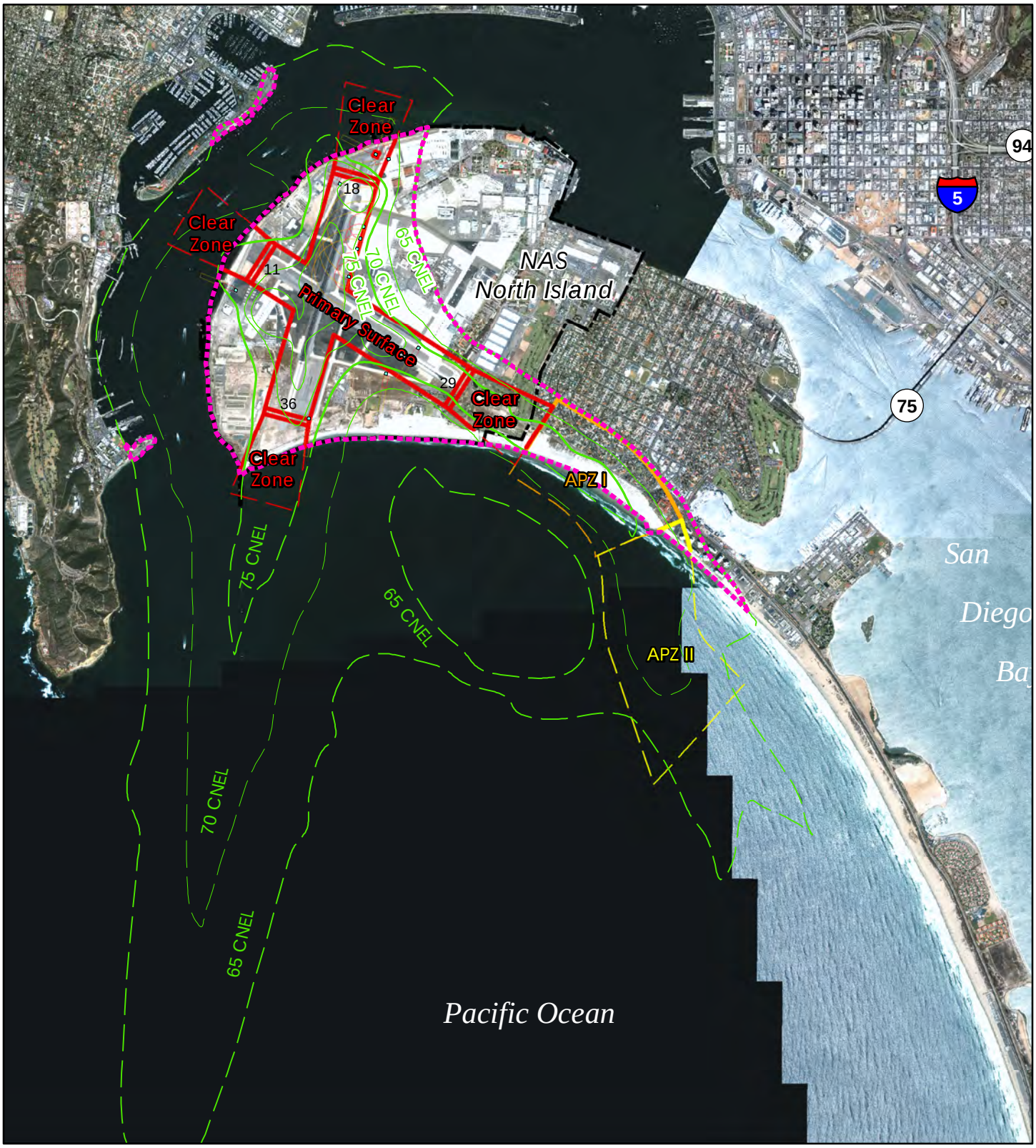
Land Use Compatibility Analysis

NAS North Island

The AICUZ area covers NAS North Island, a portion of the City of Coronado, and two small areas along the waterfront of Point Loma as shown in Figure ES-1. A portion of the CZ falls beyond the station's boundary over a small portion of Coronado. The affected areas include Sunset City Park and approximately 30 single-family residential parcels in the area to the north. This situation has existed since before the 1984 AICUZ study. The APZ I for Runway 29 is over some existing developed areas, and oceanfront recreation areas in the City of Coronado. In the City of Coronado, the 65-75 CNEL contours overlie existing residential, commercial, retail, theater, restaurant, bank, and hotel land uses. These uses have existed for many years. Height limit controls, building code sound insulation standards, and fair disclosure provisions exist throughout the AICUZ area in different forms.

NOLF Imperial Beach

Figure ES-2 shows the AICUZ area for NOLF Imperial Beach. The 65 CNEL noise contour, CZ, and APZ are largely contained within federal property. Height limit controls, building code sound insulation standards, and fair disclosure provisions exist throughout the AICUZ area in different forms.



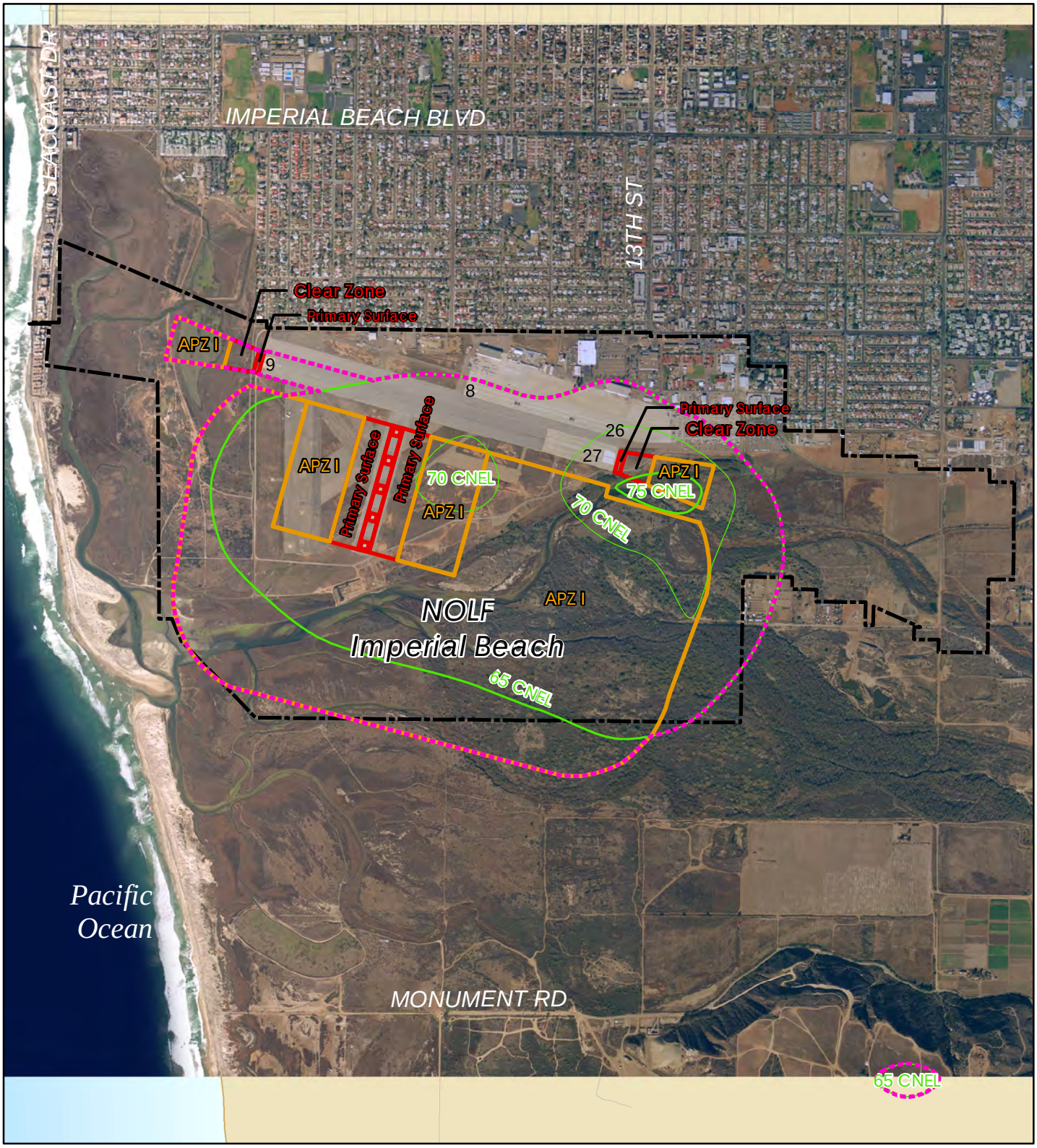
CNEL Over Land
CNEL Over Water
AICUZ Footprint Outline
Installation Boundary
APZ I Over Land
APZ I Over Water
APZ II Over Land
APZ II Over Water
Clear Zone Over Land
Clear Zone Over Water
Primary Surface Over Land
Helopad

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

0 4,100 8,200 Feet

Figure ES-1
NAS North Island
Prospective
AICUZ Footprint

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours), NAVFAC SW, 2006 (Aerial), and The Onyx Group (APZs).



CNEL
APZ I
Clear Zone
Primary Surface
Installation Boundary
AICUZ Footprint Outline

Figure ES-2
NOLF Imperial Beach
Prospective
AICUZ Footprint

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination
12° 35' E

0 1,000 2,000
Feet

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours), NAVFAC SW, 2006 (Aerial), and The Onyx Group (APZs).

Recommendations

The following specific recommendations are included as part of this AICUZ program.

Recommendations for The San Diego County Regional Airport Authority (SDCRAA)

It is recommended that the SDCRAA consider this AICUZ update in their deliberations and participate in a Joint Land Use Study (JLUS) with other land management agencies in the vicinity of NAS North Island and NOLF Imperial Beach.

Recommendations for Local Government

The City of Coronado:

It is recommended that the City of Coronado use this AICUZ plan as a guide for the review and update of the community plans and general plans for the City of Coronado and participate in a JLUS with other land management agencies in the vicinity of NAS North Island and NOLF Imperial Beach.

The City of San Diego:

It is recommended that the City of San Diego use this AICUZ plan as a guide for the review and update of the community plans and general plans for the City of San Diego and participate in a JLUS with other land management agencies in the vicinity of NAS North Island and NOLF Imperial Beach.

While it is noted that height controls for areas surrounding NAS North Island and NOLF Imperial Beach currently exist from various other regulations, they are not contained in the City zoning regulations as are height controls to protect imaginary surfaces for other airports. It is recommended that in future updates the City include imaginary surfaces (Federal Aviation Administration [FAA] Part 77) height control provisions in their zoning code for applicable areas surrounding NAS North Island and NOLF Imperial Beach within the City of San Diego.

The City of Imperial Beach:

It is recommended that the City of Imperial Beach continue cooperation with the Navy regarding land use planning at NOLF Imperial Beach. The City of Imperial Beach has passed a resolution in support of a JLUS with the San Diego County Regional Airport Authority, the DOD, and other land management agencies near NAS North Island and NOLF Imperial Beach.

Recommendations for Naval Base Coronado (NBC)

Continue community coordination efforts regarding AICUZ with affected communities, including participation in the proposed JLUS.

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Executive Summary **ES-1**

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List of Acronyms and Abbreviations

AC ..... Acre
AGL ..... Above Ground Level
AICUZ ..... Air Installations Compatible Use Zones
ALUC ..... Airport Land Use Commission
ALUCP ..... Airport Land Use Compatibility Plan
ANSI ..... American National Standards Institute
APZ ..... Accident Potential Zone
ASR ..... Airport Surveillance Radar
ASW ..... Anti-submarine Warfare
ATC ..... Air Traffic Control
BASH ..... Bird/Animal Aircraft Strike Hazard
BEQ ..... Bachelor Enlisted Quarters
BHWG ..... Bird Hazard Working Group
BOQ ..... Bachelor Officers' Quarters
BRAC ..... Base Realignment and Closure
CALTRANS ..... California Department of Transportation
CCDC ..... Centre City Development Corporation
CEQA ..... California Environmental Quality Act
CFR ..... Code of Federal Regulations
CNEL ..... Community Noise Equivalent Level
CNO ..... Chief of Naval Operations
COD ..... Carrier On-Board Delivery
COMHELWINGRES ..... Commander, Helicopter Wing Reserve
COMHSMWINGPAC ..... Commander, Maritime Strike Wing, U.S. Pacific Fleet
COMHSCWINGPAC ..... Commander, Helicopter Sea Combat Wing, U.S. Pacific Fleet
COMNAVAIRPAC ..... Commander Naval Air Forces, U.S. Pacific Fleet
CP&LO ..... Community Plans and Liaison Officer
CSAR ..... Combat Search and Rescue
CVN ..... Nuclear Powered Aircraft Carrier
CY ..... Calendar Year
CZ ..... Clear Zone
dB ..... Decibel
dBA ..... A-weighted Decibels
DDDC ..... Defense Distribution Depot
DEIS ..... Draft Environmental Impact Statement
DME ..... Distance Measuring Equipment
DNL ..... Day-Night Average Sound Level
DOD ..... Department of Defense
DU ..... Dwelling Units
EA ..... Environmental Assessment
EIS ..... Environmental Impact Statement
EMI ..... Electromagnetic Interference
EO ..... Executive Order
FAA ..... Federal Aviation Administration
FAR ..... Floor Area Ratio
FCLP ..... Field Carrier Landing Practice
FL ..... Flight Level
FLIP ..... Flight Information Publication
FODed ..... Foreign Object Damaged
GCA ..... Ground Controlled Approach

List of Acronyms and Abbreviations (Continued)

HC ..... Helicopter Combat Support Squadron
HCS ..... Helicopter Combat Support (Special) Squadron
HERO ..... Hazards of Electromagnetic Radiation to Ordnance
HMMH ..... Harris Miller Miller and Hanson, Inc.
HS ..... Helicopter Anti-Submarine Squadron
HSC ..... Helicopter Sea Combat Squadron
HSL ..... Helicopter Anti-Submarine Light Squadron
HSM ..... Helicopter Maritime Strike Squadron
HUD ..... Department of Housing and Urban Development
IFR ..... Instrument Flight Rules
JLUS ..... Joint Land Use Study
LAMPS ..... Light Airborne Multipurpose System
Ldn ..... Day-Night Average Sound Level (Mathematical Symbol)
L_{max} ..... Maximum Noise Level
MEDEVAC ..... Medical Evacuation
MOA ..... Military Operating Areas
MOU ..... Memorandum of Understanding
MILCON ..... Military Construction
MMH ..... Multi-Mission Helicopter
MSL ..... Mean Sea Level
MWTF ..... Mountain Warfare Training Facility
N/A ..... Not Available
NAVFAC ..... Naval Facilities Engineering Command
NC ..... Compressor Speed
NEPA ..... National Environmental Policy Act
NLR ..... Noise Level Reduction
NM ..... Nautical Mile
NAB ..... Naval Amphibious Base
NADEP ..... Naval Aviation Depot
NALF ..... Naval Auxiliary Landing Field
NAS ..... Naval Air Station
NASNI ..... Naval Air Station North Island
NAVAIR ..... Naval Air Systems Command
NAVSAFCEN ..... Naval Safety Center
NAVSTA ..... Naval Station
NBC ..... Naval Base Coronado
NOLF ..... Naval Outlying Landing Field
NOLFIB ..... Naval Outlying Landing Field Imperial Beach
NRS ..... FAA Identifier for NOLF Imperial Beach
NTC ..... Naval Training Center
NZY ..... FAA Identifier for NAS North Island
ODO ..... Operations Duty Officer
OEA ..... Office of Economic Adjustment
OPNAVINST ..... Chief of Naval Operations Instruction
PAR ..... Precision Approach Radar
PUD ..... Planned Unit Development
PDO ..... Planned District Ordinances
PWC ..... Public Works Center
RAC ..... Raytheon Aircraft Company

List of Acronyms and Abbreviations (Continued)

RPM ..... Revolutions Per Minute
SANDAG ..... San Diego Association of Governments
SAR ..... Search and Rescue
SDCRAA ..... San Diego County Regional Airport Authority
SEALS ..... Sea, Air, Land
SEL ..... Sound Exposure Levels
SERE ..... Survival Evasion Resistance and Escape
SLUCM ..... Standard Land Use Coding Manual
SSTC ..... Silver Strand Training Complex
STC ..... Sound Transmission Class
SUA ..... Special Use Airspace
SWS ..... Special Warfare Support
T&G ..... Touch and Go
TACAN ..... Tactical Air Navigation
TERPS ..... Terminal Instrument Procedures
TRNERR ..... Tijuana River National Estuarine Research Reserve
US ..... United States
UFC ..... Unified Facilities Criteria
USFWS ..... United States Fish and Wildlife Service
USS ..... United States Ship
VFR ..... Visual Flight Rules
VR ..... Visual Route or Fleet Logistics Support Squadron
VERTREP ..... Vertical Replenishment
VMC ..... Visual Meteorological Conditions
VRC ..... Logistics Support Squadron
VS ..... Sea Control Squadron

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1.0 Introduction

The primary goal of the Department of Defense's (DOD) Air Installations Compatible Use Zones (AICUZ) program is to protect the health, safety, and welfare of those living on and near a military airfield while preserving the operational capability of the airfield. The AICUZ program works to meet this goal by recommending compatible land uses to local communities with planning and zoning authority in the airfield environs.

An aircraft carrier in port at NAS North Island with Point Loma in the background.

This AICUZ study update includes Naval Air Station (NAS) North Island and its Naval Outlying Landing Field (NOLF) Imperial Beach in San Diego County, California. These two airfields are part of the Naval Base Coronado (NBC) installation, which encompasses a total of seven military facilities in the San Diego County area. Stretching from San Clemente Island to the Mountain Warfare Training Facility (MWTF) Camp Michael Monsoor, facilities in the NBC installation are Naval Amphibious Base (NAB) Coronado; Silver Strand Training Complex (SSTC); MWTF Camp Michael Monsoor; Remote Training Site Warner Springs (RTSWS); Naval Auxiliary Landing Field (NALF) San Clemente Island; and Camp Morena. NALF San Clemente Island is not included as part of this AICUZ study update. The regional location of NAS North Island and NOLF Imperial Beach, as well as other NBC facilities, is shown in Figure 1-1.

This AICUZ study update provides an analysis of noise and safety impacts based on existing baseline conditions and a prospective future (Calendar year [CY]2020) scenario. The baseline scenario uses a seven year average of the total flight operations for NAS North Island and NOLF Imperial Beach as published in the Air Traffic Activity Reports (ATARs) for CY2003 through CY2009. A Prospective 2020 Scenario is also included and is the basis for the updated AICUZ. The prospective future conditions for NAS North Island reflect the transition of the S-3 and H-46 out of the Navy inventory; a proposed future Helicopter Wings Realignment and MH-60R/S helicopter transition; the future transition in transient platforms supported by NAS North Island (i.e. EA-6B to the EA-18G); the future transition of the P-3C to the new Multi-mission Maritime Aircraft (MMA P-8A), as well as the potential implications at NAS North Island of the homeporting of a 3rd carrier. This study also takes into account potential transient operations at NAS North Island of the F-35 Lightning II (formally called the Joint Strike Fighter) after its introduction into the Navy inventory on the West Coast. The prospective future conditions at NOLF Imperial Beach include increased helicopter operations that would result from the proposed Helicopter Wings Realignment and MH-60R/S helicopter transition. The analysis uses operations, flight tracks, and flight procedure information provided by the Air Operations Department; tenant activities with a flying mission at either NAS North Island or NOLF Imperial Beach; and aircraft maintenance information from the Naval Aviation Depot (NADEP). The analysis also uses land use planning information obtained from the surrounding communities, San Diego County, and population data from the U.S. Census Bureau.

This section of the study provides background on the AICUZ program. Section 2.0 describes the two air installations and aircraft. Section 3.0 discusses aircraft operations at these air installations. Section 4.0 discusses aircraft noise. Section 5.0 discusses aircraft safety issues, including height and obstruction clearance and accident potential zones (APZs). Section 6.0 discusses the updated AICUZ footprints and suggested guidelines for land use compatibility with noise and safety aspects associated with aircraft operations at the installations. Section 7.0 provides AICUZ strategies and recommendations.

Figure 1-1
Regional Location Map

Source: NAVFAC SW, 2006, ESRI, 2006.

0 5 10 20 30 Miles

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

1.1 The AICUZ Program

DOD established the AICUZ Program in the early 1970s. The key to the program's success is found in intergovernmental coordination, which occurs once the reports are published and released to the public. An active local command effort to work with surrounding communities to prevent incompatible development in the vicinity of military airfields is the foundation of the program's success.

The purpose of the AICUZ program is to achieve compatibility between air installations and neighboring communities by:

a. Protecting the health, safety, and welfare of civilians and military personnel by encouraging land use that is compatible with aircraft operations;

b. Protecting Navy and Marine Corps installation investment by safeguarding the installation's operational capabilities;

c. Reducing noise impacts caused by aircraft operations while meeting operational, training, and flight safety requirements, both on and in the vicinity of air installations; and

d. Informing the public about the AICUZ program and seeking cooperative efforts to minimize noise and aircraft accident potential impact by promoting compatible development in the vicinity of military air installations.

Under the AICUZ Program, DOD identifies noise zones as a land use planning tool for local planning agencies. In addition to noise, DOD also identifies APZs as a planning tool for local planning agencies. APZs are areas where an aircraft mishap is most likely to occur, if it were to occur. Based on DOD nationwide historical records of accidents, aircraft mishaps are more likely to occur in close proximity to the airfield.

The Federal Aviation Administration (FAA) and DOD also encourage local communities to restrict development or land uses that could endanger aircraft in the vicinity of the airfield, including the following:

- Lighting (direct or reflected) that would impair pilot vision;
- Towers, tall structures, and vegetation that penetrate navigable airspace or are to be constructed near the airfield;
- Uses that would generate smoke, steam, or dust;
- Uses that would attract birds, especially waterfowl; and
- Electromagnetic interference with aircraft communications, navigation, or other electrical systems.

1.2 Purpose, Scope, and Authority

The Navy implemented the AICUZ Program at NAS North Island and NOLF Imperial Beach to encourage, through local cooperation, compatible development in and around these Navy airfields located in San Diego County, California.

The authority for the establishment and implementation of the AICUZ Program is derived from

- U.S. DOD, *Instruction 4165.57, Air Installations Compatible Use Zones*, November 8, 1977;

- Chief of Naval Operations Instruction (OPNAVINST) *OPNAV Instruction 11010.36C, Air Installations Compatible Use Zones (AICUZ) Program*, October 9, 2008;
- U.S. DOD, *Unified Facilities Criteria (UFC) 3-260-01 Airfield and Heliport Planning and Design*, November 1, 2001;
- U.S. Department of Transportation, FAA Regulations, *Title 14, Code of Federal Regulations (CFR), Part 77, Objects Affecting Navigable Airspace*, 1992.

1.3 Responsibility for Compatible Land Use

Naval Base Coronado has a twofold responsibility within the AICUZ Program. First, it seeks to reduce aircraft noise impacts, to the extent practicable, without compromising flight safety or operational capability, through operational guidance and procedures. Second, the air installation command works with state, county, and local planning officials to encourage local community implementation of the AICUZ recommendations and strives to educate and inform the local civilian community of the mutual benefits of compatible land use.

The local governments have the responsibility to protect the health, safety, and welfare of their respective residents and have control over land use planning and zoning in their communities. The airfield environs for this study are contained within the cities of Coronado, San Diego, and Imperial Beach in San Diego County, California. The State of California has a long-standing requirement that each county have an Airport Land Use Commission (ALUC) to guide the orderly growth of public airports and that the State-mandated general plans for local governments be consistent with the Airport Land Use Compatibility Plans (ALUCP) developed by the commissions (California Public Utilities Code, s. 21670, and California Government Code, ss. 65302.3).

The San Diego County Regional Airport Authority (SDCRAA) was created through legislation in 2001 and given responsibility for coordinating airport planning efforts of public agencies in San Diego County. The same legislation transferred responsibility for developing the ALUCP for public airports in San Diego County from the San Diego Association of Governments (SANDAG) to SDCRAA (California Statutes, 2001).

Cooperative action by both parties is essential to prevent land use incompatibility and encroachment.

1.4 Previous AICUZ Efforts and Related Studies

The following previous reports and documentation were reviewed in preparation of this study:

<u>1984 AICUZ Study Update, NAS North Island</u>, updated the initial AICUZ study completed in 1979. This study included initial operations of the SH-60B helicopter at NAS North Island and used a 1981 Harris Miller Miller & Hanson (HMMH) noise study for noise inputs. This AICUZ Study is the currently approved AICUZ Study for NAS North Island.

<u>1989 AICUZ Study Update, NOLF Imperial Beach</u>, the currently approved AICUZ Study for NOLF Imperial Beach.

<u>1996 Wyle Research Report 95-33, Aircraft Noise Study for NAS North Island</u>, documented 1995 aircraft noise conditions and reviewed potential changes in noise exposure under three alternative cases. Alternative 1 explored moving the initial portion of the S-3 aircraft overhead flight track to Runway 29 farther out over the ocean while Alternatives 2 and 3 explored increasing the helicopter ground controlled approach offset, aligning the tracks farther out over the ocean. The study discussed differences between the 1981 noise study and the 1995 conditions. It also measured noise levels of aircraft overflights and

documented the location of flight tracks using radar tracking. This study depicted off-base area changes in the noise contours, noting that the primary noise generator was the S-3 aircraft and the transient jet traffic. The alternatives analysis found little to no change to the cumulative noise contours under the individual alternatives due to the influence of other flight tracks. An AICUZ update did not follow this noise study.

1996 Wyle Research Report 96-16, Aircraft Noise Study for Proposed E-2C Aircraft at NAS North Island, studied the potential impacts from a 1995 proposed Base Realignment and Closure alternative that would have stationed four squadrons of E-2C Hawkeye aircraft at the base. Since the E-2C aircraft were not transferred to NAS North Island, an AICUZ update was not prepared.

1997 Wyle Research Report 97-17, Aircraft Noise Study for NAS North Island, reevaluated the same alternatives explored in Wyle Research Report 95-33 then added Alternative 4, which combines Alternatives 1 and 2. The study indicates that the S-3 and transient tactical aircraft dominated the noise environment in the vicinity of NAS North Island. Again, the alternatives analysis found little to no change to the cumulative noise contours under the individual alternatives due to the influence of other flight tracks. An AICUZ update did not follow this noise study.

2000 NAS North Island Site Development Plan, provides guidance for long-range physical development of the base and identifies land use constraints and compatibility issues on-base. The 1984 AICUZ Study was used in this document to review AICUZ-related land use constraints at that time.

2006 Wyle Research Report 06-11 September 2006 (with addendums of 2008a and 2010), examined CY2005 aircraft operations at NAS North Island and NOLF Imperial Beach and a prospective (CY2012) scenario. The first addendum published in 2008, amended the prospective scenario to reflect the future transition of the P-3 to the P-8, transitions of other transient aircraft associated with the homeporting of a 3rd carrier on the West coast of the United States affecting NAS North Island only. The second addendum, published in January 2010, included changes included in the first addendum and incorporated anticipated future changes in transient operations associated with the introduction of F-35 Lightning II into the fleet, affecting NAS North Island only.

1.5 Changes That Require an AICUZ Study Update

Operational and training requirements, aircraft mix, and tempo of aviation operations seldom remain static. Since the development of the 1984 AICUZ study for NAS North Island and the 1989 AICUZ study for NOLF Imperial Beach, many of these variables have changed. Since the air operations and aircraft mix at these airports have changed since the time that the 1984/1989 AICUZ studies were prepared, an AICUZ update was funded subsequent to the 2005 Defense Base Closure and Realignment Commission's (BRAC 2005) decisions.

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2.0 Installation

This section describes location, mission, and aircraft base loading of Naval Air Station (NAS) North Island and Naval Outlying Landing Field (NOLF) Imperial Beach. The economic impact of the installations is also described.

2.1 Location and Base Development

NAS North Island (Halsey Field) and NOLF Imperial Beach (Ream Field) are part of Naval Base Coronado (NBC) on Coronado Island in San Diego County, California. Figure 2-1 shows the regional setting of the two airfields.

Aerial view of NAS North Island looking east. The City of Coronado and the City of San Diego can be seen at the top of the picture.

2.1.1 NAS North Island

NAS North Island is southwest of the City of San Diego and adjacent to the City of Coronado on the installation's eastern boundary. NAS North Island is bounded by the San Diego Bay on the north and west and the Pacific Ocean on the south. Ground access to the installation passes through the City of Coronado after crossing the Coronado Bridge from San Diego or from around the south end of San Diego Bay north through the Silver Strand to the City of Coronado.

Commissioned in 1917, NAS North Island was granted official recognition as "The Birthplace of Naval Aviation" by resolution of the House Armed Services Committee in 1963. North Island derives its name from the original geography. A body of water named the Spanish Bight separated North Coronado Island and South Coronado Island until the early 1940s when the bight was filled in. In 1924 the USS LANGLEY, the Navy's first aircraft carrier, was homeported in San Diego, which began a continuous use of NAS North Island as a homeport for Pacific Fleet aircraft carriers. The base grew significantly during World War II as a major continental base supporting operating forces. Jets were first stationed at NAS North Island in 1948. Today the installation is home to four major flag officer staffs and three nuclear aircraft carriers. NAS North Island also hosts detachments for training at the Southern California (SOCAL) Range Complex and provides transient aircraft support.

View of NAS North Island, looking east from Shelter Island. High-rise downtown development of the City of San Diego can be seen in the background.

The majority of facilities on the installation are dedicated to air operations. Both natural and manmade constraints to development exist on the installation. Environmentally sensitive areas include areas along the Pacific Ocean and San Diego Bay as well as a least tern nesting area that is surrounded by development near the center of the installation. Areas beyond the installation boundary are also constrained. Urban development of the City of Coronado is adjacent to the base on the eastern boundary, and the rest of the installation boundary is surrounded by water. The proximity of downtown San Diego and San Diego International Airport (Lindbergh Field) influence the station's operational flexibility. The aerial image in Figure 2-2 shows the urban development in proximity to the station.

Figure 2-1
Local Area Map

Source: NAVFAC SW, 2006
ESRI, 2006
USGS, 2010

0 0.5 1 2 3 Miles

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination
12° 35' E

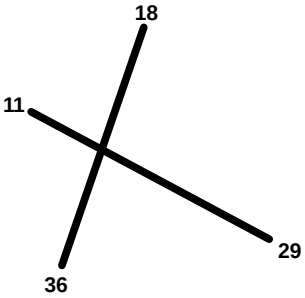
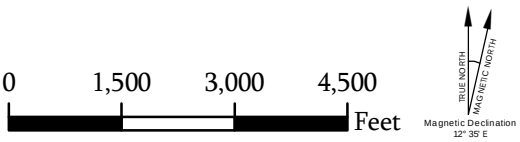


Figure 2-2
Aerial Image of
NAS North Island



Source: NAVFAC SW, 2006.

2.1.2 NOLF Imperial Beach

NOLF Imperial Beach is situated approximately 14 miles south of downtown San Diego in the City of Imperial Beach, California. Originally an Army facility, the Navy began using Ream Field (NOLF Imperial Beach) in the 1920s. The present runways were constructed in 1943, and in 1951 the first helicopter squadron arrived. Other helicopter squadrons continued to arrive until NAS Imperial Beach had grown to 3,400 personnel. In the early 1970s the station was redesignated an Outlying Landing Field and became part of NAS North Island. The helicopter squadrons that had been permanently assigned there were moved to NAS North Island at that time.

Urban development of the City of Imperial Beach is adjacent to the installation boundary on the north side, while agricultural lands exist on the eastern boundary. The Tijuana River flows north and west from the Mexican Border into an estuarine tidal salt marsh managed by the U.S. Fish and Wildlife Service (USFWS), known as the Tijuana River National Estuarine Research Reserve. The aerial image in Figure 2-3 shows the relationship of the City of Imperial Beach and the Tijuana River Valley to the airfield.

The entrance to the Tijuana Estuary area on the western boundary of NOLF Imperial Beach.

9
8
26
27

Figure 2-3
Aerial Image
NOLF Imperial Beach

0 1,000 2,000 3,000 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination
12° 35' E

Source: NAVFAC SW, 2006.

2.2 Mission

2.2.1 NAS North Island

NAS North Island is the anchor base of Naval Base Coronado and is home to four major military flag officer staffs including Commander, Naval Air Forces (CNAF), who is responsible for equipping and training all naval aviation units in the U.S. Navy. NAS North Island is also homeport for three nuclear powered aircraft carriers, the USS NIMITZ (CVN 68) and the USS RONALD REAGAN (CVN 76), and the USS CARL VINSON (CVN 70). Aircraft activities involve both fixed- and rotary-wing operations, but aircraft operations totals are largely made up of rotary-wing aircraft. Numerous aviation commands and units are assigned to or supported by NAS North Island, including:

Commander, Helicopter Maritime Strike Wing, U.S. Pacific Fleet (COMHSMWINGPAC): Provides operational, administrative, and training support to Pacific Fleet HSM and HSL squadrons consisting of one fleet replacement squadron and six fleet squadrons, two of which are forward deployed.

Commander, Helicopter Sea Combat Wing, U.S. Pacific Fleet (COMHSCWINGPAC): Provides operational, administrative, and training support to Pacific Fleet Helicopter Anti-Submarine and Helicopter Sea Combat Squadrons and Wing Weapons School. In addition, COMHSCWINGPAC provides search and rescue (SAR) training and readiness support, as well as maintenance, logistics, and supply support to HMT-303, NAS Lemoore, NAS Fallon, NAS Whidbey Island, and Pacific Missile Range Facility.

Fleet Logistics Support Squadron Three Zero (VRC-30): VCR-30 provides robust service to the fleet in a safe and expeditious manner. The movement of high-priority cargo, mail, and passengers to and from Pacific Fleet aircraft carriers on time and with seamless transfer is the goal of this squadron.

Fleet Logistics Support Squadron Five Seven (VR-57): VR-57 is a Naval Reserve Force squadron composed of Active Duty (Full Time Support) and Drilling Reserve personnel. The squadron maintains and flies three C-40A Clipper aircraft. The mission is to support United States armed forces by providing safe, reliable, and efficient airlift of personnel and cargo anywhere in the world at any time.

Naval Air Systems Command (NAVAIR) Depot North Island is NAVAIR's West Coast aircraft depot specializing in the support of naval aircraft and related systems. Through partnership with industry, other government agencies and supporting aerospace organizations, NAVAIR Depot North Island repairs and overhauls aviation systems. The NAVAIR Depot North Island team, aided by state-of-the-art technology, returns combat-ready AH-1, CH-53, C-2, E-2, F/A-18, S-3, SH/HH/MH-60, and UH/HH-1 aircraft to fleet squadrons while meeting time-critical fleet requirements at competitive costs.

NAS North Island also hosts detachments for training at the Southern California (SOCAL) Range Complex and provides transient aircraft support.

2.2.2 NOLF Imperial Beach

NOLF Imperial Beach is the site of much of the Navy's West Coast helicopter training. Helicopters stationed at NAS North Island routinely fly to NOLF Imperial Beach to conduct training and practice. Pilots complete traffic pattern training and fly instrument approaches at the facility.

2.3 Base Loading

2.3.1 NAS North Island

NAS North Island is the homeport for three aircraft carriers, the staff of CNAF, three type wing staffs, and expeditionary strike group staffs. The facility is a large aerospace-industrial complex that supports naval aviation training, logistics, maintenance, and repair activities. Naval Base Coronado (NAS North Island, NOLF Imperial Beach, NAB, and San Clemente Island) supports an average daily population (active duty and reserves), civilians, and contractors of 30,545 (NAS North Island Shaffer, 20 September 2010).

2.3.1.1 Assigned Aircraft

Table 2-1 shows the historical and projected aircraft assigned to NAS North Island. Some of the based aircraft are routinely deployed. The H-60 aircraft experience a 35 percent deployment rate, while the C-2s are normally 30 percent deployed, and the C-40s are 45 percent deployed.

Table 2-1 Historical and Projected Aircraft Base Loading

Type Aircraft	Number of Aircraft		
	AICUZ Study 1984	Site Development Plan 2000	CY 2020
S-3	78	56	0
H-2	31	0	0
H-3	58	1	0
H-46	35	33	0
CH-58A	0	3	0
H-60	0	97	203
C-1A	8	0	0
C-2	0	13	10
C-9B	3	0	0
C-40	0	0	3
C-12	3	6	6
P-3C	0	6	0
T-39	3	0	0
U-11	1	0	0
Totals	220	215	222

Sources: Air Installations Compatible Use Zones Study, NAS North Island, 1984;
Site Development Plan, NAS North Island, June 2000; NAS North Island 2010.

