FINAL

ENVIRONMENTAL ASSESSMENT

For Multi-Engine Training System
Naval Air Station Corpus Christi, Texas

August 2023

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For

Multi-Engine Training System

At

Naval Air Station Corpus Christi, Texas

August 2023

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Abstract

Designation:	**Environmental Assessment**
Title of Proposed Action:	Multi-Engine Training System
Project Location:	Naval Air Station Corpus Christi
Lead Agency:	Department of the Navy
Cooperating Agency:	None
Affected Region:	Nueces County, Texas
Action Proponent:	U.S. Fleet Forces Command on behalf of Chief of Naval Air Training
Point of Contact:	Sara Goodwin Naval Facilities Engineering Systems Command Atlantic 6506 Hampton Boulevard Norfolk, VA 23508-1278 sara.r.goodwin.civ@us.navy.mil
Date:	August 2023

U.S. Fleet Forces Command on behalf of Chief of Naval Air Training, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), has prepared this Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality regulations and Navy regulations. In support of the Navy's requirements under Title 10 of the United States Code, the Navy proposes to replace the over 40-year-old T-44C Pegasus aircraft used for multi-engine maritime flight training. This training program is operated by Commander, Training Air Wing Four, located at Naval Air Station Corpus Christi. The 54 T-44C Pegasus aircraft would be replaced with 58 new T-54A aircraft. The Navy selected the Beechcraft King Air 260 to replace the T-44C aircraft. To estimate potential impacts of the aircraft replacement, the Navy used a representative surrogate aircraft, the C-12 Huron, because the modeling software does not include reference noise data for the King Air 260. The new aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. The Proposed Action also includes short- and long-term construction projects for Navy support facilities at Naval Air Station Corpus Christi. This Environmental Assessment evaluates the potential environmental impacts associated with the two action alternatives, Alternatives 1 and 2, and the No Action Alternative to the following resource areas: noise, environmental justice, biological resources, cultural resources, and air quality.

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EXECUTIVE SUMMARY

ES.1 Proposed Action

U.S. Fleet Forces Command on behalf of Chief of Naval Air Training, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), proposes to replace aircraft used for the multi-engine maritime flight training program. This training program is operated by Commander, Training Air Wing Four, located at Naval Air Station (NAS) Corpus Christi. The Proposed Action includes replacement of 54 T-44C Pegasus aircraft with 58 new T-54A aircraft. The aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. The Proposed Action also includes short- and long-term construction projects for Navy support facilities at NAS Corpus Christi.

The Proposed Action would take place at NAS Corpus Christi in Texas and its associated training locations at Naval Outlying Landing Field Cabaniss; at international, regional, and publicly owned municipal airfields; and in the Federal Aviation Administration's National Airspace System throughout South Texas. To accommodate the new aircraft, short- and long-term construction projects for Navy support facilities at NAS Corpus Christi would be required. These activities would include the following short-term projects:

- Installing fire detection and suppression systems for Hangar 42 and reconfiguring the interior to maintenance shops and office space
- Reconfiguring the interior of Hangar 58 to office space and moving the maintenance equipment to Hangar 42
- Removing the T-44 Aircraft Protective Equipment Shelters (APES), restriping, and installing T-54 APES on Parking Apron 11
- Using a portion of Building 1218 for storage of parts
- Removing the T-44 Ground Based Training System (GBTS) and installing the Multi-Engine Training System GBTS

In the long term, the following options would be considered:

- Option 1: Recapitalize Hangars 57 and 58.
- Option 2: Demolish Hangars 57 and 58 and then install two fabric hangars or construct one new larger hangar.

The new aircraft would be delivered between the years 2024 and 2026, and proposed construction would begin in 2024 and continue through 2027. The Navy selected the Beechcraft King Air 260 to replace the T-44C aircraft. To estimate potential impacts of the aircraft replacement, the Navy used a representative surrogate aircraft, the C-12 Huron, because the modeling software does not include reference noise data for the King Air 260.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to replace the T-44C aircraft that are over 40 years old and that require upgrades to address existing training capability gaps. The T-44C fleet is nearing the end of its service life and has outdated avionics, limited availability of parts, and increased maintenance cost. The replacement of aircraft would provide advanced instrumentation for communication, navigation, and tracking aircraft health to facilitate maintenance planning and efficiency. The need for the Proposed Action is to enable continued aviator training in furtherance of the Navy's mandate to train and equip combat-capable naval forces for the peacetime promotion of the national security interests and prosperity of the United States and prompt and sustained combat incident to operations at sea.

ES.3 Alternatives Considered

Alternatives were developed for analysis based upon the following reasonable alternative screening factors: meeting overall training requirements, maintaining uninterrupted aviator production, allowing for continued operation and maintenance of T-44C and new aircraft until conversion is complete, maximizing use of existing airfields that are currently used for the student pilot training program, maintaining safety and separation parameters for student pilot training, and maximizing use of existing infrastructure for aircraft parking and maintenance.

Based on the reasonable alternative screening factors, two action alternatives were identified as meeting the purpose and need for the Proposed Action. The No Action Alternative and two action alternatives were analyzed in this Environmental Assessment (EA).

No Action Alternative

Under the No Action Alternative, the T-44C aircraft would not be replaced. The over 40-year-old T-44C aircraft would continue to operate despite capacity and capability gaps. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by the National Environmental Policy Act (NEPA), the No Action Alternative is carried forward for analysis in this EA. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action and will serve to establish a comparative baseline for analysis of environmental impacts associated with the Proposed Action.

Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)

Alternative 1 includes replacing 54 T-44C aircraft with 58 T-54A aircraft; increasing operations; and implementing short- and long-term projects for Navy support facilities. The Proposed Action would take place at NAS Corpus Christi in Texas and its associated training locations at Naval Outlying Landing Field Cabaniss; at international, regional, and publicly owned municipal airfields; and in the Federal Aviation Administration's National Airspace System throughout South Texas. To accommodate the new aircraft, short- and long term construction projects for Navy support facilities at NAS Corpus Christi would be required. Short-term projects would include the following:

- Installing fire detection and suppression systems for Hangar 42 and reconfiguring the interior to maintenance shops and office space
- Reconfiguring the interior of Hangar 58 to office space and moving the maintenance equipment to Hangar 42
- Removing the T-44 APES, restriping, and installing T-54 APES on Parking Apron 11
- Using a portion of Building 1218 for storage of parts
- Removing the T-44 GBTS and installing the Multi-Engine Training System GBTS

In the long term, the following options would be considered:

- Option 1: Recapitalize Hangars 57 and 58.
- Option 2: Demolish Hangars 57 and 58 and then install two fabric hangars or construct one new larger hangar.

Flight operations would increase by approximately 10 percent over the No Action Alternative, but personnel numbers would remain the same as current conditions. Current staffing levels would be able to manage the 10 percent increase in operations, which would be similar to surge conditions that arise due to weather and/or maintenance delays followed by an increase in operations. This alternative reflects the potential level of student pilot training necessary to support forecasted Navy, Marine Corps, and Coast Guard aviation requirements in the foreseeable future.

Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations
Alternative 2 includes the same aircraft replacement and short-term and long-term project options to provide Navy support facilities as Alternative 1 but with an increase in flight operations of approximately 20 percent over the No Action Alternative. With this increase in flight operations, the Navy estimates that there would be an increase of 33 additional personnel and their families at NAS Corpus Christi. Alternative 2 assesses a level of operations based on increases in demand for ready naval forces in response to national security requirements. This alternative represents the maximum potential level of student pilot training necessary to support forecasted Navy, Marine Corps, and Coast Guard aviation requirements in the foreseeable future.

ES.4 Summary of Environmental Resources Evaluated in the EA

NEPA, Council on Environmental Quality regulations, and Navy regulations specify that an EA should address those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

The following resource areas have been addressed in this EA: noise, environmental justice, biological resources, cultural resources, and air quality. Because potential impacts were considered to be negligible or nonexistent, the following resources were not evaluated in this EA: water resources, geological resources, land use, visual resources, airspace, infrastructure, transportation, public health and safety, hazardous materials and wastes, and socioeconomics.

ES.5 Summary of Potential Environmental Consequences of the Action Alternatives and Major Mitigating Actions

Table ES-1 provides a tabular summary of the potential impacts to the resources associated with each of the alternative actions analyzed. Note that an acronym key is provided at the end of the table.

ES.6 Public Involvement

NEPA and its implementing regulations require federal agencies to involve the public in preparing and implementing their NEPA procedures. The Navy prepared a Draft EA to inform the public of the Proposed Action and to allow the opportunity for public review and comment.

The Navy published a Notice of Availability of the Draft EA for three days in the *Corpus Christi Caller Times* on the dates of June 16, 18, and 19, 2023, and once in the weekly *The Island Moon Newspaper* on June 16, 2023. The notice described the Proposed Action, solicited public comments on the Draft EA, provided dates of the public comment period (June 16, 2023, through July 17, 2023), and announced that a copy of the EA would be available for review on the website:

www.navy.nepa.mil/mets/

Copies of the EA were also provided to 10 local libraries. No public comments were received.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)*	*Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations*
Noise	• Operations would not change relative to baseline conditions, and no additional noise impacts would occur. Aircraft noise levels in excess of 65 dBA DNL would continue to affect 50 acres of off-installation land and an estimated 91 residents near NAS Corpus Christi. • No off-station land would exceed 65 dBA DNL near NOLF Cabaniss. • Aircraft noise levels near international, regional, and publicly owned municipal airfields are variable with some airfields experiencing frequent jet aircraft noise (e.g., Corpus Christi International) and other airfields being used relatively infrequently (e.g., Palacios).	• The number of off-station land acres exposed to 65 dBA DNL or greater at NAS Corpus Christi would increase by one, from 50 to 51, and the estimated number of off-installation residents exposed to 65 dBA DNL or greater would remain at 91. Noise levels would not increase at representative locations near NAS Corpus Christi. • Noise levels near NOLF Cabaniss would increase by 0.5 dBA DNL or less and would remain below 65 dBA DNL. • Speech interference events per average daytime hour would increase by one or less at the locations studied. • Noise levels at all schools studied would remain below 60 dBA $L_{eq(8hr)}$. • Aircraft noise levels near international, regional, and publicly owned municipal airfields would remain below 65 dBA DNL at nearby sensitive locations or would not change measurably (i.e., change would be less than 0.1 dBA DNL and rounds to zero) at	• The number of off-station land acres exposed to 65 dBA DNL or greater at NAS Corpus Christi would increase by the same amount as under Alternative 1, but the estimated number of residents exposed would increase by one, from 91 to 92. Noise levels would increase by 0.1 dBA DNL or less near NAS Corpus Christi. • Noise levels near NOLF Cabaniss would increase by as much as 0.8 dBA DNL but would remain below 65 dBA DNL. • Speech interference events per average daytime hour would increase by one or less at the locations studied. • Noise levels at all schools studied would remain below 60 dBA $L_{eq(8hr)}$. • Aircraft noise levels near international, regional, and publicly owned municipal airfields would remain below 65 dBA DNL at nearby sensitive locations or would not change measurably at sensitive locations. • The Navy has determined that there would be no