Transient aircraft operate in and out of NAS North Island. These transient operations are mission essential. They include Air Force cargo aircraft supporting the movement of Navy equipment, personnel and Navy aircraft detachments aboard the NAS in preparation for deployment to carriers or for training on the sea range and airspace in the Pacific Ocean near NAS North Island. Aircraft arriving and departing for major maintenance at the NAS North Island Naval Aviation Depot (NADEP) are also counted among the transient aircraft. The 1996 and 1997 noise studies (all based on 1995 operations data) pointed out that transient jet aircraft are the primary contributors to the noise contours. Although some S-3 aircraft were at NAS North Island in 2005, this platform began leaving the Navy inventory in 2006, and it is not considered in the analysis for this update. Table 2-2 shows aircraft types that have routinely conducted transient operations in the past, baseline, and prospective case. The F-14 has left the Navy inventory; the EA-6B will be replaced by the EA-18G, the P-3C aircraft will be replaced by the P-8A, the number of H-60s will increase, and the percentage of F/A-18E/F will also increase. For the prospective case it was assumed that as the F-35 is introduced it will replace some of the legacy F/A-18C/D aircraft.

Table 2-2 Historical and Projected Transient Aircraft Loading

Type Aircraft	Category	Percent of Total Operations			
		AICUZ 1984 (1981 Data)	Noise Study 1995	Seven Yr Average (CY03- CY 09)	CY 2020
A-4/A-6/A-7/F-4	Transient	10%	-	-	-
EA-6B	Transient	-	-	1.0%	0
EA-18G	Transient	-	-	0	1.0%
AV-8B	Transient	-	0.4%	0.1%	0
C-17	Transient	-	-	0.3%	0.3%
C-5	Transient	-	-	0.3%	0.3%
C-130H	Transient	-	-	1.3%	1.4%
H-53	NADEP	-	-	0.4%	0%
E-2	NADEP	-	-	0.4%	0.2%
F-14	Transient	-	0.2%	0	0
F-15	Transient	-	0.02%	0	0
F-16	Transient	-	0.1%	0	0
F/A-18C/D	NADEP/Transient	-	2%	1.5%	0.2%
F/A-18E/F	NADEP/Transient	-	-	0.2%	1.2%
F-35	NADEP/Transient				0.2%
Totals		10%	2.7%	5.5%	4.8%

Sources: Wyle, 2010; Wyle, 1996; AICUZ, 1984

The presence of NADEP, the proximity of tactical training areas to NAS North Island, and the operational demands of deploying units assigned to Naval Base Coronado drive the requirement for transient aircraft use of NAS North Island. Tactical aircraft deployed to NAS North Island have ready access to valuable sea training areas, and aircraft supporting training of units based at NAB Coronado can most effectively support that training while operating out of NAS North Island.

2.3.1.2 Aircraft Types

The following aircraft types are assigned to NAS North Island:

SH-60B Seahawk

Role: The SH-60B operates as an integral fighting unit aboard specifically configured ships as the Light Airborne Multipurpose System (LAMPS). It is part of a complete weapon (ship/air) system designed to keep sea lanes open and to protect high-value military and commercial ships.

The SH-60B is an integral fighting unit as the Light Airborne Multipurpose System.

SH-60F Seahawk

Role: The SH-60F operates primarily off of aircraft carriers, providing close-in anti-submarine protection of the carrier battle group, and SAR support during carrier flight operations. During anti-submarine operations it employs a powerful dipping sonar, an arsenal of sonobuoys, and MK 50 torpedoes. The SH-60F is also used for logistics, transporting personnel, mail, and supplies between ships in the carrier battle group.

The SH-60F is a highly versatile helicopter that operates primarily off of aircraft carriers.

HH-60H Seahawk

Role: A variant of the SH-60F, the HH-60H is designed specifically as a Combat Search and Rescue (CSAR) and Naval Special Warfare platform.

An HH-60H deploys Navy SEALS aboard an assault craft (U.S. Navy photo by Photographer's Mate Chief Johnny R. Wilson.)

MH-60S Knighthawk

Role: The primary missions are day and night Vertical Replenishment (VERTREP), day and night amphibious SAR, vertical onboard delivery, and airhead operations. Secondary missions are CSAR and Special Warfare Support (SWS).

The MH-60S is used in both active and reserve helicopter squadrons.

MH-60R Seahawk

Role: The MH-60R Multi-Mission Helicopter (MMH) is the new primary maritime dominance helicopter, gradually replacing the SH-60B and SH-60F aircraft. The MH-60R features a glass cockpit and significant mission system enhancements.

The new MH-60R features a glass cockpit and significant mission system enhancements.

C-2A Greyhound

Role: The C-2A is a carrier-based transport, capable of carrying high-priority cargo and passengers, for Carrier On-Board Delivery (COD). Among the high-priority items are special stores, jet engines, and afterburners. The maximum weight for payload and route support equipment combined is 10,000 pounds.

A C-2A Greyhound arrives aboard an aircraft carrier.

C-12 Huron

Role: The C-12 Huron, a twin turboprop passenger and cargo aircraft, is the military version of the Beechcraft Super King Air. The C-12 aircraft, manufactured by Raytheon Aircraft Company (RAC) (formerly Beech Aircraft Corporation), is a high-performance, T-tail, pressurized monoplane that can transport up to seven passengers.

A C-12 aircraft ready for boarding on the parking apron.

C-40A Clipper

Role: VR-57 currently operates three Boeing C-40A Clipper aircraft. Each aircraft is normally manned with a crew of six, and is capable of carrying 121 passengers or 40,000 pounds of cargo or a combination of 68 passengers and 15,000 pounds of cargo.

The C-40A Clipper can transport 121 passengers or 40,000 pounds of cargo a distance of 3,100 miles.

EA-6B Prowler

Role: The EA-6B Prowler is a unique national asset that can be deployed from land bases and aircraft carriers to monitor the electromagnetic spectrum and actively deny an adversary the use of radar and communications. The EA-6B is a unique, high-demand low-volume national asset that provides electronic attack for the Navy, Marines, and Air Force. The Prowler was the first aircraft built from the drawing boards to fulfill the role of an electronic warfare aircraft and is included in every aircraft carrier deployment.

The EA-6B Prowler is capable of jamming enemy radars.

F/A-18 Hornet

Role: The combat-proven F/A-18 Hornet is the first tactical aircraft designed from its inception to carry out both air-to-air and air-to-ground missions. The F/A-18 can deliver conventional air-to-air and air-to-ground weapons and can carry airborne control pods for various missions. The combination of excellent thrust-to-weight ratio and maneuverability creates an unmatched combat capability. The multi-mission F/A-18E/F Super Hornet strike fighter is an upgrade of the combat-proven night strike F/A-18C/D; both aircraft currently are flown.

The F/A-18E Super Hornet.

EA-18G Growler

Role: The E/A-18G is the fourth major variant of the F/A-18 family of aircraft. The EA-18G will serve as the Navy's replacement for the EA-6B, providing a capability to detect, identify, locate, and suppress hostile emitters. The EA-18G will have the capability to operate autonomously or as a major node in a network-centric operation.

The EA-18G is an Airborne Electronic Attack Aircraft.

F-35- Lightning II (Potential Transient Operations Only)

Role: The F-35 Lightning II is a fifth-generation, single-seat, single-engine stealth multirole fighter that can perform close air support, tactical bombing, and air defense missions. The F-35 has three different models; one is a conventional takeoff and landing variant, the second is a short take off and vertical-landing variant, and the third is a carrier-based variant. The F/A-18A/B/C and D Hornets will transition to the F-35 in the future.

The F-35 is a stealth multirole fighter

2.4 Economic Impact

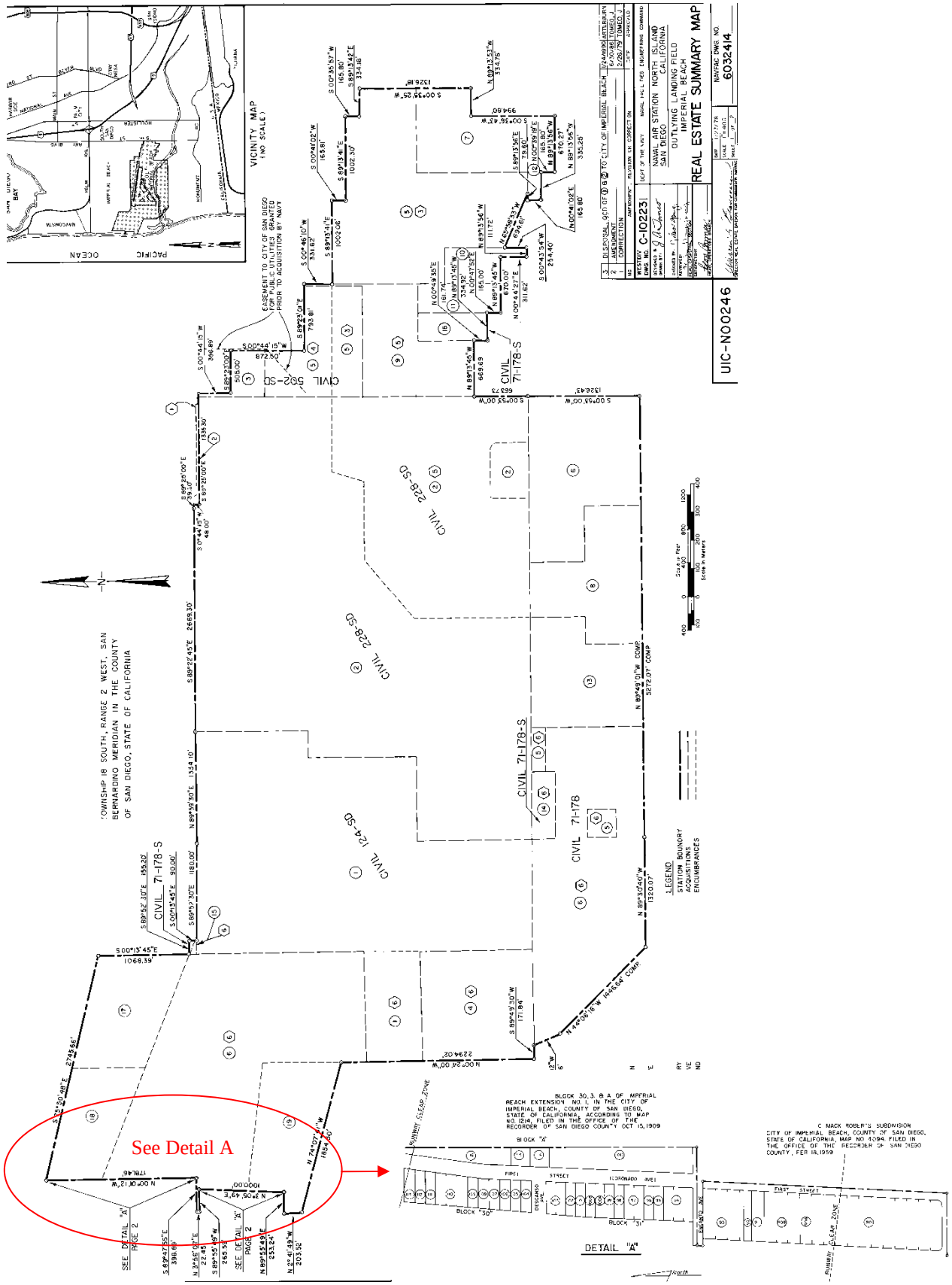
The United States Navy presence in San Diego County, California generates a significant economic impact for the region. Naval Base Coronado installations are the work place for more than 30,000 military and civilian personnel. As the homeport for three nuclear powered aircraft carriers, the economic effects are important. Each homeported carrier provides an impact to San Diego of more than $150 million direct dollars per year, with an additional 5,360 non-direct jobs and more than $270 million non-direct dollars. DON total direct expenditures or obligations in San Diego County amount to $9.26 billion. Military and civilian salaries and wages amount to $4.94 billion, and procurement contracts amount to $3.19 billion (Navy Region Southwest Web site 2006). The economic impact of the Navy homeporting of a third carrier on the West Coast is not included in the totals above.

2.5 Real Estate

NAS North Island comprises 2,803 acres, of which 282 acres are tideland. The Navy has an easement in place for the runway lights on the approach to Runway 29, since the lights extend 350 feet beyond the installation boundary.

NOLF Imperial Beach comprises 1,293 acres. A Memorandum of Understanding (MOU) between the USFWS and NAS North Island permits USFWS personnel to conduct management and research activities on 606 acres of the Tijuana Marsh on NOLF Imperial Beach property. This area is now part of the Tijuana Slough National Wildlife Refuge. Also, the U.S. Navy acquired flight clearance easements on 29 contiguous properties along the coastline, totaling 9.8 acres. The flight clearance easements gave the Navy the right to prevent natural and man-made objects from penetrating imaginary surfaces associated with the NOLF Imperial Beach runways (easements specifically limit the height of natural or man-made objects to 45 feet above ground level, but not to exceed 60 feet Mean Sea Level [MSL] on these parcels). The area properties with flight clearance easements at NOLF Imperial Beach are shown in Figure 2-4.

Figure 2-4 NOLF Imperial Beach Real Estate Summary Map



3.0 Aircraft Operations

This section addresses the operation of aircraft in the Naval Air Station (NAS) North Island and Naval Outlying Landing Field (NOLF) Imperial Beach airfield environs. The main sources of sound at Navy air installations are aircraft operations, including flight operations and engine maintenance operations, or run-ups. The level of sound exposure is related to a number of variables; however, the types of aircraft, number, types and times of aircraft operations, location of flight tracks, and altitudes are the most significant factors.

3.1 Airfield Description

3.1.1 NAS North Island Airfield Description

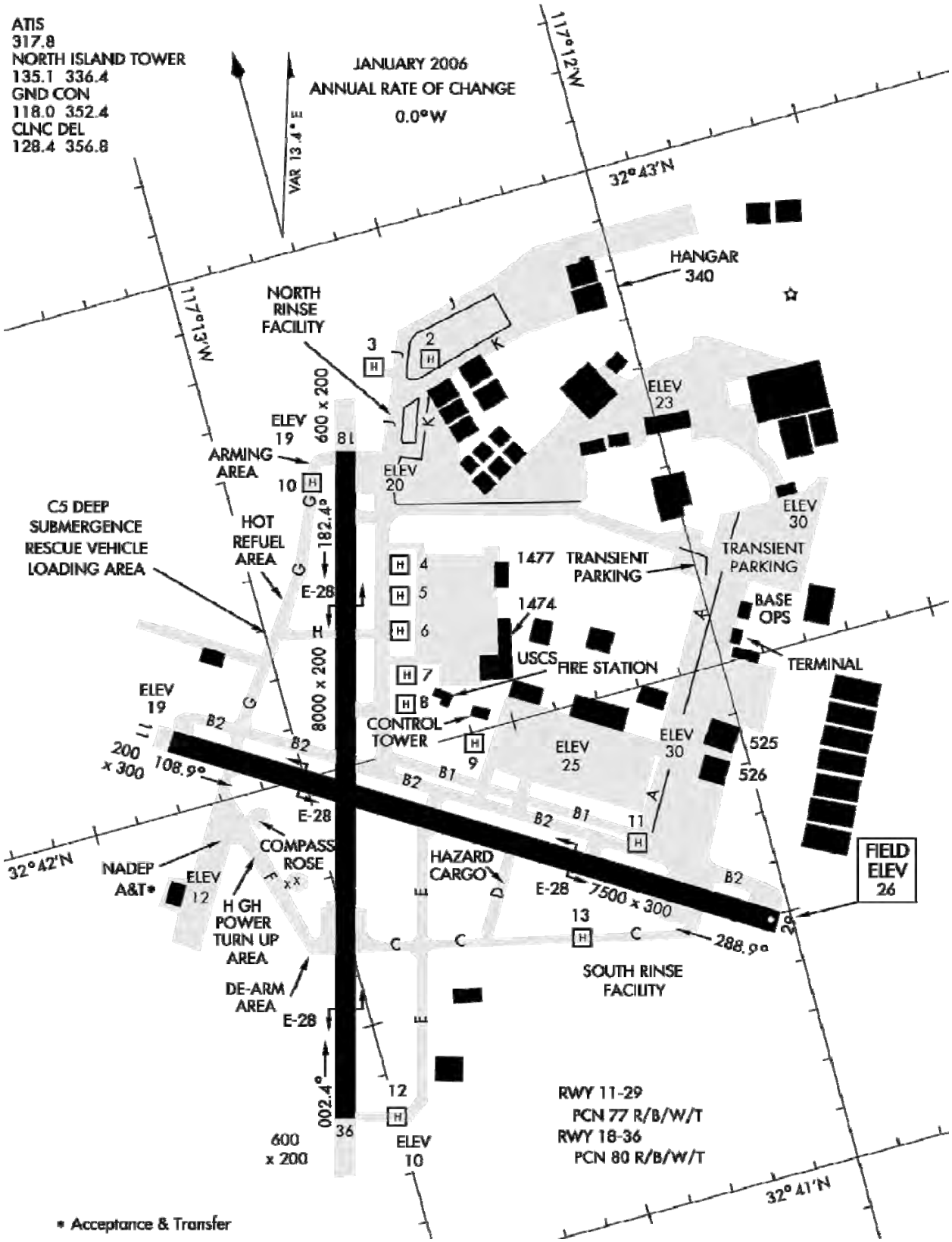
NAS North Island (Federal Aviation Administration [FAA] identifier: NZY) is located at coordinates North 32 degrees 41.95 minutes, West 117 degrees 12.92 minutes. The field elevation is 26 feet MSL. The airfield has two runways. Runway 11/29 is 7,500 feet in length and 300 feet wide. Runway 18/36 is 8,000 feet long and 200 feet wide. While the airfield could operate 24/7 if necessary, currently the airfield is normally open for flight operations from 6:30 a.m. Monday through 10:00 p.m. Friday, and 8:00 a.m. to 10:00 p.m. Saturday and Sunday. The NAS North Island airfield diagram is shown in Figure 3-1.

Helicopter pads are also shown on the airfield diagram. All helicopter pads are 100 feet by 100 feet, except for pads located on taxiways. Taxiway pads are 75 feet by 75 feet.

3.1.2 NOLF Imperial Beach Airfield Description

NOLF Imperial Beach (FAA identifier: NRS) is at coordinates North 32 degrees 34 minutes, West 117 degrees 7 minutes. The field elevation is 24 feet MSL. The airfield has two runways and five practice helicopter pads. Runway 9/27 is 4,999 feet long and 340 feet wide. Runway 9/27 is painted with two white dashed “centerlines,” each 70 feet inboard from the runway edge. This configuration allows simultaneous helicopter operations. Runway 8/26 is actually painted on the south edge of the parking apron. It is marked 2,239 feet long and 150 feet wide. Helicopter flight deck markings for a Spruance Class Destroyer are painted 700 feet from the Runway 26 threshold, and deck markings for a Guided Missile Frigate flight deck are painted 700 feet from the Runway 8 threshold. See Figure 3-2 for a map of the NOLF. While this airfield could also operate 24/7 if necessary, currently normal hours of operation are Monday through Thursday 8:00 a.m. to 10:30 p.m. and Friday 8:00 a.m. to 6:00 p.m. Pacific Standard Time (PST) (Monday through Thursday hours are extended to 11:00 p.m. during Pacific Daylight Time [PDT]).

Figure 3-1 Airfield Diagram for NAS North Island



Source: United States Flight Information File, 2006

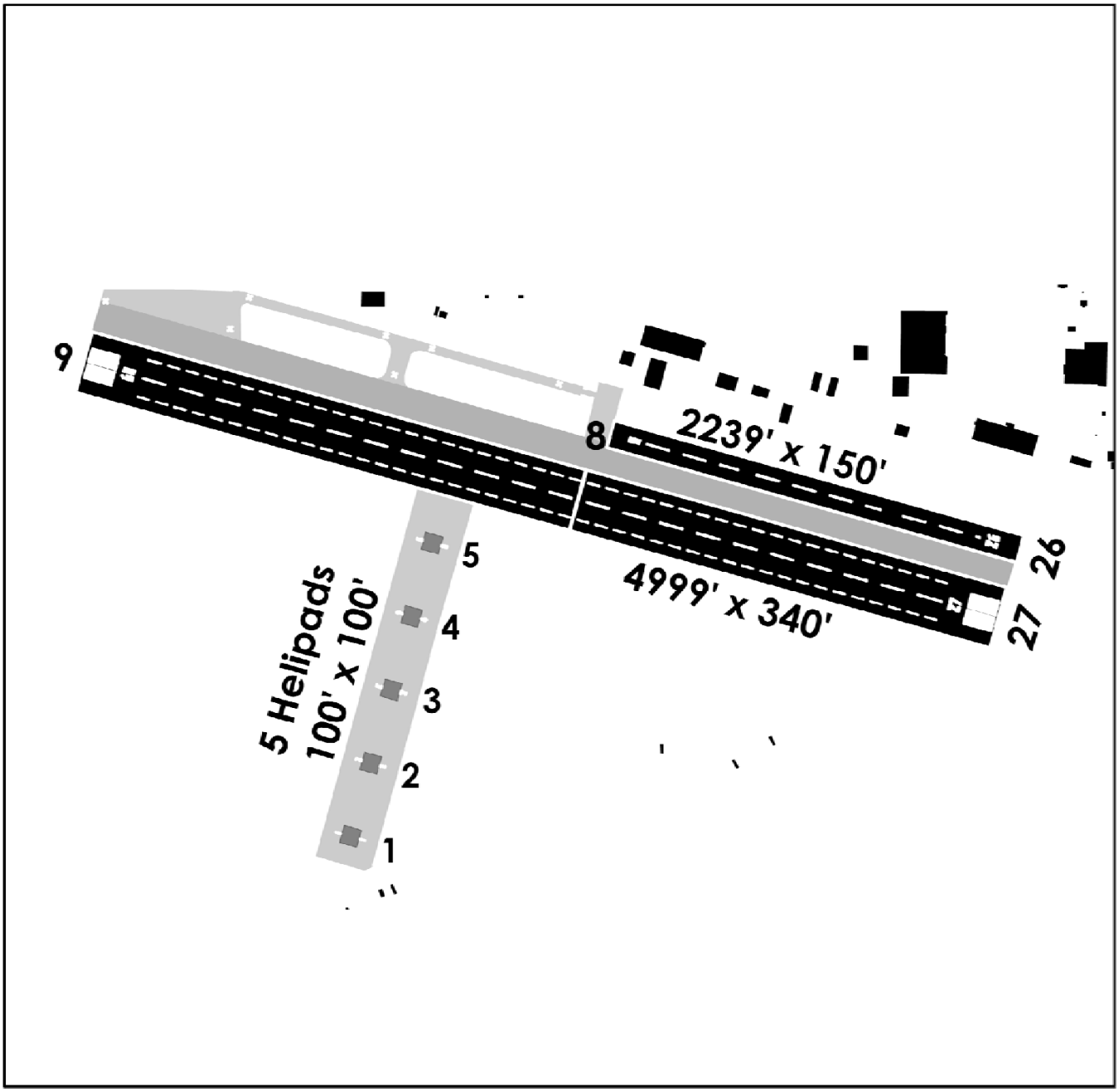


Figure 3-2
Airfield Diagram for
NOLF Imperial Beach

Source: NAVFAC SW GIS Data, 2006

0 500 1,000 Feet

3.2 Airspace Description

The airspace above San Diego County is very complex due to the extensive types of operations and extensive types of aircraft and airfields in the area. Commercial and general aviation airports are in the vicinity as well as military airfields. Air carrier operations are underway in the airspace at the same time as general aviation and military flying. In addition, the aircraft mix in the area requires accommodation of air carrier aircraft, military cargo aircraft, high-performance jets, and helicopters simultaneously in the airspace.

The airspace surrounding NAS North Island is shown in Figure 3-3. NAS North Island Class D tower airspace is centered on the station and includes the portion of a 4.3 nautical mile (nm) circle south and west of San Diego International Airport Class B airspace. The airspace extends from the surface up to but not including 2,800 feet Mean Sea Level (MSL). The station also is assigned Class E airspace in a 10-mile extension to the southeast for instrument approaches.

The airspace surrounding NOLF Imperial Beach is shown in Figure 3-4. Class D tower airspace assigned for NOLF Imperial Beach includes the area 5.2 nm west, 4.7 nm east, 2.6 nm north and 1.7 nm south of the field. Vertical limits are surface to 1,500 feet MSL.

NAS North Island and NOLF Imperial Beach are just two of many airfields that generate specific airspace requirements to operate successfully. The primary requirement for airspace in the area is for San Diego International Airport Class B Airspace, the airspace designation reserved for the busiest airports in the nation. San Diego International Airport is approximately 3 miles from NAS North Island. Class B Airspace presents the most demanding constraints for aircraft and pilots. Because of the extensiveness of the Class B airspace around San Diego International, it influences the operation of almost every other airfield in the San Diego area.

3.3 Aircraft Flight Operations

A diverse set of missions is flown by stationed and transient aircraft at NAS North Island and NOLF Imperial Beach. Aircraft operations involving deployment to and from ships, post-Naval Aviation Depot (NADEP) maintenance check flights, fleet replacement training, operational support flights, transient operations, and pilot currency are routinely flown in the area. Extensive off-shore training areas west of NAS North Island make the air station an essential basing location providing efficient access for training operations.

U.S. Navy aircraft flight operations in the San Diego County area consist of intensive helicopter training. Helicopter squadrons based at NAS North Island are assigned and prepared to execute several essential missions requiring a variety of training conditions ranging from sonar dip areas at sea to mountainous area operations. Further, pilots with a variety of skill levels train in the area, from basic fleet replacement training to advanced pilot currency.

Tables 3-1 and 3-2 provide a historical perspective of aircraft flight operations at NAS North Island and NOLF Imperial Beach. It is noted that the totals shown include air carrier and general aviation in these tables and that the general aviation numbers result in a major portion of the variation in the totals. Another change resulting in a drop in the Navy and Marine Corps numbers is the transition of the H-46 helicopter (which made up some 20 percent of the operations at NAS North Island in 1995) out of the Navy inventory. Due to the nature of general aviation aircraft and the size and noise characteristics of the air carrier aircraft typically involved at these two airports, these operations were not modeled in past noise surveys. This is due to the fact that the fixed-wing jet aircraft tend to dominate the noise energy and resulting noise contours. While these lower noise aircraft were modeled in the noise survey, it was again established that the fixed-wing jet aircraft operations dominate the noise contours with the majority of acoustic energy modeled is from transient jet traffic.

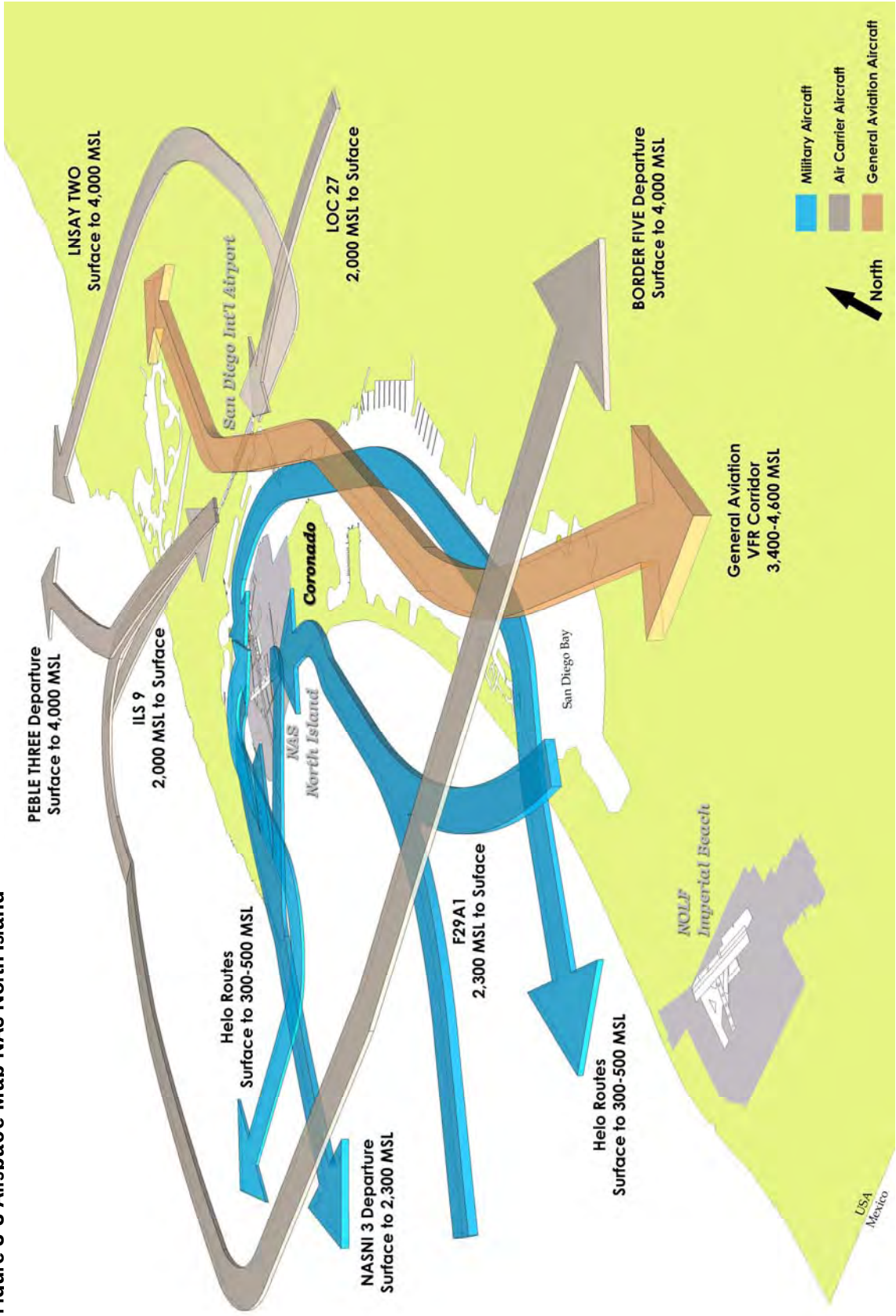


Figure 3-3 Airspace Map NAS North Island

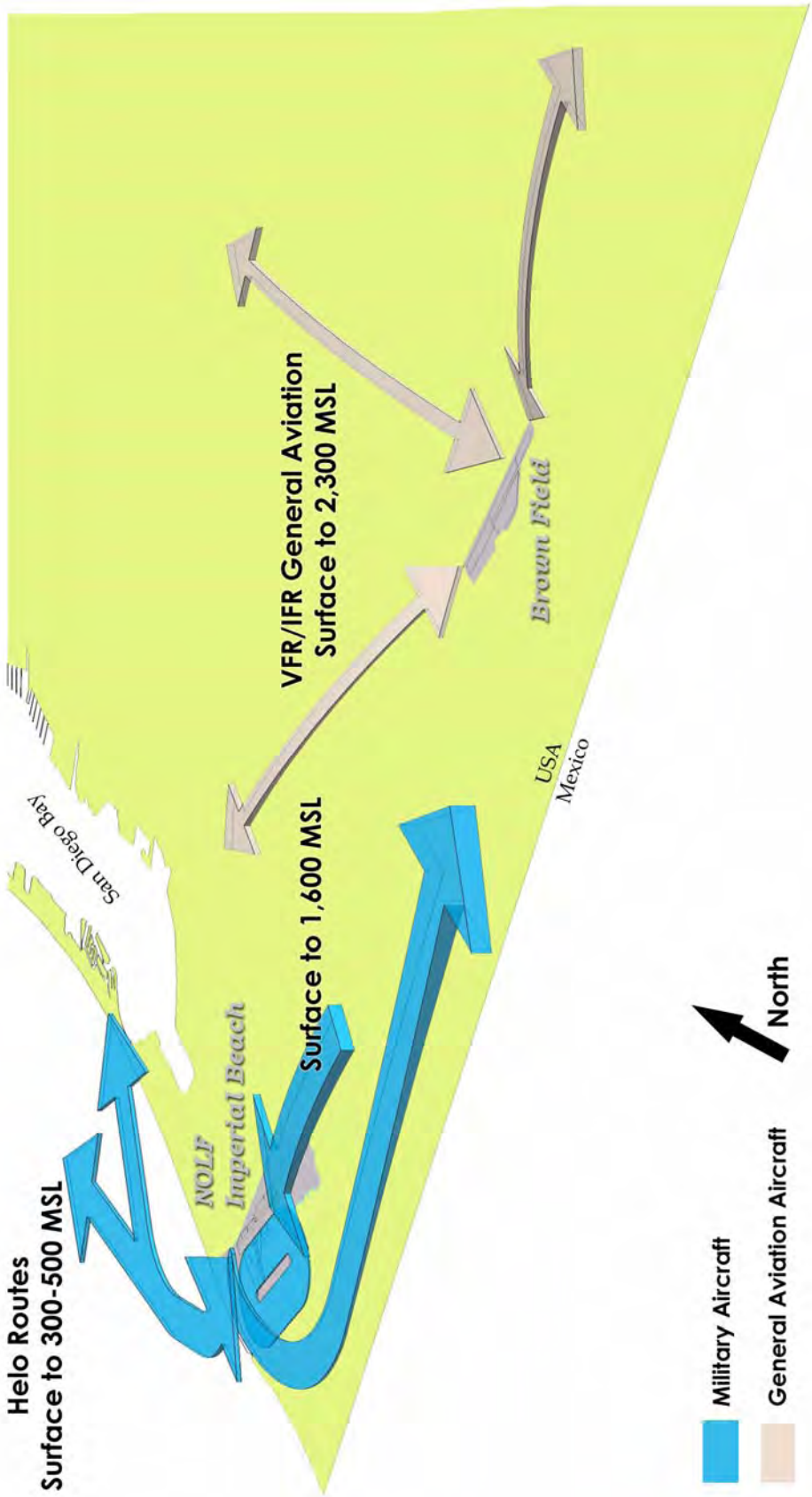


Figure 3-4 Airspace Map NOLF Imperial Beach

Table 3-1 Historical Annual Operations for NAS North Island

Year	NAS North Island				
	Military		Civilian		Totals
	Navy/Marine Corps	Other	Air Carrier	General Aviation	
1998	125,974	3,027	2,011	6,269	137,281
1999	123,344	3,112	2,026	6,249	134,731
2000	123,788	2,979	4,031	5,768	136,566
2001	121,412	4,662	3,372	6,061	135,507
2002	113,658	4,002	5,474	15,019	138,153
2003	93,378	3,962	5,249	12,886	115,475
2004	83,614	3,024	5,601	15,802	108,041
2005	81,422	1,838	3,844	8,205	95,309
2006	62,185	3,062	3,664	13,944	82,855
2007	63,661	4,706	3,883	14,729	86,979
2008	64,167	3,121	3,672	12,123	83,083
2009	73,272	3,058	3,732	10,074	90,136

Source: NAS North Island Air Traffic Control, 2006, 2010

Table 3-2 Historical Annual Operations for NOLF Imperial Beach

Year	NOLF Imperial Beach				
	Military		Civilian		Totals
	Navy/Marine Corps	Other	Air Carrier	General Aviation	
1998	216,783	2,262	0	156	219,201
1999	218,413	4,352	0	72	222,837
2000	174,675	5,656	0	32	180,363
2001	203,838	5,631	0	16	209,485
2002	233,776	5,076	0	52	238,904
2003	249,171	4,057	0	50	253,278
2004	238,784	4,009	0	8	242,801
2005	212,523	10,945	0	261	223,729
2006	224,518	14,234	0	40	235,792
2007	219,737	14,028	0	173	233,938
2008	261,016	6,154	0	44	267,214
2009	275,207	9,004	0	122	284,333

Source: NAS North Island Air Traffic Control, 2006, 2010

3.3.1 Flight Tracks

Flight tracks are developed using operational procedures and information gathered from air traffic control personnel and pilots. However, there will normally be some variation on either side of a single flight track in daily operations for a variety of reasons. Flight shadows depict potential variation in the ground track flown by pilots during operational procedures, including instrument and visual maneuvers and closed traffic patterns. Figures 3-5 through 3-11 show the flight tracks representing the normal center of the flight shadow depicted for general information. The tracks shown include arrival, departure, closed pattern, and interfacility flight tracks.

3.3.2 Typical Aircraft Flight Operations

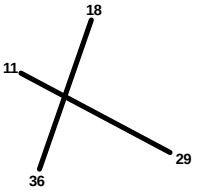
A flight operation is any takeoff or landing at an airfield. The takeoff and landing may be part of a training maneuver (or pattern) associated with the airfield's runways and helipads or may simply be a departure or arrival of an aircraft. Several basic flight operations are listed below:

- Departure: An aircraft takeoff.
- Overhead Break Arrival: An expeditious arrival using visual flight rules. 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 descending left turn to enter the landing pattern. Once established in the pattern, the aircraft lowers landing gear and flaps and performs a 180-degree descending left turn to land on the runway.
- Ground Controlled Approach (GCA): An approach directed from the ground by Air Traffic Control (ATC) personnel. ATC personnel provide aviators with verbal course and glide slope information. The approach may be flown to a full stop landing or the aircraft may fly a box pattern to practice multiple approaches.
- Touch and Go (T&G): An aircraft lands and takes off on a runway without coming to a full stop. After touching down, the pilot immediately goes to the appropriate take off power setting and takes off again.

It should be noted that ATC traffic numbers count pattern operations (T&G or GCA, etc.) as two operations, a take off and a landing, while for the purposes of noise modeling the number modeled is one circuit around the pattern.