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Resource Area	*No Action Alternative*	*Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)*	*Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations*
		representative sensitive locations. • The Navy has determined that there would be no environmental health and safety risks that would disproportionately affect children.	environmental health and safety risks that would disproportionately affect children.
Environmental Justice	• The Navy determined that there are minority and low-income populations present within the 65 dBA DNL noise contour at NAS Corpus Christi. • There would be no change in existing conditions for minority or low-income populations within the 65 dBA DNL noise contour. • A comparison group showed that impacts would be similar for all populations. • Therefore, the No Action Alternative would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations.	• The Navy determined that there are minority and low-income populations present within the 65 dBA DNL noise contour at NAS Corpus Christi. • The total affected population at NAS Corpus Christi within the 65 dBA DNL noise contour would remain the same as under the No Action Alternative (91 people). As a result, impacts to minority and low-income populations would be similar to the No Action Alternative. • A comparison group showed that impacts would be similar for all populations. • Therefore, Alternative 1 would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations.	• The Navy determined that there are minority and low-income populations present within the 65 dBA DNL noise contour at NAS Corpus Christi. • The total affected population at NAS Corpus Christi within the 65 dBA DNL noise contour would increase by one compared to the No Action Alternative (from 91 to 92 people). As a result, impacts to minority and low-income populations would be similar to the No Action Alternative. • A comparison group showed that impacts would be similar for all populations. • Therefore, Alternative 2 would not cause disproportionately high and adverse human health or environmental effects on minority or low-income populations.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)*	*Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations*
Biological Resources	• There would be no change in existing aircraft operations or BASH impacts on birds covered by the MBTA.	• There would be a 10 percent increase in aircraft operations at NAS Corpus Christi; NOLF Cabaniss; and international, regional, and publicly owned municipal airfields (from 184,672 to 203,000 annual operations). No changes to existing flight paths, procedures, or habitat would occur. The Navy would continue to manage airfield environments in accordance with its BASH Plan in order to reduce the likelihood of aircraft collisions with federally and state-protected species. • Construction projects under Alternative 1 include demolishing or recapitalizing buildings that may contain active bird nests within the buildings or on the rooftop. Building demolition or recapitalization work and tree removal (if any) would, to the extent feasible, take place outside of the breeding season. If this work must be conducted during the bird breeding season, a qualified biologist must confirm that no active nest would be impacted by these	• There would be a 20 percent increase in aircraft operations at NAS Corpus Christi; NOLF Cabaniss; and international, regional, and publicly owned municipal airfields (from 184,672 to 221,500 annual operations). No changes to existing flight paths, procedures, or habitat would occur. The Navy would continue to manage airfield environments in accordance with its BASH Plan in order to reduce the likelihood of aircraft collisions with federally and state-protected species. • Construction projects under Alternative 2 include demolishing or recapitalizing buildings that may contain active bird nests within the buildings or on the rooftop. Building demolition or recapitalization work and tree removal (if any) would, to the extent feasible, take place outside of the breeding season. If this work must be conducted during the bird breeding season, a qualified biologist must confirm that no active nest would be impacted by these

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)*	*Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations*
		actions. With implementation of these measures, construction activities associated with Alternative 1 would avoid or minimize incidental takes of birds protected under the MBTA (including Birds of Conservation Concern) or their active nests. • For T-54A aircraft operations, the Navy has determined that Alternative 1 may result in the incidental "take" of native birds protected by the MBTA. Under the MBTA's regulations applicable to military readiness activities (50 CFR part 21), the USFWS authorizes the incidental take of MBTA-listed birds, provided they do not result in significant adverse effects on their population. Alternative 1 is not expected to result in any adverse impacts to populations of species covered by the MBTA, with current standard operating procedures (BASH Plan). • Alternative 1 may affect, but is not likely to adversely affect, the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat. For all other	actions. With implementation of these measures, construction activities associated with Alternative 2 would avoid or minimize incidental takes of birds protected under the MBTA (including Birds of Conservation Concern) or their active nests. • For T-54A aircraft operations, the Navy has determined that Alternative 2 may result in the incidental "take" of native birds protected by the MBTA. Under the MBTA's regulations applicable to military readiness activities (50 CFR part 21), the USFWS authorizes the incidental take of MBTA-listed birds, provided they do not result in significant adverse effects on their population. Alternative 2 is not expected to result in any adverse impacts to populations of species covered by the MBTA, with current standard operating procedures (BASH Plan). • Alternative 2 may affect, but is not likely to adversely affect, the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat. For all other

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	***No Action Alternative***	***Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)***	***Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations***
		federally listed species identified with potential to occur within the ROI, the Navy has determined that there would be no effect. • The Navy consulted with the USFWS, and the agency concurred with the Navy's findings on August 2, 2023 (Appendix B, *Special Status Species Documentation*). Recommended measures to prevent or minimize potential adverse effects to the northern aplomado falcon and whooping crane were added to this Final EA.	federally listed species identified with potential to occur within the ROI, the Navy has determined that there would be no effect.
Cultural Resources	• There would be no change to existing conditions.	• No adverse effects would occur to the Warehouse/Industrial Historic District and the Seaplane Hangars/Ramps Historic District from building recapitalization or demolition. • Adverse effects to the Landplane Hangars Historic District would occur from building recapitalization or demolition. • Adverse effects would be resolved through consultation with the SHPO and development of a MOA.	• No adverse effects would occur to the Warehouse/Industrial Historic District and the Seaplane Hangars/Ramps Historic District. • Adverse effects to the Landplane Hangars Historic District would occur from building recapitalization or demolition. • Adverse effects would be resolved through consultation with the SHPO and development of a MOA.

Table ES-1 Summary of Potential Impacts to Resource Areas

Resource Area	***No Action Alternative***	***Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)***	***Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations***
		• The Navy consulted with the Texas SHPO, and a MOA was signed on August 21, 2023 (Appendix C, *National Historic Preservation Act Section 106 Documentation*).	
Air Quality	• There would be no change to existing conditions.	• No significant impacts to air quality would occur. The six counties where Navy and non-Navy airfield operations would occur are in attainment of the NAAQS and, thus, General Conformity does not apply. • Emissions of criteria pollutants and GHGs above the No Action Alternative would occur from the short- and long-term construction projects and the planned 10 percent increase in operations of the T-54A. However, the increases would be minor relative to each county's overall emissions and would not result in significant impacts to air quality.	• No significant impacts to air quality would occur. The six counties where Navy and non-Navy airfield operations would occur are in attainment of the NAAQS and, thus, General Conformity does not apply. • Emissions would be slightly higher than those under Alternative 1, as annual flight operations would increase 20 percent above No Action Alternative levels, and there would be 33 additional personnel and their families commuting to NAS Corpus Christi and the surrounding areas. However, the increases would be minor relative to each county's overall emissions and would not result in significant impacts to air quality.

Key: BASH = Bird/Animal Aircraft Strike Hazard; CFR = Code of Federal Regulations; dBA = A-weighted decibels; DNL = day-night average sound level; EA = Environmental Assessment; GHG = greenhouse gas; $L_{eq(8hr)}$ = eight-hour equivalent sound level; MBTA = Migratory Bird Treaty Act; MOA = Memorandum of Agreement; NAAQS = National Ambient Air Quality Standards; NAS = Naval Air Station; Navy = U.S. Navy; NOLF = Naval Outlying Landing Field; ROI = region of influence; SHPO = State Historic Preservation Officer; USFWS = U.S. Fish and Wildlife Service.

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Multi-Engine Training System
Naval Air Station Corpus Christi, Texas

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Abbreviations and Acronyms

Acronym	*Definition*
%	Percent
+	Plus
<	Less than
$\mu g/m^3$	Microgram per cubic meter
AGL	Above ground level
AICUZ	Air Installations Compatible Use Zones
AIMD	Aircraft Intermediate Maintenance Department
ALI	Alice International Airport
APE	Area of Potential Effects
APES	Aircraft Protective Equipment Shelters
AQCR	Air Quality Control Region
BASH	Bird/Animal Aircraft Strike Hazard
BG	Block Group
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best management practice
BSVE	Base Support Vehicles and Equipment
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CRP	Corpus Christi International Airport
CT	Census Tract
dB	Decibels
dBA	A-weighted decibels
DNL	Day-night average sound level
DoD	Department of Defense
EA	Environmental Assessment
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
GBTS	Ground Based Training System
GHG	Greenhouse gas

Acronym	*Definition*
HAP	Hazardous air pollutant
HRL	Valley International Airport
ID	Identification
IPaC	Information for Planning and Consultation
$L_{eq(8hr)}$	Eight-hour equivalent sound level
L_{max}	Maximum A-weighted sound level
LT	Lieutenant
MBTA	Migratory Bird Treaty Act
METS	Multi-Engine Training System
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSAT	Mobile Source Air Toxic
NA	Not applicable
NAA	No Action Alternative
NAAQS	National Ambient Air Quality Standards
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Systems Command
Navy	U.S. Navy
NC	Core engine speed
NEPA	National Environmental Policy Act
NGP	NAS Corpus Christi
NGW	Naval Outlying Landing Field Cabaniss
NHPA	National Historic Preservation Act
No.	Number
NO_2	Nitrogen dioxide
NOLF	Naval Outlying Landing Field
NO_x	Nitrogen oxides
NRHP	National Register of Historic Places
O_3	Ozone
PIL	Port Isabel-Cameron County Airport
PKV	Calhoun County Airport
PM_{10}	Particulate matter less than or equal to 10 microns in diameter

Acronym	*Definition*
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns in diameter
pp.	Pages
ppb	Parts per billion
ppm	Parts per million
PSD	Prevention of Significant Deterioration
PSX	Palacios Municipal Airport
ROI	Region of influence
RPM	Revolutions per minute
SE	Southeast
SHPO	State Historic Preservation Officer
SO_2	Sulfur dioxide
SOP	Standard Operating Procedure
sq ft	Square feet
TBD	To be determined
TPWD	Texas Parks and Wildlife Department
tpy	Tons per year
TRAWING 4	Training Air Wing Four
U.S.C.	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VCT	Victoria Regional Airport
VOC	Volatile organic compound
Vol.	Volume
VT-	Navy Training Aircraft Squadron
WWTP	Wastewater treatment plant

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1 Purpose of and Need for the Proposed Action

1.1 Introduction

U.S. Fleet Forces Command on behalf of Chief of Naval Air Training, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), proposes to replace the over 40-year-old T-44C Pegasus aircraft used for the multi-engine maritime flight training program. This training program is operated by Commander, Training Air Wing Four (TRAWING 4), located at Naval Air Station (NAS) Corpus Christi. The 54 T-44C aircraft would be replaced by 58 new T-54A aircraft. The new aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. The Proposed Action also includes short- and long-term construction projects for Navy support facilities at NAS Corpus Christi.

The Proposed Action would take place at NAS Corpus Christi in Texas and its associated training locations at Naval Outlying Landing Field (NOLF) Cabaniss; at international, regional, and municipal airfields; and in the Federal Aviation Administration's National Airspace System throughout South Texas. To accommodate the new aircraft, short- and long-term construction projects of Navy support facilities would be required. These activities would include the following short-term projects:

- Installing fire detection and suppression systems and reconfiguring the interior to maintenance shops and office space in Hangar 42
- Reconfiguring the interior of Hangar 58 to office space and moving the maintenance equipment to Hangar 42
- Removing the T-44 Aircraft Protective Equipment Shelters, restriping, and installing T-54 Aircraft Protective Equipment Shelters
- Using a portion of Building 1218 for storage of parts
- Removing the T-44 Ground Based Training System (GBTS) and installing the Multi-Engine Training System (METS) GBTS

In the long-term, the following options would be considered:

- Option 1: Recapitalize Hangars 57 and 58.
- Option 2: Demolish Hangars 57 and 58 and then install two fabric hangars or construct one new larger hangar.

T-54A aircraft would be delivered between the years of 2024 and 2026, and proposed construction would begin in 2024 and continue through 2027.

The Navy has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA), as implemented by the Council on Environmental Quality (CEQ) regulations and Navy regulations.

1.2 Background

The T-44C aircraft is used to teach student military aviators multi-engine flying skills necessary to qualify for multi-engine and tilt-rotor military aviator designations. The T-44C aircraft is 43 years old, has antiquated avionics, is requiring more frequent repairs with limited availability of parts, and has become more expensive to operate and maintain. In 2015, the Navy conducted a capabilities-based assessment of naval aviation undergraduate training to analyze the Navy's capabilities and capacity to meet future undergraduate flight training requirements. The report identified several factors that would prevent the T-44C aircraft from being adequately available for the training of aviators to meet future mission requirements, including the need for more frequent maintenance and the limited availability of parts. In 2015, the Navy estimated the end-of-service date for the T-44C as 2025, based on current and projected usage rates. However, increased student throughput requirements, and the use of the T-44C fleet to compensate for retirement of other aircraft models, resulted in a need to move up the end-of-service date to 2023. Furthermore, operating older aircraft typically increases cost of repair and the length of maintenance time, removing the aircraft from service and decreasing the number of aircraft available for training (Navy, 2021). In December 2019, the Navy prepared a METS Decision Analysis Support study. The METS was determined to be the solution to address identified training and production gaps. It is a complete training system that includes the new aircraft and a GBTS comprised of flight training devices (simulators), part task trainers, and computer-based coursework and instruction, as well as the maintenance infrastructure support necessary for ensuring aircraft availability. The Navy chose to pursue an existing Federal Aviation Administration-certified commercial aircraft to address identified capability and capacity gaps. In 2021, the Navy issued a request for proposals to secure the best commercial aircraft solution. The Navy evaluated proposals received from vendors, including the ability to meet required performance specifications and cost. A contract was awarded in January 2023 for the T-54A, based on the Beechcraft King Air 260. To assess noise impacts, the Navy used a representative surrogate aircraft, the C-12 Huron, because the noise modeling software does not include reference noise level data for the King Air 260. The C-12 was selected because it is very similar to the King Air 260. Both aircraft are powered by two turboprop engines that each generate 850 shaft horsepower.

1.3 Location

1.3.1 NAS Corpus Christi

NAS Corpus Christi is located along the southeast coast of Texas, within the city limits of Corpus Christi in Nueces County. The air station is approximately 140 miles southeast of San Antonio, Texas, and 170 miles north of the U.S.-Mexico border (Figure 1-1). NAS Corpus Christi is approximately 2,340 acres in size. NAS Corpus Christi serves as one of five naval air stations in the Southeast Region that are used by the Navy to provide primary, intermediate, and advanced flight training to naval flight students. It is home to the Chief of Naval Air Training and TRAWING 4.

NAS Corpus Christi has supported pilot training and operations at its main airfield, Truax Field, as well as NOLF Cabaniss, since 1941. NAS Corpus Christi and its associated landing fields are aviation facilities with a mission to effectively support the current and future training of Navy, Marine Corps, Coast Guard, and international student pilots.

1.3.2 NOLF Cabaniss

NOLF Cabaniss is an outlying landing field managed by NAS Corpus Christi. It is located approximately 8.5 miles southwest of the station and is approximately 953 acres in size. NOLF Cabaniss is the primary NOLF used by T-44C aircraft and currently supports more than 50,000 T-44C aircraft training operations annually.

NOLF Cabaniss Sign (Undated)

1.3.3 Other Navy Outlying Landing Fields

The Navy also owns and operates NOLF Waldron and NOLF Goliad (Figure 1-1). NOLF Waldron is located in the Flour Bluff area of Corpus Christi on the Encinal Peninsula, approximately 4 miles southwest of the main airfield at NAS Corpus Christi. It is an 851-acre training airfield for touch-and-go practice for the T-6B aircraft. NOLF Goliad is in Goliad County, Texas, approximately 100 miles north-northwest of NAS Corpus Christi. The airfield is used by T-6B aircraft for touch-and-go and simulated emergency landings. T-44C aircraft do not train at either of these airfields.

1.3.4 International, Regional, and Publicly Owned Municipal Airfields

In addition to the Navy-owned airfields, pilot training and operations originating from NAS Corpus Christi use international, regional, and publicly owned municipal airfields in the region to support current and future student naval aviator training capacity requirements. These airfields provide diverse training experiences and operational flexibility, particularly when weather or other factors impact Navy-owned airfields. Figure 1-2 shows the location of these airfields that are currently used by T-44C aircraft and would continue to see regular flight operations by the new T-54A aircraft.

In addition to these airfields, multi-engine flight training by TRAWING 4 may include transient use of other airfields available for public use within South Texas.

1.4 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to replace T-44C aircraft that are over 40 years old and require upgrades to address existing training capability gaps. The T-44C fleet is nearing the end of its service life and has outdated avionics, limited availability of parts, and increased maintenance cost. The replacement of aircraft would provide advanced instrumentation for communication, navigation, and tracking aircraft health to facilitate maintenance planning and efficiency. The need for the Proposed Action is to enable continued aviator training in furtherance of the Navy's mandate to train and equip naval forces for the peacetime promotion of the national security interests and prosperity of the United States and for prompt and sustained combat incident to operations at sea.

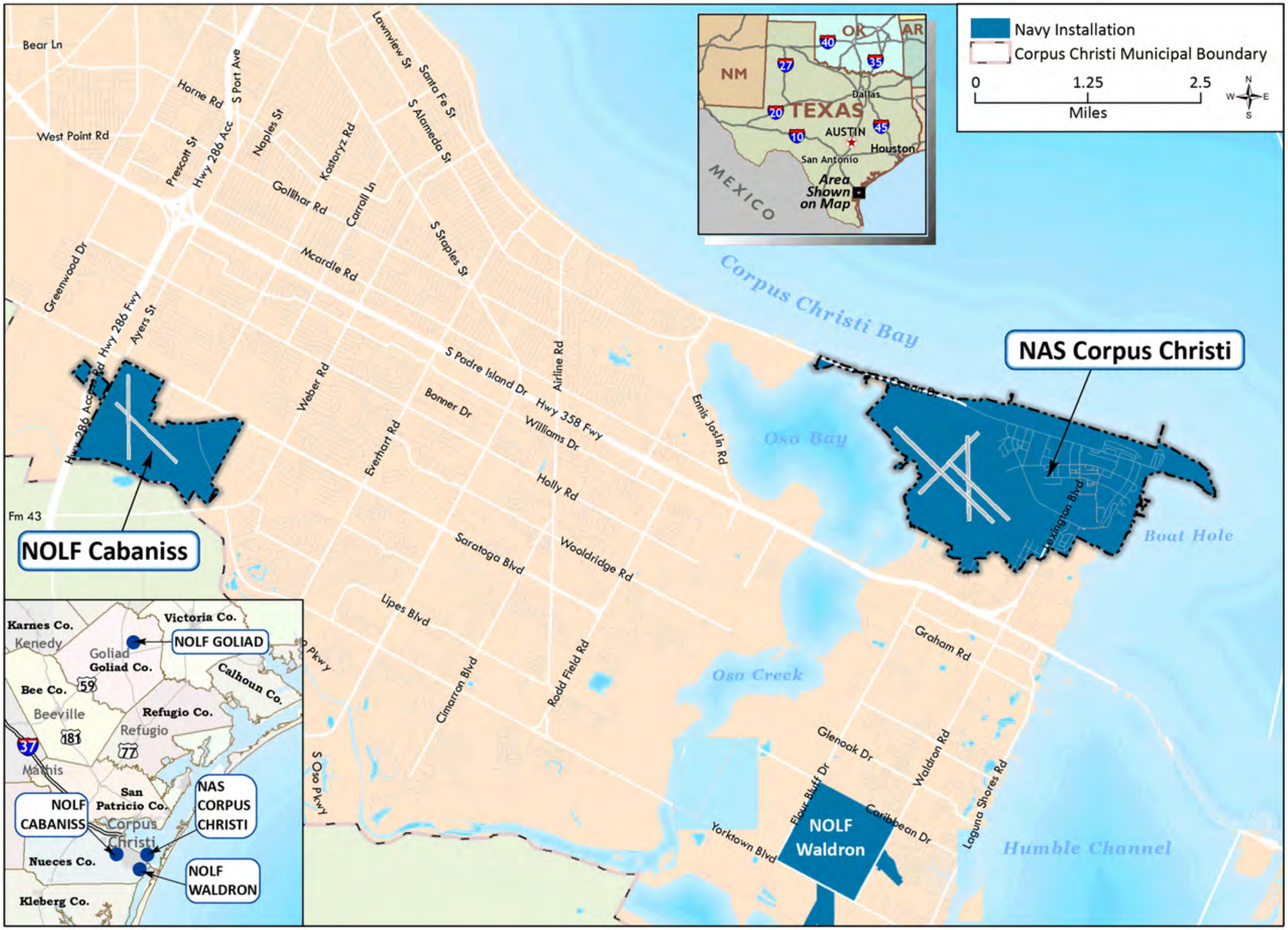

Figure 1-1 NAS Corpus Christi and NOLF Cabaniss Location Map

Figure 1-2 International, Regional, and Municipal Airfields Location Map

1.5 Scope of Environmental Analysis

This EA includes an analysis of potential environmental impacts associated with the action alternatives and the No Action Alternative. The environmental resource areas analyzed in this EA include noise, environmental justice, biological resources, cultural resources, and air quality. The region of influence for each resource analyzed is defined by how the Proposed Action interacts with or impacts the resource. For example, the region of influence for noise would include areas that may be impacted by airborne or construction noise.