3.3.3 Aircraft Operations Used in Noise Study

Baseline and prospective conditions operations for NAS North Island and for NOLF Imperial Beach in this AICUZ update come from WR-10-18 (2010). Please see Appendix A for total operations Tables from WR-10-18. The baseline noise contours for NOLF Imperial Beach are based on 248,726 (ATC) annual operations. The prospective case operations at NOLF Imperial Beach are based on a total of 323,344 (ATC) annual rotary wing operations, reflecting an anticipated future increase in H-60 training operations at NOLF Imperial Beach. The baseline noise contours for NAS North Island were based on 94,554 (ATC) annual operations. The prospective (2020) scenario for NAS North Island includes 100,325 (ATC) annual aircraft operations. The prospective scenario at NAS North Island include an increase in H-60 operations, the future transition in transient platforms supported by NAS North Island (i.e. EA-6B to the EA-18G; the P-3C to the P-8A; an increase in the percentage of F/A-18E/F, and F-35 with a corresponding decrease in the percentage of F/A-18C/D), as well as transient aircraft changes arising from the homeporting of the 3rd carrier at NAS North Island, and a projected increase in F/A-18E/F NADEP maintenance operations. The prospective condition for NAS North Island did not include operations flown by the flying club, which was disbanded in 2008.



Fixed-Wing Arrival Pattern

Fixed-Wing Overhead Break Pattern

Rotary-Wing Arrival Pattern

Flight Shadow

Figure 3-5
Arrival Flight Tracks
NAS North Island

Source: Wyle Labs Noise Study, 2010 (Flight Tracks), NAVFAC SW, 2006 (Base Data), The Onyx Group (Shadows), and USGS 2010.

0 1 2 Miles

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

9 8 26 27

Fixed-Wing Arrival Pattern

Rotary-Wing Arrival Pattern

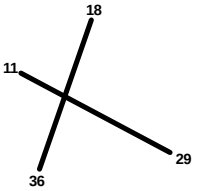
Flight Shadow

Figure 3-6
Arrival Flight Tracks
NOLF Imperial Beach

Source: Wyle Labs Noise Study, 2010 (Flight Tracks), NAVFAC SW, 2006 (Base Data), The Onyx Group (Shadows), and USGS, 2010.

0 2,800 5,600 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E



Fixed-Wing Departure Pattern

Rotary-Wing Departure Pattern

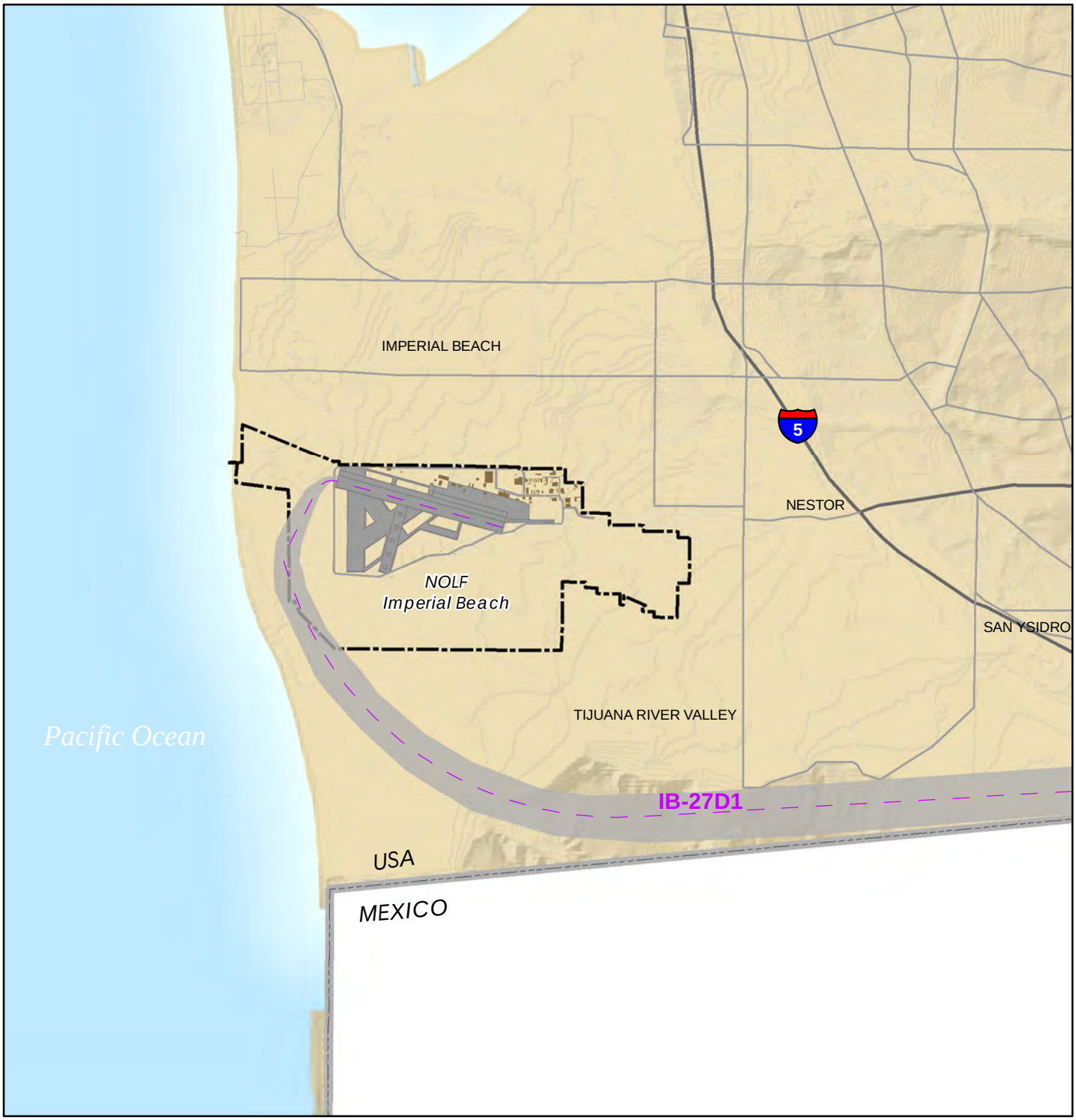
Flight Shadow

Figure 3-7
Departure Flight Tracks
NAS North Island

Source: Wyle Labs Noise Study, 2010 (Flight Tracks), NAVFAC SW, 2008 (Base Data), The Onyx Group (Shadows), and USGS, 2010.

0 0.75 1.5 Miles

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E



9
8
26
27

Fixed-Wing Departure Pattern

Rotary-Wing Departure Pattern

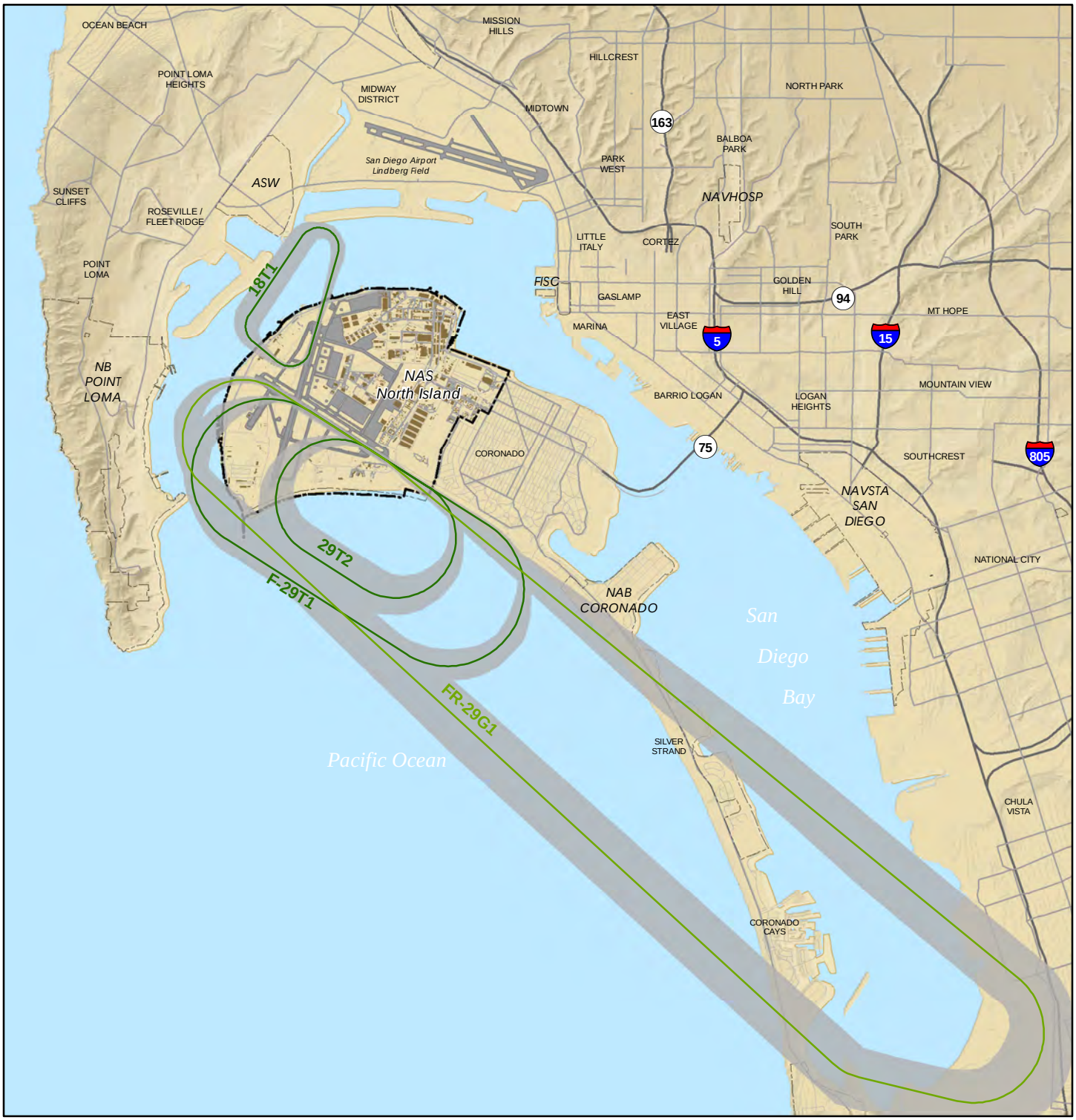
Flight Shadow

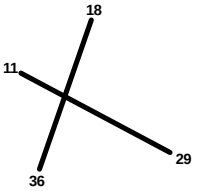
Figure 3-8
Departure Flight Tracks
NOLF Imperial Beach

Source: Wyle Labs Noise Study, 2010 (Flight Tracks), NAVFAC SW, 2006 (Base Data), The Onyx Group (Shadows), and USGS, 2010.

0 2,800 5,600 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E





Fixed-Wing Touch & Go Pattern

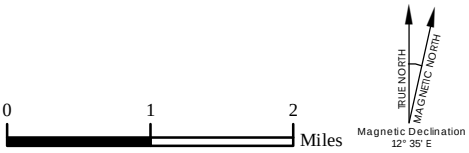
Fixed-Wing GCA Pattern

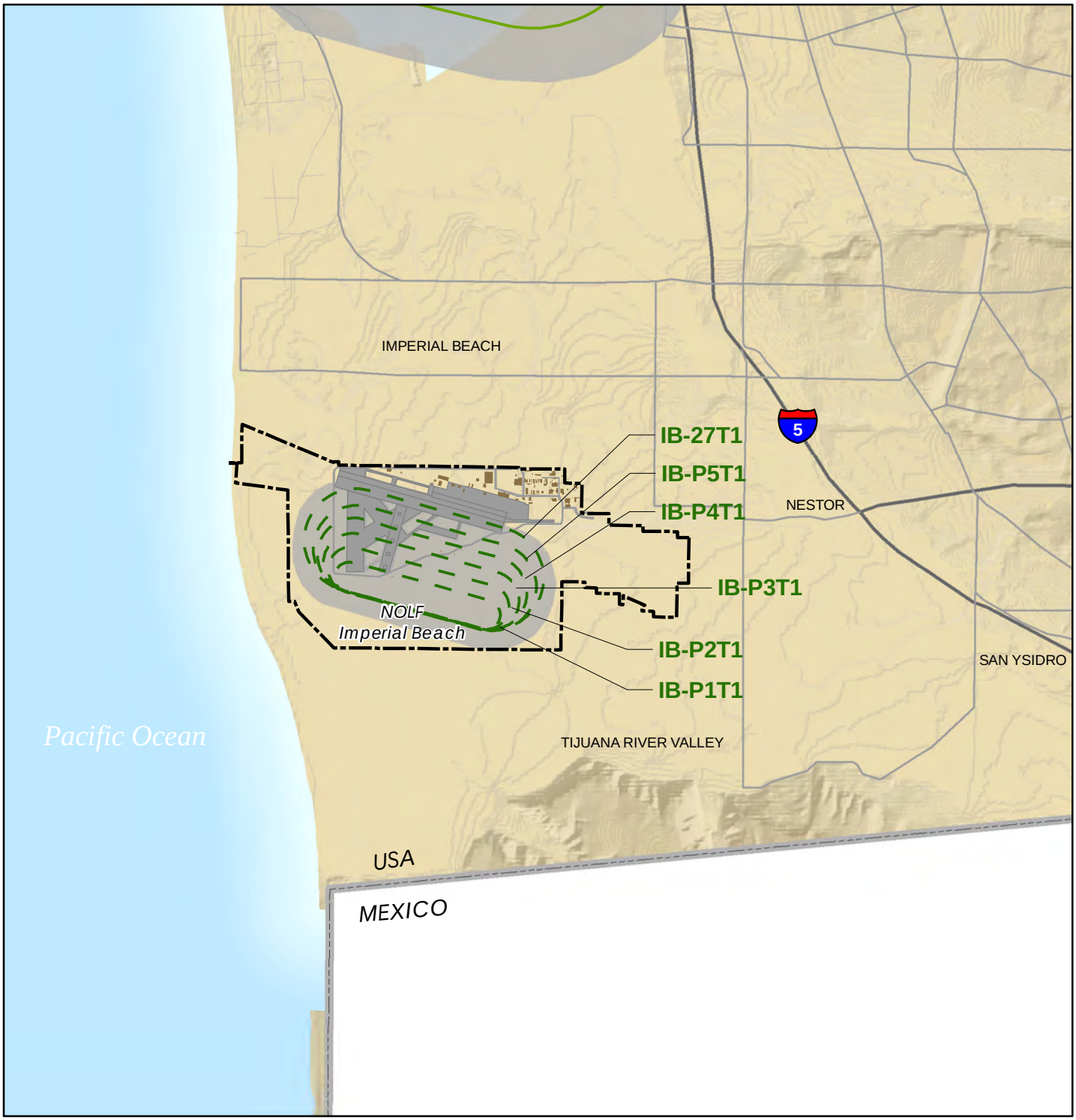
Rotary-Wing Touch & Go Pattern

Flight Shadow

Figure 3-9
Closed Flight Tracks
NAS North Island

Source: Wyle Labs Noise Study, 2010 (Flight Tracks), NAVFAC SW, 2006 (Base Data), The Onyx Group (Shadows), and USGS, 2010.





9
8
26
27

Fixed-Wing Touch & Go Pattern

Fixed-Wing GCA Pattern

Rotary-Wing Touch & Go Pattern

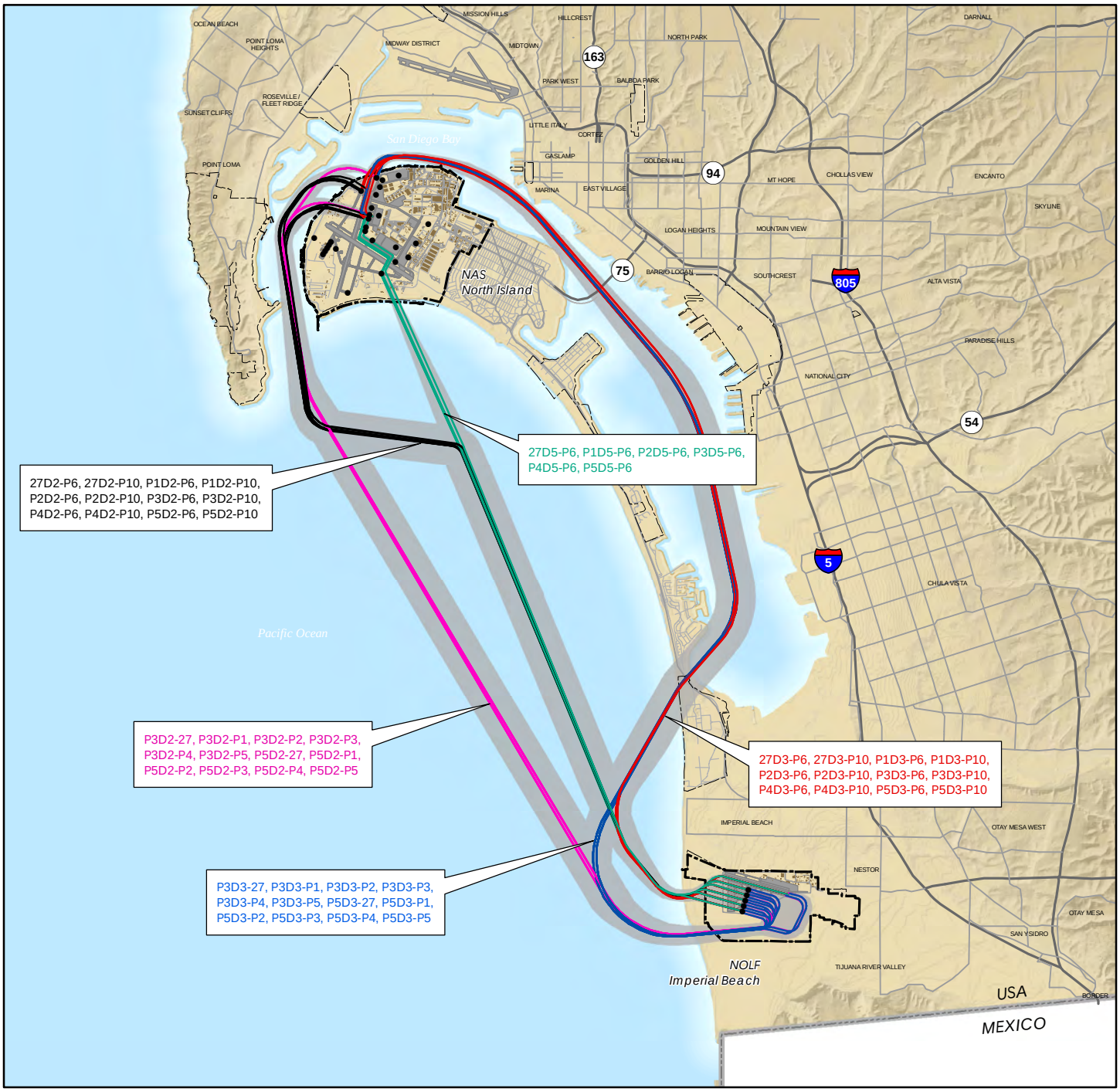
Flight Shadow

Figure 3-10
Closed Flight Tracks
NOLF Imperial Beach

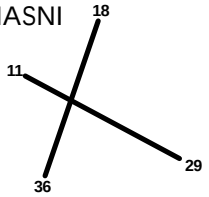
Source: Wyle Labs Noise Study, 2010 (Flight Tracks), NAVFAC SW, 2006 (Base Data), The Onyx Group (Shadows), and USGS, 2010.

0 2,500 5,000 Feet

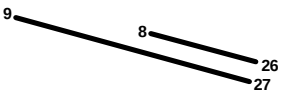
TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E



NASNI



NOLFIB



- Static Pads
- NASNI Pads to OLF IB Pads Interfacility #1
- OLF IB Pads to NASNI Pads Interfacility #2
- OLF IB Pads to NASNI Pads Interfacility #3
- OLF IB Pads to NASNI Pads Interfacility #4
- NASNI Pads to OLF IB Pads Interfacility #5
- Flight Shadow

Figure 3-11
Interfacility Flight Tracks

Source: Wyle Labs Noise Study, 2010 (Flight Tracks), NAVFAC SW, 2006 (Base Data), The Onyx Group (Shadows), and USGS, 2010.

0 1 2 Miles

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

3.4 Noise Abatement Procedures

Aircraft noise is a consideration for operations at NAS North Island and NOLF Imperial Beach. Noise abatement procedures for assigned and transient aircrews have been voluntarily developed by the Navy for these locations. The installation has collaborated with the surrounding communities, especially the City of Coronado, in developing airfield operations procedures to reduce noise associated with aircraft while executing the mission and maintaining flight safety.

Noise abatement procedures are published in *Naval Base Coronado Instruction 3710.7T, Air Operations Manual for NAS North Island and Naval Outlying Landing Field Imperial Beach*, 19 August 2005, as well as in Department of Defense (DOD) Flight Information Publication (FLIP) *Area Planning, North and South America*. This wide dissemination assists pilots of aircraft not normally assigned to the NAS in understanding and complying with procedures.

The first step in the noise abatement procedure is to require inbound transient pilots to have permission from operations prior to scheduling a mission into NAS North Island. This ensures base operations have an opportunity to brief inbound pilots on the procedures.

Basic procedures include a prohibition on practice approaches (full stop landing only) and on section (multiple aircraft in formation) approaches. Pilots are also instructed to use aircraft configuration, power settings, and airspeeds for a low noise profile. Overhead approaches are not normally used by high-performance tactical aircraft so the number of passes over the City of Coronado is reduced.

During normal flight hours (7:00 a.m. to 10:00 p.m. local, Monday through Thursday and 7:00 a.m. to 6:00 p.m. on Friday) fixed-wing aircraft land on Runway 29 and depart on Runway 18.

During noise abatement hours (10:00 p.m. to 7:00 a.m. Monday through Friday and 6:00 pm Friday through 7:00 a.m. Monday) fixed-wing aircraft normally land on Runway 36 and depart on Runway 18, normally making full stop landings.

Aircraft will not normally fly over the following areas below 2,500 feet altitude:

- City of Coronado
- Point Loma
- Coronado Cays (6.5 nautical miles southeast of NAS on Silver Strand)
- Coronado Shores Condominiums and Hotel Del Coronado on Runway 29 final approach

NAS North Island has published the HOTEL VISUAL RWY 29 visual approach procedure in FLIP terminal publications to assist pilots in following noise abatement requirements. The procedure is shown in Figure 3-12. Weather permitting, the Precision Approach Radar (PAR) and Airport Surveillance Radar (ASR) instrument approaches are offset 8 degrees to the left of centerline for Runway 29 to keep aircraft on final approach south of Coronado until the need for transitioning to align with the runway centerline at 2.5 miles Distance Measuring Equipment (DME). When weather conditions are below a 600-foot cloud ceiling or less than 2 miles visibility, the offset approach is not used and aircraft fly the approach aligned with the extended centerline of the runway.

Engine run-up operations are also normally limited for noise abatement purposes. General instructions require run-ups to be accomplished during periods of highest daily activity to use ambient noise to mask the operation and to minimize the number and duration of operations. In addition, efforts are normally made to position aircraft to attenuate sound by obstruction (buildings, for example) or distance. Engine run-ups are normally to be avoided between 6:00 p.m. and 10:00 p.m. and will be accomplished after 10:00 p.m. only in cases of operational necessity.

Noise abatement procedures are also in place for NOLF Imperial Beach. Pilots are instructed to remain above prescribed altitude minimums and avoid overflight of the City of Imperial Beach.

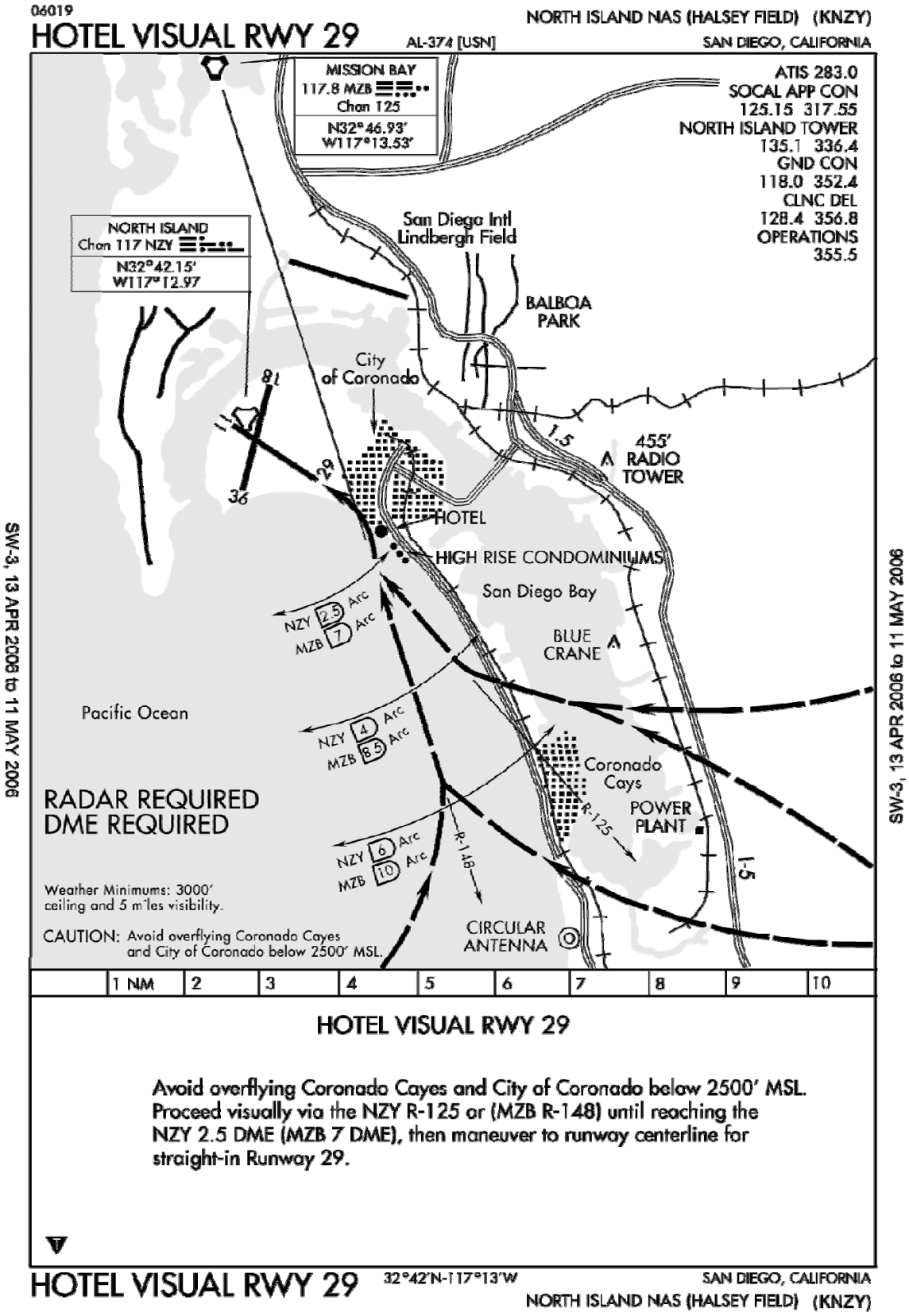
3.5 Operational Alternatives

A major operational alternative implemented at NAS North Island is the offset Runway 29 approach. This offset has been in place for over 25 years on this primary approach to NAS North Island. The reason for the establishment of the offset is to avoid normal over-flight of the obstruction posed by the Coronado Shores condominiums and for noise abatement purposes. A more standard approach would involve a straight-in approach aligned with the centerline of the runway, which would result in moving the Accident Potential Zone (APZ) and noise contours further into the City of Coronado.

An additional operational alternative evaluated for implementation was a 700' displaced threshold on Runway 29. This alternative, first announced in NAS North Island's 1984 AICUZ update, would remove all Coronado residences from the Runway 29 Clear Zone by moving the Clear Zone completely onto Navy property. If implemented, this alternative would meet Clear Zone criteria; that is, an area that should remain undeveloped. However, this alternative would create unacceptable changes to NAS North Island airfield operations. Displacing the threshold 700' would result in an increase in the precision approach radar (PAR) decision height (from 267' to 540') and loss of visual approach capability to Runway 29 during night and/or Instrument Meteorological Conditions (IMC). In addition, the runway's landing distance would be too short for MD-11 and L-1011 aircraft, and possibly other aircraft depending on atmospheric and runway surface conditions. While constructing an extension onto the departure end of Runway 29 may solve the landing distance challenge for larger aircraft, it would not mitigate the increased PAR minimums and loss of night/IMC visual approach capability, which result from immovable physical obstructions brought to bear with the threshold displacement. Based on NAS North Island's weather and flying environment, these changes are untenable and would seriously degrade the airfield's capability as a Naval Air Station.

Other alternatives have been examined and many implemented over the years to reduce noise and other impacts on the surrounding community. Some examples of operational alternatives that were implemented are: limited overhead break approaches, no field carrier landing practice (FCLP), limited touch and go's, designating runway 18 as the main takeoff runway, designating runway 36 as the main landing runway as operations allow, reducing NASNI operating hours on weekends, and limiting the times and location for high power engine run-ups. These alternatives and a host of others minimize aircraft overflights of Coronado residences and greatly reduce noise impacts to the communities surrounding NASNI.

Figure 3-12 HOTEL VISUAL RWY 29 APPROACH



Source: United States Flight Information File, 2006

4.0 Aircraft Noise

This section provides background discussion on sound; environmental noise descriptors; noise metrics; noise analysis; and the noise associated with aircraft operations, including that generated by in-flight operations and maintenance run-up operations at Naval Air Station (NAS) North Island and flight operations at Naval Outlying Landing Field (NOLF) Imperial Beach.

4.1 Aircraft Noise Sources

The main sources of sound at air installations are generally related to aircraft in-flight operations and pre-flight and maintenance run-up operations. The Department of Defense (DOD) uses standard computer models to develop noise contours for land use planning purposes. The following factors are considered in the models:

- Type of operation (e.g., arrival, departure, pattern)
- Number of operations per day of aircraft types
- Time of operation
- Flight tracks
- Aircraft power settings, speeds, and altitudes
- Number and duration of maintenance run-ups
- Environmental data (temperature and humidity)
- Topographical features of the area

4.2 Characteristics of Sound

The measurement and human perception of sound involves three basic physical characteristics—intensity, frequency, and duration. Intensity is a measure of the acoustic energy of the sound vibrations and is expressed in terms of sound pressure. The higher the sound pressure, the more energy carried by the sound and the louder the perception of that sound. Frequency is the number of times per second the air vibrates or oscillates. Low-frequency sounds are characterized as rumbles or roars, while sirens or screeches typify high-frequency sounds. Duration is the length of time the sound can be detected.

A logarithmic unit known as decibel (dB) is used to represent the intensity of sound. Such a representation is called a sound level. A sound level of 10 dB is approximately the threshold of human hearing and is barely audible under extremely quiet conditions. Normal speech has a sound level of approximately 60 dB. Sound levels above 120 dB begin to be felt inside the human ear as discomfort and above 140 dB as pain. See Figure 4-1.

Because of the logarithmic nature of the decibel unit, sound levels cannot be arithmetically added or subtracted. Therefore, the total sound level produced by two sounds of different levels is usually slightly higher than the higher of the two. If two sounds of equal intensity are added, the sound level increases by 3 dB. For example:

$$60.0 \text{ dB} + 70.0 \text{ dB} = 70.4 \text{ dB};$$

$$60 \text{ dB} + 60 \text{ dB} = 63 \text{ dB}.$$

A change of 3 dB is the smallest change detected by the average human ear. An increase of about 10 dB is usually perceived as a doubling of loudness. This applies to sounds of all volumes. Figure 4-1 provides some examples of general sound levels of typical noise sources and noise environments.

Figure 4-1 Sound Levels of Typical Sources and Environments

4.2.1 Environmental Noise Descriptor

For DOD noise studies, the Day-Night Average Sound Level (DNL) is used to describe the noise environment around airfields, except in the State of California where the Community Noise Equivalent Level (CNEL) is used per OPNAVINST 11010.36C. Accordingly, CNEL contours are provided in this Air Installations Compatible Use Zones (AICUZ) study.

4.2.2 Individual Response to Sound Levels

Individual response to sound levels is influenced by many factors, including the following:

- Activity the individual is engaged in at the time of the event
- General sensitivity to sound
- Time of day
- Length of time an individual is exposed to a sound
- Predictability of sound
- Average temperature/inversions/other weather phenomena

4.3 What Is Noise?

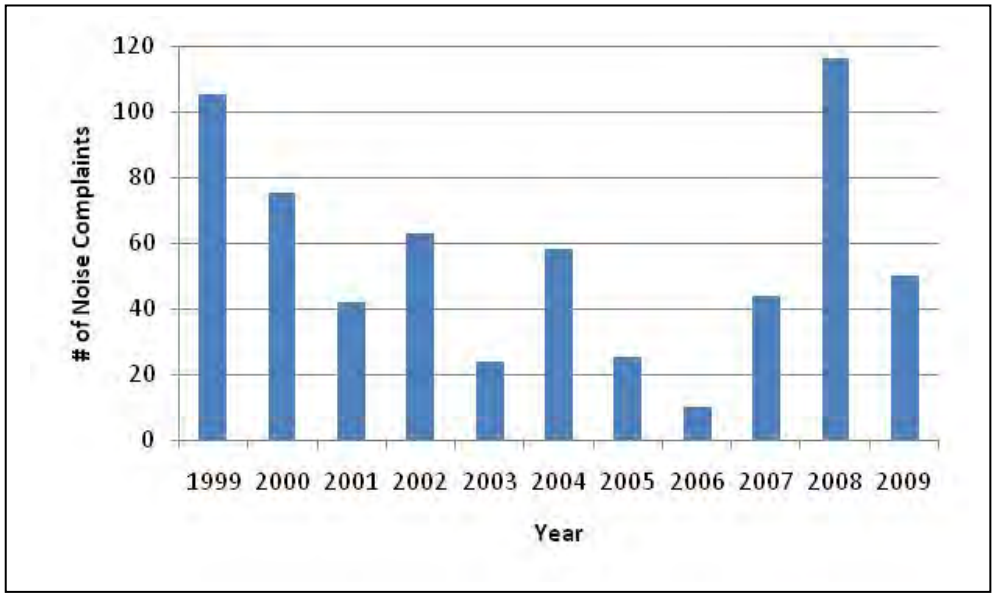
Noise is unwanted sound. Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the ear. Whether that sound is interpreted as pleasant (e.g., music) or unpleasant (e.g., jackhammers) depends largely on the listener's current activity, past experience, and attitude toward the source of that sound. Sound is all around us; sound becomes noise when it interferes with normal activities such as sleep and conversation.

Aircraft noise is of concern to many in communities surrounding airports. The impact of aircraft noise is also a factor in the planning of future land use near air facilities. Because the noise from these operations can impact surrounding land use, the Navy has defined certain noise zones and provided associated recommendations regarding compatible land use in the AICUZ Program.