10 U.S.C. section 8062: "The Navy shall be organized, trained, and equipped for the peacetime promotion of the national security interests and prosperity of the United States and for prompt and sustained combat incident to operations at sea. It is responsible for the preparation of naval forces necessary for the duties described in the preceding sentence except as otherwise assigned and, in accordance with integrated joint mobilization plans, for the expansion of the peacetime components of the Navy to meet the needs of war."

10 U.S.C. section 8063: "The Marine Corps shall be organized, trained, and equipped to provide fleet marine forces of combined arms, together with supporting air components, for service with the fleet in the seizure or defense of advanced naval bases and for the conduct of such land operations as may be essential to the prosecution of a naval campaign."

1.6 Key Documents

Key documents used in the development of this EA include the following:

- **Final EA for Providing OLF Capabilities to Support T-6 Undergraduate Pilot Training, Training Air Wing Four, NAS Corpus Christi, January 2018 (T-6 EA).** The Navy proposed to provide outlying landing field capacity and support infrastructure for T-6 aircraft primary flight training at TRAWING 4 in South Texas. Under the Preferred Alternative, T-6 primary flight training landings occur at the following four airfields: (1) NOLF Goliad, 85,000 landings; (2) NOLF Waldron, 125,000 landings; (3) Aransas County Airport, 20,000 landings; and (4) McCampbell-Porter Airport, 20,000 landings.
- **NAS Corpus Christi Noise Study, 2016.** The NAS Corpus Christi Noise Study was completed concurrently with the T-6 EA. The EA found short-term noise impacts associated with construction and long-term noise impacts with increased T-6 aircraft tempo at NOLF Waldron, Aransas County Airport, and McCampbell-Porter Airport. Minimal additional acreage outside the airfield boundaries would be exposed to 65 A-weighted decibel day-night average sound level or greater in comparison to existing conditions. Noise impacts from the Proposed Action and alternatives were determined to be not significant.
- **Air Installations Compatible Use Zones Study, 2020.** An Air Installations Compatible Use Zones Study was prepared for NAS Corpus Christi, NOLF Waldron, and NOLF Cabaniss. This study is part of the Navy's continuing participation in the local planning process. The report analyzes current airspace and aircraft operations at the station and auxiliary airfields, aircraft noise zones, aircraft safety, and the compatibility of surrounding land uses with aircraft operations. In addition, the Navy provides recommendations for promoting land use compatibility.
- **NAS Kingsville and NAS Corpus Christi Combined South Texas NASMOD Airspace and Airfield Operations Analysis Study, 2016.** The study was performed concurrently with the T-6 EA. The study modeled airfield and airspace operations at NAS Kingsville, NAS Corpus Christi, NOLF Waldron, NOLF

Cabaniss, NOLF Goliad, Naval Auxiliary Landing Field Orange Grove, and local training airspace. The National Airspace System Modernization (NASMOD) Program model was calibrated to fiscal year 2014 operations to validate current flight profiles and airfield procedures. Except for NOLF Waldron, aircraft experienced minimal congestion. All required training events were able to be completed. The airfields proved capable of supporting proposed T-6 pattern operations. No operating area appeared to hinder squadron training completion rates.

1.7 Relevant Laws and Regulations

The Navy has prepared this EA based upon federal and state laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- NEPA (42 United States Code [U.S.C.] section 4321 et seq.)
- CEQ regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations parts 1500–1508)
- Navy regulations for implementing NEPA (32 Code of Federal Regulations part 775)
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- National Historic Preservation Act (54 U.S.C. section 300101 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Migratory Bird Treaty Act (16 U.S.C. section 703 et seq.)
- Bald and Golden Eagle Protection Act (16 U.S.C. section 668 et seq.)
- Emergency Planning and Community Right-to-Know Act (42 U.S.C. section 11001 et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Toxic Substances Control Act (15 U.S.C. section 2601 et seq.)
- Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*
- EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*
- EO 13175, *Consultation and Coordination with Indian Tribal Governments*
- EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All*
- Any additional, relevant statutes or governing directives

A description of the Proposed Action's consistency with these laws, policies, and regulations, as well as the names of regulatory agencies responsible for their implementation, is presented in Chapter 5, *Other Considerations Required by NEPA* (Table 5-1).

1.8 Public and Agency Participation and Intergovernmental Coordination

The CEQ regulations require that federal agencies involve the public in preparing and implementing NEPA procedures. The Navy prepared the Draft EA to inform the public of the Proposed Action and to allow the opportunity for public review and comment.

The Navy published a Notice of Availability of the Draft EA for three days in the *Corpus Christi Caller Times* on the dates of June 16, 18, and 19, 2023, and once in the weekly *The Island Moon Newspaper* on June 16, 2023. The notice described the Proposed Action, solicited public comments on the Draft EA, provided dates of the public comment period (June 16, 2023, through July 17, 2023), and announced that a copy of the EA would be available for review on the website:

www.navy.nepa.mil/mets/

The Draft EA was also made available in the following local libraries:

Library	*Address*
Nueces County Law Library	901 Leopard Street Corpus Christi, Texas 78401
Corpus Christi Public Library – Owen R. Hopkins Public Library	3202 McKinzie Road Corpus Christi, Texas 78410
Mary and Jeff Bell Library Texas A&M University Library	6300 Ocean Drive Corpus Christi, Texas 78412
Janet F. Harte Public Library	2629 Waldron Road Corpus Christi, Texas 78418
Dr. Clotilde P. Garcia Library	5930 Brockhampton Street Corpus Christi, Texas 78414
Anita & W.T. Neyland Public Library	1230 Carmel Parkway Corpus Christi, Texas 78411
Harlingen Public Library (Cameron County)	410 76 Drive Harlingen, Texas 78550
Victoria Public Library (Victoria County)	302 North Main Street Victoria, Texas 77901
Palacios Library Inc. (Matagorda County)	326 Main Street Palacios, Texas 77465
Alicia Salinas Public Library (Jim Wells County Public Library)	401 East 3rd Street Alice, Texas 78332

No comments were received during the comment period for the Draft EA. The Noise Study is provided in Appendix A, *Noise Methodology and Calculations*. The Navy has conferred with the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department regarding the Proposed Action (Appendix B, *Special Status Species Documentation*). The U.S. Fish and Wildlife Service concurred with the Navy's findings in a letter dated August 2, 2023. The agency recommended measures to prevent or minimize potential adverse effects to the northern aplomado falcon and whooping crane, and these measures were added to this Final EA. The Navy also consulted with the Texas Historical Commission (State Historic Preservation Office) (Appendix C, *National Historic Preservation Act Section 106 Documentation*) and Tribal Historic Preservation Officer regarding this Proposed Action (Appendix D, *Tribal Government-to-Government Documentation*). A signed Memorandum of Agreement dated August 21, 2023 is provided in Appendix C, *National Historic Preservation Act Section 106 Documentation*. A Coastal Consistency Determination was prepared and submitted to the Texas General Land Office, which manages the Texas Coastal Management Program (Appendix E, *Coastal Consistency Determination*). The Texas General Land Office concurred on July 28, 2023, that the project will likely not have adverse impacts on coastal natural resource areas in the coastal zone and is consistent with the goals and policies of the Texas Coastal Management Program. However, the agency recommended that siting and construction avoid and minimize impacts to coastal natural resource areas. The Clean Air Act air quality calculations are provided in Appendix F, *Air Quality Methodology and Calculations*. Newspaper notices are provided in Appendix G, *Newspaper Notices*.

2 Proposed Action and Alternatives

2.1 Proposed Action

U.S. Fleet Forces Command on behalf of Chief of Naval Air Training, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), proposes to replace aircraft used for the multi-engine maritime flight training program. This training program is operated by Commander, Training Air Wing Four (TRAWING 4), located at Naval Air Station (NAS) Corpus Christi. The Proposed Action includes replacement of 54 T-44C aircraft with 58 T-54A aircraft. The aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. The Proposed Action also includes short- and long-term construction projects for Navy support facilities at NAS Corpus Christi.

The Proposed Action would take place at NAS Corpus Christi in Texas and its associated training locations at Naval Outlying Landing Field (NOLF) Cabaniss; at international, regional, and municipal airfields; and in the Federal Aviation Administration's (FAA's) National Airspace System throughout South Texas. To accommodate the new aircraft, short- and long-term construction projects for Navy support facilities at NAS Corpus Christi would be required. These activities would include the following short-term projects (Figure 2-1):

- Installing fire detection and suppression systems and reconfiguring the interior to maintenance shops and office space in Hangar 42
- Reconfiguring the interior of Hangar 58 to office space and moving the maintenance equipment to Hangar 42
- Removing the T-44 Aircraft Protective Equipment Shelters (APES), restriping, and installing T-54 APES
- Using a portion of Building 1218 for storage of parts
- Removing the T-44 Ground Based Training System (GBTS) and installing the Multi-Engine Training System (METS) GBTS

In the long-term, the following options would be considered:

- Option 1: Recapitalize Hangars 57 and 58.
- Option 2: Demolish Hangars 57 and 58 and then install two fabric hangars or construct one new larger hangar.

T-54A aircraft would arrive between the years 2024 and 2026, and proposed construction would begin in 2024 and continue through 2027.

2.1.1 Aircraft Replacement

The Proposed Action includes replacement of 54 T-44C aircraft with 58 T-54A aircraft, an increase in proposed aircraft training operations, and short- and long-term construction projects for Navy support facilities at NAS Corpus Christi.

The T-44C Pegasus aircraft is a twin-engine, pressurized, fixed-wing monoplane. The aircraft is currently used for advanced turboprop and intermediate carrier-based turboprop aircraft training. The T-44C is powered by two 550 shaft horsepower PT6A-34B turboprop engines (Navy, ND).

T-44C Pegasus

Table 2-1 compares the current T-44C aircraft with the specifications of the new aircraft. The T-54A aircraft (based on the commercial Beechcraft King Air 260) would provide advanced instrument and asymmetric engine handling training to student naval aviators selected for multi-engine fleet communities. The T-54A would have the latest avionics and navigational updates, such as virtual reality and augmented reality devices, to ensure pilots can face any real-world challenges. The T-54A is powered by two 850 shaft horsepower PT6A-52 turboprop engines with four composite blades.