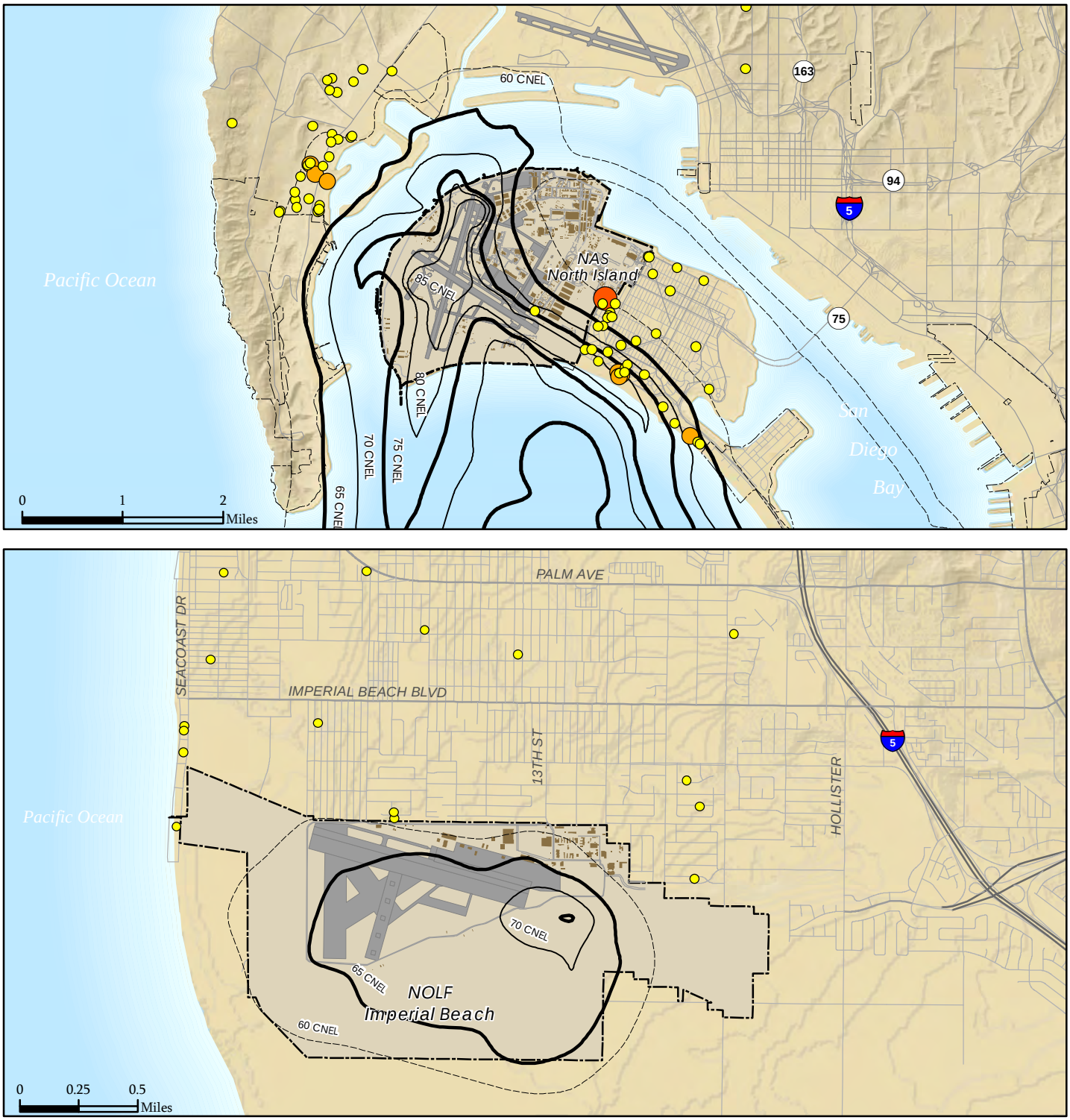
4.4 Noise Complaints

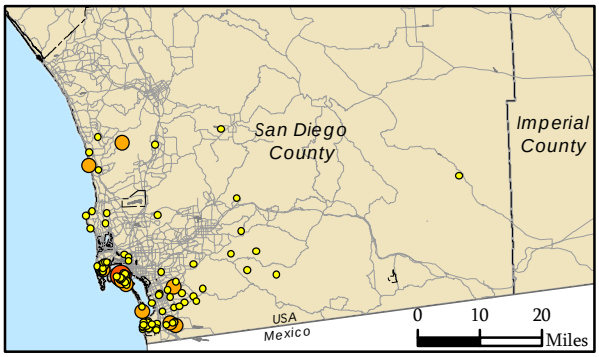
NAS North Island Instruction 3710.9H, *Sonic Boom, Low Flying Aircraft and Noise Complaint Policy and Procedures*, August 27, 2004, outlines the handling of complaints received by the installation. The policy directs that all complaints be referred to the Operations Duty Officer (ODO) and provides a form that the ODO completes to collect information from people contacting the base with a noise complaint. Figure 4-2 shows a record of noise complaints by year, while Figure 4-3 provides a map pinpointing the location of noise complaints. It should be recognized that complaints sometimes originate from areas outside noise contours due to sensitivity of the individual, an unusual incident, changes in local weather conditions, or aircraft not associated with NAS North Island. Changes such as increases in air operations reflecting more single event overflights in an area and more aircraft being seen can also result in noise complaints. The spike in 2008 noise complaints was mainly from one frequent caller.

Figure 4-2 Noise Complaints



Source: NAS North Island Air Operations, Department, 2008, 2010





# of Noise Complaints

- 1 - 5
- 6 - 16
- 17 - 34

Figure 4-3
1999-2009 Noise Complaints
with Baseline Noise Contours

Source: NAS North Island Air Ops Department, 2010, NAVFAC SW, 2006, ESRI, 2006, and USGS 2010.
Wyle 2010

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination
12° 35' E

4.5 Noise Metrics

As used in environmental noise analyses, a metric refers to the unit or quantity that measures the effect of noise on the environment. CNEL is the standard metric used in California to quantify noise in aircraft noise studies and associated compatible land use and zoning analysis.

Aircraft noise is expressed in terms of A-weighted sound levels. A-weighting is a method of adjusting the frequency content of a sound event to closely resemble the way the average human ear responds to aircraft sound. The A-weighting scale is therefore considered to provide a good indication of the impact of noise produced by aircraft operations.

Since land use compatibility guidelines are based on yearly average noise levels, noise contours were developed using Average Annual Day (AAD) operations in accordance with OPNAVINST 11010.36C. The operations level on an AAD is calculated by dividing the total annual airfield operations by 365 days. While annual operations will change from year to year, if other variables (aircraft type, location of flight paths, altitudes, times of day, power settings, etc) remain the same, a doubling of annual operations would result in a 3dB increase in CNEL contours.

Noise levels of the loudest aircraft operations significantly influence the 24-hour average. For example, if one daytime aircraft overflight measuring 100 dBA for 30 seconds occurs within a 24-hour period in a 50-dBA noise environment, the CNEL will be 65.5. If ten such 30-second aircraft overflights occur in daytime hours in the 24-hour period, the CNEL will be 75.4. Therefore, a few maximum sound events occurring during a 24-hour period will have a strong influence on the 24-hour CNEL, even though lower sound levels from other aircraft between these flights could account for the majority of the flight activity.

The accumulation of noise computed in this manner provides a quantitative tool for comparing overall noise environments and for use in developing compatible land use plans and zoning regulations in the airfields' environs. CNEL values are represented as contours connecting points of equal value, usually in 5-dB increments from 60 or 65 dB up to 75 or 80 dB contours.

4.6 Noise Contours

At a minimum, DOD requires that contours be plotted for CNEL values of 65, 70, 75, and 80 in AICUZ studies. Additionally, per OPNAVINST 11010.36C, contours of 60 CNEL are depicted to account for potential noise impacts in areas of low ambient noise levels. Three general noise exposure zones are defined in the AICUZ program: areas with a CNEL of less than 65, areas with a CNEL between 65 and 74, and areas with a CNEL of 75 or greater. These three areas are defined as Noise Zones 1, 2, and 3, respectively.

4.6.1 Methodology

The Navy periodically conducts noise studies to assess the noise impacts of aircraft operations, and there were noise studies conducted for NAS North Island in 1996 and 1997 as noted earlier in this study. A noise study is also normally conducted as part of an update of an AICUZ study.

The following paragraphs discuss previous noise contours as well as current modeled noise contours and the prospective noise contours for NAS North Island and NOLF Imperial Beach.

4.6.2 Previous AICUZ Noise Contours

The noise contours for NAS North Island included in the 1984 AICUZ study are shown in Figure 4-4. These contours were developed based on aircraft operations in 1981. The primary fixed-wing aircraft were the S-3, F-4, A-4, A-6, A-7, C-9, and a variety of helicopters, including the H-2, H-3, and H-46.

Figure 4-4 shows that the 65 CNEL contour extended off the installation into the southwestern portion of Coronado over residential areas. The 65dB CNEL contour also extended over a small area of the waterfront area of Naval Station Point Loma. The shape of the contours primarily represents the influence of flight tracks, including a large number of Touch and Go (T&G) and overhead approaches, modeled as an average busy day. Major changes in the aircraft mix and operations levels occurred by the time the 1996/1997 noise studies were prepared. However, contribution of fixed-wing jet based and transient aircraft were the predominate factors in the 1996/1997 noise contours.

The 1989 AICUZ study for NOLF Imperial Beach was based on the extensive helicopter operations and training conducted at the field. Aircraft considered in the study were the H-2, H-3, H-46, H-53, and H-60. Figure 4-5 shows the noise contours developed during the 1989 study. The generally oval shape of the contours shows the influence of the traffic pattern to the pads and runways, while the extension to the east shows the influence of the instrument approaches to Runway 27. The 65 CNEL contour did extend off the installation over residential properties to the northwest, but most of the 65 CNEL contour remained over undeveloped land.

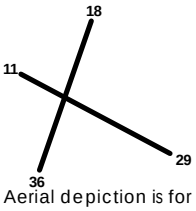
4.6.3 Current Noise Contours

The current (baseline) noise contours come from a 2010 noise study (WR-10-18 of September 2010) conducted as part of this AICUZ update for both NAS North Island and NOLF Imperial Beach. The current noise contours remain similar to those developed in 1997 and 2008. In 2009 the Navy confirmed plans to redevelop the homeport facilities for three NIMITZ Class aircraft carriers in support of the U.S. Pacific Fleet at NAS North Island (*Record of Decision Final Supplemental Environmental Impact Statement 9 January 2009*). Also, proposals for Navy Helicopter Wings Realignment and MH-60R/S Helicopter Transition at Naval Base Coronado were being considered. In order to provide the best estimate of future air operations at NAS North Island and NOLF Imperial Beach in this AICUZ update, the overall previous operations data used in WR-06-11 (as amended) was re-examined in detail by NAS North Island, Naval Aviation Depot (NADEP) San Diego, the Naval Air Forces staff, and Naval Facilities Engineering Command (NAVFAC) SW in late summer of 2010. As a result of this re-examination, an updated set of operational data were provided by the Navy for use in developing the updated baseline contours and prospective future contours reflected in WR-10-18 and used in this AICUZ update.

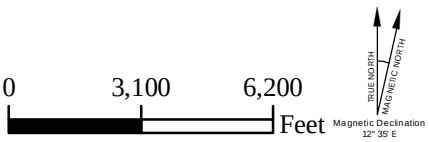
The current baseline noise contours modeled for NAS North Island are shown in Figure 4-6. The current baseline noise contours modeled operations for NOLF Imperial Beach are shown in Figure 4-7. While operations will normally change from year to year, as noted earlier, if other variables remain the same, a doubling of annual operations would result in a 3dB increase in contours.

When comparing the 1984 AICUZ contours (based on 1981 data) shown in Figure 4-4 with the current contours in Figure 4-6 for NAS North Island, and the 1989 AICUZ contours in Figure 4-5 with the current contours in Figure 4-7 for NOLF Imperial Beach, there are two main factors to remember in understanding the differences between the two sets of noise contours. First, there have been updates and improvements over the past 25 years in the computer noise model that generates and plots the noise contours. Advancing technology has allowed modeling pre-flight run-ups and improved lateral attenuation algorithms, which accounts for changes in aircraft speed more accurately. The current noise models better represent noise behavior, including terrain effects and propagation, than in previous noise studies. For example, the contours will be larger over water areas in the newer models. Second, there have been major changes in aircraft mix and operations in the quarter-century since the previous AICUZ studies were developed. For example, the F/A-18 is a louder aircraft than the S-3 and the F-14; flight procedure changes were introduced, such as the reduction in the number of carrier break landings by high performance jets that require two passes over the City of Coronado on landings on Runway 29. Operational changes over the past quarter century such as these influence changes in contour shape and size.

Figure 4-4
1984 Noise Contours
NAS North Island



Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: NAS North Island AICUZ, 1984 (Contours) and NAVFAC SW, 2006 (Aerial).



9 8 26 27

Figure 4-5
1989 Noise Contours
NOLF Imperial Beach

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: NOLF Imperial Beach AICUZ, 1989 (Contours) and NAVFAC SW, 2006 (Aerial).

0 2,000 4,000 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

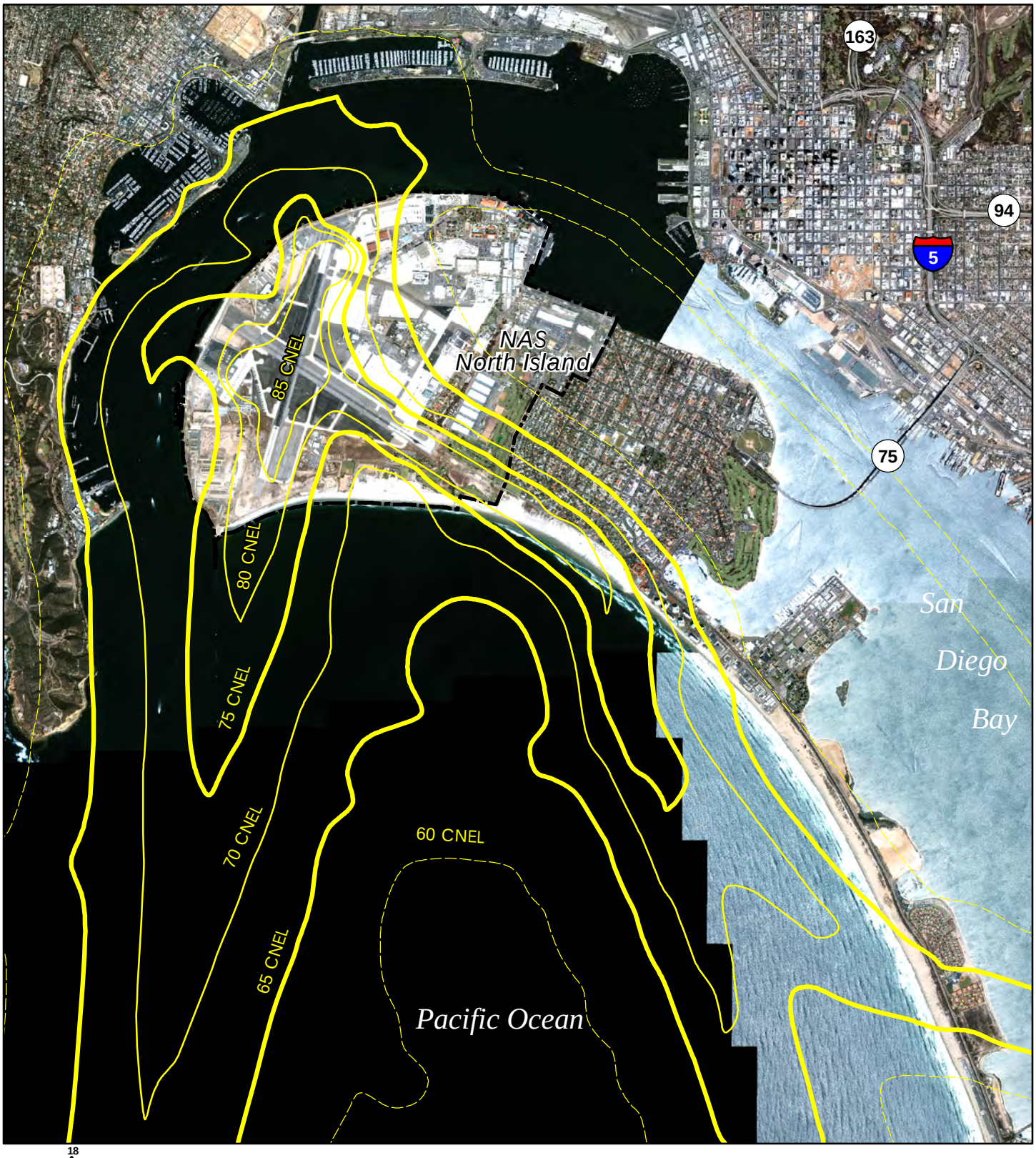
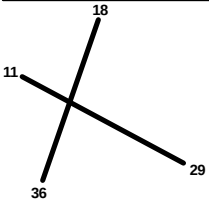


Figure 4-6
Baseline Noise Contours
NAS North Island



Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours) and NAVFAC SW, 2006 (Aerial).

0 4,600 9,200 Feet

Figure 4-7
Baseline Noise Contours
NOLF Imperial Beach

0 1,000 2,000 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours) and NAVFAC SW, 2006 (Aerial).

4.6.4 Prospective Future Noise Contours

The prospective noise contours for NAS North Island and NOLF Imperial Beach in this AICUZ update were modeled using updated prospective operations (circa 2020). The NAS North Island prospective noise contours are shown in Figure 4-8. The shape of the contours continue to show the influence of the number of operations on the Hotel Visual Runway 29 primary approach that is consistent in earlier noise contours in the mid 1990s, 2006, and 2008. It is noted that the contours are also similar to those included in the City of Coronado's Noise element of their General Plan[1].

The noise contours for the prospective case at NAS North Island show a slight decrease in area over the baseline contours. Loud fixed-wing events have a strong effect on the 24 hour CNEL contours, even though there are more rotary-wing aircraft with lower sound levels operating at NAS North Island.

The prospective (circa 2020) noise contours for operations for NOLF Imperial Beach are shown in Figure 4-9, showing an increase over the baseline contours. However, the prospective noise contours for NOLF Imperial Beach are smaller than the approved 1989 AICUZ noise contours, and the 65dB CNEL (and above) contours essentially remain within the Navy installation boundary. While increases in operations at NOLF Imperial Beach can be perceived as a change in single-event overflights by listeners, the vast majority of the increase in operations is anticipated to be in pattern operations within the installation. The small area of 65dB CNEL near the Mexican border is due to a rise in ground elevation for helicopters departing on a flight track to the east.

Figure 4-10 shows a comparison of the approved noise contours from the 1984 NAS North Island AICUZ with the prospective noise contours for NASNI, while Figure 4-11 provides a detailed comparison at the approach end of Runway 29. Figure 4-12 shows a comparison of the approved 1989 NOLF Imperial Beach AICUZ with the prospective noise contours for NOLF Imperial Beach.

[1] Chapter "L" City of Coronado General Plan Noise Element revised April 20, 1999

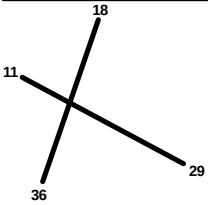


Figure 4-8
Prospective Noise Contours
NAS North Island

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours) and NAVFAC SW, 2006 (Aerial).

0 4,400 8,800 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

Figure 4-9
Prospective Noise Contours
NOLF Imperial Beach

0 1,000 2,000 Feet

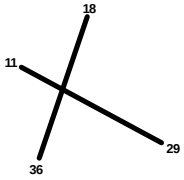
TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours) and NAVFAC SW, 2006 (Aerial).

1984 NASNI Noise Contours
- 65 CNEL
- 75 CNEL

Prospective Contours
- 65
- 75

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 and NASNI AICUZ, 1984 (Contours), and NAVFAC SW, 2006 (Aerial).



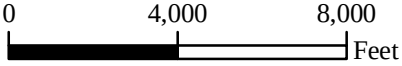


Figure 4-10
NAS North Island Comparison of 1984 Noise with Prospective Noise Contours

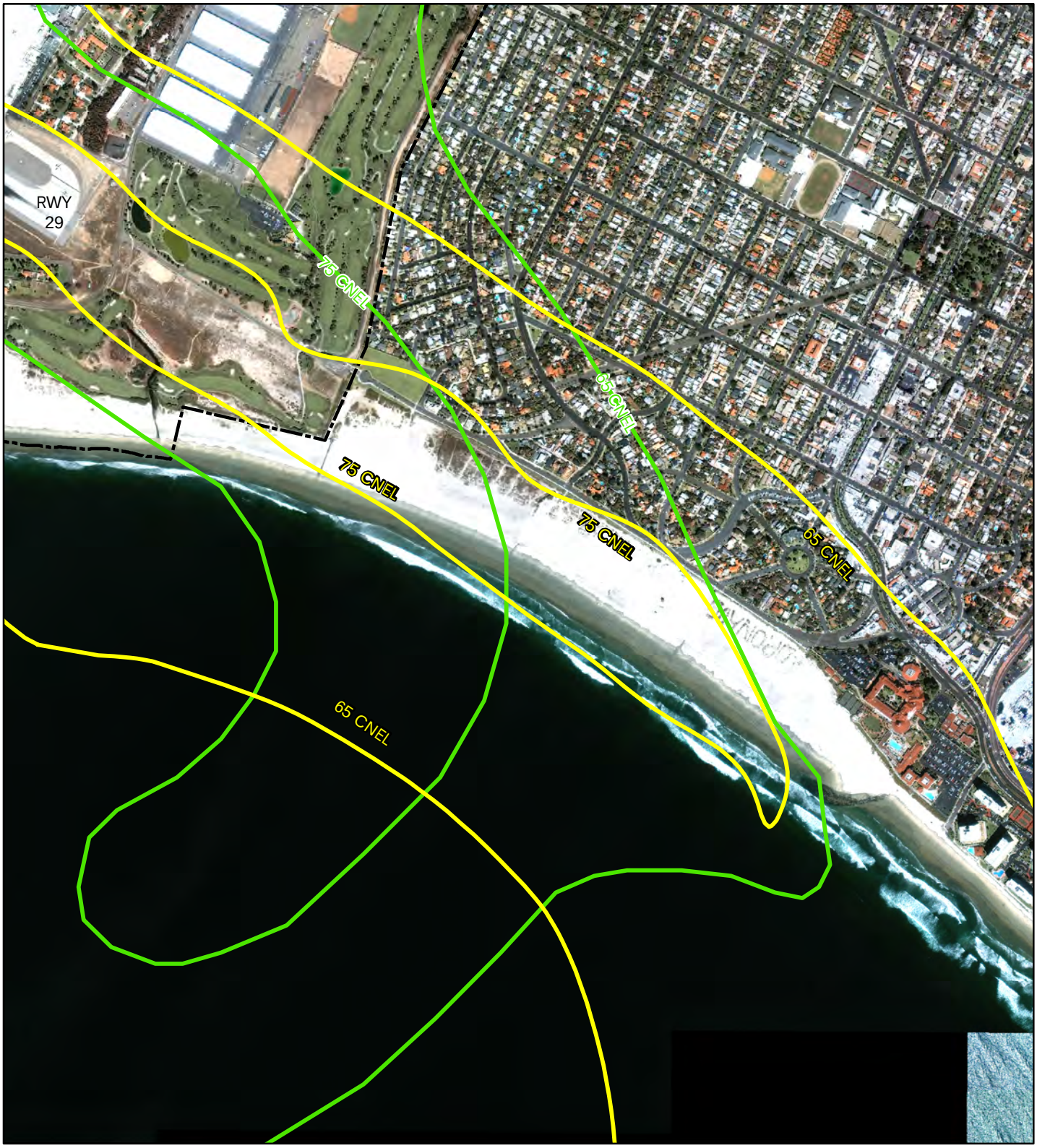


Figure 4-11
NAS North Island RWY29
Noise Contour Comparison

1984 Noise Contours	Prospective Contours
65 CNEL	65
75 CNEL	75

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: 1984 NASNI AICUZ and Wyle Noise Study, 2010 (Contours), and NAVFAC SW, 2006 (Aerial).

0 940 1,880 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

1989 NOLF IB Noise Contours	Prospective NOLF IB Noise Contours
60 CNEL	60
65 CNEL	65
70 CNEL	70
75 CNEL	75

9 8 26 27

Figure 4-12
NOLF Imperial Beach
Comparison of 1989 Noise
with Prospective Noise Contours

0 1,600 3,200 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 and NOLFIB AICUZ, 1989 (Contours), and NAVFAC SW, 2006 (Aerial).

5.0 Safety

Aerial view of NAS North Island.

Airfield planning tools have been developed to assist Department of Defense (DOD) and local community planners in creating compatible land uses on and around DOD airfields. These tools include imaginary surfaces and Accident Potential Zones (APZs). The imaginary surfaces tool helps identify objects that potentially obstruct or interfere with aircraft arrivals, departure, and flight patterns. The APZs tool helps identify incompatible land uses and promote compatible land uses surrounding air installations.

This section details APZs, as well as prevention of obstructions that can cause aircraft mishaps or impact operations. For the safety of the aviators and to protect persons on the ground, the height of objects and vegetation should be restricted. Imaginary surfaces that extend off runways can help to identify areas where potential airspace obstructions could occur and help with their prevention before they occur.

APZs rely on the fact that aircraft mishaps are more likely to occur on or near the runways than in other areas. The Navy has identified APZ criteria around its runways and under flight tracks based on historical data showing where mishaps have occurred. Although the likelihood of an accident is remote, the Navy recommends that certain land uses that concentrate large numbers of people, such as dense residential developments and schools, not be located in the APZs.

Other hazards to flight safety that are not recommended in the vicinity of the airfield include the following:

- Uses that attract birds, especially waterfowl
- Lighting (direct or reflected) that impairs pilot vision
- Uses that would generate smoke, steam, or dust
- Uses that generate electromagnetic interference with aircraft communication, navigation, and electric systems

5.1 Objects Affecting Navigable Airspace

Aircraft operations can be constrained by the surrounding natural terrain and man-made features such as buildings, towers, poles, and other potential vertical obstructions to navigation. The Federal Aviation Administration (FAA), *CFR Title 14, Part 77, Objects Affecting Navigable Airspace* (PART 77), outlines a notification procedure for proposed construction or alteration of objects near airports that could affect navigable airspace. Naval Facilities Engineering Command (NAVFAC) P-80.3 (as well as PART 77) also identifies a complex series of imaginary surfaces or planes used for siting facilities on and near military airfields and determining obstructions or hazards to air navigation for these airfields.

The U.S. Standard for Terminal Instrument Procedures (TERPS) for airports (a joint Army, Navy, Air Force, Coast Guard, and FAA publication) outlines procedures to be used in analyzing the potential impact proposed construction or alteration projects may have on instrument approaches for an airfield and whether the proposal would create an obstruction to air navigation if constructed. The early analysis of construction or alteration proposals in areas identified near airfields could identify and help preclude an air navigation obstruction before it occurs.

5.1.1 Notice of Construction or Alteration

Under the provisions of Federal Aviation Regulations (FAR) PART 77, each sponsor[1] who proposes any of the following construction/alteration must notify the Administrator of the FAA prior to beginning so that its potential impact on airspace can be assessed. As part of this assessment, both obstruction standards and TERPS impacts are evaluated to determine whether the project will result in an adverse impact on the airport flight procedures or create an obstruction or hazard to air navigation. Notification to the FAA is required in the following areas:

1. Any construction or alteration of more than 200 feet in height above ground level (AGL) at its site.
2. Any construction or alteration of greater height than an imaginary surface extending outward and upward at a 100 to 1 slope for a horizontal distance of 20,000 feet from the nearest point of the nearest runway.
3. Any highway, railroad, or other traverse way for mobile objects of a height which, if adjusted upward (specific distances specified in the PART 77), and for a waterway or any other traverse way not previously mentioned, is such that an amount equal to the height of the highest mobile object that would normally traverse it would exceed the heights outlined in subparagraphs 1 and 2 above.
4. Any construction or alteration that would be in an instrument approach area (defined in FAA standards) and available information indicates it might exceed a (imaginary surface) standard for obstructions. Paragraph 5.1.2 below outlines these standards.
5. Any construction or alterations on an airport.

5.1.2 Obstruction Standards

Subpart C of PART 77 establishes standards for determining obstructions to air navigation commonly referred to as imaginary surfaces. Imaginary surfaces criteria are based on the class of runway involved. DOD rotary- and fixed-wing runways are separated into two classes for the purpose of defining runways, Class A and Class B. Class A runways are used primarily by light and rotary-wing aircraft and do not have the potential for intensive (over 10 percent of operations) use by heavy or high-performance aircraft. Class B runways are used by all other fixed-wing aircraft.

- NAS North Island has two Class B runways.
- NOLF Imperial Beach has a helicopter runway, which does not preclude occasional landings by fixed-wing aircraft in certain situations.

Figure 5-1 details the imaginary surfaces for the runways at NAS North Island. Figure 5-2 details the imaginary surfaces for NOLF Imperial Beach, including Instrument Flight Rules (IFR) helicopter runway for Runway 9/27, Visual Flight Rules (VFR) helicopter runway for Runway 8/26 and VFR helipads for the Pads 1 through 5. Detailed geometry can be found in Appendix A.

In general, Navy criteria provide that no aboveground structures should be constructed in the Primary Surface and Clear Zone (CZ) areas. The height of structures should be controlled to prevent penetration of the transitional surfaces and approach departure surfaces. These restrictions limit the height of structures as the distance from the runway surface decreases. Approaching the runway surface and its corresponding flight path, more stringent height limitations are imposed.

[1] PART 77 provides for certain specific exceptions to the notification generally encompassing those situations in which a proposed project would be lower than a similar adjacent object (see PART 77 for specific details).

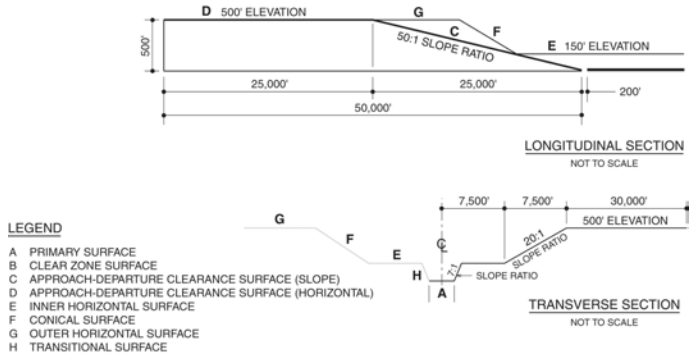
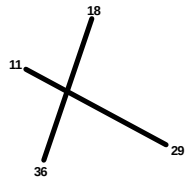
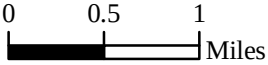


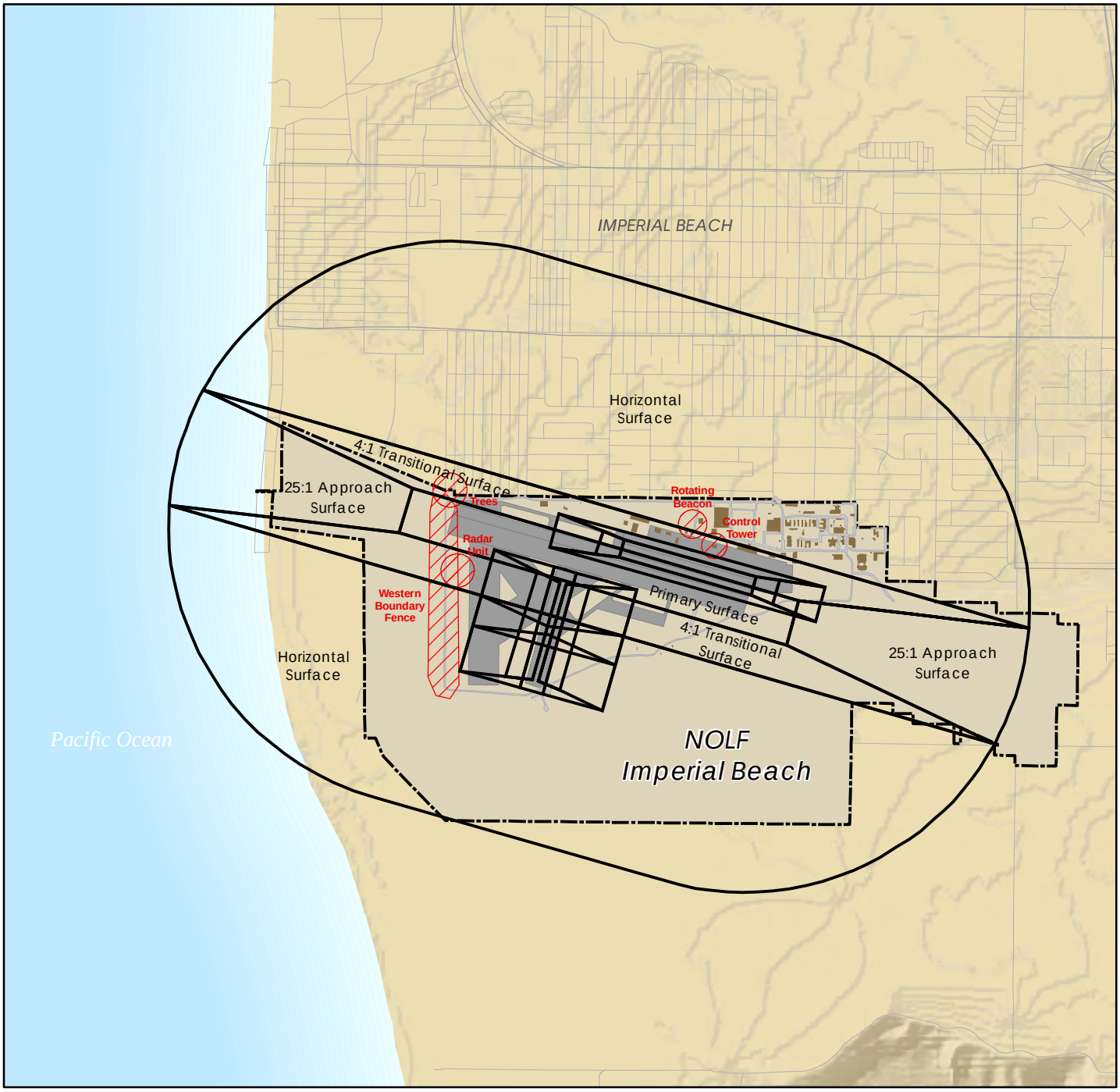
Figure 5-1
Imaginary Surfaces
NAS North Island

Areas of Existing Height Obstructions





Source: 1984 NAS North Island AICUZ NAVFAC P-80.3 Class B Runway (Imaginary Surfaces), The Onyx Group (Hazards), and USGS, 2010.



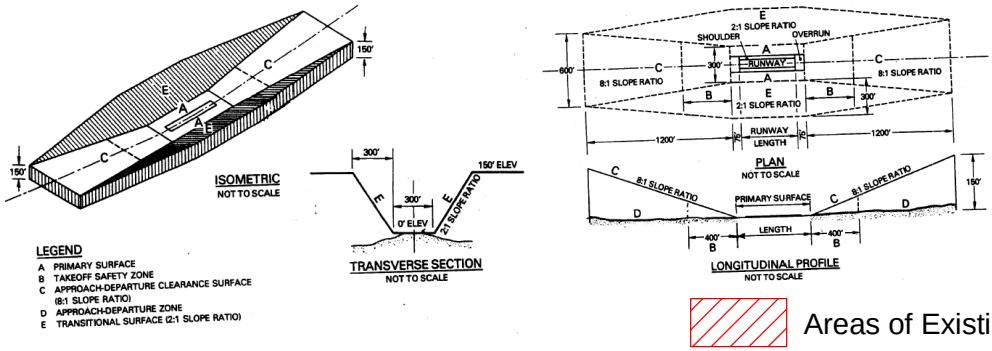


Figure 5-2
Imaginary Surfaces
NOLF Imperial Beach

Areas of Existing Height Obstructions

Source: 1989 NOLF Imperial Beach AICUZ NAVFAC P-80.3 Helicopter IFR Runway, VFR Runway, and VFR Helipad (Imaginary Surfaces), The Onyx Group (Hazards), and USGS, 2010.

0 1,600 3,200 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

5.2 Accident Potential Zones

APZs are based on historical accident data throughout the military and the application of margins of safety within those areas (which have been determined to be potential impact areas) if an accident were to occur. As with obstruction standards discussed above, APZ criteria is based on the class of the runway involved. The U.S. Navy recognizes three types of APZs for runways and helicopter landing areas in OPNAVINST 11010.36C: the CZ, APZ I, and APZ II, depending on the type of runway or landing area involved (see Appendix B for geometry). For Class B runways, the following criteria apply:

- **Clear Zones.** The area immediately beyond the usual runway threshold is designated "clear zone." It is the area with the greatest potential for occurrence of aircraft accidents. For DON airfields a trapezoidal or "fan shaped" CZ shall be used that is 3,000 feet long, 1,500 feet wide at the end of the runway and widening to 2,284 feet at its end as shown in Appendix B. The CZ is required for all active runway ends. (OPNAVINST 11010.36C)
- **APZ I.** The APZ I is the area beyond the CZ that still possesses a measurable potential for accidents relative to the CZ. APZ I is provided under flight tracks that experience 5,000 or more annual fixed wing operations (departures or approaches, but not both combined). The APZ I is 5,000 feet long by 3,000 feet wide extending from the end of the CZ. (OPNAVINST 11010.36C)
- **APZ II.** APZ-II is an area beyond APZ I (or CZ if APZ I is not used) that has a measurable potential for aircraft accidents relative to APZ-I or the CZ. APZ II is used whenever APZ-I is required. APZ II is 7,000 feet long by 3,000 feet wide extending from the end of APZ I. (OPNAVINST 11010.36C)

5.2.1 Fixed-Wing Runway APZs at NAS North Island

NAS North Island has two Class B runways. Current Navy policy is not to depict APZs over water areas. Navy criterion provides that normally 5,000 fixed-wing annual operations (arrivals or departures not combined) are the basis for designating an APZ to a runway.

Figure 5-3 depicts the prospective fixed-wing APZs for Runway 29 at NAS North Island. The prospective future utilization shown in Table 5-1 is above 7,000 fixed-wing annual operations. The fixed wing operations levels for the scenarios analyzed in this Air Installations Compatible Use Zones (AICUZ) update (current, future prospective) are above the criterion of 5,000 fixed-wing annual operations for APZ I and II for arrival to Runway 29. Therefore, an APZ I and APZ II are included on the approach to Runway 29 and are the same for both scenarios.

The APZs to Runway 29 are aligned with the predominant flight track of "Hotel Visual" requiring a curved shape to follow the ground track of the aircraft as they turn to final to align with the runway for landing.