T-54A (King Air 260)

Table 2-1 Comparison of Aircraft Specifications

Aircraft Specifications	*T-44C*	*T-54A*
Length	35.5 feet	43.8 feet
Height	14.25 feet	14.83 feet
Wingspan	50.25 feet	57.91 feet
Weight (empty)	6,246 pounds	8,830 pounds
Weight (maximum takeoff)	9,650 pounds	12,500 pounds
Ceiling	31,300 feet	35,000 feet
Range	1,300 nautical miles	1,720 nautical miles
Maximum Airspeed	245 knots	310 knots
Crew	3	3

Sources: (Navy, 2021; Navy, ND; Textron, 2023)

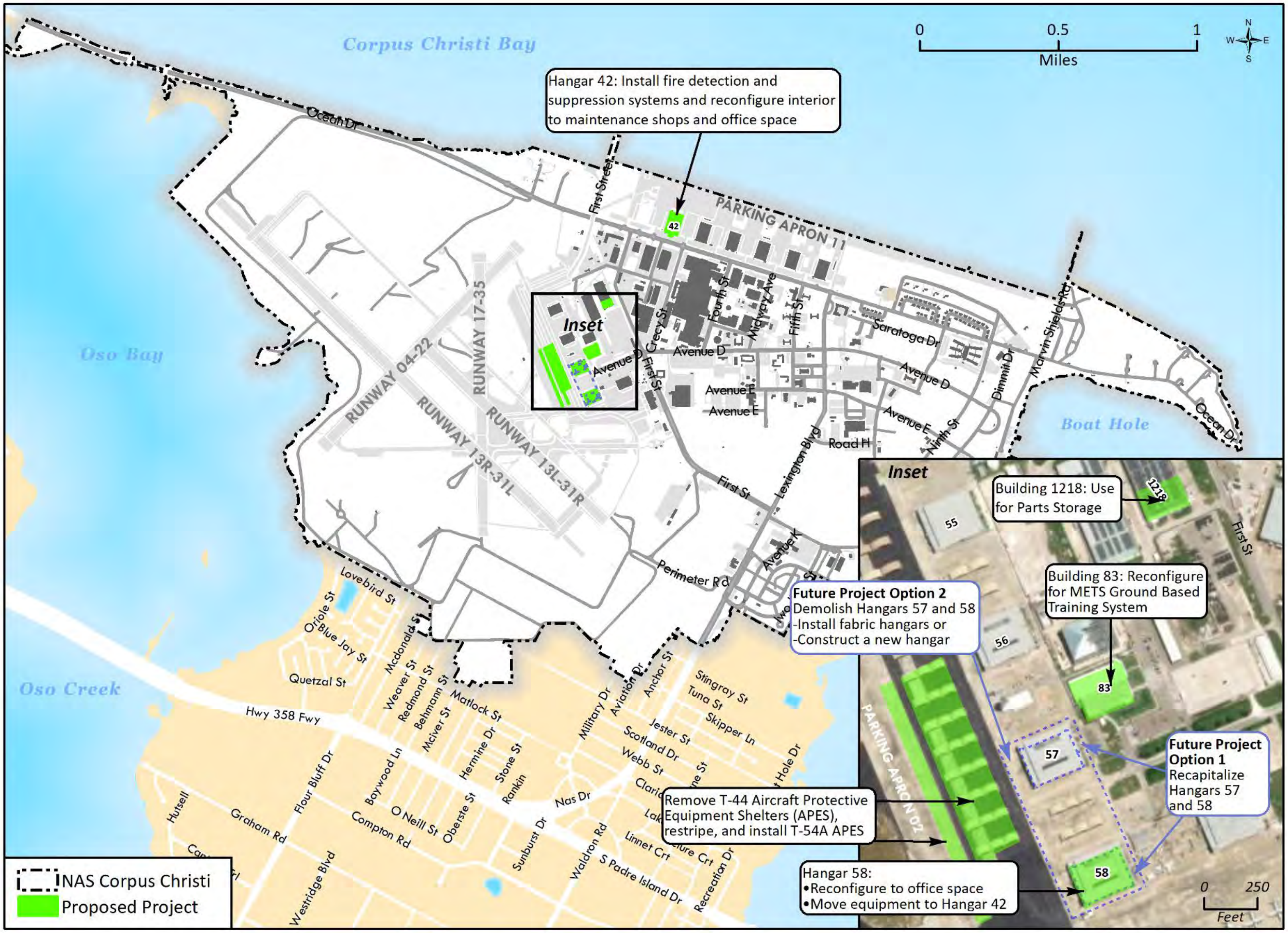

Figure 2-1 Location of Short- and Long-Term Construction Projects at Corpus Christi

2.1.2 Personnel

Under Alternative 1, there would be no increase in personnel levels necessary to support the T-54A aircraft. Current staffing levels would be able to manage the 10 percent increase in operations that would be similar to surge conditions that arise due to weather and/or maintenance delays followed by an increase in operations. Only Alternative 2 would increase the number of personnel.

Table 2-2 shows the proposed change in personnel under the No Action Alternative and Alternatives 1 and 2.

Table 2-2 Comparison of Navy T-44C and T-54A Aircraft and Personnel

Aircraft and Personnel Numbers	*Baseline and No Action Alternative (T-44C)*	*Alternative 1 (T-54A)*	*Alternative 2 (T-54A)*
Aircraft			
Number of Aircraft	54	58	58
Personnel			
Students	110	110	132
Instructors	55	55	66
Maintenance	175 (Contractor)	175 (Contractor)	175 (Contractor)
Total Personnel	340	340	373

2.1.3 Aircraft Training and Operations

The T-44C aircraft is used by TRAWING 4 for pilot flight training. Students practice navigation; visual and instrument flight rules; communications with various airspace controllers; operations in the different classes of FAA-designated airspace; and landing, obtaining services, and launching from a variety of airfields that range from international airports to small municipal fields.

Airfield operations include takeoffs, landings, touch-and-go operations, low approaches, and simulated emergency landings. An approach and departure from an airfield are considered two airfield operations that occur with one landing. A practice approach can end in a full-stop landing, touch-and-go, or low approach (no landing). Landing requirements include the following:

- Full-stop landing is a typical landing, ending with the aircraft stopping and exiting the runway.
- Touch-and-go operations are when the student pilot lands (touches down) and then takes off again without coming to a stop; the “touch-and-go” is considered two operations but a single landing. As many as five or six aircraft may enter the landing pattern at an airfield, sequentially performing touch-and-go operations.
- Low approach is a practice approach without landing followed by a go-around maneuver.
- Simulated emergency landings are performed while in the landing pattern at surrounding airfields. During a simulated landing, the student pilot practices landing the aircraft under a simulated emergency condition, under the instruction and direct supervision of a qualified instructor pilot.

Table 2-3 shows the annual number of operations of the T-44C aircraft and projected operations under the alternatives at NAS Corpus Christi and NOLF Cabaniss.

Table 2-3 Current and Projected Use of Navy Airfields

Name	*FAA Identifier*	*No Action Alternative T-44C Aircraft Operations*	*Alternative 1 Projected T-54A Operations*	*Alternative 2 Projected T-54A Operations*
NAS Corpus Christi	NGP	32,760	36,000	39,300
NOLF Cabaniss	NGW	56,012	61,600	67,200
TOTAL		88,772	97,600	106,500

Key: FAA = Federal Aviation Administration; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.
Note:
1. Alternative 1 includes a 10 percent increase in operations, while Alternative 2 includes a 20 percent increase in operations.

Table 2-4 shows the primary international, regional, and publicly owned municipal airfields and projected number of operations for both the T-44C and T-54A aircraft. Approximately 96,000 T-44C operations are conducted at non-Navy facilities under baseline conditions. Figure 1-2 shows the location of these airfields.

Table 2-4 Current and Projected Use of Non-Navy Airfields

Name	*FAA Identifier*	*No Action Alternative T-44C Aircraft Operations[1]*	*Alternative 1 Projected T-54A Operations[1]*	*Alternative 2 Projected T-54A Operations[1]*
Alice International Airport	ALI	28,200	31,000	33,800
Calhoun County Airport	PKV	3,600	3,900	4,300
Corpus Christi International Airport	CRP	20,800	22,900	25,000
Palacios Municipal Airport	PSX	5,200	5,700	6,200
Port Isabel-Cameron County Airport	PIL	11,000	12,000	13,100
Valley International Airport	HRL	14,800	16,300	17,800
Victoria Regional Airport	VCT	4,900	5,400	5,900
Other[2]		7,400	8,200	8,900
TOTAL		95,900	105,400	115,000

Key: FAA = Federal Aviation Administration; METS = Multi-Engine Training System.
Notes:
1. Numbers are rounded to the nearest hundred. Alternative 1 includes a 10 percent increase in operations, while Alternative 2 includes a 20 percent increase in operations.
2. Other refers to several airports located in the region, each with relatively small numbers of METS operations.

2.1.4 Construction Projects

Figure 2-1 shows the locations, and Table 2-5 provides the dates of proposed short-and long-term construction projects for Navy support facilities at NAS Corpus Christi. More detail of the projects along the flightline are shown in Figure 2-2.

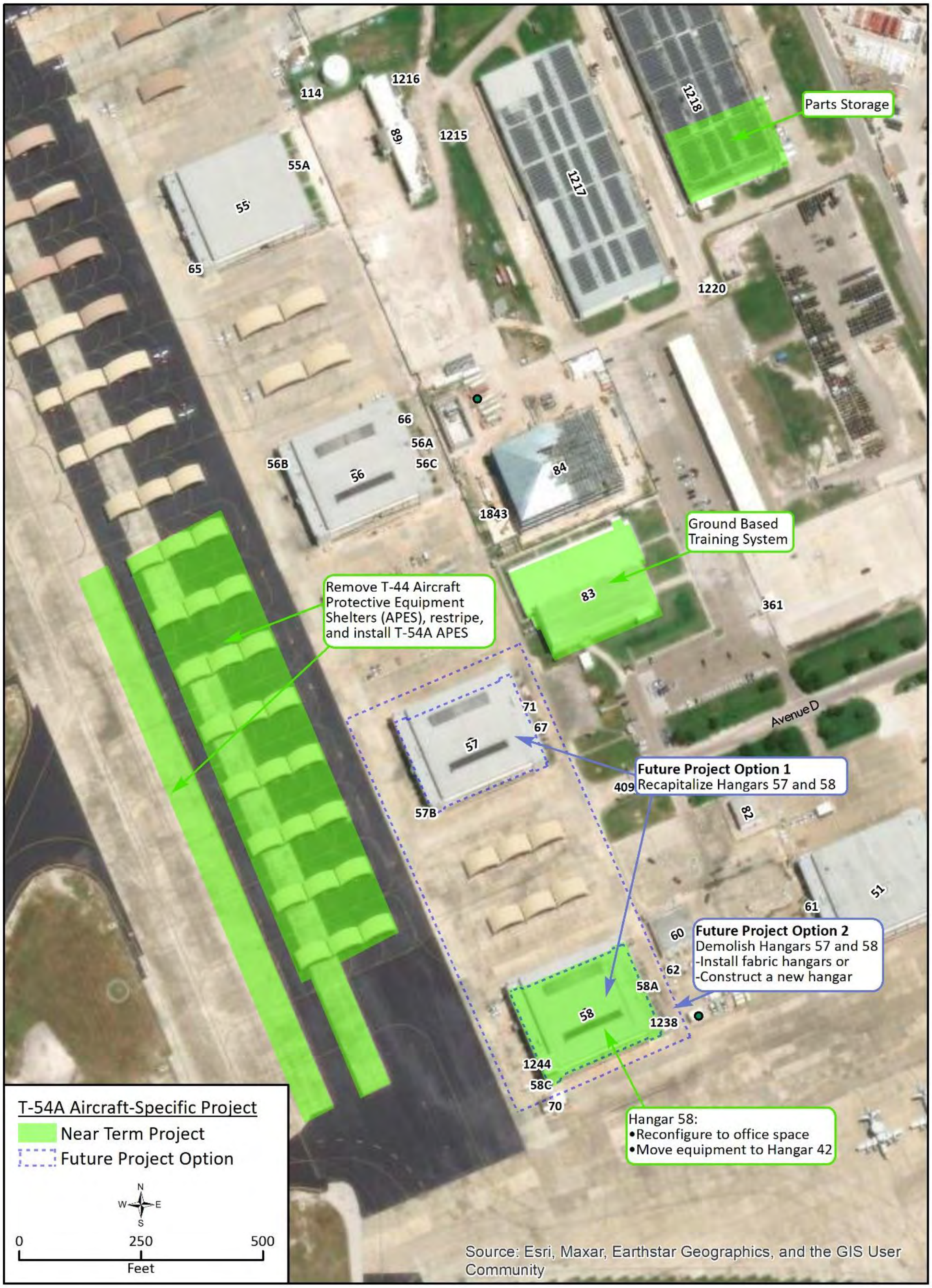

Figure 2-2 Flightline Short- and Long-Term Construction Projects

Table 2-5 Dates of Proposed Short- and Long-Term Construction Projects

Proposed Project	***Year***	***Description***
Short-Term Projects		
Hangar 42	2024	• Install fire detection and suppression system and reconfigure interior to maintenance shops and office space.
Hangar 58	2024	• Reconfigure interior to office space. • Move equipment from Hangar 58 to Hangar 42.
Aircraft Protective Equipment Shelter (APES)	2024	• Remove T-44 APES, restripe, and install T-54 APES.
Building 1218	2024	• Use existing building for storage of parts.
Building 83	2024	• Remove existing T-44 Ground Based Training System (GBTS) and replace with new METS GBTS.
Long-Term Project Options		
Hangars 57 and 58	2027	• Option 1: Recapitalize Hangar 57 and Hangar 58.[1] • Option 2: Demolish Hangars 57 and 58 and then install two fabric hangars or construct one new larger hangar.

Key: APES = Aircraft Protective Equipment Shelter; GBTS = Ground Based Training System; METS = Multi-Engine Training System.

Note:

1. The Navy defines recapitalization as major renovation or reconstruction activities (including facility replacements) needed to keep existing facilities modern and relevant in an environment of changing standards and missions (CNIC, 2023).

The following short-term projects would be implemented:

- **Hangar 42.** This 87,000-square foot hangar is currently vacant and would be reconfigured to house the maintenance functions currently in Hangar 58. Hangar 42 would require installation of fire detection and suppression systems to comply with the latest published National Fire Protection Association 101, Life Safety Code (safe personnel egress); Unified Facilities Criteria 4-211-01, Aircraft Maintenance Hangars (hazardous locations); and Unified Facilities Criteria 3-00-01, Fire Protection Engineering for Facilities. In addition, the interior space would be converted to accommodate maintenance offices and additional shop support spaces. Broken windows and exterior personnel doors would be replaced. In addition, the parking apron would be re-striped and aircraft tie-downs would be installed. The existing exterior gate at the crossing of Ocean Drive and Taxiway Sierra would be repaired. This serves as a temporary location to accommodate the transitioning new aircraft. A larger hangar would be needed once all the new aircraft arrive.
- **Hangar 58.** The maintenance equipment in Hangar 58 would be moved to Hangar 42. Hangar 58 would require interior modifications including conversion of maintenance space to shop space. All work would be interior.
- **APES.** The existing APES for the T-44C would be unbolted and removed and new APES for the T-54A would be installed. The existing striping would be removed, and new striping would be added. All work would be on the existing parking apron.
- **Building 1218.** The parts storage would be located at the south end of existing Building 1218. No new construction or interior renovation would be required.
- **Building 83.** The T-44 aircraft have GBTS equipment located in Building 83. This equipment would be removed and replaced with METS GBTS. Only internal renovations would be required.

There are two options for long-term projects that could include recapitalizing or demolishing Hangars 57 and 58. Ancillary facilities would be demolished under either option and are shown in Table 2-6.

- **Option 1: Recapitalize Hangars 57 and 58.** Recapitalizing the hangars would involve stripping the hangars down to the concrete foundation and steel frames. The frames would be repaired as needed and the exterior envelope including roof, siding, windows, and doors would be rebuilt. All new building systems, components, and fixtures would be installed. The overhead space would be configured for aircraft maintenance and shops would be provided. This would extend the hangar service life for 65 years.
- **Option 2: Demolish Hangars 57 and 58 and then Install Two Fabric Hangars or Construct One New Larger Hangar.** This project includes demolition of Hangars 57 and 58 and either installation of fabric hangars or construction of a new maintenance hangar with a maximum footprint of 94,000 square feet.


Source: (EMR, Inc., 2021)

Example Fabric Hangar

The Department of Defense (DoD) Instruction 2000.16, *DoD Antiterrorism Standards*, requires all DoD Components to adopt and adhere to common criteria and minimum construction standards to mitigate antiterrorism vulnerabilities and terrorist threats. Antiterrorism standards would be incorporated into the design of the new facilities, where applicable.

Table 2-6 Facilities to be Demolished

Facility Number	*Name*	*Year Built*	*Area (sq ft)*
57A	Hazardous/Flammable Storehouse	1941	108
57B	Storage – Hangar 57	1942	108
57C	Anchor Display at Hangar 57	1995	2
58A	Hazardous/Flammable Storehouse	1941	196
58C	Electrical Switching Building at Hangar 58	2013	240
60	Ground Electronics Maintenance Division Shop	1984	6,500
62	General Building at Building 60	1984	432
67	Compressor Building at Hangar 57	1995	144
70	Air Operations Fight Support	1994	588
71	1st LT Office at Hangar 57	1993	480
1238	General Building at Hangar 58	1957	384
1244	Operational Facility at Hangar 58	1953	208
Total			9,390

Key: LT = Lieutenant; sq ft = square feet.

Construction projects would incorporate Leadership in Energy and Environmental Design, commonly referred to as "LEED," and sustainable development concepts to achieve optimum resource efficiency, sustainability, and energy conservation.

2.2 Screening Factors

The National Environmental Policy Act's (NEPA's) implementing regulations provide guidance on the consideration of alternatives to a federally proposed action and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable and to meet the purpose and need require detailed analysis.

Potential alternatives that meet the purpose and need were evaluated against the following screening factors:

- **Meet overall training requirements.** TRAWING 4 has been training the world's premier military pilots for nearly 50 years. During Pre-Flight Indoctrination, student aviators learn the basics of flight, with classes on aerodynamics, weather, air navigation, flight rules, and aircraft engines and systems. Pre-Flight Indoctrination is followed by the Primary phase, the first phase of flight training that all Navy, Marine Corps, Coast Guard, and international students undergo. Primary students fly the T-6B aircraft. Student aviators complete different Intermediate and Advanced phase syllabi and operate different aircraft platforms based on their specific training pipelines. Students within the Maritime and Advanced Tilt-Rotor pipelines complete Advanced multi-engine training in the T-44C twin-engine aircraft (to be replaced with the T-54A aircraft). Upon graduation from the Advanced phase, students are designated as naval aviators and are assigned to Fleet Replacement Squadrons for training on their specific fleet aircraft type.
- **Maintain uninterrupted aviator production.** The requirement to maintain T-44C aircraft training while ramping up METS training would cause resourcing challenges with facilities and staffing. The Navy addresses these challenges early in the planning process to prevent disruptions in training and production during the execution phase. The T-44C is currently capable of meeting pilot production requirements but has minimal excess capacity and is nearing its end-of-service life, at which time it will be retired from use. The METS transition and subsequent T-44C retirement need to be planned and executed appropriately to not create a capacity gap.
- **Allow for continued operation and maintenance of T-44C and new aircraft until conversion is complete.** New aircraft would be transitioned over time. TRAWING 4 needs to be able to operate and maintain both aircraft until the transition is complete.
- **Maximize use of existing airfields that are currently used for the student pilot training program.** The current balance of operations at each airfield has developed over time and through operational experience to properly reflect the capabilities necessary to implement the full training curriculum and production requirements.
- **Maintain safety and separation parameters for student pilot training.** Although different types of aircraft may be based at the same facilities, there are a limited number of aircraft that can operate at a time at any NOLF or other international, regional, and publicly owned municipal airfield for safety reasons.
- **Maximize use of existing infrastructure for aircraft parking and maintenance.** Use of existing infrastructure minimizes the duration of the construction schedule, potential environmental impacts, and cost. The Navy's goal is to protect resources present in areas where it trains, while still providing the realistic experiences necessary for the readiness and safety of its Sailors.

2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors, two action alternatives were identified as meeting the purpose and need for the Proposed Action. The No Action Alternative and two action alternatives were analyzed in this Environmental Assessment (EA).

2.3.1 No Action Alternative

Under the No Action Alternative, the T-44C aircraft would not be replaced. The over 40-year-old T-44C aircraft would continue to operate despite capacity and capability gaps. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, as required by NEPA, the No Action Alternative is carried forward for analysis in this EA. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action and will serve to establish a comparative baseline of environmental impacts for analysis.

2.3.2 Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)

Alternative 1 includes replacing 54 T-44C aircraft with 58 T-54A aircraft; an increase in operations; and implementation of short- and long-term projects to provide Navy support facilities. Proposed short- and long-term construction projects are described in Section 2.1.4, *Construction Projects*. Table 2-3 shows the change in operations with an increase of approximately 10 percent over the No Action Alternative, while Table 2-2 shows that the personnel numbers would remain the same as current conditions. Current staffing levels would be able to manage the 10 percent increase in operations, which would be similar to surge conditions that arise due to weather and/or maintenance delays followed by an increase in operations. This alternative reflects the forecasted increase in student pilot training necessary to support Navy, Marine Corps, and U.S. Coast Guard aviation requirements in the foreseeable future.

2.3.3 Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations

Alternative 2 includes the same aircraft replacement and implementation of short- and long-term projects to provide Navy support facilities as Alternative 1 but with an increase in aircraft operations of approximately 20 percent over the No Action Alternative. With this increase in flight operations, the Navy estimates that there would be an increase of 33 additional personnel and their families at NAS Corpus Christi.