Table 5-1 Annual Fixed-Wing Operations for NAS North Island (Prospective Future)

Runway	Operation	Track	Annual Ops
NZY-11	Arrival	N/A	
	Departure	F11D1	398
NZY 29	Arrival	F29A1	1,330
		F29A2	1,330
		F29A3	1,330
		F29A4	1,330
		F29O1	328
		F29T1	293
		FR29G1	1,175
		Subtotal	7,116
	Departure	F29D1	670
NZY 18	Arrival	F18A1	156
		F18A2	8
		F18A3	0
		F18O1	0
		Subtotal	156
	Departure	F18D1	6,878
NZY 36	Arrival	F36A1	2,130
	Departure	F36D1	0
Total Operations			16,956

Source: Wyle Labs 2010; The Onyx Group, 2010

Table 5-2 - Total Annual H-60 Operations NOLF Imperial Beach (Prospective Future)

Operation	Runway/ Pad	Annual Ops
Departure	NRS-27	6,305
Arrival	NRS-27	6,305
Interfacility Departure	NRS-27	6,890
	NRS-P1	1,882
	NRS-P2	2,661
	NRS P3	1,285
	NRS-P4	2,182
	NRS-P5	666
Interfacility Arrival	NRS-27	6,849
	NRS-P1	1,245
	NRS-P2	2,646
	NRS P3	1,090
	NRS-P4	2,700
	NRS-P5	1,035
Touch & Go	(Closed Flight Tracks)	279,602
Total Operations		323,344

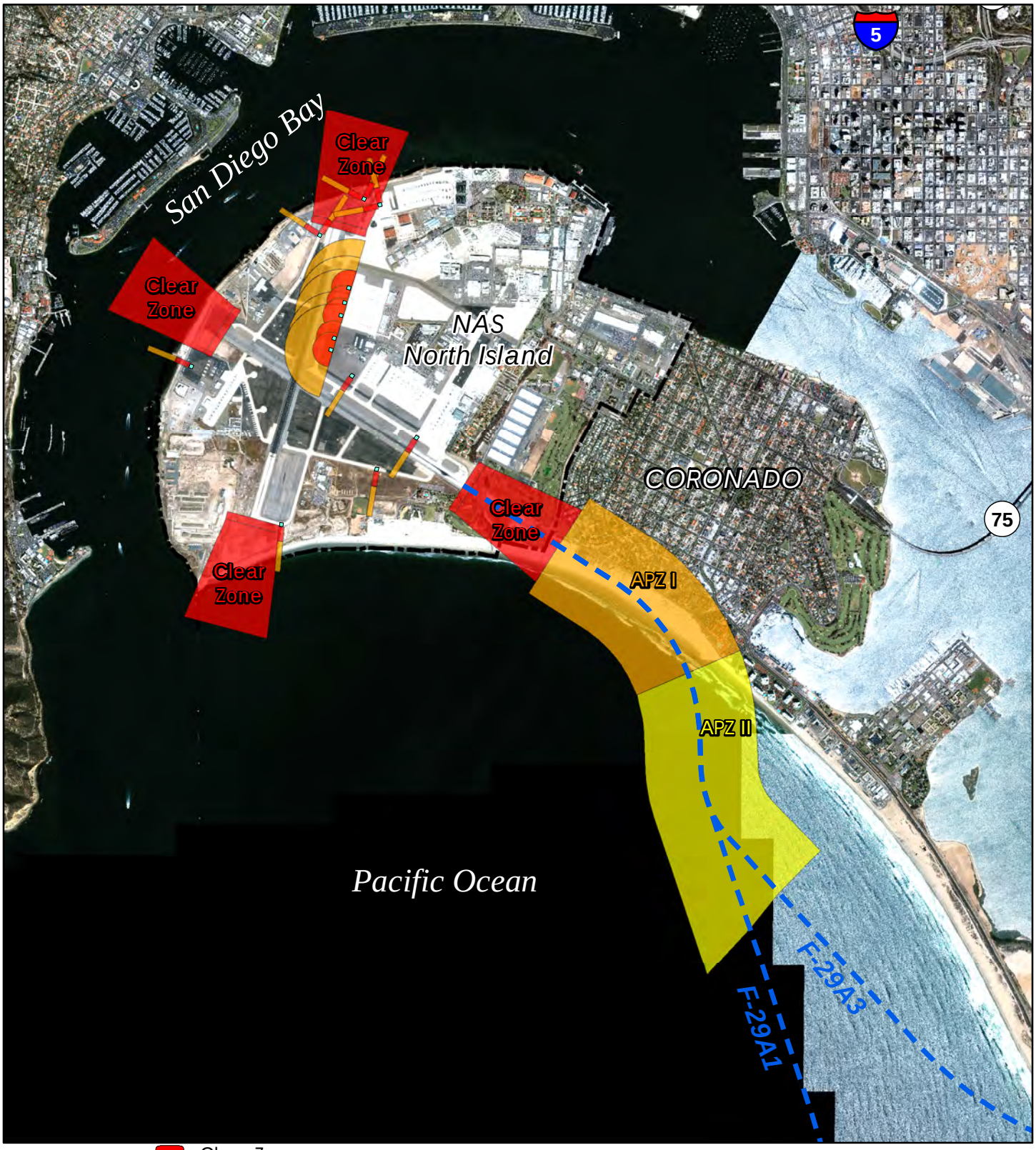
Source: Wyle Labs 2010; The Onyx Group, 2010

5.2.2 Helicopter APZs at NAS North Island

Helicopter APZs at NAS North Island are established at each of the helicopter pads and are oriented along the flight tracks established for the departure and approach operations flown at those pads. APZ guidelines for helicopters, which are outlined in OPNAVINST 11010.36C, are much smaller than those for fixed-wing aircraft and are on base. These helicopter APZs can be seen on Figure 5-3.

5.2.3 APZs at NOLF Imperial Beach

Figure 5-4 depicts APZs based on prospective operations at NOLF Imperial Beach, as shown in Table 5-2. The intensity of helicopter operations indicates the requirement for CZ and APZ I for Helipads 1 through 5 at the airfield. Due to the intensity of operations in the traffic pattern and the nature of pattern operations, including flight with external loads, an oval area shadowing the traffic pattern is also designated as APZ I. In addition, a number of operations are completed to Runway 27, including instrument approaches and autorotations. Helicopter runway CZs and APZs are established at both ends of this runway.

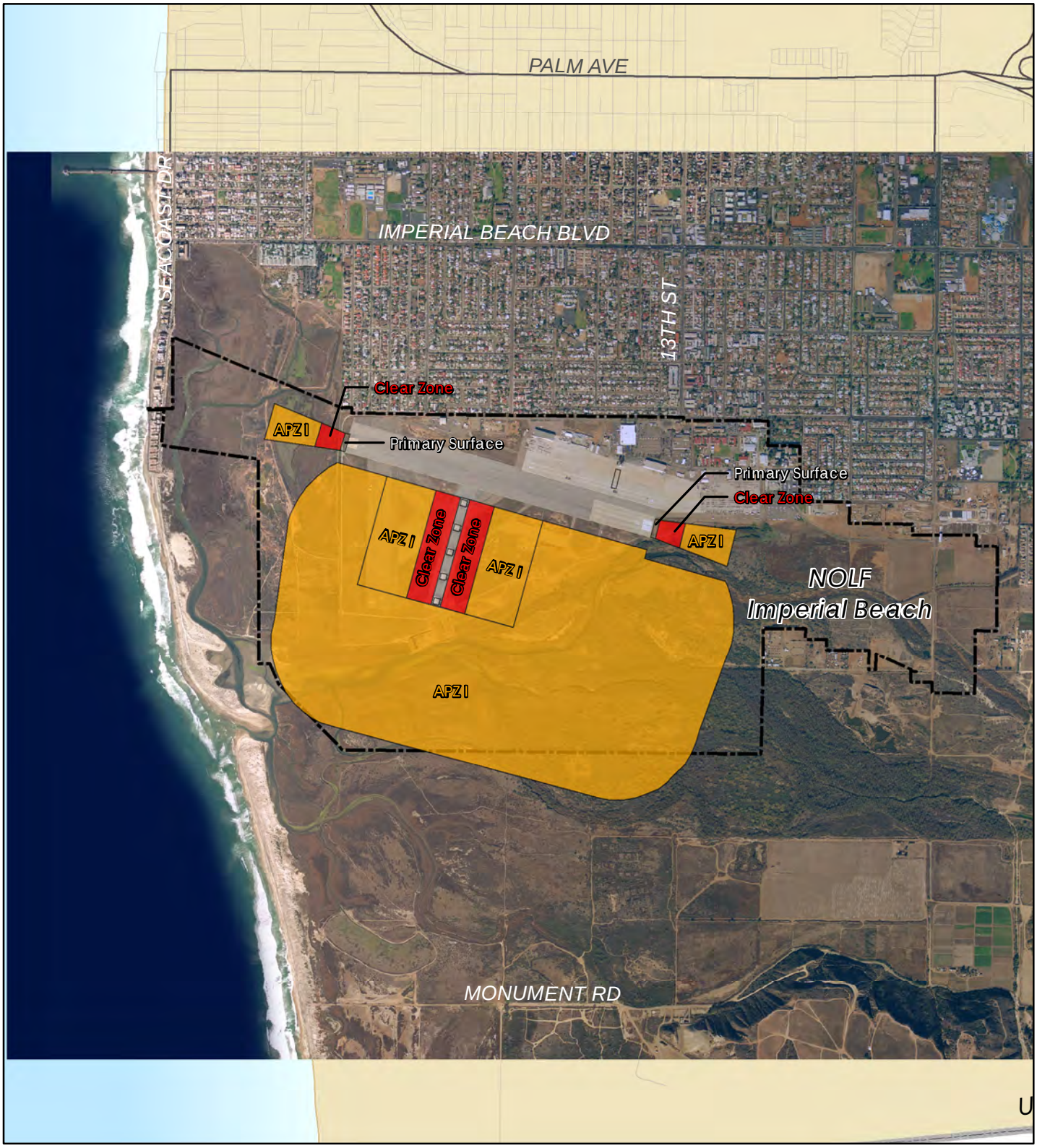


Clear Zone
APZ I
APZ II
Hotel Visual Flight Track
Helopad

Figure 5-3
NAS North Island
Accident Potential Zones

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs, 2010 (Flight Tracks), Onyx Group (APZs), and NAVFAC SW, 2006 (Aerial).

0 2,500 5,000 Feet



Primary Surface
Clear Zone
APZ I

Figure 5-4
NOLF Imperial Beach
Accident Potential Zones

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: The Onyx Group (APZs) and NAVFAC SW, 2006 (Aerial).

0 1,500 3,000 Feet

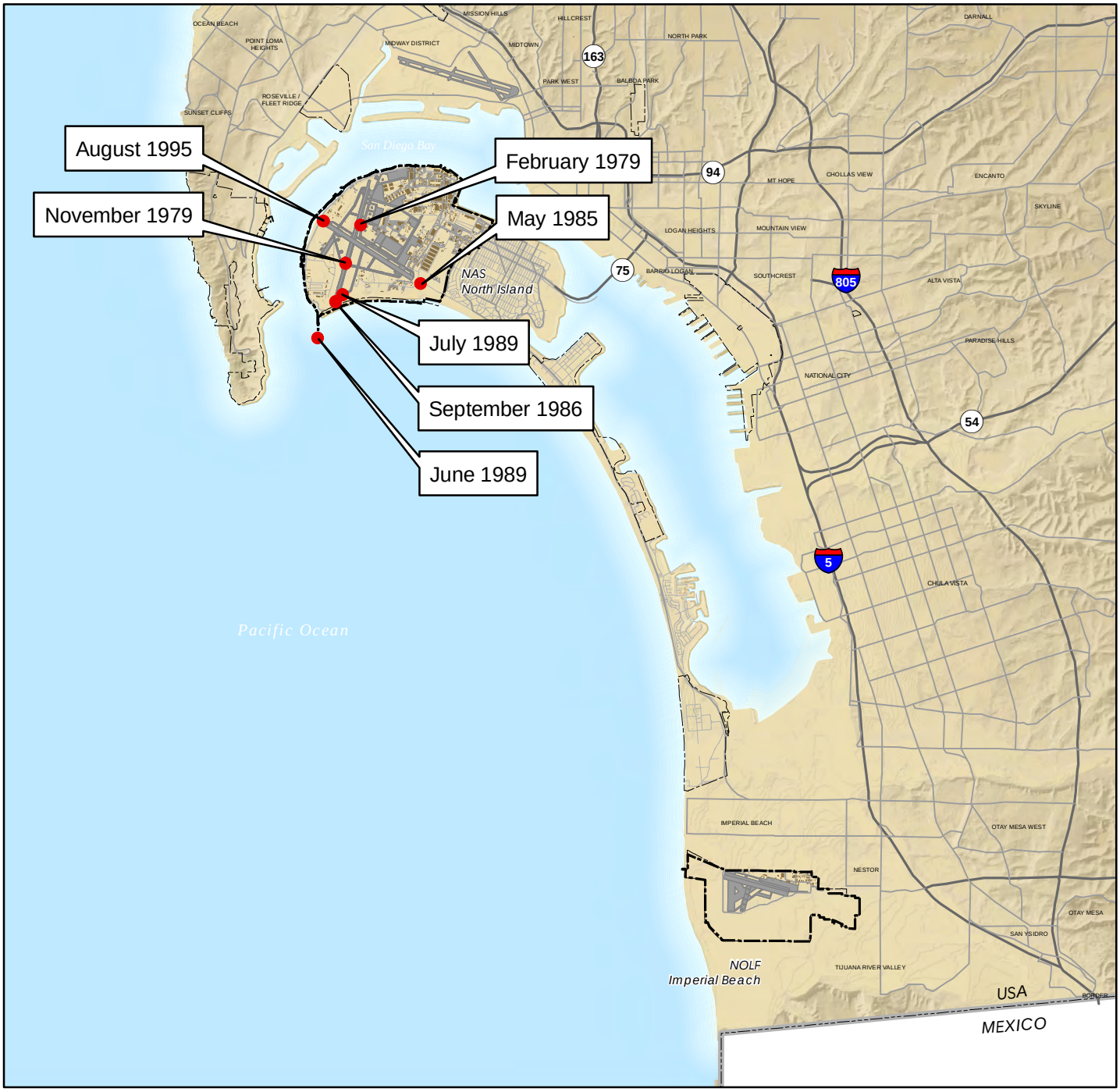
5.2.4 Accident History

A summary of NAS North Island Class A aircraft accidents that occurred near the airfields during flight operations is presented in Table 5-3. A Class A mishap is defined by OPNAVINST 5102.1D as one in which the resulting total cost of damages to DOD or non-DOD property is in an amount of $1 million or more; a DoD aircraft is destroyed; or an injury and/or occupational illness result in a fatality or permanent total disability. The location of these accidents is pinpointed in Figure 5-5.

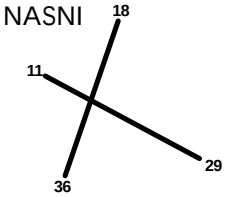
Table 5-3 Accident History Summary, 1979-Present

Aircraft Type	Date	Accident General Location
UH-1N	Feb. 1979	Control problem shortly after take-off from helopad. Impacted on nearby taxiway.
A-6	Nov. 1979	Port landing gear collapsed upon touchdown on Runway 36. Aircraft came to rest on runway 1,800 ft. short of intersection.
TA-4	May 1985	Mechanical failure during missed approach to Runway 29. Impacted in channel off Runway 29.
F-14A	Sept. 1986	Mechanical failure after take-off from Runway 18.
SH-60B	June 1989	Mechanical failure after take-off from Runway 18. Aircraft ditched south of Zuniga jetty.
EA-6B	July 1989	Control problem during take-off from Runway 18. Aircraft crashed and burned south of Runway 18, in Runway Primary Surface Zone.
E-2	Aug. 1995	Aircraft aborted take-off from Runway 29 after colliding with seagulls at the end of Runway 11.

Source: NAVFACENGCOM, SW 2006; NAS North Island 2008.



NASNI



Accident Location

NOLFIB

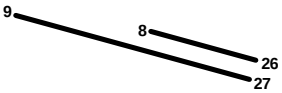


Figure 5-5
Accident History Map

Source: NAVFACENGCOM SW, 2006 (Accident Locations), USGS, 2010, and ESRI, 2006.

0 1 2 Miles

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination
12° 35' E

5.2.5 Current and Previous AICUZ APZ Comparison

Figure 5-6 compares the APZs at NAS North Island developed for this study with those from the 1984 AICUZ document. Figure 5-7 provides a comparison at the approach end of Runway 29 of the 1984 AICUZ APZs and the APZs developed for this study. Changes in APZs at NAS North Island include the elimination of APZs on Runways 11, 18, and 36, because current Navy policy does not require APZ designation when the APZ would lie over water.

The 1984 AICUZ depicted APZs I and II at the approach end of Runway 29, aligned with the 8 degree offset approach to the threshold of the runway.

The Hotel Visual approach to Runway 29 is the standard and predominant approach to the runway, which by necessity includes the provision of aircraft transition from an offset to an alignment along the runway centerline for landing at 2.5 miles distance measuring equipment (DME), or approximately 4,700 feet from the Runway 29 threshold. Runway 29 is also the primary instrument runway, and on instrument approaches in actual instrument conditions, the aircraft are aligned with the runway centerline and do not employ an offset. The APZ in this update is aligned with the predominant approach "Hotel Visual," resulting in the curved shape following the flight shadow, and is depicted using standard DOD and Navy APZ criteria dimensions.

Figure 5-8 compares the APZs at NOLF Imperial Beach with those from the last approved AICUZ documents, dated 1989. Comparison of the APZs for NOLF Imperial Beach with the previous study shows most requirements remaining in place. However, operational levels would not require designating APZ I and II at the approach end of Runway 27.

5.3 Airfield Safety Violations (Flight Height Obstructions)

Airfield safety violations, in the form of flight height obstructions, occur when any object (natural, man-made, stationary, or mobile) penetrates the imaginary surfaces, outlined in FAR Part 77 criteria. Airfield safety violations require waivers on-base and obstruction marking on air navigation charts and hazard lighting of the obstruction off-base. The man-made and natural objects located within the NAS North Island airspace that encroach on the imaginary surfaces of the runway are listed in Table 5-4 and depicted in Figures 5-1 and 5-2. To prevent airfield safety violations in the future, new construction on-base follows the established DOD airfield planning and design criteria (UFC 3-260-01). Future man-made obstructions off-base are regulated through local zoning regulations.

Table 5-4 Obstructions and Prominent Objects in Airfield Safety Violation

Installation	Obstruction	Location	Distance (From TACAN)	Elevation (MSL)
NAS North Island	Collimation Tower	NE on Station	1.5 NM	193’
	Bldg. #8 Rotating Beacon	NE on Station	1.3 NM	174’
	Bay Bridge	E	3.0 NM	287’
	Hotel Del Coronado	ESE	2.3 NM	180’
	Coronado Shores Condos	ESE	2.7 NM	196’
	“O” Club Area (Trees)	700’ Left Side Runway 29 Threshold	n/a	114’
	Control Tower	1,000’ NE Runway Intersection	n/a	112’
	Radio Towers on South tip of Point Loma	SSW	2.3 NM	513’
	Radio Tower on Point Loma	1 NM W of Airfield	1.6 NM	544’
	ASR-8 Antenna	1,700’ NW Runway Intersection	n/a	59’
	Ammo Pier Crane (when extended)	SW Edge of Station	n/a	135’
NOLF Imperial Beach	Control Tower	1,100’ NW of Approach End of Runway 27	n/a	93’
	Rotating Beacon	500’ NW of Control Tower	n/a	86’
	Trees	386’ N of Approach End of Runway 9	n/a	Approximately 85’
	Radar Unit	650’ S of Runway Centerline at Approach End of Runway 9	n/a	34’
	Western Boundary Fence	Lighted, in Runway 9/27 Clear Zone	n/a	8’

Note: MSL = Mean Sea Level; NM = Nautical Miles; TACAN = Tactical Air Navigation
Source: NBCINST 3710.7T, August 19, 2005

1984 AICUZ APZs	Current APZs
Clear Zone	Clear Zone
APZ I	APZ I
APZ II	APZ II
	Helopad

18
11
29
36

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

0 2,600 5,200 Feet

Figure 5-6
NAS North Island
Accident Potential Zones
Comparison

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: NAS North Island AICUZ, 1984 and Onyx Group (APZs), and NAVFAC SW, 2006 (Aerial).
The Clear Zone dimensions and location did not change from 1984. A more accurate GIS representation is provided in this update.

1984 APZs
- Clear Zone
- APZ I
- APZ II

Current APZs
- Clear Zone
- APZ I
- APZ II

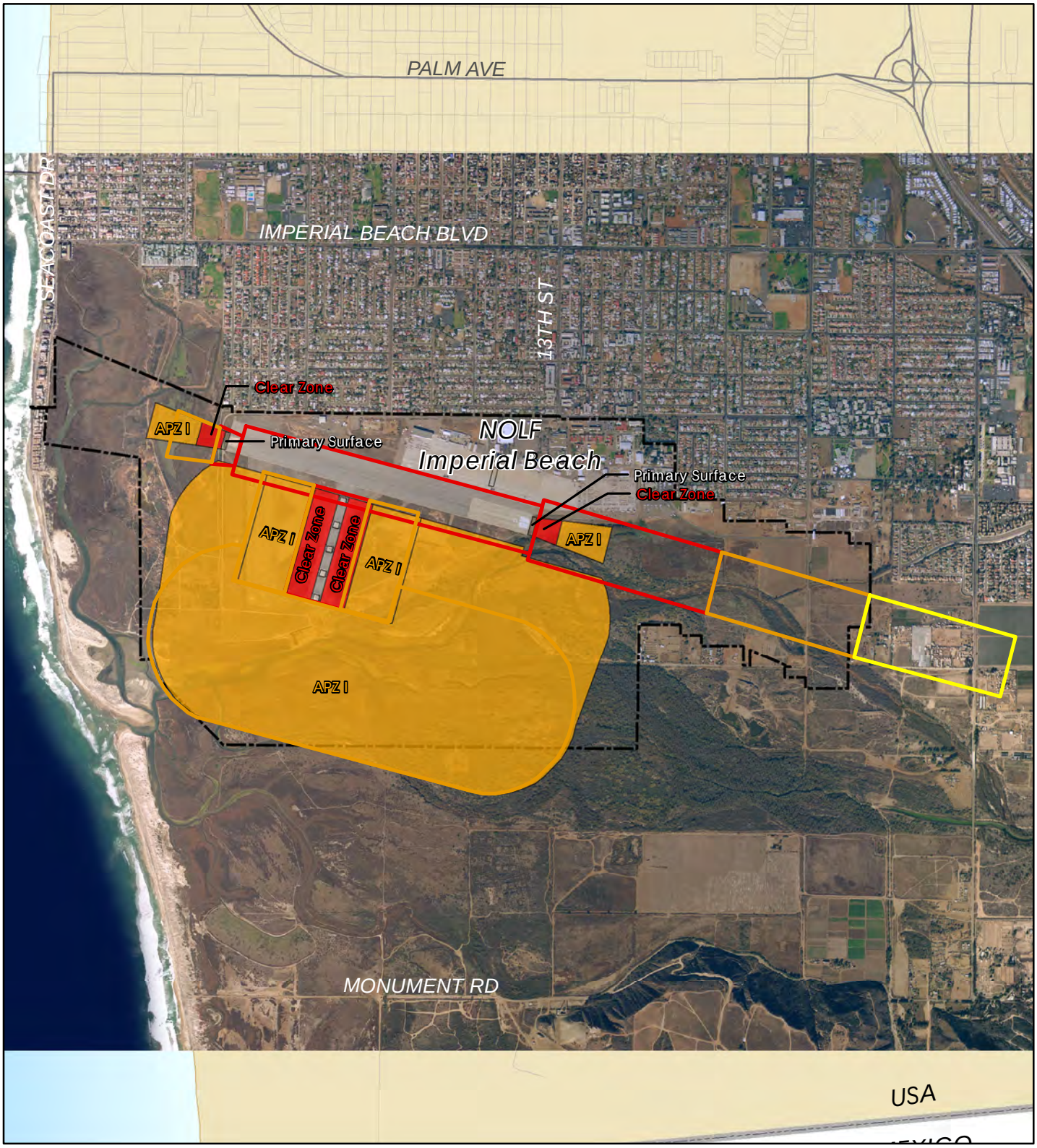
Current Hotel Visual Flight Track

Figure 5-7
NASNI RWY29
APZ Comparison

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: 1984 NASNI AICUZ and Onyx Group (APZs), Wyle Labs, 2010 (Flight Track),
and NAVFAC SW, 2006 (Aerial).
The Clear Zone dimensions and location did not change from 1984. A more accurate GIS representation is provided in this update.

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination
12° 35' E

0 800 1,600
Feet



1989 AICUZ APZs
- Clear Zone
- APZ I
- APZ II

Current APZs
- Primary Surface
- Clear Zone
- APZ I

Figure 5-8
NOLF Imperial Beach
Accident Potential Zones
Comparison

0 1,500 3,000 Feet

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: 1989 NOLFIB AICUZ and The Onyx Group (APZs), and NAVFAC SW, 2006 (Aerial).

5.4 Electromagnetic Interference and Radiation

New generations of military aircraft are highly dependent on complex electronic systems to perform critical flight and mission-related functions. This dependence on digital electronics, combined with higher clock rates, power-conserving signal levels, increased use of composite materials, onboard radar, communications transmitters, and lasers, increases the susceptibility of aircraft communication, navigation, and other electrical systems to electromagnetic interference (EMI). EMI is defined by the American National Standards Institute (ANSI) as any electromagnetic disturbance that interrupts, obstructs, or otherwise degrades or limits the effective performance of electronics/electrical equipment. It can be induced intentionally, as in forms of electronic warfare, or unintentionally, as a result of spurious emissions and responses, such as high-tension line leakage. EMI may also be caused by atmospheric phenomena, such as lightning and precipitation static, and non-telecommunications equipment, such as vehicles and industrial machinery.

EMI may also affect aircraft weapons systems, which often include a myriad of digital electronics. Hazards of electromagnetic radiation to ordnance (HERO) are also of concern. NBCINST 3710.7T, August 19, 2005, provides guidelines related to HERO during aircraft weapons loading and unloading. All inert ordnance units are permitted to be loaded and unloaded without restriction in aircraft parking areas. Ordnance units that include Class 1, Division 3 or 4 explosives, including exercise torpedoes and practice bombs, may be loaded and unloaded only at approved aircraft grounding locations while maintaining a minimum of 100 feet from the nearest hangar. Ordnance units that include Class 1, Division 1 or 2 explosives, including general purpose bombs, torpedoes, and rockets with explosive warheads, must be loaded and unloaded in designated Red Label areas only.

5.5 Lighting

Bright lights, either directed or reflected, in the vicinity of an airfield 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 destroy the eye's adaptation to darkness, typically requiring 40 to 45 minutes for partial recovery. Several recent DOD pilot encounters with laser flashes from outdoor light at concerts, fairs, theme parks, and casinos have increased the awareness of this hazard. Spotlights and reflected light from glass-exterior buildings can also impair pilot vision.

5.6 Smoke, Dust, and Steam

Unchecked land uses around airfields may emit smoke, fly ash, dust, steam, vapor, gases, or other forms of air emissions that can impair visibility in the vicinity of the airfield, interfere with the safe operation of aircraft, and endanger the landing, takeoff, or maneuvering of aircraft at the airfield.

5.7 Bird/Animal Aircraft Strike Hazard (BASH)

Wildlife represents a significant hazard to flight operations. Birds, in particular, are drawn to the open grassy areas, standing water, and warm pavements of airfields. Although most bird and animal strikes do not result in crashes, they may involve extensive mechanical and structural damage to aircraft. Since 1980, Navy aviation-mishap reports show strike events have caused the death of two naval aviators, 14 crashed aircraft, 17 ejections, 36 injured aircrew, and 243 Class A, B, and C foreign object damaged (FODed) engines. These reports also indicate the top four wildlife species involved in mishap events are

gulls, vultures, waterfowl, and deer. The cost to the Navy of these mishaps is more than $313 million nationwide.[2]

A large number of resident and migratory bird species can be found in the vicinity of NAS North Island and NOLF Imperial Beach. This area, especially NOLF Imperial Beach, lies within the Tijuana River National Estuarine Research Reserve and Tijuana Slough National Wildlife Refuge, a major migratory bird attractant. As a result, NAS North Island maintains a BASH plan and has implemented BASH guidelines for aviators through the *Bird/Animal Aircraft Strike Hazard (BASH) Plan, Naval Base Coronado, San Diego, CA, January 2006*. NAS North Island is also home to the NBC Bird Hazard Working Group (BHWG) chaired by the NAS North Island Aviation Safety Officer, which serves as the proving ground for many of the BASH initiatives.

Table 5-5 lists the number of BASH incidents on record at the Naval Safety Center (NAVSAFCEN) for NAS North Island and NOLF Imperial Beach from 2001 through 2009. Most incidents primarily involve the SH-60 Seahawk followed by the EA-6B Prowler and the CH-46 Sea Knight. Most incidents occurred during the low phases of flight—takeoffs and landings. The records show that several different bird species were primarily involved in the incidents, including pelicans, gulls, swallows, and finches. Although BASH incidents are still a prime deterrent at NAS North Island, the implementation of the BASH Program and the establishment of the BHWG have effectively reduced the number of bird strikes since June 1996, due to a combination of the reduction of bird attractants and the use of bird dispersal and deterrent techniques through the management of the U.S. Fish and Wildlife Service (USFWS). However, since NOLF Imperial Beach is located in such proximity to major wildlife habitat areas to the south and west, BASH incidents could still present a problem for ongoing operations.

Table 5-5 BASH Incidents

Location	Year	Incidents on Record
NAS North Island	2009	9
	2008	3
	2007	7
	2006	2
	2005	1
	2004	1
	2003	6
	2002	6
	2001	6
NOLF Imperial Beach	2009	6
	2008	0
	2007	0
	2006	2
	2005	2
	2004	5
	2003	3
	2002	2
	2001	0

Source:
Naval Safety Center 2006, NAS North Island Air Operations 2008, 2010

[2] Naval Safety Center BASH article in Approach Magazine, April 2003.

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6.0 Land Use Compatibility Analysis

Existing off-base areas in proximity to the Naval Air Station (NAS) North Island and Naval Outlying Landing Field (NOLF) Imperial Beach airfields have been developed for many years. Land use planning outside of the military installation boundary is the responsibility of local government. The following paragraphs outline current and proposed land use and zoning in the NAS North Island and NOLF Imperial Beach environs.

6.1 Land Use Compatibility Guidelines

Department of the Navy (DON) land use guidelines for Air Installations Compatible Use Zones (AICUZ) studies are provided for local governments' consideration in their land use planning and zoning decision-making processes.

6.1.1 Suggested Land Use Compatibility for Noise

For land use planning purposes, the noise exposure area is divided into three noise zones for DON AICUZ studies. Noise Zone 1 (Community Noise Equivalent Level [CNEL] 64 and below) is essentially an area of low or no impact. Noise Zone 2 (CNEL 65-74) is an area of moderate impact where some land use controls are recommended. Noise Zone 3 (CNEL 75 and above) is the most severely impacted area where the greatest degree of compatible land use controls are recommended. In addition to the noise zones, areas of concern may be defined where noise levels are not normally considered to be objectionable (less than CNEL 65), but land use controls are recommended in that particular area.

Land use compatibility information and general guidance, by land use category, from OPNAVINST 11010.36C is presented in Appendix C, Table C-1. Further amplification is available from three sources: (1) "Standard Land Use Coding Manual" U. S. Department of Transportation, Federal Highway Administration, March 1977; (2) "Guidelines for Considering Noise in Land Use Planning and Control," Federal Interagency Committee on Urban Noise, June 1980; and (3) Federal Interagency Committee on Noise (FICON) "Federal Agency Review of Selected Noise Issues," August 1992.

6.1.2 Suggested Land Use Compatibility for APZs

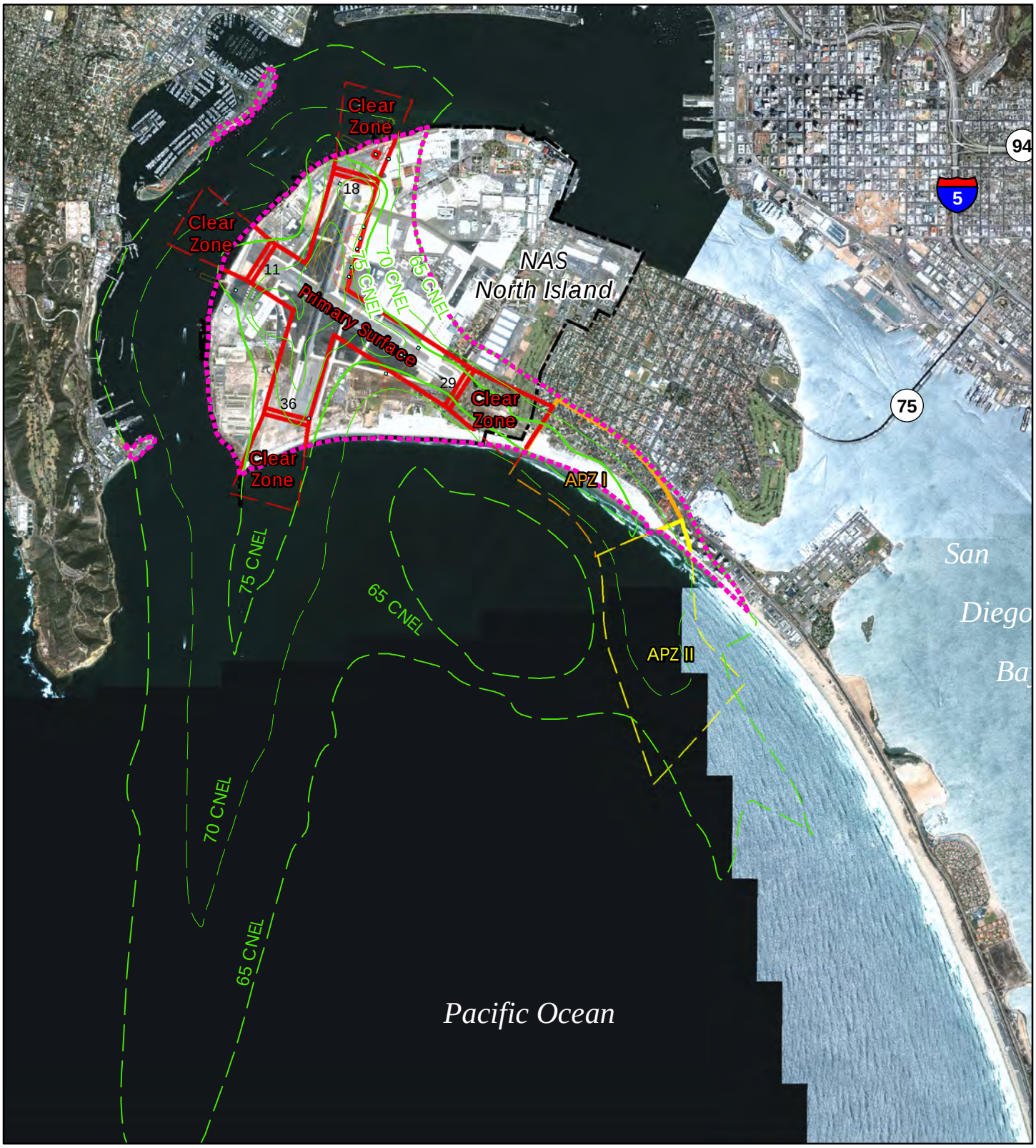
For land use planning purposes, recommended land use compatibility guidelines for clear zones (CZs) and Accident Potential Zones (APZs) are shown in Appendix C, Table C-2. Local planning and zoning authorities may desire to implement different criteria than those included herein, to reflect specific local conditions. Chief of Naval Operations (CNO) approval is required prior to an installation's public support of any criteria other than that contained in OPNAVINST 11010.36C.

Floor area ratio (FAR) is the ratio between square feet of floor area and square feet of site area based on parking generation requirements, vehicle occupancy rates, and desired maximum density. This measure is commonly used to identify population density or intensity for non-residential structures or land uses. For APZs I and II, recommended FARs were calculated to achieve a maximum density of 25 and 50 people per acre, respectively. The maximum FAR recommendations in Appendix C are provided as an aid to local officials and installation personnel considering restrictions on the density/intensity of non-residential development in APZs. However, it is not realistic to state that one numerical density is safe while another is not. The objective is to maximize the degree of safety that can reasonably be attained within local land use considerations.

6.1.3 AICUZ Footprints for NAS North Island and NOLF Imperial Beach

Department of Defense (DOD) policy is to work toward promoting compatible land use development in the vicinity of air installations, and to encourage local governments to incorporate the AICUZ study recommendations into the local land use planning and control process. This process includes, but is not limited to, zoning and subdivision ordinances and building codes. Land use planning must address long-range strategies involving present and future land use and development. Application of land use control strategies often does not result in immediate changes in land use development in the areas subject to the specific requirements or restrictions. Additionally, since land use planning is a long-range process, it is imperative that AICUZ studies consider not only current but also realistic 5-to-10-year projections of airfield operations when making land use planning recommendations. Accordingly, the AICUZ footprint for NAS North Island reflects the latest estimate of projected future air operations at NAS North Island, including future H-60, P-8A and F-35 aircraft operations, as well as transient aircraft operations changes projected to result at NAS North Island from the homeporting of the third carrier on the West Coast. The Prospective AICUZ footprint for NOLF Imperial Beach is based on prospective (circa 2020) H-60 operations projections for NOLF Imperial Beach.