Alternative 2 assesses a level of operations based on increases in demand for ready naval forces in response to national security requirements. This alternative reflects the maximum forecasted student pilot training necessary to support Navy, Marine Corps, and U.S. Coast Guard aviation requirements in the foreseeable future.

2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

The following alternatives were considered but not carried forward for detailed analysis in this EA, as they did not meet the purpose and need for the project and satisfy the reasonable alternative screening factors presented in Section 2.2, *Screening Factors*.

2.4.1 Relocate the Pilot Training Mission from NAS Corpus Christi to Another Training Station

The Navy considered an alternative that would site the new aircraft and the METS pilot training mission at another station that already has a pilot training mission. These training facilities include NAS Kingsville, Texas; NAS Meridian, Mississippi; and NAS Whiting Field and NAS Pensacola, Florida. Moving METS squadrons to another Naval Air Training Command station would require new construction to build METS capacity. Chief of Naval Air Training locations are specifically designed to support student naval aviator training requirements. For example, these facilities provide necessary classroom space, flight simulators, briefing rooms, aircraft hangars, and maintenance spaces. In addition, the stations at which student pilots train are located near NOLFs that are dedicated for student aviator use. The requirement to maintain T-44C aircraft training while relocating students and facilities to another station would disrupt aviator training and production. Further, such a move would result in creating excess capacity at NAS Corpus Christi and would not be an efficient use of resources.

Conducting METS training at alternative sites besides NAS Corpus Christi would prohibit maximum use of existing airfields that are currently used for the student pilot training system. The current operational balance is based on years of experience in pilot training and serves to support the capabilities necessary for the full training curriculum. The Navy conducts capabilities-based assessments of naval aviation undergraduate training to analyze the Navy's capabilities and capacity to meet future undergraduate flight training requirements. This alternative, therefore, does not constitute a reasonable alternative and is not carried forward in this document for detailed analysis.

2.4.2 Change Percent of Flight Training Operations at Various NOLFs and International, Regional, and Publicly Owned Municipal Airfields

This alternative considers redistribution of training flight operations between the NOLFs and international, regional, and publicly owned municipal airfields. Consideration would be given to use of less populated airfields to the largest extent operationally feasible. This alternative was considered but dismissed from further consideration because of safety precautions and need for training diversity.

Although different types of aircraft may be based at the same facilities, there are a limited number of aircraft that can operate at a time at any NOLF or other non-Navy airfields for safety reasons. For the multi-engine pipeline, TRAWING 4 has allocated NOLF Cabaniss for T-44C landing practice. An important factor in reserving NOLF Cabaniss for T-44C operations, and the more advanced flight students, is the field's proximity to Corpus Christi International Airport. The FAA-designated airspace in this area, and the elevated level of air traffic, does not support the type and level of simulated emergency landing procedures, solo landing operations, and pattern work that is required for Primary students operating the T-6B aircraft. An additional safeguard for T-44C students operating at NOLF Cabaniss is the presence of a Navy control tower to provide traffic separation safety measures.

The multi-engine training syllabus specifically requires exposure of students to operations in a diversity of airspaces and varying airfield conditions to replicate conditions they will encounter while deployed. Students practice navigation; visual and instrument flight rules; communications with various airspace controllers; operations in the different classes of FAA-designated airspace; and landing, obtaining services, and launching from a variety of airfields that range from international to regional and small municipal airfields. In order to efficiently execute daily flight requirements, instructors need the operational flexibility to fly throughout South Texas to avoid congestion and temporary airspace restrictions due to weather (e.g., rerouting of commercial aircraft) and other events (e.g., SpaceX launches). Restricting or otherwise limiting operations to NOLFs would not properly prepare multi-engine students for follow-on Fleet Replacement Squadron assignment. As a result, this alternative was eliminated from further consideration.

2.4.2.1 Replace Aircraft with No Increase in Operations

Under this alternative, the 54 T-44C aircraft would be replaced with 58 T-54A aircraft, but operations would not increase. The implementation of short- and long-term projects to provide Navy support facilities as described under Alternatives 1 or 2 would still occur. This alternative would meet current flight training requirements but would not meet the potential level of student pilot training necessary to support forecasted Navy, Marine Corps, and U.S. Coast Guard aviation requirements in the foreseeable future. As a result, this alternative was eliminated from further consideration.

2.4.3 Facility Alternatives

Several facility construction alternatives were evaluated for NAS Corpus Christi considering selection factors. These options are presented in Table 2-7 along with the factor or factors that were not met.

Table 2-7 Facility Construction Options

Facility Options	*Description*	*Reason Dismissed*	*Screening Factor Not Met*
Renovate and reconfigure the existing four hangars.	Renovate and reconfigure National Register of Historic Places-eligible structures instead of demolishing. No recapitalization or demolition would occur.	Each hangar is inadequate in physical condition. The maintenance functions have changed since the hangars were built in 1941.	The hangars are in poor condition and would adversely affect aircraft maintenance schedules.
Demolish hangars and construct one new larger hangar.	Demolish Hangars 55 and 56 and construct a new large hangar to support METS.	This alternative is feasible but is unfunded. Selection of the T-54A aircraft does not need as much maintenance space as previously estimated. This option would result in overbuilt maintenance space.	This construction project would not minimize the duration of the construction schedule, potential environmental impacts, and cost.
Construct two new separate hangars.	Construct two new hangars, one for METS and one for other aircraft. Proposed layout would require one hangar to be larger than the other.	A METS hangar would be constructed to the north of Hangar 58. The new METS Hangar in this location would not allow the 90-foot aircraft movement lanes needed between the hangar, Air Traffic Control, and Hangar 58. The other aircraft hangar would be located north of the METS Hangar; it would be a larger size and have increased depth to accommodate other aircraft. Demolition of Hangars 55 and 56 would be required since the flightline has limited space and environmental and flight safety constraints.	This construction project would not minimize the duration of the construction schedule, potential environmental impacts, and cost. This option is not funded and would not allow for continued operation and maintenance of T-44C and new aircraft until conversion was complete.

Key: METS = Multi-Engine Training System.

2.5 Best Management Practices Included in Proposed Action

This section presents an overview of the best management practices (BMPs) that are incorporated into the Proposed Action in this document. BMPs are existing policies, practices, and measures that the Navy would adopt to reduce the environmental impacts of designated activities, functions, or processes. Although BMPs mitigate potential impacts by avoiding, minimizing, or reducing/eliminating impacts, BMPs are distinguished from potential mitigation measures because BMPs are (1) existing requirements for the Proposed Action; (2) ongoing, regularly occurring practices; or (3) not unique to this Proposed Action. In other words, the BMPs identified in this document are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the NEPA environmental review process for the Proposed Action. Table 2-8 includes the list of BMPs that would be incorporated as part of the Proposed Action.

Table 2-8 Best Management Practices

BMP	*Description*	*Impacts Reduced/Avoided*
Air Installations Compatible Use Zones (AICUZ)	AICUZ studies balance the need for military aircraft operations and community concerns over aircraft noise and accident potential.	Protects the public's health, safety, and welfare and prevents encroachment from degrading the operational capability of the installation.
Bird/Animal Aircraft Strike Hazard (BASH) Plan Implementation	BASH Plan implementation minimizes aircraft risks from potentially hazardous wildlife strikes. The program establishes methods to decrease the attractiveness of the airfield and nearby areas to birds and animals and provides guidelines for dispersing birds and animals when they compromise the safety of operations on the airfield.	Reduces impacts to biological resources and airfield safety related to aircraft strikes.
Airfield Operating Procedures	BMP consists of management of procedures for aircraft approach and departure patterns.	Reduces potential for impacts to safety.
Encroachment Partnering	Programs such as Readiness and Environmental Protection Integration and Joint Land Use Studies protect these military missions by helping remove or avoid land use conflicts near installations and addressing regulatory restrictions that inhibit military activities.	Protects the public's health, safety, and welfare and prevents encroachment from degrading the operational capability of the installation.
Community Outreach	BMP opens lines of communication with the surrounding community and stakeholders through noise complaint hotlines, public meetings, and newspaper advertisements.	Prevents encroachment from degrading the operational capability of the installation.
Hazardous Materials and Wastes	Hangars proposed for recapitalization or demolition are assumed to contain asbestos, lead-based paint, and polychlorinated biphenyls. Removal and abatement would be handled by a licensed contractor.	Ensures proper handling, transport, and disposal of toxic substances.
	Personnel and contractors must follow BMPs and standard operating procedures outlined in the NAS Corpus Christi Hazardous Waste Management Plan to include handling, removal, disposal, or storage of hazardous materials and wastes.	Protects health and safety.

Table 2-8 Best Management Practices

BMP	*Description*	*Impacts Reduced/Avoided*
Spill Prevention	Contractors would comply with the NAS Corpus Christi Spill Prevention, Control, and Countermeasure Plan.	Ensures any spills are contained and cleaned up in accordance with regulatory requirements.
Protection of Stormwater Features During Construction	Examples include use of perimeter controls, site stabilization, storm outlet protection, dust control, check dams, mulching, and seeding.	Reduces sediment-laden stormwater runoff during construction.
Fugitive Dust Control	Examples include staging construction/demolition site to minimize exposed areas, watering soil for dust suppression, covering exposed dirt or storage piles, and rinsing vehicles before leaving the construction site.	Controls particulate matter emissions during construction.
Low Impact Development	The term Low Impact Development refers to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration, or use of stormwater in order to protect water quality and associated aquatic habitat.	Provides flood protection, cleaner air, and cleaner water. Low Impact Development practices aim to preserve, restore, and create green space using soils, vegetation, and rainwater harvest techniques.

Key: AICUZ = Air Installations Compatible Use Zones; BASH = Bird/Animal Aircraft Strike Hazard; BMP = best management practice; NAS = Naval Air Station.

3 Affected Environment and Environmental Consequences

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing any of the alternatives and an analysis of the potential direct and indirect effects of each alternative.

All potentially relevant environmental resource areas were initially considered for analysis in this Environmental Assessment (EA). In compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and Department of the Navy guidelines, the discussion of the affected environment (i.e., existing conditions) focuses only on those resource areas potentially subject to impacts. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

NEPA requires federal agencies to consider the environmental impacts of major federal actions that significantly affect the quality of the human environment. “Significantly,” as used in NEPA, requires considerations of both the potentially affected environment and degree of potential impacts. The potential environmental impact can be thought of in terms of the amount of the likely change. In general, the more sensitive the environment, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the environment, the more intense a potential impact would need to be in order to be considered significant. Significance varies with the setting of a proposed action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. The resource areas that are potentially subject to impacts resulting from the Proposed Action include noise, environmental justice, biological resources, cultural resources, and air quality. The potential impacts to these resource areas are analyzed in detail in this EA.