Figures 6-1 and 6-2 present the Prospective AICUZ footprints for NAS North Island and NOLF Imperial Beach respectively, reflecting CNEL contours and APZs based on prospective aircraft operations discussed earlier in this study. The AICUZ boundary shown is the areas contained within Noise Zone 2 (CNEL 65-74) and Noise Zone 3 (CNEL 75 and above), as well as APZs (CZ, APZ I, and APZ II) of these air installations. The AICUZ footprint is the minimum area where land use controls are recommended to protect the health, safety, and welfare of those living on or near a military airfield.



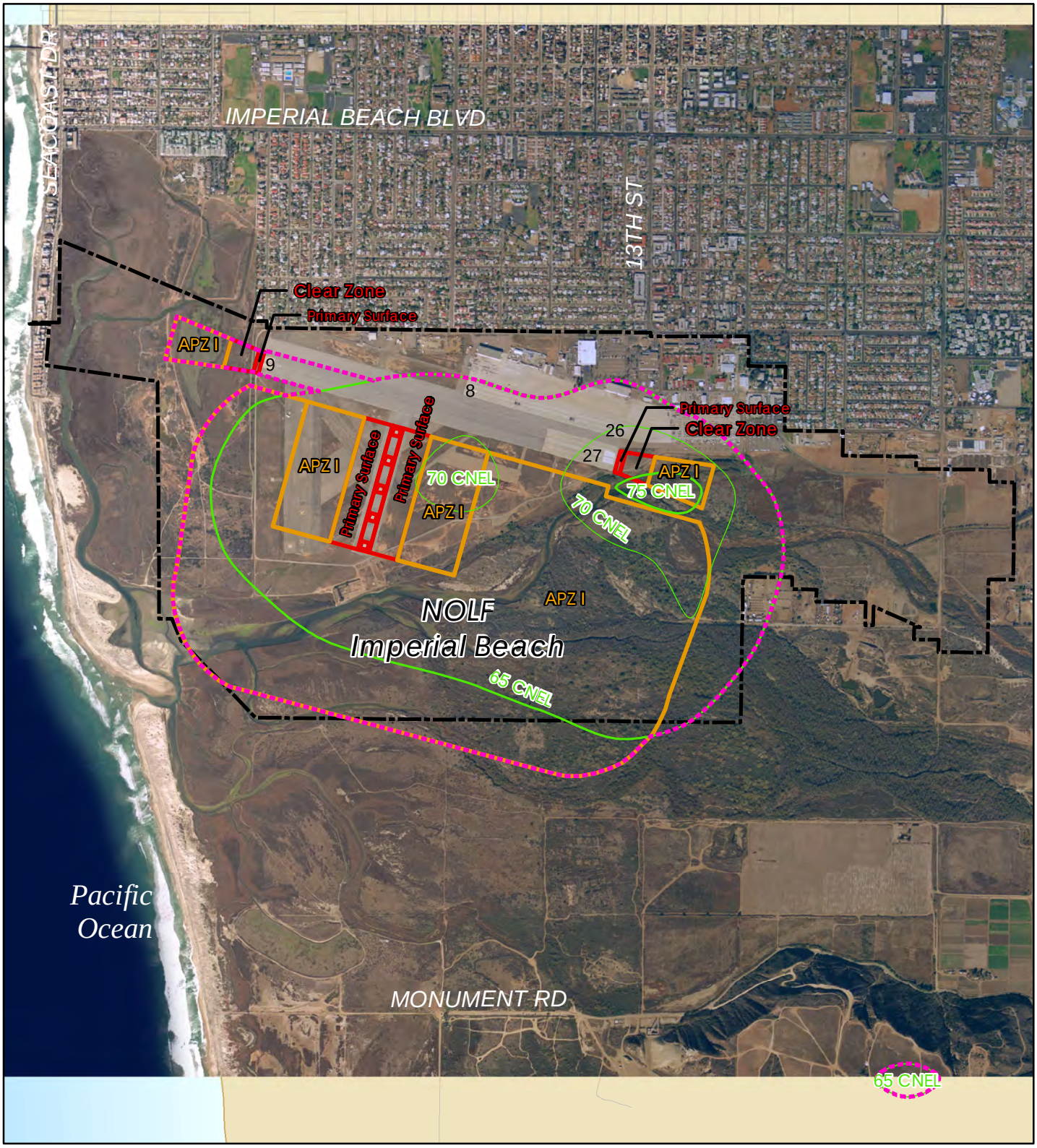
CNEL Over Land
CNEL Over Water
AICUZ Footprint Outline
Installation Boundary
APZ I Over Land
APZ I Over Water
APZ II Over Land
APZ II Over Water
Clear Zone Over Land
Clear Zone Over Water
Primary Surface Over Land
Helopad

Figure 6-1
NAS North Island
AICUZ Footprint

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

0 4,100 8,200 Feet

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours), NAVFAC SW, 2006 (Aerial), and The Onyx Group (APZs).



CNEL
APZ I
Clear Zone
Primary Surface
Installation Boundary
AICUZ Footprint Outline

Figure 6-2
NOLF Imperial Beach
AICUZ Footprint

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination
12° 35' E

0 1,000 2,000
Feet

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Labs Noise Study, 2010 (Contours), NAVFAC SW, 2006 (Aerial), and The Onyx Group (APZs).

6.2 On-Station Existing and Planned Land Use

6.2.1 NAS North Island

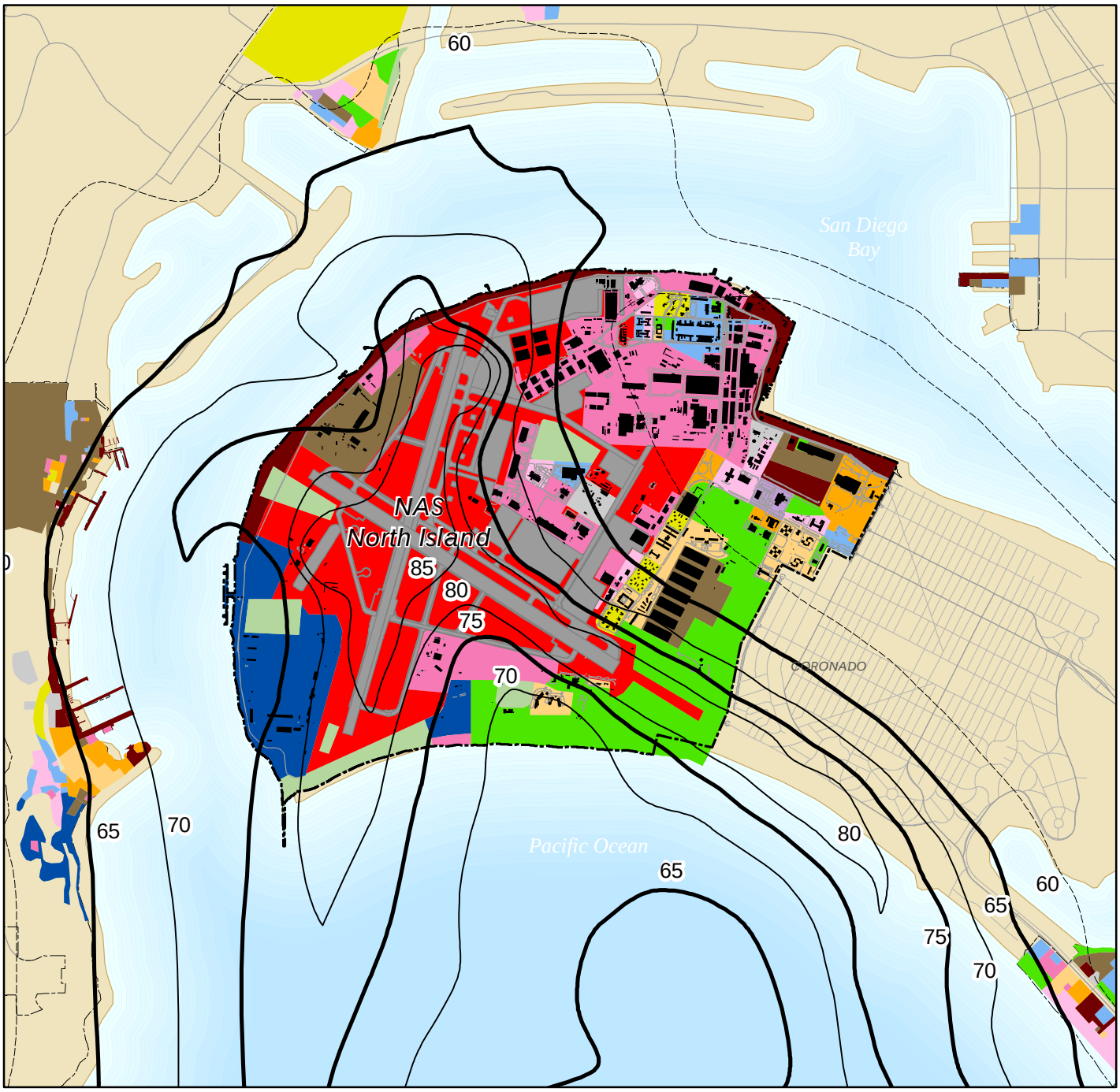
The majority of land area at NAS North Island is devoted to operations, consisting of areas adjacent to runways and taxiways. Additional land uses include weapons, maintenance, supply, administration, Command and Control, community support, and housing. Figure 6-3 is the existing land use map for NAS North Island.

The majority of development on-base is located within Noise Zone 2. Noise level reduction and sound attenuation will be included in new construction and major building rehabilitation in this zone per Navy design criteria. As an example, the new Navy Lodge Complex Expansion, located south of Runway 29 and east of Runway 36, is located within Noise Zone 2. The 75 CNEL contour bisects the site in a northwest/southeast direction. The Environmental Assessment (EA) (January 2006) for the lodge expansion states that new structures planned for the complex will be designed to reduce indoor noise levels below 45 CNEL through the use of double pane windows, increased insulation, and acoustic doors. Additional projects planned for NAS North Island include construction of 20 Morale, Welfare, and Recreation (MWR) beach cottages, an MWR Island Club, a Child Development Center, and a new barracks.

6.2.2 NOLF Imperial Beach

NOLF Imperial Beach consists of two runways and five helicopter pads. The runways are parallel to one another in an east-west direction. The helicopter pads are located south of the runways. Support facilities and hangars are located in the northeastern portion of the base. The majority of facilities at NOLF Imperial Beach are outside the prospective 65 CNEL contour. Figure 6-4 is the existing land use map for NOLF Imperial Beach.

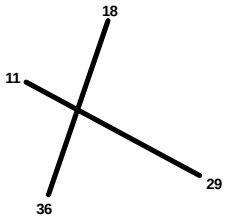
The NOLF Imperial Beach Master Plan (1989) outlines land use and activities associated with the field. NOLF Imperial Beach provides a practice field for helicopter operation and a site for personnel support facilities.

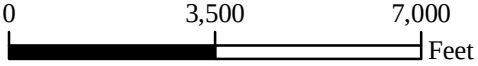


Noise Contours
- 60
- 65
- 70
- 75
- 80
- 85

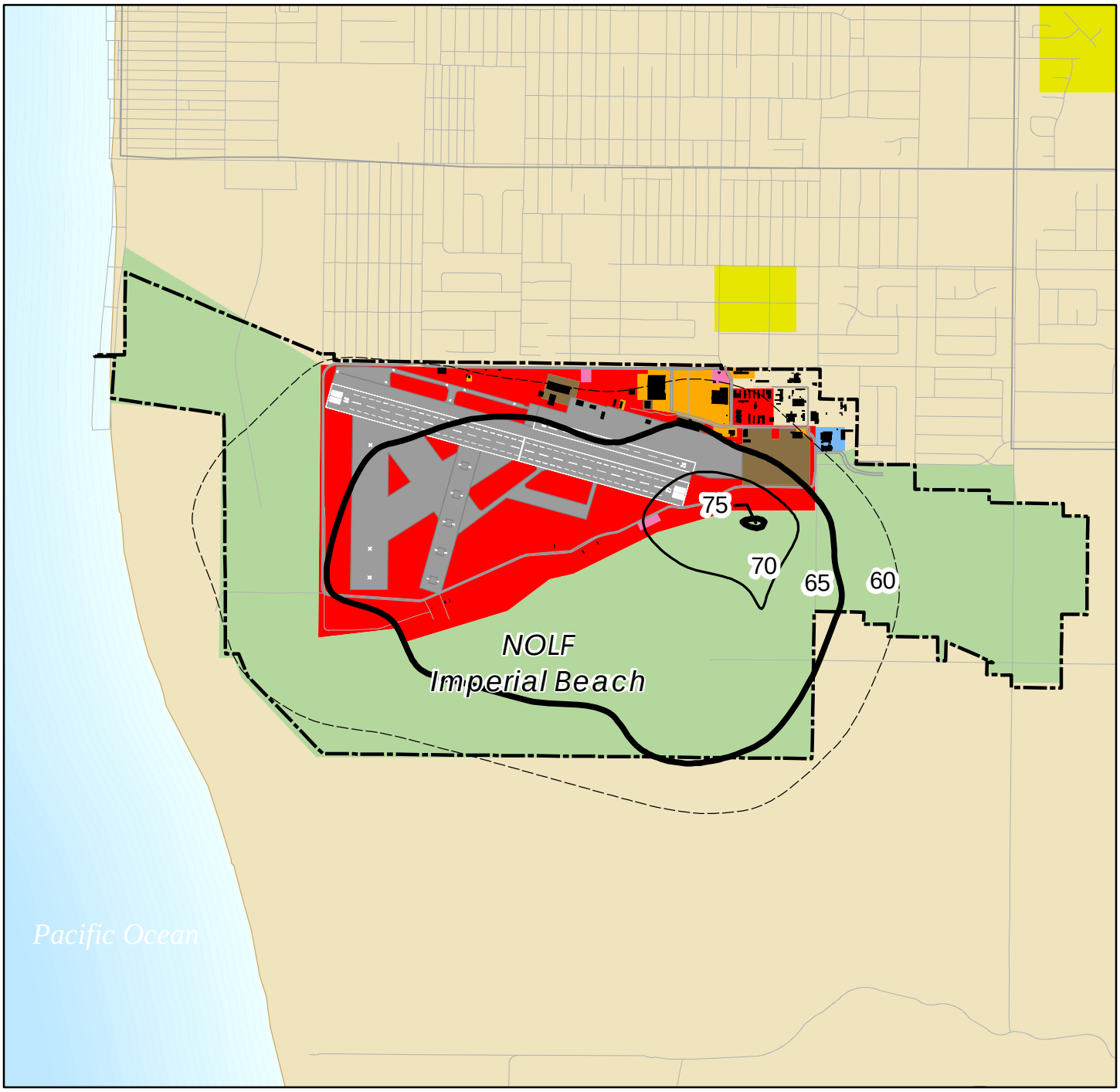
Land Use
- Administration
- Air Operations
- BQ
- Community Support
- Family Housing
- Maintenance
- Medical
- Open Space/Habitat
- Ordnance
- Port Operations
- Recreation
- Supply/Storage
- Training
- Utilities

Figure 6-3
NAS North Island
Existing Land Use





Source: NAVFAC SW, 2006
and Baseline Contours Wyle Labs Noise Study, 2010.



Noise Contours
- 60 CNEL
- 65 CNEL
- 70 CNEL
- 75 CNEL

Land Use
- Administration
- Air Operations
- Community Support
- Family Housing
- Maintenance
- Open Space/Habitat
- Supply/Storage

Figure 6-4
NOLF Imperial Beach
Existing Land Use

Source: NAVFAC SW, 2006
and Baseline Contours Wyle Labs Noise Study, 2010.

9 8 26 27

0 1,500 3,000 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

6.3 Off-Station Areas Impacted by NAS North Island AICUZ

Jurisdictions controlling land use and zoning in the vicinity of NAS North Island include the City of Coronado and the City of San Diego and its proximate communities of Peninsula and Centre City. Figure 6-5 illustrates the land uses proximate to NAS North Island. The zoning enacted by these jurisdictions in the vicinity of NAS North Island is shown in Figure 6-6.

6.3.1 City of Coronado

The City of Coronado is located east and adjacent to NAS North Island. Coronado is approximately 7.4 square miles in size, connected to the City of San Diego by the San Diego-Coronado Bridge and to the City of Imperial Beach to the south by State Highway 75. Land uses are predominantly residential, serviced by a small-scale downtown commercial district and institutional, hotel/motel, and open space uses.

6.3.1.1 City of Coronado Planning and Zoning

Land use planning for the City of Coronado is outlined in its General Plan Land Use Element, The Local Coastal Program Land Use Plan, and the Zoning Ordinance. The city is nearly completely developed. Each area of the city has been given the same land use designation on the General Plan, Zoning Map, and Local Coastal Plan (with the exception that the Zoning Plan breaks residential categories down in the R-1A planning district into more detailed zoning districts, closest to NAS North Island).

The City of Coronado General Plan Noise Element cites two major sources of noise for the city: ground traffic and aircraft operations at NAS North Island. The element includes Noise Sensitivity of Land Use Compatibility Standards and mapping of NAS North Island Average-Busy Day CNEL Contours. The reference for the noise contours in the element is cited as Wyle Laboratories, 1995. The southwest portion of the City experiences noise levels that exceed 65 CNEL. Implementation strategies to address these noise concerns are spelled out in the Element. They include developing a Noise Ordinance as part of the Zoning Ordinance, building code regulations including sound attenuation requirements, subdivision regulations, and proactive participation with all agencies concerned with noise. The city does have a Noise Ordinance in place. Among the purposes of the noise ordinance is to implement programs to reduce noise in areas experiencing noise above acceptable limits. The ordinance requires review of the noise impact of zoning changes through an acoustical analysis that includes mitigation measures and compliance with California Noise Insulation Standards (Coronado Municipal Code, Title 41). The ordinance names the Director of Community Development as the Noise Control Officer and gives authority to work with other local, regional, state, and federal organizations on noise issues.

The City of Coronado General Plan Safety Element (February 15, 2005) references under Transportation and Related Hazards that additional unique hazards for the community include the NAS North Island airplane and helicopter flight paths (primarily over ocean or bay waters). The flight paths are not mapped in the Element.

Building height restrictions are set forth in the City Zoning Ordinance and are set for a maximum height of 40 feet, with many zones set for 30 feet or less for consistency with the city's General Plan, Zoning Map, and Local Coastal Plan. Maximum width and total allowed area of buildings decrease as the structure approaches a height of 30 feet. Architectural features at the maximum height cannot exceed a width of one foot and a total area of one square foot.

In June 2008 the City of Coronado adopted The Hotel Del Coronado Amended Master Plan. This plan is consistent with the master plan adopted in 2002 and was necessary due to earthquake fault zones identified by the state of California subsequent to the adoption of the original plan.

The Hotel Del Coronado (Hotel Del) is situated on 28 acres approximately 3 miles south of NAS North Island. It is located within the 65-75 CNEL and APZ I. In addition to the master plan, the Hotel Del has a development agreement with the City of Coronado that allows the hotel to construct projects outlined in the master plan over the next 15-20 years under the city's 2002 building codes. One such project is a proposed 20,000 square foot conference center and associated guest rooms. The Master Plan states that no buildings on the property will exceed 40 feet. The conference center will be 35.61 feet.

Residential
Lodging/Group Quarters
Industrial
Transportation
Commercial
Office
Public Service
Medical
Military
Schools
Parks & Recreation
Open Space
Agriculture
Vacant Land
Under Construction

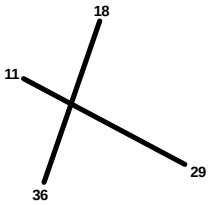
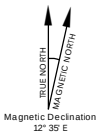


Figure 6-5
NAS North Island
Existing Off-Station Land Use



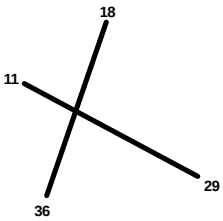
Source: SANDAG Land Use, 2003

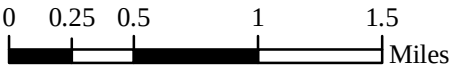
City of Coronado Zoning
- Commercial
- Civic Use
- Hotel Motel
- Military Zone
- Open Space
- Residential - Single Family
- Residential - Multiple Family
- Residential - Planned Community
- Residential - Special Care Development

City of San Diego Zoning
- Agriculture
- Commercial
- Hotel Residential
- Industrial
- Marina
- Mixed Use
- Neighborhood Professional
- Open Space
- Public
- Recreation
- Residential - Single Family
- Residential - Mulitple Family
- Sub District
- Unzoned

- Community Plan Areas
- Installation Boundary
- No Zoning Information Available

Figure 6-6
NAS North Island
Zoning Map





Source: City of Coronado, 2006 and SANDAG, 2006.

6.3.1.2 City of Coronado Land Use Compatibility

Figure 6-7 shows an aerial photograph of the area of the City of Coronado under noise contours and APZs. This area has been developed for many years. Some of the land uses, shown in yellow in tables 6-1 and 6-2, are considered existing and nonconforming to the Navy guidelines for noise and APZs. These land use compatibility guidelines are described in Appendix C (Tables C-1 and C-2, respectively).

Noise Contours

60
65
70
75
80
85

APZs

Clear Zone
APZ I
APZ II

AICUZ Footprint Outline

Figure 6-7
Detailed Aerial Showing Prospective Noise Contours and APZs in Coronado

Aerial depiction is for planning purposes, specific real estate decisions should be confirmed by normal surveying.
Source: Wyle Noise Study, 2010 (Contours), NAVFAC SW, 2006 (Aerial) and Onyx Group (APZs).

0 1,000 2,000 Feet

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

6.3.2 City of San Diego

Two community planning areas in San Diego are near NAS North Island and are influenced by the AICUZ. The Peninsula Community and the Centre City Community both lie under the imaginary surfaces generated by the runways at NAS North Island. Though outside the 65 CNEL contour, the Peninsula community has experienced single event aircraft noise that has caused residents to file complaints with the installation.

The Peninsula Community, located west and northwest of NAS North Island, is a highly urbanized community composed of several distinct residential neighborhoods, commercial core areas, and three major regional recreational resources: Sunset Cliffs, Shelter Island, and Cabrillo National Monument. A fourth recreational resource is under development at Liberty Station (the former Naval Training Center [NTC]). This community is composed of approximately 4,409 acres. Several areas outside the jurisdiction of the City of San Diego, including the former NTC and the Point Loma Naval Complex facilities, were added to the Peninsula study area in the late 1970s to facilitate preparation of the Peninsula Local Coastal Program Land Use Plan. Shelter Island and adjacent areas under the jurisdiction of the San Diego Unified Port District were included in the 1968 Plan.

The Peninsula Community in San Diego northwest of NAS North Island.

The Centre City Community is essentially Downtown San Diego, encompassing eight highly urbanized neighborhoods: Gaslamp, East Village, Columbia, Marina, Cortez, Little Italy, Horton Plaza, and Core. These neighborhoods are the heart of the business, arts, and entertainment communities and contain a broad mix of urban land uses. Currently, more than 8,000 residential housing units are under construction. Twenty years of redevelopment have transformed the downtown area into a vibrant urban center. The Centre City Development Corporation (CCDC) is a public, non-profit corporation created by the City of San Diego to staff and implement downtown redevelopment projects and programs. The breakdown of existing downtown land use (2004) includes 9 percent residential, 13 percent commercial and office, 5 percent industrial, 22 percent public/institutional, 3 percent open space, 46 percent other uses (streets and rights-of-way), and 2 percent vacant.

The Centre City Community includes the downtown area of San Diego.

6.3.2.1 City of San Diego Planning and Zoning

Land use controls utilized by the City of San Diego include the General Plan (and various Community Plans) and the San Diego Municipal Code containing the Planning and Zoning Ordinances and Land Development Code. Proposed development projects are submitted to the Department of Development Services and are subject to stringent review under these plans, codes, and ordinances. Because the areas are outside the 65 CNEL contour but under the imaginary surfaces, the key issue for local governments in those areas is height controls. Building height limits are summarized as follows.

***Local Coastal Zone*:** 30 feet, extending inland to the location of Interstate 5 on January 1, 1971. This limitation does not apply to San Diego Bay; however, this height limitation applies to the Peninsula Community.

Centre City Community: 500 feet above ground level (AGL) under Federal Aviation Regulations (FAR) Part 77. CCDC is responsible for the planning and zoning functions for the City of San Diego within the Centre City Planned District. Building heights west of Harbor Drive are subject to approval of the San Diego Unified Port District. The San Diego Downtown Community Plan applies to all of downtown, but several Federal and state agencies own property in the area, and the Port of San Diego has planning jurisdiction over and along the waterfront. Sites owned by these agencies/organizations may be exempt from certain planning regulations based on primacy or intergovernmental immunity. Prominent ownerships include the Federal Government, U.S. Navy, State of California, County of San Diego, and the San Diego Unified Port District.

The San Diego Land Development Code includes two overlay zones specific to airports. The Airport Approaches Overlay Zone addresses protection of the FAR Part 77 surfaces for Lindbergh Field (also known as San Diego International Airport). It does not specifically address protection of the imaginary surfaces for NAS North Island (San Diego Municipal Code, Article 2: Overlay Zones, Division 2). The Airport Environs Overlay Zone (San Diego Municipal Code, Article 2: Overlay Zones, Division 3) applies to airports in the City of San Diego. This overlay zone applies to properties identified in the Brown Field, Montgomery Field, Lindbergh Field, and Marine Corps Air Station Miramar Comprehensive Land Use Plans as areas within a noise contour zone, accident potential zone, or flight activity zone. A key purpose of this overlay zone is ensuring property owners receive information regarding noise impacts and safety hazards associated with aircraft operations.

A comprehensive update to the City of San Diego General Plan was adopted by the San Diego City Council on March 10, 2008. The Mobility Element of the General Plan describes the location and importance of NAS North Island and includes a policy that the city supports the activities of military aviation installations. Updates to the Land Development Code are currently in process to align with the changes to the General Plan Update.

6.3.2.2 City of San Diego Current Projects

All the city's land use categories, except for agriculture and commercial employment/retail and services, will experience some rate of increase in their total acreage in accordance with planned land use maps found in adopted community plans. Industrial lands will increase by approximately 37 percent, mostly in the central and southern portions of the city. Because the majority of the city is developed, infill development and redevelopment will play an increasingly significant role.

The Peninsula Community Plan and Local Coastal Program was adopted on July 14, 1987, and the NTC land use designation change was made on September 28, 2000. The Peninsula is a highly urbanized

community, with 90 percent of the community dominated by residential land uses. As a result, plan recommendations are generally geared to conservative infill and redevelopment of the various land uses, with the exception of industrial uses being limited to Naval Complex Point Loma. The plan also recommends mixed used development via a precise plan for former NTC property. Some zoning changes are recommended to accomplish these objectives. The entire Peninsula Community, as well as coastal portions of San Diego, is subject to a 30-foot height limit for all new construction as a result of Proposition D, which passed in 1972.

Centre City Community Plan: Formed in 1975 by the City of San Diego, CCDC serves on behalf of the San Diego Redevelopment Agency as the catalyst for public/private partnerships to facilitate redevelopment projects adopted pursuant to redevelopment law. Through an operating agreement, CCDC is the Agency's representative in the development of retail, residential, office, hotel, cultural, and educational and public improvement projects.

Development in downtown San Diego is currently guided by the San Diego Downtown Community Plan, adopted by the CCDC in April 2006 and updated in 2007 and again in 2009. The horizon for this plan is 2030, with much emphasis on redevelopment. The plan identifies numerous Land Use and Opportunity Sites of balanced land uses, primarily located in five of the eight urban neighborhoods: East Village, Columbia, Cortez, Little Italy, and Core. Growth is planned to remain robust in the downtown area as a major employment and cultural center. Recent updates to the plan are focused on historic designation and preservation issues.

6.3.2.3 City of San Diego Land Use Compatibility

The City of San Diego is not largely impacted by the AICUZ footprint. There are some waterfront areas along Shelter Island impacted by the 65dB CNEL contour. These areas have been developed as parkland, marinas, hotels, and restaurants for many years. However, noise complaints suggest the presence of noise-sensitive residents in the Peninsula community.

The imaginary surfaces of the NAS North Island airfield overlie areas of the City of San Diego. Provision of information concerning NAS North Island operations and imaginary surfaces in the City of San Diego airport overlay ordinances could aid in providing a better understanding by residents in Peninsula and Centre City of the NAS North Island AICUZ.

6.3.3 NAS North Island AICUZ Summary

Tables 6-1 and 6-2 provide an overview of land uses within the AICUZ footprint. Some of the land uses (shown in yellow) are considered existing and nonconforming to Navy guidelines (see Appendix C). Figure 6-8 provides a graphic overview of land use and the NAS North Island AICUZ footprint.

Table 6-1 Historical and Projected Comparison of Acreage in Noise Contours

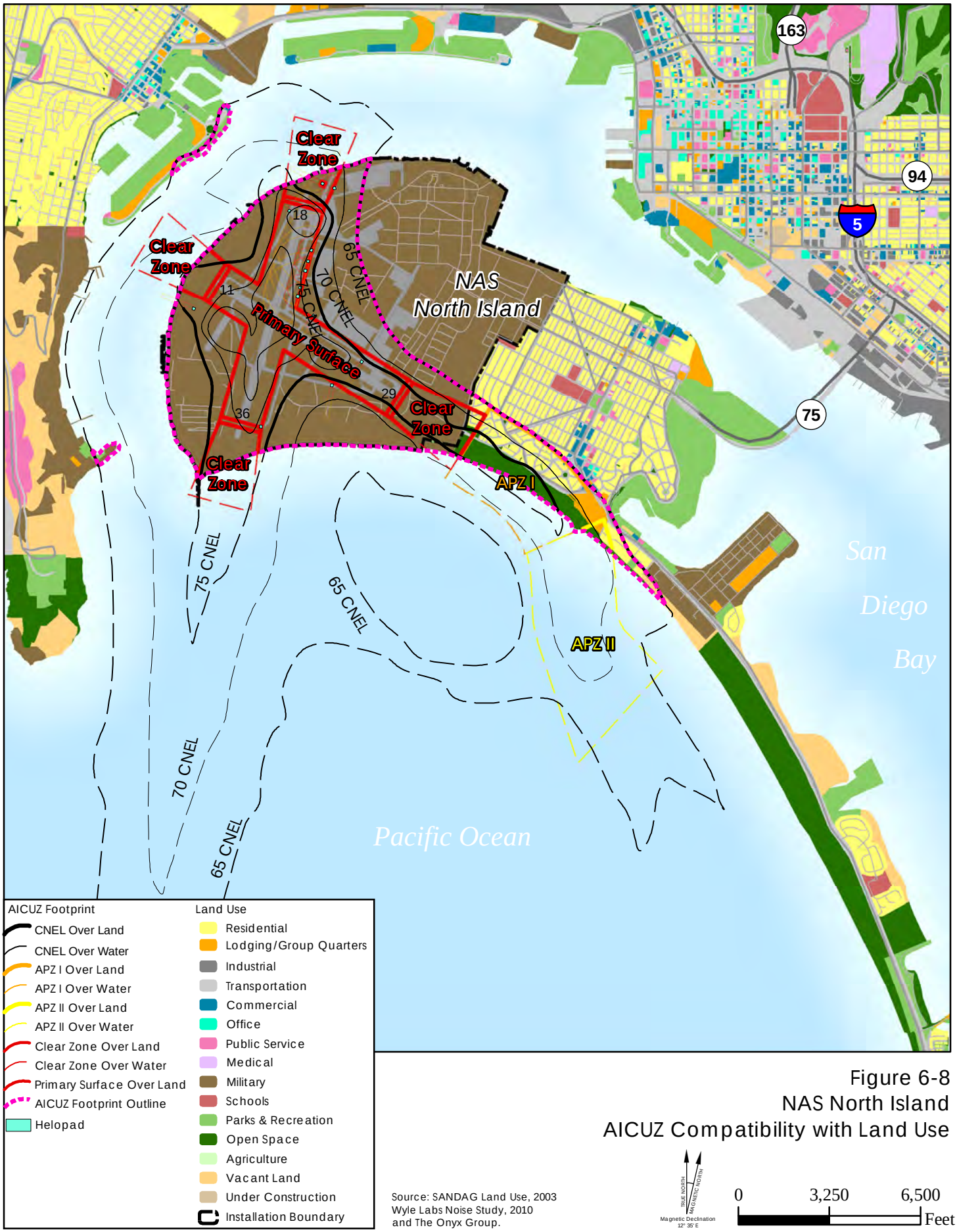
NAS North Island	65 - 75 CNEL			75 - 85 CNEL			85 + CNEL		
Land Use	1984	Baseline	Prospective	1984	Baseline	Prospective	1984	Baseline	Prospective
Residential	53	136	90	2	26	2	0	0	0
Lodging/Group Quarters	0	28	24	0	1	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0
Transportation	29	92	60	3	21	5	0	0	0
Commercial	0	8	0	0	0	0	0	0	0
Office	0	2	1	0	0	0	0	0	0
Public Service	0	1	0	0	0	0	0	0	0
Medical	0	<1	0	0	0	0	0	0	0
Military	849	681	759	1404	778	690	0	276	174
Schools	0	13	0	0	0	0	0	0	0
Parks & Recreation	1	19	15	0	0	0	0	0	0
Open Space	38	140	35	30	87	63	0	0	0
Agriculture	0	0	0	0	0	0	0	0	0
Vacant Land	0	13	6	0	0	0	0	0	0
Total Acres	970	1134	990	1439	913	759	0	276	174

Source: The Onyx Group, 2010
Note: Some of the land uses (shown in yellow) are considered existing and nonconforming to Navy guidelines for Noise (See appendix B).
Fractions of acreage rounded up to whole numbers for each category.

Table 6-2 Historical and Projected Comparison of Acreage in APZs

NAS North Island	Clear Zone		APZ I		APZ II	
Land Use	1984	Prospective	1984	Prospective	1984	Prospective
Residential	5	5	1	59	14	3
Lodging/Group Quarters	0	0	1	17	3	2
Industrial	0	0	0	0	0	0
Transportation	3	3	5	44	2	1
Commercial	0	0	0	1	0	0
Office	0	0	0	0	0	0
Public Service	0	0	0	0	0	0
Medical	0	0	0	0	0	0
Military	105	106	0	0	29	0
Schools	0	0	0	0	0	0
Parks and Recreation	8	8	74	79	25	7
Open Space	0	0	0	0	3	0
Agriculture	0	0	0	0	0	0
Vacant Land	0	0	0	0	22	0
TOTAL ACRES	121	121	82	201	99	13

Source: The Onyx Group, 2010
Note: Some of the land uses (shown in yellow) are considered existing and nonconforming to Navy guidelines for APZs (See appendix B).
APZs for CY2005 and CY2012 remain the same.



Source: SANDAG Land Use, 2003
Wyle Labs Noise Study, 2010
and The Onyx Group.

Figure 6-8
NAS North Island
AICUZ Compatibility with Land Use

6.4. Off-Station Areas Impacted by NOLF Imperial Beach AICUZ

Jurisdictions controlling land use in the vicinity of NOLF Imperial Beach include the City of Imperial Beach and the City of San Diego and its communities proximate to the military airfield. Figure 6-9 illustrates the communities and land uses proximate to NOLF Imperial Beach. The zoning map for jurisdiction in the vicinity of NOLF Imperial Beach is shown in Figure 6-10.

6.4.1 City of Imperial Beach

The City of Imperial Beach is located north and southwest of the military airfield. The majority of NOLF Imperial Beach is included within the city's boundary.

Existing land uses consist of residential, commercial, industrial, retail, service, manufacturing, and office. The city is nearly fully developed, and substantial land use changes other than minor infill and redevelopment are not anticipated.

A Seahawk on static display during a community event in Imperial Beach.

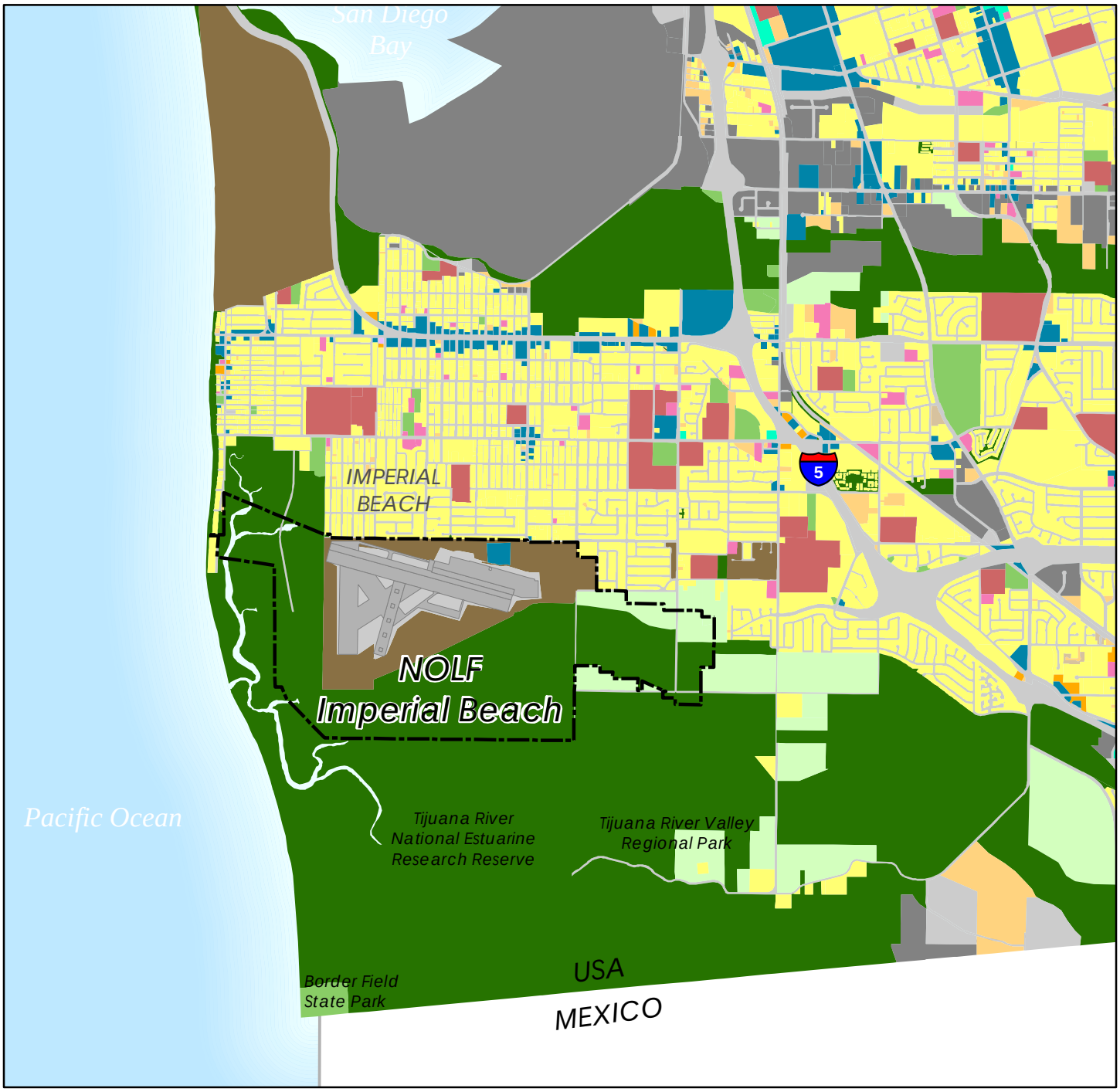
6.4.1.1 City of Imperial Beach Planning and Zoning

Development in the city is guided by the City of Imperial Beach General Plan and Coastal Plan (adopted October 19, 1994). The Plan's Land Use Element outlines general policies for residential, commercial, industrial, retail, service, manufacturing, and office. The Housing Element of the General Plan was updated in September 2009.

Building height limits in the City include 26 feet for single-family residential and 30 feet for condominiums. Cellular communication tower construction is limited to the height restrictions as building construction. Variances, upon special review, can be granted for commercial and hotel land uses up to a 40-foot height.

The General Plan Noise Element references an independent noise study conducted for the city in 1994 (traffic, airfield, and temporary construction). For NOLF Imperial Beach, it was reported that the activity level of helicopters varied considerably from day to day. The 65 CNEL and above noise contour (confirmed by a later study in 1992) covers portions of the City. Adverse helicopter noise reportedly impacts the South Seacoast, Tijuana Estuary, Seaside Point, and Oneonta neighborhoods (source: Ream Field Helicopter Noise Contours 1988 and 1992, Figure N2, Noise Element, General Plan, 1994). These areas are located in the southwestern portion of the City.

The AICUZ portion of the NOLF Imperial Beach Master Plan (1989) shows a smaller footprint for the 65 CNEL contour (Figure E.9 in the master plan) that avoids the City's Seacoast Drive area entirely and affects a smaller portion of the Oneonta neighborhoods than the City's 1992 Noise Contours.



Residential
Lodging/Group Quarters
Industrial
Transportation
Commercial
Office
Public Service
Medical
Military
Schools
Parks & Recreation
Open Space
Agriculture
Vacant Land
Under Construction

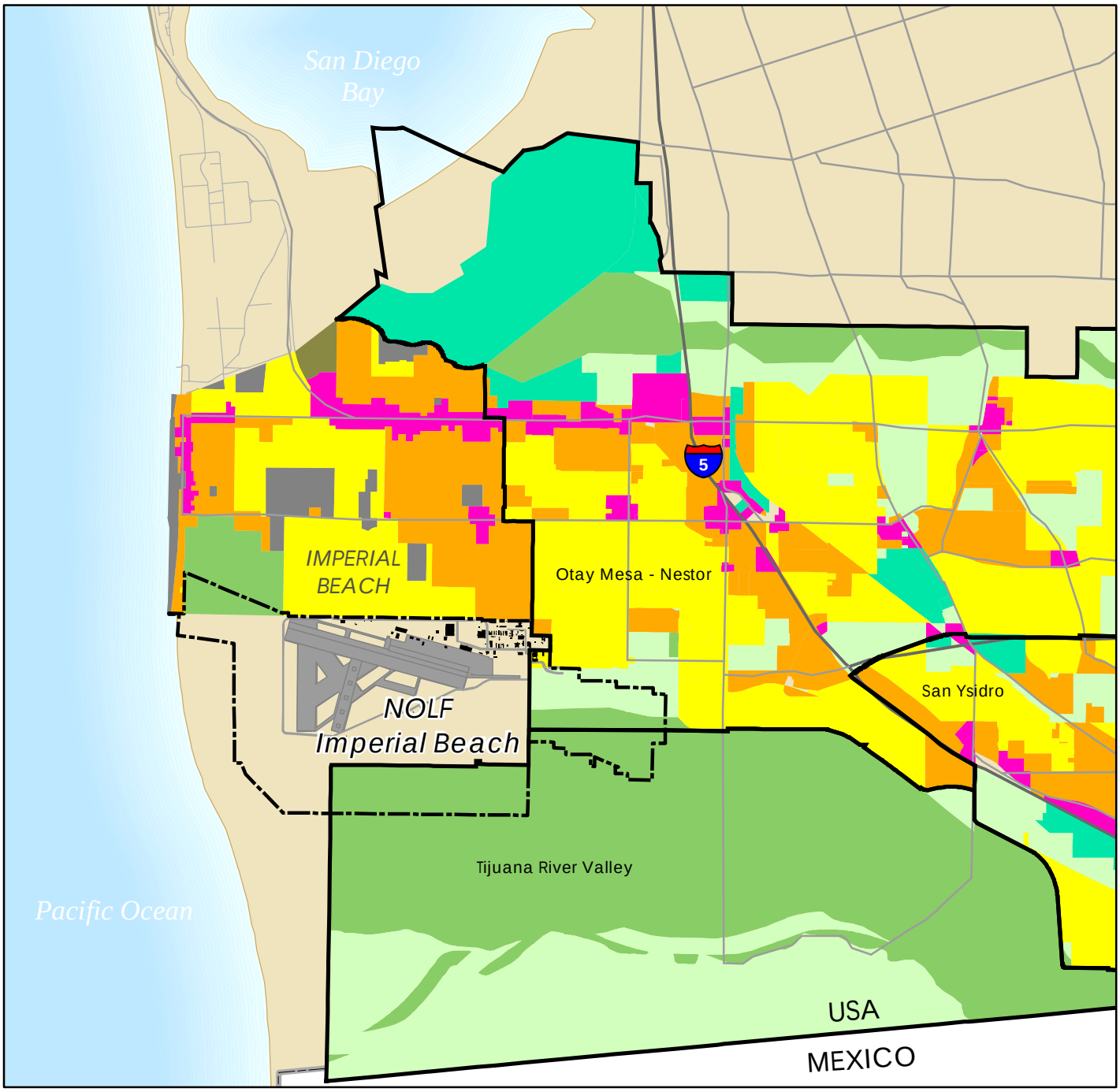
Figure 6-9
NOLF Imperial Beach
Existing Off-Station Land Use

Source: SANDAG Land Use, 2003

9 8 26 27

0 0.5 1 1.5 Miles

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E



City of Imperial Beach Zoning
- Commercial
- Open Space
- Public Facility
- Residential - Single Family
- Residential - Multiple Family
- Urban Reserve

City of San Diego Zoning
- Agriculture
- Commercial
- Hotel Residential
- Industrial
- Marina
- Mixed Use
- Neighborhood Professional
- Open Space
- Public
- Recreation
- Residential - Single Family
- Residential - Mulitple Family
- Sub District
- Unzoned

- Community Plan Areas
- Installation Boundary
- No Zoning Information Available

Source: City of Imperial Beach, 2006 and SANDAG, 2006.

9 8 26 27

0 0.5 1 1.5 Miles

TRUE NORTH MAGNETIC NORTH
Magnetic Declination 12° 35' E

Figure 6-10
NOLF Imperial Beach
Zoning Map

The city has developed and adopted a noise ordinance to control noise levels, as well as a formal noise complaint center to handle noise complaints. In addition, Land Use Compatibility Guidelines for Development in relation to noise are incorporated into the Noise Element.

The General Plan Safety Element does not include Ream Field because the APZs are contained within the airfield boundaries with regard to the City of Imperial Beach boundaries.

6.4.1.2 City of Imperial Beach Current Projects

Of particular significance to the NOLF Imperial Beach AICUZ, the Land Use Element identifies a "Ream Field (NOLF Imperial Beach) Reserve Area." It is stated that the city shall encourage the U.S. government to close Ream Field and release the land for a combination of public and private uses. It is noted that the Navy currently has no plans to close this military airfield essential to carrying out its vital training mission in the interest of the national defense.

The City of Imperial Beach entered into an Exclusive Negotiation Agreement with Sudberry Properties in August 2009 to redevelop a site located at Palm Avenue and 9th Street. The development concept for the site is 45,000 square feet of commercial development with ground level parking. A series of public workshops were held to receive community input on the proposed development.

6.4.1.3 City of Imperial Beach Land Use Compatibility

On-base the 65 CNEL noise contour and CZ avoid military development resulting in compatible land use. The 65 CNEL noise contour and CZ are also contained on-base, resulting in compatible land use off-base in the area of the installation adjacent to Imperial Beach. Though height controls are specified in zoning districts, specific protection of the imaginary surfaces that extend off of the runways is not directly addressed in the city's zoning ordinance.

6.4.2 City of San Diego

Two community planning areas in San Diego are near NOLF Imperial Beach:

The Otay Mesa-Nestor Community at the south end of San Diego Bay.

The Otay Mesa-Nestor Community located adjacent to NOLF Imperial Beach on the eastern boundary. The current community plan was adopted on May 6, 1997. A plan update has been in process since 2001 but has not yet been completed. The City of San Diego is currently identifying consultants needed to complete the update process. The area is not under NOLF Imperial Beach AICUZ noise contours or APZs but is under imaginary surfaces and instrument approach path. The area is urbanized with over 57 percent of the area in residential land use (approximately 17,000 units). Commercial land use comprises 5 percent and industrial uses are 3 percent of the area. Schools, parks, transit, and public facilities comprise 20 percent, and vacant, undeveloped, agricultural, and mineral extraction and processing uses comprise the remaining 15 percent. Brown Field is a general aviation airport in Otay Mesa owned and operated by the City of San Diego. The 8,000 foot runway has an east-west alignment and accommodates propeller and jet aircraft. Brown Field is considered a reliever airport

by the FAA and is used by military and law enforcement agencies. The flow of air traffic is primarily north-south along the coast.

Tijuana River Valley Community: The Tijuana River Valley is a broad natural floodplain located adjacent to the station south and east of the airfield. The helicopter traffic pattern APZ I crosses the southern station boundary into this community. The area contains a variety of wetland and riparian areas. The floodplain contains salt marsh near the coast, agricultural fields, equestrian facilities, rural housing, riparian woodland, and disturbed habitats. Agriculture has declined due to salt intrusion into the soils. The Tijuana River National Estuarine Research Reserve (TRNERR), or National Estuarine Sanctuary, encompasses approximately 2,531 acres of tidal wetlands and riparian and upland habitats. Border Field State Park is a 418-acre parcel at the southern end of the sanctuary, owned by the State of California and administered by the California Department of Parks and Recreation. The Tijuana River Valley Regional Park, managed by the San Diego County Parks and Recreation Department, also serves the community.

The Tijuana River Valley Community is adjacent to the Mexican Border.

6.4.2.1 City of San Diego Planning and Zoning

The Otay Mesa-Nestor Community, east of NOLF Imperial Beach, falls within the Local Coastal Overlay Zone (west of Interstate 5), with a height restriction of 30 feet. The majority of this community is zoned single family residential. Two land areas in proximity to the base boundary are zoned for residential medium-density multiple dwelling units (RM-2-5); however, the Local Coastal Overlay Zone restricts the building height of these areas to 30 feet.

The Tijuana River Valley Community falls within the Local Coastal Overlay Zone (west of Interstate 5), with a height restriction of 30 feet. In addition, a majority of the planning area is designated for long-term natural open space use (Multiple Species Conservation Open Space) consistent with the NOLF Imperial Beach AICUZ.

Noise controls are administered under the San Diego General Plan and various community plans. There are no known issues regarding military airfield noise with regard to the communities of Otay Mesa-Nestor and Tijuana River Valley located in the NOLF Imperial Beach vicinity. Proposed land use in the valley is guided by the Tijuana River Valley Local Coastal Program Land Use Plan (adopted by the San Diego City Council June 1, 1999 and certified by the California Coastal Commission November 4, 1999).

6.4.2.2 City of San Diego Current Projects

The Otay Mesa-Nestor Community Plan: A single-family housing project, Rio Walk, is planned on an existing agricultural parcel (currently being rezoned to conforming use) located at Leon Avenue and Tremaine Way, east and slightly north of the military airfield runway's approach zone. This project will construct 182 single-family residences on a 41.32-acre site. The community planners have worked with

Air Operations, NAS North Island, on this project to ensure compatibility with the military airfield (outside the approach zone and within the previously identified 60 to 65 CNEL noise contour zone).

Tijuana River Valley Community Plan: A majority of the planning area (2,970 acres) is designated for long-term natural open space use (multiple species conservation open space). A smaller area (434 acres) is designated for other community open space/agricultural use. The only other land use designations are military (177-acre eastern portion of NOLF Imperial Beach at the northern edge of the planning area) and utility. The utility designation applies to the 189-acre site of the International Wastewater Treatment Plant and the South Bay Water Reclamation and Wastewater Treatment Plants located in the eastern portion of the planning area.

6.4.2.3 City of San Diego Land Use Compatibility

Existing land uses surrounding NOLF Imperial Beach consist of residential, commercial, agriculture, recreational, and natural preserve (TRNERR). These land uses provide a mixture of urbanized areas and natural open space that is compatible with the NOLF Imperial Beach AICUZ. The 65 CNEL noise contour is largely contained within the station boundaries. APZ I, established for the helicopter traffic pattern extends beyond the station's southern boundary and over a low-intensity recreation open space preserve area, compatible by AICUZ standards.

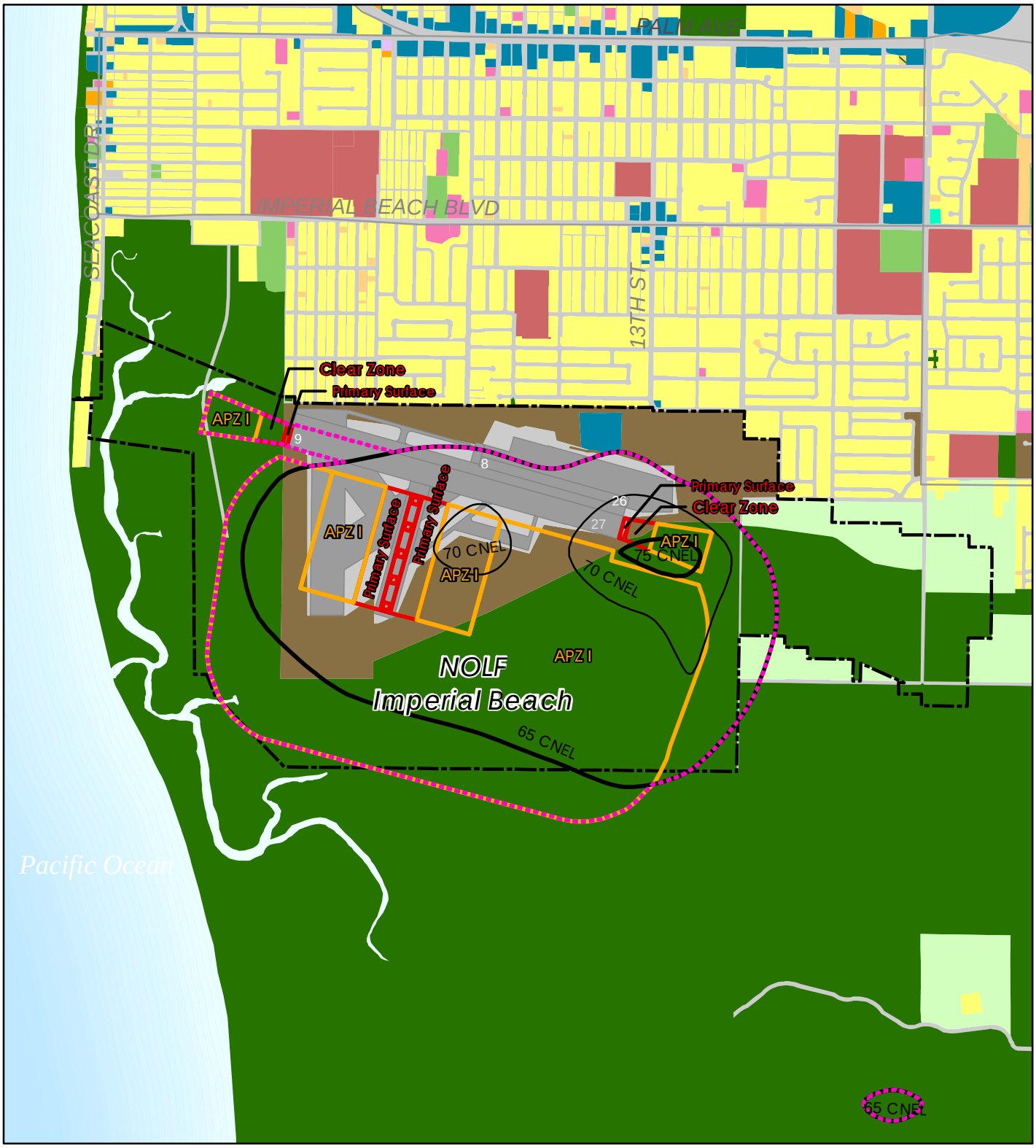
6.4.3 NOLF Imperial Beach AICUZ Summary

Table 6-3 provides a comparison between historical and projected acreages in noise contours at NOLF Imperial Beach. Figure 6-11 provides an overview of land use compatibility with the AICUZ footprint for NOLF Imperial Beach. The AICUZ footprint is largely contained on military property. A segment of APZ I protecting the helicopter traffic pattern extends over the southeastern boundary but overlies land that is open space in existing and zoned land use and is compatible. Additional protection of the NOLF Imperial Beach imaginary surfaces by the City of Imperial Beach would aid in implementing the AICUZ.

Table 6-3 Historical and Projected Acreage Comparison in Noise Contours

NOLF Imperial Beach	65-75 CNEL			75+ CNEL		
Land Use	1989	Baseline	Prospective	1989	Baseline	Prospective
Residential	**12**	0	0	0	0	0
Lodging/Group Quarters	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Transportation	**14**	2	0	0	0	0
Commercial	0	0	0	0	0	0
Office	0	0	0	0	0	0
Public Service	0	0	0	0	0	0
Military	**174**	**430**	**501**	**186**	**<1**	**0**
Schools	0	0	0	0	0	0
Parks & Recreation	0	0	0	0	0	0
Open Space	**1005**	**105**	**151**	**30**	0	0
Agriculture	**25**	3	6	0	0	0
Vacant Land	0	0	0	0	0	0
Total Acres	**1230**	**540**	**658**	**216**	**<1**	**0**

Source: The Onyx Group, 2010.
Transportation and Open Space categories in CY05 and CY13 are based on property. The Open Space category includes the Tijuana National Wildlife refuge Area.



AICUZ Footprint
- APZ I
- APZ II
- Clear Zone
- Primary Surface
- Installation Boundary
- AICUZ Footprint Outline

Land Use
- Residential
- Lodging/Group Quarters
- Industrial
- Transportation
- Commercial
- Office
- Public Service
- Medical
- Military
- Schools
- Parks & Recreation
- Open Space
- Agriculture
- Vacant Land
- Under Construction

Figure 6-11
NOLF Imperial Beach
AICUZ Compatibility with Land Use

Source: SANDAG Land Use, 2003
Wyle Labs Noise Study, 2010
and The Onyx Group.

TRUE NORTH
MAGNETIC NORTH
Magnetic Declination 12° 35' E

0 1,250 2,500 Feet

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7.0 AICUZ Strategies

Department of Defense (DOD) and Department of the Navy (DON) Air Installations Compatible Use Zones (AICUZ) policy (DODI 4165.57 and OPNAVINST 11010.36C, respectively) is predicated on promoting harmony between air installations and neighboring communities through a compatible land use planning and control process conducted by the responsible local authorities. This policy recognizes the local government's responsibility under its police power to protect the public health, safety and welfare. By enacting compatible land use controls, local government protects its citizens from high noise levels or accident potential. This section presents strategies and recommendations for the continued implementation of the AICUZ program at Naval Air Station (NAS) North Island and Naval Outlying Landing Field (NOLF) Imperial Beach.

7.1 Current Situation

The local community areas in the NAS North Island and NOLF Imperial Beach environs are essentially fully developed and have been for many years. Some of the existing development near NAS North Island within the updated AICUZ footprint is nonconforming to the Navy guidelines in Appendix B as noted in Chapter 6. The existing land uses within the updated AICUZ footprint for NOLF Imperial Beach conform to the Navy guidelines in Appendix B. Little future development other than infill and redevelopment is anticipated in either of these airfield's environs. Height restrictions that protect the imaginary surfaces associated with the airfields are in place within the impacted areas at this time.

7.2 "The Way Ahead"

Successful implementation of an AICUZ program depends on a close working relationship between installation and community leaders. The Department of the Navy (DON) mechanism to promote compatible development of land affected by military operations is the AICUZ Program. Cooperative efforts employed by local, regional, state, and federal government agencies are important to the sustainability of the military mission to meet national security objectives. Strategic planning on all levels and ongoing dialogue within the neighboring communities continues to serve as a foundation for existing and future program initiatives.

Federal Laws and Regulations

The following federal laws and regulations provide an opportunity for Naval Base Coronado (NBC) to identify, comment on, and influence the direction of land uses around the installations. This list is not meant to be exhaustive, but will serve as a foundation for future AICUZ efforts.

National Environmental Policy Act (NEPA) mandates full analysis of the environmental impacts of proposed federal actions. The requirement for federal agencies to solicit comments and fully coordinate NEPA documentation provides an opportunity for local Navy staff to provide comments on federal projects of other agencies that affect the AICUZ.

Intergovernmental Review of Federal Programs (Executive Order (EO) 12372) requires federal agencies to use review processes established by states to provide state and local officials an opportunity to comment on proposed federal assistance or direct federal development. Through the state clearinghouse, the base is able to enter into the planning process and comment on federal projects that it may not see otherwise.

Department of Housing and Urban Development (HUD) Circular 1390.2 sets forth requirements for approval of housing loans from the Federal Housing Administration or the Department of Veterans Affairs. The circular sets forth a discretionary policy to withhold funds for housing projects when noise exposure levels are in excess of prescribed levels. HUD funding for residential housing may be permitted inside the 65 CNEL contour,

provided sound insulation is accomplished. Because the HUD policy is discretionary, variances may or may not be permitted, depending on regional interpretation and local conditions. HUD also has a policy which does not provide funding for projects in Clear Zones and accident potential zones unless the project is compatible with AICUZ (24 CFR Section 51.3).

7.3 Department of Navy Real Estate Efforts

Easements
Restrictive easements give DON the ability to ensure that development and land uses outside the base are consistent with AICUZ recommendations. Navy policy is to consider easement acquisition only if all other means of ensuring future development and compatible land use fail. The Navy had purchased easements in the NOLF Imperial Beach environs as noted earlier in this study.

Fee Title Acquisitions
Lands considered essential in protecting the airspace and operations of the base that cannot be controlled through cooperative efforts with the local land use agencies or acquisition of restrictive use easements could be considered for fee title acquisition and Navy ownership. However, Navy policy provides that unless unusual situations exist that would warrant the expense and disruption of "trying to turn back the clock" in developed areas, the primary focus of these acquisition efforts is on undeveloped land. At this time, no land acquisition projects are proposed for NAS North Island or NOLF Imperial Beach.

Encroachment Partnering
Per 10 U.S.C. 2684a ("Agreements to limit encroachments and other constraints on military training, testing, and operations,"), the Secretary of Defense or the Secretary of a military department may enter into agreements with an eligible entity or entities to address the use or development of real property in the vicinity of, or ecologically related to, a military installation or military airspace in order to limit encroachment or other constraints on military training, testing, and operations. Eligible entities include a state, a political subdivision of a state, and a private entity that has, as its principal organizational purpose or goal, the conservation, restoration, or preservation of land and natural resources, or a similar purpose or goal.

Encroachment Partnering Agreements provide for an eligible entity to acquire fee title, or a lesser interest, in land for the purpose of limiting encroachment on the mission of a military installation and/or to preserve habitat off the installation to relieve current or anticipated environmental restrictions that might interfere with military operations or training on the installation. The DoD can share the real estate acquisition costs for projects that support the purchase of fee or a conservation or other restrictive easement for such property. The eligible entity negotiates and acquires the real estate interest for encroachment partnering projects with a voluntary seller. The eligible entity must transfer the agreed-upon restrictive easement interest to the United States of America upon the request of the Secretary.

7.4 State and Regional Laws and Regulations

California Environmental Quality Act (CEQA) requires local governments to consider potential environmental impacts of a project before they approve it. It also requires that a planned project's environmental impacts be publicly disclosed so the community can make informed comments. In 2002 the California Legislature passed **Assembly Bill 1108** amending CEQA with provisions for the military to be directly notified for certain projects in specific locations. To receive this notification the military must provide contact information to lead agencies and delineate a "military impact zone," which is defined in the legislation as an area within 2 miles of a military installation. Notification to the military of projects in the military impact zone would be required for projects involving a general plan amendment, projects of statewide, regional, or area wide significance, or projects that must be referred to the Airport Land Use Commission.

California State Clearinghouse and **Area Wide Clearinghouse** provide essential mechanisms for coordination of documents prepared under the auspices of CEQA/NEPA and EO 12372. The State Clearinghouse publishes a newsletter twice per month, both on the Web and in hard copy, listing environmental documents received and copies of federal grant applications received. The Area Wide Clearinghouse, operated by the San Diego Association of Governments, has established a Web site providing information similar to the newsletter.

California Senate Bill 1468 and 1462
In 2002 the California Legislature strengthened the Planning and Zoning law through **Senate Bill 1468,** requiring local governments to consider impacts on military readiness in the land use, open space, and circulation elements, setting the stage for more collaborative planning among communities and military locations. In 2005 **Senate Bill 1462** passed, requiring local governments to notify the military of proposed projects within 1,000 feet of a military installation. The bill also laid out provisions and procedures for consultation to address potential conflicts.

San Diego County Regional Airport Authority (SDCRAA)
In California, airport land use commissions have been established to guide development occurring around airports. The SDCRAA has been assigned responsibility for preparing Airport Land Use Compatibility Plans (ALUCP) for San Diego County public and military airports. ALUCPs can affect land use and development near airports.

7.5 City and Local Strategies

Land use compatibility is a shared concern of the Navy, the public, and local government agencies who have planning and zoning authority. The decision makers for local government have the key responsibility for taking actions that protect the public health, safety, and welfare and preserving land use compatibility. City and local governments have responsibility to develop strategies of land use planning, zoning, ordnances, and public improvement programs to provide for compatible land use.

However, when land is already developed the focus is often on redevelopment and infill. From this AICUZ study's perspective, local governments should encourage fair disclosure to the public of the noise and APZ situation, and not take actions that would make an existing land use compatibility (or incompatibility) situation worse (for example by allowing increased densities in redevelopment of currently low density incompatible land uses).

7.6 Specific Recommendations

The following section provides specific recommendations as part of this AICUZ program.

7.6.1 Recommendations for the San Diego County Regional Airport Authority

It is recommended that the SDCRAA consider this AICUZ update in their deliberations and participate in a Joint Land Use Study (JLUS) with other land management agencies in the vicinity of NAS North Island and NOLF Imperial Beach.

7.6.2 Recommendations for Local Government

The City of Coronado

It is recommended that the City of Coronado use this AICUZ plan as a guide for the review and update of the community plans and general plans for the City of Coronado and participate in a JLUS with other land management agencies in the vicinity of NAS North Island and NOLF Imperial Beach.

The City of San Diego

It is recommended that the City of San Diego use this AICUZ plan as a guide for the review and update of the community plans and general plans for the City of San Diego and participate in a JLUS with other land management agencies in the vicinity of NAS North Island and NOLF Imperial Beach.

While it is noted that height controls for areas surrounding NAS North Island and NOLF Imperial Beach currently exist from various other regulations, they are not contained in the City zoning regulations as are height controls to protect imaginary surfaces for other airports. It is recommended that, for consistency in providing imaginary surfaces protection at all airports, the City of San Diego include imaginary surfaces (FAA Part 77) height control provisions in their zoning code for applicable areas surrounding NAS North Island and NOLF Imperial Beach within the City of San Diego.

The City of Imperial Beach

It is recommended that the City of Imperial Beach continue coordination with the Navy regarding land use planning at NOLF Imperial Beach. The City of Imperial Beach has passed a resolution in support of a JLUS with the San Diego County Regional Airport Authority, the DOD, and other land management agencies near NAS North Island and NOLF Imperial Beach

7.6.3 Recommendations for Naval Base Coronado

It is recommended that NBC continue community coordination efforts regarding AICUZ with affected communities, including participation in the proposed JLUS.

NAS North Island and NOLF Imperial Beach Operations Modeled in Noise Survey

Table A-1 Baseline Total Annual Flight Operations for NAS North Island A-1

Table A-2 Modeled Baseline Total Flight Operations at NOLF Imperial Beach A-4

Table A-3 Prospective Future Total Flight Operations at NAS North Island A-5

Table A-4 Future Prospective Future Total Flight Operations at NOLF Imperial Beach A-8

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Table A-1 Baseline Total Annual Flight Operations for NAS North Island

Squadron/Unit	Aircraft Type (Modeled As)	Operation Type	Baseline Total Annual Operations			
			0700-1900	1900-2200	2200-0700	Total
DHS-CBP	Citation 550	Departure	1,447	27	0	1,474
		Arrival	1,435	38	0	1,473
		Touch and Go	6	0	0	6
		GCA	158	0	0	158
SUBTOTAL			3,046	65	0	3,111
Station/DHS-CBP	C-210	Departure	376	10	0	386
		Arrival	382	4	0	386
		Touch and Go	6	0	0	6
		GCA	113	3	0	116
SUBTOTAL			877	17	0	894
DHS-CBP VP Det	P-3	Departure	938	36	19	993
		Arrival	938	37	18	993
		Touch and Go	0	0	0	0
		GCA	33	13	39	85
SUBTOTAL			1,909	96	76	2,071
L3 Flight International	Lear 24/35/36	Departure	1,726	0	0	1,726
		Arrival	1,726	0	0	1,726
		Touch and Go	503	0	0	503
		GCA	1,526	0	0	1,526
SUBTOTAL			5,481	0	0	5,481
Transient	E/A-6B	Departure	464	9	4	477
		Arrival	443	9	0	452
		Overhead Arrival	16	9	0	25
		Touch and Go	0	0	0	0
		GCA	0	0	0	0
SUBTOTAL			923	27	4	954
Transient	AV-8B (F/A-18C/D)	Departure	42	9	0	51
		Arrival	42	9	0	51
		Overhead Arrival	0	0	0	0
		Touch and Go	0	0	0	0
		GCA	0	6	0	6
SUBTOTAL			84	24	0	108
Transient	C-17	Departure	105	4	0	109
		Arrival	105	4	0	109
		Touch and Go	0	0	0	0
		GCA	26	3	0	29
SUBTOTAL			236	11	0	247

Table A-1 Baseline Total Annual Flight Operations for NAS North Island (continued)

Squadron/Unit	Aircraft Type (Modeled As)	Operation Type	Baseline Total Annual Operations			
			0700-1900	1900-2200	2200-0700	Total
Transient	C 5	Departure	95	7	3	105
		Arrival	95	7	3	105
		Touch and Go	0	0	0	0
		GCA	24	3	0	27
SUBTOTAL			214	17	6	237
NADEP/Transient	F/A-18E/F	Departure	67	3	1	71
		Arrival	37	2	1	40
		Overhead Break Arrival	30	0	0	30
		Touch and Go	4	0	0	4
		GCA	8	2	1	11
SUBTOTAL			146	7	3	156
NADEP/Transient	F/A-18C/D	Departure	596	24	10	630
		Arrival	334	17	7	358
		Overhead Break Arrivals	272	0	0	272
		Touch and Go	35	0	0	35
		GCA	76	14	8	98
SUBTOTAL			1,313	55	25	1,393
VR-17	C-40	Departure	1,519	38	23	1,580
		Arrival	1,475	61	45	1,581
		Touch and Go	280	43	36	359
		GCA	0	0	0	0
SUBTOTAL			3,274	142	104	3,520
Transient	C-130H	Departure	573	22	0	595
		Arrival	573	22	0	595
		Touch and Go	0	0	0	0
		GCA	39	13	0	52
SUBTOTAL			1,185	57	0	1,242
VRC 30	C-2	Departure	932	71	5	1,008
		Arrival	835	40	4	879
		Overhead Arrival	114	15	0	129
		Touch and Go	174	9	0	183
		GCA	465	45	0	510
SUBTOTAL			2,520	180	9	2,709
NADEP	E-2	Departure	190	0	0	190
		Arrival	190	0	0	190
		GCA	33	0	0	33
SUBTOTAL			413	0	0	413

Table A-1 Baseline Total Annual Flight Operations NAS North Island (concluded)

Squadron/Unit	Aircraft Type (Modeled As)	Operation Type	Baseline Total Annual Operations			
			0700-1900	1900-2200	2200-0700	Total
Station/DHS-CBP	C-12 (C-12/C26)	Departure	971	45	12	1,028
		Arrival	988	30	10	1,028
		Touch and Go	208	0	0	208
		GCA	164	16	1	181
SUBTOTAL			2,313	91	23	2,445
Flying Club	C-172	Departure	3,705	32	0	3,737
		Arrival	3,721	16	0	3,737
		Touch and Go	38	0	0	38
		GCA	30	55	0	85
SUBTOTAL			7,494	103	0	7,597
DHS-CBP, NADEP, HSC	H-53/H-3 (H-60)	Departure	165	35	0	200
		Arrival	165	35	0	200
		Touch and Go	0	0	0	0
		GCA	4	3	0	7
SUBTOTAL			334	73	0	407
HSC/HSL	H-60	Departure	12,749	1,685	199	14,633
		Interfacility Departures to NOLF IB	10.431	1,380	163	11,974
		Arrival	12,272	2,002	340	14,634
		Interfacility Arrivals from NOLF IB	10,041	1,666	279	11,974
		Touch and Go	0	0	0	0
		GCA	7,575	694	85	8,354
SUBTOTAL			53,068	7,436	1,066	61,559
GRAND TOTALS			84,848	8,391	1,315	94,554

Source: WR-10-18 September 2010

NOTES:

1. AV8 operations were modeled as Transient F/A-18C/D
2. H-53/H-3 operations were modeled as H-60
3. Each Touch and Go is counted as two operations; Each GCA Box Circuit is counted as two operations.

Table A-2 Modeled Baseline Total Flight Operations at NOLF Imperial Beach

Squadron	Aircraft Type	Operations Type	Baseline Total Annual Operations			
			0700-1900	1900-2200	2200-0700	Total
HS/HSL	H-60	Arrivals	1,117	3,551	182	4,850
		Interfacility Arrivals from NASNI	10,431	1,380	163	11,974
		Touch & Go	150,555	60,222	4,301	215,078
		Interfacility Departures to NASNI	10,041	1,655	278	11,974
		Departures	1,551	3,245	54	4,850
Totals			**173,695**	**70,053**	**4,978**	**248,726**

Note: Touch & Go counted as two operations

Source: WR-10-18 September 2010

Table A-3 Prospective Future Total Flight Operations at NAS North Island

Squadron/Unit	Aircraft Type (Modeled As)	Operation Type	Prospective (Circa CY2020) Operations			
			0700-1900	1900-2200	2200-0700	Total
NADEP/Transient	F-35C	Departure	87	5	1	93
		Arrival	50	3	1	54
		Overhead Break Arrival	38	-	-	38
		Touch and Go	5	-	-	6
		GCA	10	3	1	14
SUBTOTAL			190	11	3	204
NADEP/Transient	F/A-18E/F	Departure	523	27	8	558
		Arrival	302	20	5	327
		Overhead Break Arrival	229	2	1	232
		Touch and Go	29	-	-	29
		GCA	62	16	7	85
SUBTOTAL			1,145	65	21	1,231
Transient	E/A-18G	Departure	487	9	4	500
		Arrival	465	9	-	474
		Overhead Break Arrival	17	9	-	26
		Touch and Go	-	-	-	-
		GCA	-	-	-	-
SUBTOTAL			969	27	4	1,000
NADEP/Transient	F/A-18C/D	Departure	87	5	1	93
		Arrival	50	3	1	54
		Overhead Break Arrival	38	-	-	38
		Touch and Go	5	-	-	5
		GCA	10	3	1	14
SUBTOTAL			190	11	3	204
Transient	C-5	Departure	94	7	25	126
		Arrival	94	7	26	127
		GCA	24	3	-	27
SUBTOTAL			212	17	51	280
Transient	C-17	Departure	104	4	20	128
		Arrival	104	4	21	129
		GCA	26	3	0	29
SUBTOTAL			234	11	41	286

Table A-3 Prospective Future Total Flight Operations at NAS North Island (continued)

Squadron/Unit	Aircraft Type (Modeled As)	Operation Type	Prospective (Circa 2020) Operations			
			0700-1900	1900-2200	2200-0700	Total
DHS-CBP	Citation 550 [1]	Departure	138	69	23	230
		Arrival	138	69	23	230
SUBTOTAL			276	138	46	460
L3 Flight International	L24/35/36 (Lear25 & Lear35)	Departure	1,878	-	-	1,878
		Arrival	1,878	-	-	1,878
		Touch and Go	548	-	-	548
		GCA	1,661	-	-	1,661
SUBTOTAL			5,965	-	-	5,965
VR-57	C-40	Departure	1,804	46	28	1,878
		Arrival	1,751	72	54	1,877
		Touch and Go	-	-	-	-
		GCA	332	52	43	427
SUBTOTAL			3,87	170	125	4,182
Transient	C-130H	Departure	652	25	-	677
		Arrival	652	25	-	677
		Touch and Go	-	-	-	-
		GCA	45	15	-	60
SUBTOTAL			1,349	65	-	1,414
VRC-30	C2 [1]	Departure	507	39	3	549
		Arrival	507	39	3	549
SUBTOTAL			1,014	78	6	1,098
NADEP	E-2 [1]	Departure	94	-	-	94
		Arrival	94	-	-	94
		GCA	33	-	-	33
SUBTOTAL			221	-	-	221

Table A-3 Prospective Future Total Flight Operations at NAS North Island (concluded)

Squadron/Unit	Aircraft Type (Modeled As)	Operation Type	Prospective (Circa 2020) Operations			
			0700-1900	1900-2200	2200-0700	Total
Station/DHS-CBP	C-12 [1] (C-12/C-26)	Departure	148	74	25	247
		Arrival	148	74	25	247
SUBTOTAL			296	148	50	494
DHS-CBP	AS350 [1,3]	Departure	288	144	48	480
		Arrival	288	144	48	480
SUBTOTAL			576	288	96	960
DHS-CPB/VP-DET	P-8A [5]	Departure	272	68	200	540
		Arrival	272	68	200	540
SUBTOTAL			544	136	400	1,080
DHS-CBP	DASH 8[1,4]	Departure	71	142	142	355
		Arrival	71	142	142	355
SUBTOTAL			142	284	284	710
DHS	H-60 [1]	Departure	99	99	49	247
		Arrival	99	99	49	247
SUBTOTAL			198	198	98	494
HSC/HSL	H-60	Departure	16,574	2,191	259	19,024
		Interfacility Departure to NOLF IB	13,560	1,794	212	15,566
		Arrival	15,954	2,629	442	19,025
		Interfacility Arrival from NOLF IB	13,053	2,152	361	15,566
		GCA	9,848	902	111	10,861
SUBTOTAL			68,989	9,668	1,385	80,042
TOTAL			**86,397**	**11,315**	**2613**	**100,325**

.

Notes:

(1) Assumed source documents provided sorties vice operations; split sorties evenly between departures and non-break arrivals.

(2) Touch and Go and GCA box circuit are counted as two operations.

(3) AS350 not modeled

(4) Dash 8 modeled as E-2

(5) Source: WR 06-11 Addendum #2

(6) 30 percent increase relative to baseline

Source: WR-10-18 Sept. 2010.

Table A-4 Prospective Future Total Flight Operations at NOLF Imperial Beach

Squadron	Aircraft Type	Operations Type	Prospective Future (Circa 2020) Operations			
			0700-1900	1900-2200	2200-0700	Total
HS/HSL	H-60	Departure	2,016	4,219	70	6,305
		Interfacility Departure To NASNI	13,053	2,154	391	15,566
		Arrival	1,452	4,616	237	6,305
		Interfacility Arrival From NASNI	13,560	1,794	212	15,566
		Touch & Go	195,722	78,289	5,591	279,602
Totals			225,803	91,070	6,471	323,344

Source: WR-10-18 September 2010

Imaginary Surface Criteria

Imaginary Surface Criteria – Class B Runways **B-1**

Imaginary Surface Criteria – Helicopter Landing Areas **B-3**

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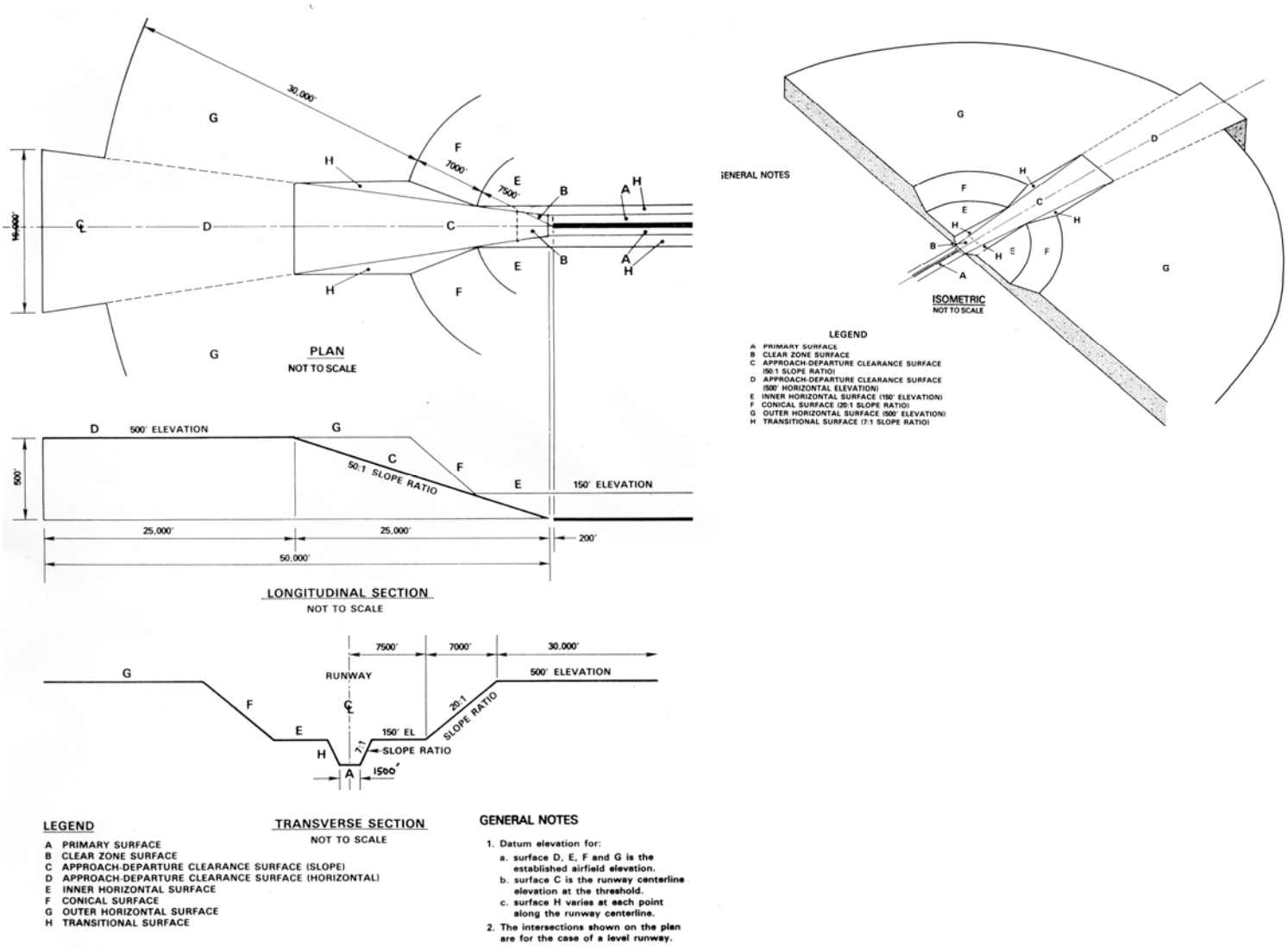
Imaginary Surface Criteria – Class B Runways

Navy criteria for Imaginary Surfaces for Class B runways include the following:

- The *Primary Surface* is a surface on the ground or water centered lengthwise on the runway and extending 200 feet beyond each end of the runway. The width is 1,500 feet per Class B runway. The Primary Surface is normally highly protected and free of all obstructions.
- The *Clear Zone Surface* is immediately adjacent to the end of the runway and extends 3,000 feet outward along the runway centerline.
- *Approach/Departure Clearance Surfaces* extend from the primary surfaces at a 50:1 inclined plane for a Class B runway. When the surface reaches an elevation of 500 feet, the surface becomes a horizontal plane.
- *Horizontal Clearance Surfaces* include one at 150 feet above airfield elevation extending to 7,500 feet from the runway, and another at 500 feet above airfield elevation extending from 14,500 feet to 44,500 feet from the runway end.
- *Conical and other Transitional Surfaces* connect the Horizontal Clearance Surfaces to the Approach/Departure Clearance Surfaces and the Primary Surfaces.

Figure B-1 details the geometry used to create the imaginary surfaces for Class B runways.

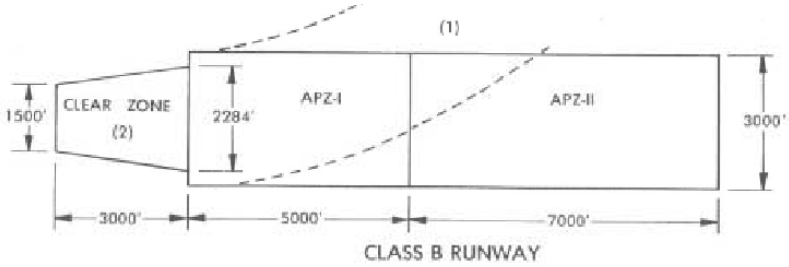
Figure B-1 Imaginary Surfaces for Class B Runways



Notes:

(1) APZ I and II may be altered to conform to flight shadow.

(2) The 2284' dimension is based on criteria of using a 7°-58'-11" flare angle for the approach departure surface where the outer width of that surface was established at 15,500'. This dimension would be 2,312' where the outer width of the surface was established at 16,000'. Flare starts at 200' from end of runways and 3,000' Clear Zone length starts at runway end. See NAVFAC P-80.3 for more details.



Sources:
UFC 3-260-01, 01 November 2001
OPNAVINST 11010.36C, October 2008

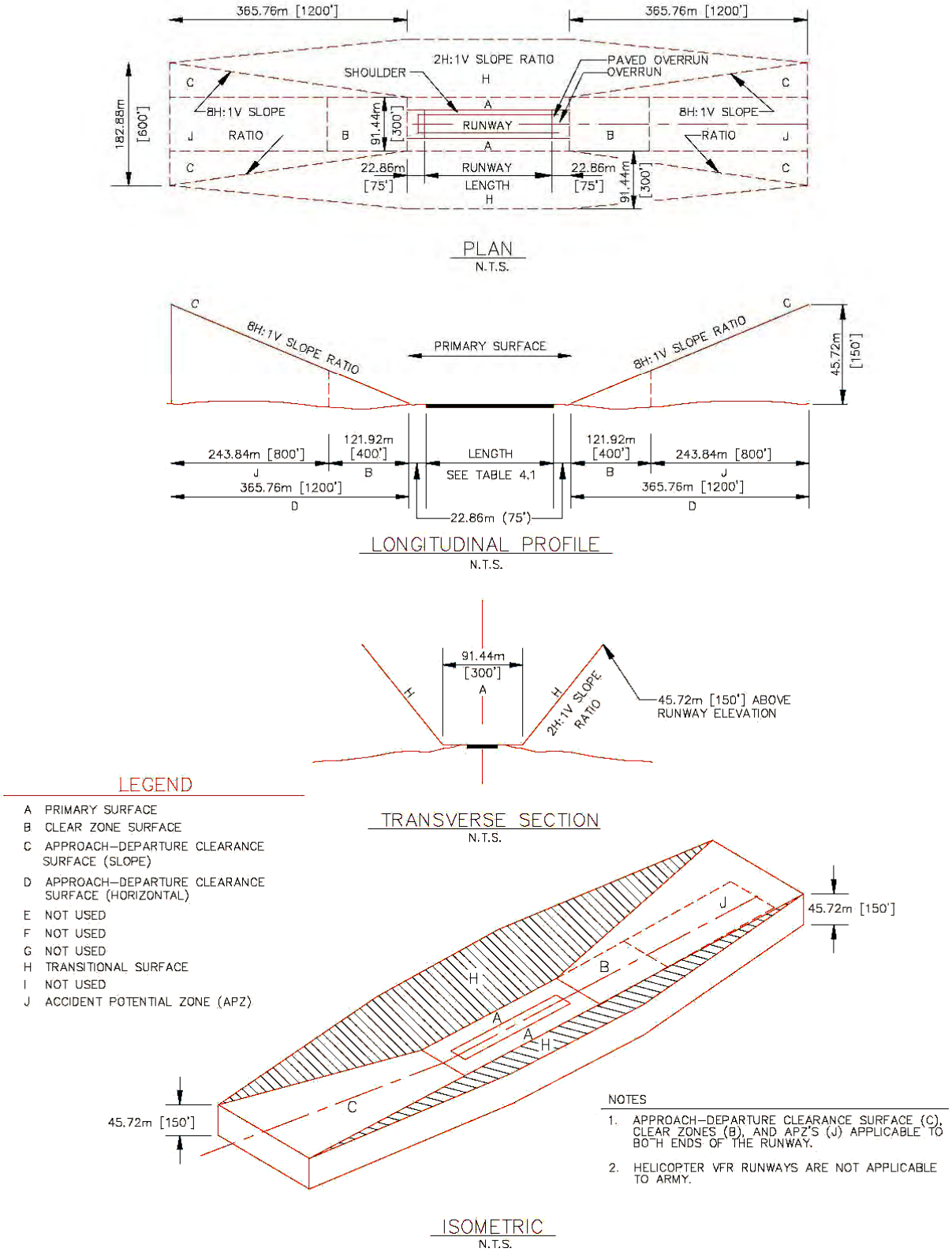
Imaginary Surface Criteria – Helicopter Landing Areas

Navy criteria for VFR Helicopter landing pads include the following:

- The *Primary Surface* is a horizontal plane symmetrically centered on the helicopter runway or pad at the elevation of the landing surface. The width is 150 feet. The length is 150 feet for pads and runway length plus 75 feet for runways. The Primary Surface is normally highly protected and free of all obstructions.
- The *Clear Zone Surface* or *Take Off Safety Zone Surface* is under the first 400 feet of the Approach/Departure Clearance Surface and has the same width as the Approach/Departure Clearance Surface. This area is normally free of obstructions.
- *Approach/Departure Clearance Surfaces* extend from the primary surfaces at an 8:1 inclined plane. The surface is 1,200 feet long and flares to a 500 foot width for helipads and 600 foot width for helicopter runways.
- *Transitional Surfaces* connect to the Primary Surface to the Approach/Departure Clearance Surface outward and upward from the edge of the surfaces at a 2:1 slope.

Figure B-2 details the geometry used to create the imaginary surfaces for helicopter runways.

Figure B-2 Imaginary Surfaces for VFR Helicopter



Sources:
UFC 3-260-01, 01 November 2001

AICUZ Suggested Land Use Compatibility Tables

Table C-1 Suggested Land Use Compatibility in Noise Zones C-1

Table C-2 Suggested Land Use Compatibility in Accident Potential Zones C-6

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Land Use Compatibility Tables

Table C-1 Suggested Land Use Compatibility in Noise Zones (Adapted from OPNAVINST 11010.36C)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(CNEL)*		Noise Zone 2 *(CNEL)*		Noise Zone 3 *(CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55–64	65–69	70–74	75–79	80–84	85+
	Residential							
11	Household units	Y	Y [1]	N [1]	N [1]	N	N	N
11.11	Single units: detached	Y	Y [1]	N [1]	N [1]	N	N	N
11.12	Single units: semidetached	Y	Y [1]	N [1]	N [1]	N	N	N
11.13	Single units: attached row	Y	Y [1]	N [1]	N [1]	N	N	N
11.21	Two units: side-by-side	Y	Y [1]	N [1]	N [1]	N	N	N
11.22	Two units: one above the other	Y	Y [1]	N [1]	N [1]	N	N	N
11.31	Apartments: walk-up	Y	Y [1]	N [1]	N [1]	N	N	N
11.32	Apartments: elevator	Y	Y [1]	N [1]	N [1]	N	N	N
12	Group quarters	Y	Y [1]	N [1]	N [1]	N	N	N
13	Residential hotels	Y	Y [1]	N [1]	N [1]	N	N	N
14	Mobile home parks or courts	Y	Y [1]	N	N	N	N	N
15	Transient lodgings	Y	Y [1]	N [1]	N [1]	N [1]	N	N
16	Other residential	Y	Y [1]	N [1]	N [1]	N	N	N
20	***Manufacturing***							
21	Food and kindred products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
22	Textile mill products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
23	Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
24	Lumber and wood products (except furniture); manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
25	Furniture and fixtures; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
26	Paper and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
27	Printing, publishing, and allied industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
28	Chemicals and allied products; manufacturing	Y	Y	Y	Y[2]	Y[3]	Y[4]	N
29	Petroleum refining and related industries	Y	Y	Y	Y[2]	Y[3]	Y[4]	N

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Table C-1 Suggested Land Use Compatibility in Noise Zones (continued)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(CNEL)*		Noise Zone 2 *(CNEL)*		Noise Zone 3 *(CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55–64	65–69	70–74	75–79	80–84	85+
30	***Manufacturing (continued)***							
31	Rubber and misc. plastic products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
32	Stone, clay, and glass products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
33	Primary metal products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
34	Fabricated metal products; manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
35	Professional, scientific, and controlling instruments; photographic and optical goods; watches and clocks	Y	Y	Y	25	30	N	N
39	Miscellaneous manufacturing	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
40	***Transportation, communication, and utilities***							
41	Railroad, rapid rail transit, and street railway transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
42	Motor vehicle transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
43	Aircraft transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
44	Marine craft transportation	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
45	Highway and street right-of-way	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
46	Automobile parking	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
47	Communication	Y	Y	Y	25 [5]	30 [5]	N	N
48	Utilities	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
49	Other transportation, communication, and utilities	Y	Y	Y	25 [5]	30 [5]	N	N
50	***Trade***							
51	Wholesale trade	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
52	Retail trade—building materials, hardware and farm equipment	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
53	Retail trade—shopping centers	Y	Y	Y	25	30	N	N
54	Retail trade—food	Y	Y	Y	25	30	N	N

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Table C-1 Suggested Land Use Compatibility in Noise Zones (continued)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 (CNEL)		Noise Zone 2 (CNEL)		Noise Zone 3 (CNEL)		
SLUCM NO	LAND USE NAME	< 55	55–64	65–69	70–74	75–79	80–84	85+
50	***Trade (Continued)***							
55	Retail trade—automotive, marine craft, aircraft and accessories	Y	Y	Y	25	30	N	N
56	Retail trade—apparel and accessories	Y	Y	Y	25	30	N	N
57	Retail trade—furniture, home furnishings and equipment	Y	Y	Y	25	30	N	N
58	Retail trade—eating and drinking establishments	Y	Y	Y	25	30	N	N
59	Other retail trade	Y	Y	Y	25	30	N	N
60	***Services***							
61	Finance, insurance, and real estate services	Y	Y	Y	25	30	N	N
62	Personal services	Y	Y	Y	25	30	N	N
62.4	Cemeteries	Y	Y	Y	Y [2]	Y [3]	Y [4,11]	Y [6,11]
63	Business services	Y	Y	Y	25	30	N	N
63.7	Warehousing and storage	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
64	Repair services	Y	Y	Y	Y [2]	Y [3]	Y [4]	N
65	Professional services	Y	Y	Y	25	30	N	N
65.1	Hospitals, other medical facilities	Y	Y [1]	25	30	N	N	N
65.16	Nursing homes	Y	Y	N [1]	N [1]	N	N	N
66	Contract construction services	Y	Y	Y	25	30	N	N
67	Government services	Y	Y [1]	Y [1]	25	30	N	N
68	Educational services	Y	Y [1]	25	30	N	N	N
69	Miscellaneous	Y	Y	Y	25	30	N	N
70	***Cultural, entertainment, and recreational***							
71	Cultural activities (churches)	Y	Y[1]	25	30	N	N	N
71.2	Nature exhibits	Y	Y[1]	Y[1]	N	N	N	N
72	Public assembly	Y	Y[1]	Y	N	N	N	N
72.1	Auditoriums, concert halls	Y	Y	25	30	N	N	N
72.11	Outdoor music shells, amphitheaters	Y	Y [1]	N	N	N	N	N
72.2	Outdoor sports arenas, spectator sports	Y	Y	Y [7]	Y [7]	N	N	N
73	Amusements	Y	Y	Y	Y	N	N	N
74	Recreational activities (golf courses, riding stables, water recreation)	Y	Y[1]	Y[1]	25	30	N	N
75	Resorts and group camps	Y	Y [1]	Y [1]	Y [1]	N	N	N
76	Parks	Y	Y [1]	Y [1]	Y [1]	N	N	N
79	Other cultural, entertainment, and recreation facilities	Y	Y [1]	Y [1]	Y [1]	N	N	N

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Table C-1 Suggested Land Use Compatibility in Noise Zones (continued)

Land Use		Suggested Land Use Compatibility						
		Noise Zone 1 *(CNEL)*		Noise Zone 2 *(CNEL)*		Noise Zone 3 *(CNEL)*		
SLUCM NO	LAND USE NAME	< 55	55–64	65–69	70–74	75–79	80–84	85+
80	***Resource production and extraction***							
81	Agriculture (except livestock)	Y	Y	Y [8]	Y [9]	Y [10]	Y [10,11]	Y [10,11]
81.5	Livestock farming	Y	Y	Y [8]	Y [9]	N	N	N
81.7	Animal breeding	Y	Y	Y [8]	Y [9]	N	N	N
82	Agriculture-related activities	Y	Y	Y [8]	Y [9]	Y [10]	Y [10,11]	Y [10,11]
83	Forestry activities	Y	Y	Y [8]	Y [9]	Y [10]	Y [10,11]	Y [10,11]
84	Fishing activities	Y	Y	Y	Y	Y	Y	Y
85	Mining activities	Y	Y	Y	Y	Y	Y	Y
89	Other resource production or extraction	Y	Y	Y	Y	Y	Y	Y

Key:

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

Y (Yes) Land use and related structures compatible without restrictions.

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

Y* (Yes with Restrictions) Land use and related structures are generally compatible. However, see note(s) indicated by the superscript.

N* (No with Exceptions) Land use and related structures are generally incompatible. However, see notes indicated by the superscript.

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

25, 30, or 35 The numbers refer to NLR levels. Land use and related structures generally are compatible; however, measures to achieve NLR of 25, 30, or 35 must be incorporated into design and construction of structures. Measures to achieve an overall noise reduction do not necessarily solve noise difficulties outside the structure, and additional evaluation is warranted. Also, see notes indicated by superscripts where they appear with one of these numbers.

DNL Day Night Average Sound Level.

CNEL Community Noise Equivalent Level (Normally within a very small decibel difference of DNL).

Ldn Mathematical symbol for DNL.

Notes:

1.

a) Although local conditions regarding the need for housing may require residential use in these zones, residential use is discouraged in CNEL 65–69 and strongly discouraged in CNEL 70–74. The absence of viable alternative development options should be determined and an evaluation should be conducted locally prior to local approvals, indicating that a demonstrated community need for the residential use would not be met if development were prohibited in these zones.

b) Where the community determines that these uses must be allowed, measures to achieve and outdoor to indoor NLR of at least 25 dB in CNEL 65–69 and NLR of 30 dB in CNEL 70–74 should be incorporated into building codes and be in individual approvals; for transient housing, an NLR of at least 35 dB should be incorporated in CNEL 75–79.

c) Normal permanent construction can be expected to provide an NLR of 20 dB; thus, the reduction requirements are often stated as 5, 10, or 15 dB over standard construction and normally assume mechanical ventilation, upgraded Sound Transmission Class ratings in windows and doors and closed windows year-round. Additional consideration should be given to modifying NLR levels based on peak noise levels or vibrations.

d) NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure NLR particularly from ground-level sources. Measures that reduce noise at a site should be used wherever practical in preference to measures that protect only interior spaces.

Notes (cont.):

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

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

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

5. If project or proposed development is noise sensitive, use indicated NLR; if not, land use is compatible without NLR.

6. No buildings.

7. Land use compatible provided special sound reinforcement systems are installed.

8. Residential buildings require NLR of 25.

9. Residential buildings require NLR of 30.

10. Residential buildings not permitted.

11. Land use not recommended, but if community decides use is necessary, hearing protection devices should be worn.

Source:
Department of Navy, Chief of Naval Operations OPNAVINST 11010.36C/Commandant of Marine Corps MCO 11010.16 of 9 Oct 2008.

Table C-2 Suggested Land Use Compatibility in Accident Potential Zones[1]

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
10	***Residential***				
11	Household units				
11.11	Single units: detached	N	N	Y[2]	Maximum density of 1-2 Du/Ac
11.12	Single units: semidetached	N	N	N	
11.13	Single units: attached row	N	N	N	
11.21	Two units: side-by-side	N	N	N	
11.22	Two units: one above the other	N	N	N	
11.31	Apartments: walk-up	N	N	N	
11.32	Apartments: elevator	N	N	N	
12	Group quarters	N	N	N	
13	Residential hotels	N	N	N	
14	Mobile home parks or courts	N	N	N	
15	Transient lodgings	N	N	N	
16	Other residential	N	N	N	
20	***Manufacturing*** [3]				
21	Food and kindred products; manufacturing	N	N	Y	Maximum FAR 0.56 in APZ II
22	Textile mill products; manufacturing	N	N	Y	Same as above
23	Apparel and other finished products; products made from fabrics, leather, and similar materials; manufacturing	N	N	N	
24	Lumber and wood products (except furniture); manufacturing	N	Y	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
25	Furniture and fixtures; manufacturing	N	Y	Y	Same as above
26	Paper and allied products; manufacturing	N	Y	Y	Same as above
27	Printing, publishing, and allied industries	N	Y	Y	Same as above
28	Chemicals and allied products; manufacturing	N	N	N	
29	Petroleum refining and related industries	N	N	N	

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Table C-2 Suggested Land Use Compatibility in Accident Potential Zones[1] (continued)

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
30	***Manufacturing*** [3] ***(continued)***				
31	Rubber and misc. plastic products; manufacturing	N	N	N	
32	Stone, clay, and glass products; manufacturing	N	N	Y	Maximum FAR 0.56 in APZ II
33	Primary metal products; manufacturing	N	N	Y	Same as above
34	Fabricated metal products; manufacturing	N	N	Y	Same as above
35	Professional scientific, and controlling instruments; photographic and optical goods; watches and clocks	N	N	N	
39	Miscellaneous manufacturing	N	Y	Y	Maximum FAR of 0.28 in APZ I & 0.56 in APZ II
40	***Transportation, communication, & utilities*** [4,5]				
41	Railroad, rapid rail transit, and street railway transportation	N	Y[5]	Y	Same as above.
42	Motor vehicle transportation	N	Y[5]	Y	Same as above
43	Aircraft transportation	N	Y[5]	Y	Same as above
44	Marine craft transportation	N	Y[5]	Y	Same as above
45	Highway and street right-of-way	N	Y[5]	Y	Same as above
46	Auto parking	N	Y[5]	Y	Same as above
47	Communication	N	Y[5]	Y	Same as above
48	Utilities	N	Y[5]	Y	Same as above
485	Solid waste disposal (landfills, incineration, etc.)	N	N	N	
49	Other transport, communication, and utilities	N	Y[5]	Y	See Note 5 below
50	***Trade***				
51	Wholesale trade	N	Y	Y	Maximum FAR of 0.28 in APZ I. & 0.56 in APZ II.
52	Retail trade—building materials, hardware and farm equipment	N	Y	Y	See Note 6 below
53	Retail trade[7] - shopping centers	N	N	Y	Maximum FAR of 0.16 in APZ II.
54	Retail trade—food	N	N	Y	Maximum FAR of 0.24 in APZ II
55	Retail trade—automotive, marine craft, aircraft and accessories	N	Y	Y	Maximum FAR of 0.14 in APZ I & 0.28 in APZ II
56	Retail trade—apparel and accessories	N	N	Y	Maximum FAR 0.28 in APZ II
57	Retail trade—furniture, home furnishings and equipment	N	N	Y	Same as above
58	Retail trade—eating and drinking establishments	N	N	N	
59	Other retail trade	N	N	Y	Maximum FAR of 0.16 in APZ II

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Table C-2 Suggested Land Use Compatibility in Accident Potential Zones[1] (continued)

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
60	***Services*** [6]				
61	Finance, insurance, and real estate services	N	N	Y	Maximum FAR of 0.22 for "General Office/Office park" in APZ II
62	Personal services	N	N	Y	Office uses only. Maximum FAR of 0.22 in APZ II
62.4	Cemeteries	N	Y[9]	Y[9]	
63	Business services (credit reporting; mail, stenographic, reproduction; advertising)	N	N	Y	Max. FAR of 0.22 in APZ II
63.7	Warehousing and storage services	N	Y	Y	Max. FAR 1.0 APZ I; 2.0 in APZ II
64	Repair services	N	Y	Y	Max. FAR of 0.11 APZ I; 0.22 in APZ II
65	Professional services	N	N	Y	Max. FAR of 0.22 in APZ II
65.1	Hospitals, nursing homes	N	N	N	
65.1	Other medical facilities	N	N	N	
66	Contract construction services	N	Y	Y	Max. FAR of 0.11 APZ I; 0.22 in APZ II
67	Government services	N	N	Y	Max FAR of 0.24 in APZ II
68	Educational services	N	N	N	
69	Miscellaneous	N	N	Y	Max. FAR of 0.22 in APZ II
70	***Cultural, entertainment, and recreational***				
71	Cultural activities	N	N	N	
71.2	Nature exhibits	N	Y[10]	Y[10]	
72	Public assembly	N	N	N	
72.1	Auditoriums, concert halls	N	N	N	
72.11	Outdoor music shells, amphitheaters	N	N	N	
72.2	Outdoor sports arenas, spectator sports	N	N	N	
73	Amusements—fairgrounds, mini-golf, driving ranges; amusement parks	N	N	Y	
74	Recreational activities (including golf courses, riding stables, water recreation)	N	Y[10]	Y[10]	Max. FAR of 0.11 APZ I; 0.22 in APZ II
75	Resorts and group camps	N	N	N	
76	Parks	N	Y[10]	Y[10]	Same as 74
79	Other cultural, entertainment, & recreation facilities	N	Y[9]	Y[9]	Same as 74
80	***Resource production and extraction***				
81	Agriculture (except livestock)	Y[4]	Y[11]	Y[11]	
81.5, 81.7	Livestock farming and breeding	N	Y[11,12]	Y[11,12]	
82	Agriculture-related activities	N	Y[11]	Y[11]	Max FAR of 0.28 APZ I; 0.56 APZ II no activity which produces smoke, glare, or involves explosives

Table C-2 Suggested Land Use Compatibility in Accident Potential Zones[1] (continued)

SLUCM NO.	LAND USE NAME	CLEAR ZONE Recommendation	APZ-I Recommendation	APZ-II Recommendation	Density Recommendation
83	Forestry activities [13]	N	Y	Y	Same as Above
84	Fishing activities [14]	N[14]	Y	Y	Same as Above
85	Mining activities	N	Y	Y	Same as Above
89	Other resource production or extraction	N	Y	Y	Same as Above
90	***Other***				
91	Undeveloped land	Y	Y	Y	
93	Water areas	N[15]	N[15]	N[15]	

Key:

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

Y (Yes) Land use and related structures are normally compatible without restriction.

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

Y^x (Yes with restrictions) Land use and related structures are generally compatible. However, see notes indicated by the superscript.

N^x (No with exceptions) Land use and related structures are generally incompatible. However, see notes indicated by the superscript.

FAR Floor area ratio. A floor area ratio is the ratio between the square feet of floor area of the building and the site area. It is customarily used to measure nonresidential intensities.

Du/Ac Dwelling units per acre. This metric is customarily used to measure residential densities.

Notes:

1. A "Yes" or a "No" designation for compatible land use is to be used only for general comparison. Within each, uses exist where further evaluation may be needed in each category as to whether it is clearly compatible, normally compatible, or not compatible due to the variation of densities of people and structures. In order to assist installations and local governments, general suggestions as to FARs are provided as a guide to density in some categories. In general, land use restrictions that limit commercial, services, or industrial buildings or structure occupants to 25 per acre in APZ I and 50 per acre in APZ II are the range of occupancy levels considered to be low density. Outside events should normally be limited to assemblies of not more that 25 people per acre in APZ I and not more than 50 people per acre in APZ II.

2. The suggested maximum density for detached single-family housing is one to two Du/Ac. In a planned unit development (PUD) of single-family detached units where clustered housing development results in large open areas, this density could possibly be increased provided the amount of surface area covered by structures does not exceed 20 percent of the PUD total area. PUD encourages clustered development that leaves large open areas.

3. Other factors to be considered: labor intensity, structural coverage, explosive characteristics, air pollution, electronic interference with aircraft, height of structures, and potential glare to pilots.

4. No structures (except airfield lighting), buildings, or aboveground utility/ communications lines should normally be located in Clear Zone areas on or off the installation. The Clear Zone is subject to severe restrictions. See UFC 3-260-01 "Airfield and Heliport Planning and Design" dated 10 November 2001 for specific design details.

5. No passenger terminals and no major aboveground transmission lines in APZ I.

6. Within SLUCM code 52, Max FARs for lumber yards (SLCUM code 521) are .20 in APZ – I and 0.40 in APZ – II. For hardware/paint and farming equipment stores, SLUCM Code 525, the Max FARs are 0.12 in APZ I and 0.24 in APZ II.

7. A shopping center is an integrated group of commercial establishments that is planned, developed, owned, or managed as a unit. Shopping center types include Strip, Neighborhood, Community, Regional, and Super Regional facilities anchored by small businesses, supermarket or drug store, discount retailer, department store, or several department stores, respectively. Included in this category are such uses as Big Box Discount Clubs, Home Improvement Superstores, Office Supply Superstores, and Electronics Superstores. The maximum recommended FAR for SLUCM 53 should be applied to the gross leasable area of the shopping center rather than attempting to use other recommended FARs listed in Table 3 under Retail or Trade.

8. Low-intensity office uses only. Accessory uses such as meeting places and auditoriums are not recommended.

9. No chapels are allowed within APZ I or APZ II.

10. Facilities must be low intensity, and provide no tot lots, etc. Facilities such as clubhouses, meeting places, auditoriums, and large classrooms are not recommended.

11. Includes livestock grazing but excludes feedlots and intensive animal husbandry. Activities that attract concentrations of birds, creating a hazard to aircraft operations, should be excluded.

12. Includes feedlots and intensive animal husbandry.

13. Lumber and timber products removed due to establishment, expansion, or maintenance of Clear Zones will be disposed of in accordance with appropriate DOD Natural Resources Instructions.

14. Controlled hunting and fishing may be permitted for the purpose of wildlife management.

15. Naturally occurring water features (e.g., rivers, lakes, streams, wetlands) are compatible.

Source:
Department of Navy, Chief of Naval Operations OPNAVINST 11010.36C/Commandant of Marine Corps MCO 11010.16 of 9 Oct 2008.

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LCDR William M. Wehrmeyer, USN, AIR OPS Officer

Mr. James John, Air Operations Department

Lt. Candice James, USN, Air Traffic Control Officer

Lt. J. P. Gonzales, USN, ATCFO

Mr. Carl (Bruce) Shaffer, AICP Community Plans & Liaison

Mr. Joseph Cote, RA, NAS Planning & Engineering Director

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Mr. Thomas Horsch, PE, Project Manager

Mr. Keith Bonar, AICP, Senior Planner/GIS

Ms. Melanie Fosnaught, Senior Planner

Mr. Andrew D'huyvetter, LEED AP Urban Planner/GIS

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Mr. Joe Czech, Senior Aircraft Noise Analyst

Mr. Koffi Amefia, Senior Aircraft Noise Analyst

Mr. Fabio Grandi, Senior Aircraft Noise Analyst

Mr. Cris Fernando, Aircraft Noise Analyst

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