The potential impacts to the following resource areas are considered to be negligible or nonexistent, so they were not analyzed in detail in this EA:

Water Resources: Proposed projects would be constructed on existing pavement and/or include interior work in buildings. Erosion and sedimentation control best management practices including compliance with applicable stormwater pollution prevention requirements would be used to prevent and/or minimize runoff. As a result, impacts to water resources would be negligible; therefore, water resources were not carried forward for detailed analysis in this EA.

Geological Resources: Proposed construction and demolition projects would occur on existing pavement and/or only include interior work in buildings. As a result, ground disturbance would be negligible; therefore, geological resources were not carried forward for detailed analysis in this EA.

Land Use: Proposed construction projects would occur on Navy property only. Changes in noise contours would not substantially increase or result in additional incompatible land uses. As a result, land use was not carried forward for detailed analysis in this EA.

Visual Resources: Equipment used during the proposed construction projects could create a short-term visual effect; however, the only construction would occur on Navy property. Following completion of construction, these effects would be negligible; therefore, visual resources were not carried forward for detailed analysis in this EA.

Airspace: The Proposed Action does not include the creation of any new Federal Aviation Administration (FAA)-designated controlled airspace or the redesignation of any existing airspace. All Multi-Engine

Training System (METS) aircraft operations would continue to take place in airspace currently used by the T-44C aircraft. There would be no changes in flight operations that would conflict with use of the international, regional, and publicly owned municipal airfields and military use of regional airspace. Current airspace management procedures would continue. As a result, airspace was not carried forward for detailed analysis in this EA.

Infrastructure: There are approximately 8,300 employees (CNRSE, 2022) at Naval Air Station (NAS) Corpus Christi. Under Alternative 2, an additional 33 personnel or an increase of 0.4 percent would result in a negligible increase in utility (e.g., drinking water, wastewater, stormwater, solid waste management, energy, and communications) use or need for additional capacity. Design and construction of proposed projects would comply with applicable stormwater pollution prevention requirements; therefore, infrastructure was not carried forward in this EA.

Transportation: Personnel numbers at NAS Corpus Christi would have a negligible increase, with only a slight increase (0.4 percent) under Alternative 2. Any increase in traffic as a result of the slight increase in personnel under Alternative 2 would not be significant. The proposed construction would require use of heavy equipment and worker commutes that would generate short-term increases in traffic. The local roadway infrastructure would be sufficient to support these activities, and effects would be negligible. Because most of the work would take place on Navy property, road closures or detours would not occur. As a result, transportation was not carried forward for detailed analysis in this EA.

Public Health and Safety: Construction would occur on Navy property that would not be accessible to the public and would not pose environmental health and safety risks to the general public. Bird/Animal Aircraft Strike Hazard (BASH) risk is discussed under Biological Resources. Accident potential zones would not change under the Proposal Action; therefore, there would be no change compared to current conditions.

Hazardous Materials and Wastes: Proposed new facilities would be constructed on existing pavement. Demolition and interior renovations could result in generation of hazardous material and wastes but would be handled in accordance with state and federal laws. Asbestos and lead-based paint would be abated prior to demolition or renovation. Construction contracts would specify procedures for the handling and disposal of hazardous materials and wastes by construction contractors. There are no environmental restoration sites near Hangars 57 and 58; the closest is the fuel farm located 750 feet due east of Hangar 58. A per- and polyfluoroalkyl substances (PFAS) investigation is ongoing. If the plume extends to the construction sites, contract documents would contain provisions for any special worker safety requirements for construction and handling and disposal of wastes. As a result, impacts to hazardous materials and wastes were not carried forward for detailed analysis in this EA.

Socioeconomics: Personnel numbers would not change under Alternative 1 but would have a small increase under Alternative 2 (an increase of 33 personnel or 0.4 percent of the station population); therefore, there would not be a major change to socioeconomics (e.g., employment or population) due to the Proposed Action. Construction projects would provide a beneficial one-time injection of funds to the local economy. As a result, socioeconomics was not carried forward for detailed analysis in this EA.

3.1 Noise

This discussion of noise focuses on potential noise effects on the human environment. Noise in relation to biological resources is discussed in the *Biological Resources* section (Section 3.3, *Biological Resources*).

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Sound is all around us. The perception and evaluation of sound involves three basic physical characteristics:

- Intensity – the acoustic energy, which is expressed in terms of sound pressure, in decibels (dB)
- Frequency – the number of cycles per second the air vibrates, in Hertz
- Duration – the length of time the sound can be detected

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise; perceived importance of the noise; its appropriateness in the setting, time of day, and type of activity during which the noise occurs; and the sensitivity of the individual. While aircraft are not the only sources of noise in an urban or suburban environment, they are readily identified by their noise output and are given special attention in this EA.

3.1.1 Basics of Sound and A-Weighted Sound Level

The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. Table 3-1 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Table 3-1 Subjective Responses to Changes in Decibels

Change	*Change in Perceived Loudness*
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

Key: dB = decibels.

All sounds have a spectral content, which means the magnitude or level changes with frequency, where frequency is measured in cycles per second or Hertz. To mimic the human ear’s non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an “A-weighted” scale that filters out very low and very high frequencies in order to replicate human sensitivity. It is common to add the “A” to the measurement unit in order to identify that the measurement has been made with this filtering process (dBA). In this document, the dB unit refers to A-weighted sound levels. Figure 3-1 (Cowan, 1994) provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed below.

Noise levels from aircraft operations that exceed background noise levels at an airfield typically occur beneath main approach and departure corridors, in local air traffic patterns around the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft in flight gain altitude, their noise contributions drop to lower levels, often becoming indistinguishable from the background noise.

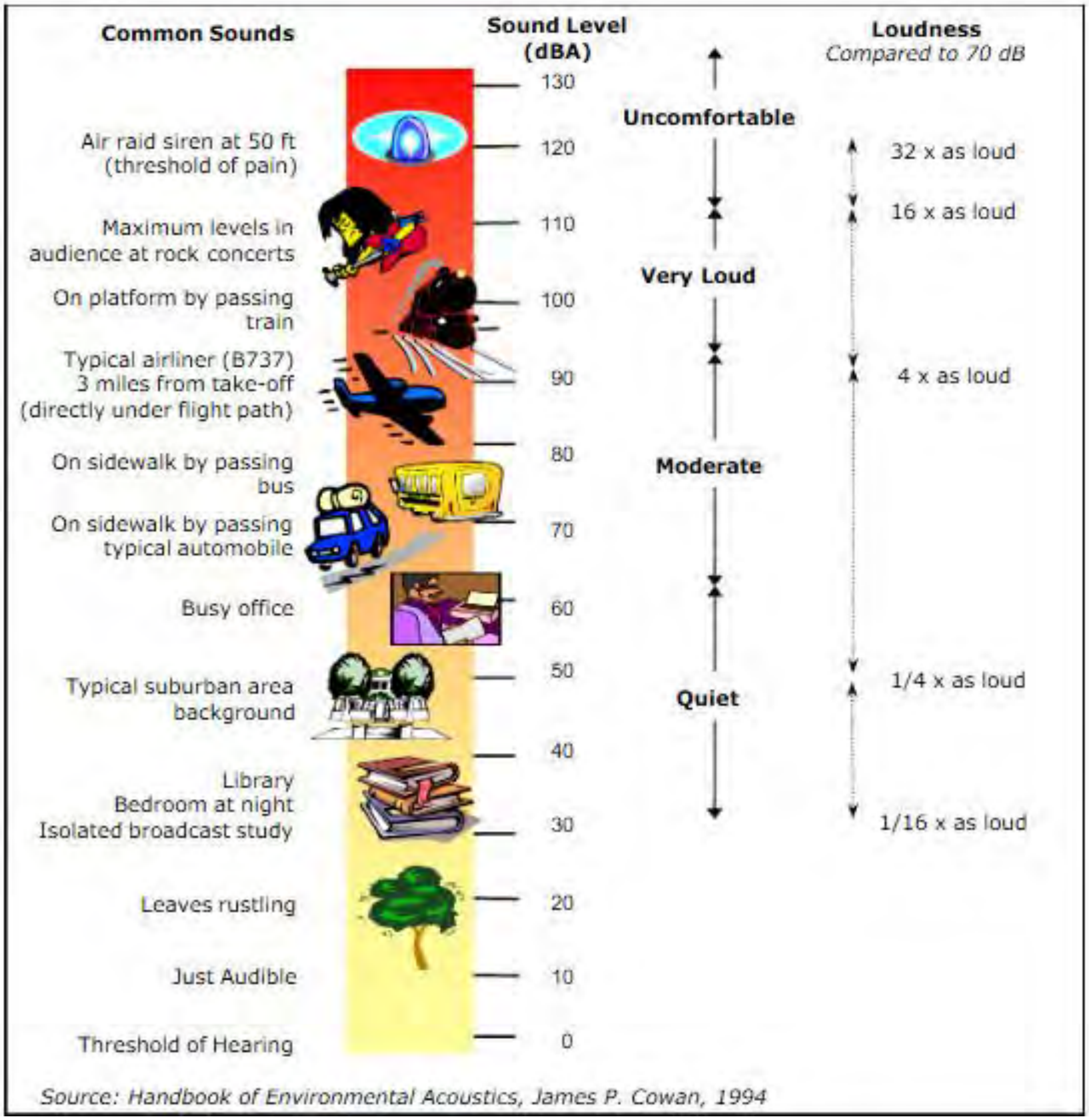

Figure 3-1 A-Weighted Sound Levels from Typical Sources

3.1.2 Noise Metrics

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment. The noise metrics used in this EA are described below. While the day-night average sound level (DNL) is the most commonly used metric for analyzing noise generated at an airfield, supplemental metrics provide more detailed noise exposure information for the decision process. The Department of Defense (DoD) Noise Working Group product, *Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics* (DoD Noise Working Group, 2009) was used to determine the appropriate metrics and analysis tools for this EA.

3.1.2.1 Day-Night Average Sound Level

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10 p.m. and 7 a.m. (acoustic night). DNL values are average quantities, mathematically representing the continuous sound level that would be present if all the variations in sound level that occur over a 24-hour period were averaged to have the same total sound energy. The DNL metric quantifies the total sound energy received and is therefore a cumulative measure, but it does not provide specific information on the number of noise events or the individual sound levels that occur during the 24-hour day. DNL is the standard noise metric used by the U.S. Department of Housing and Urban Development, FAA, U.S. Environmental Protection Agency (USEPA), and DoD. Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments; there is a consistent relationship between DNL and the level of annoyance. Most people are exposed to sound levels of 50 to 55 DNL or higher on a daily basis.

Research has indicated that about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dBA DNL (Federal Interagency Committee on Urban Noise, 1980). Therefore, the 65 dBA DNL noise contour is used to help determine compatibility of military aircraft operations with local land use, particularly for land use associated with airfields.

3.1.2.2 Equivalent Sound Level

A cumulative noise metric useful in describing noise is the Equivalent Sound Level (L_{eq}). L_{eq} is the continuous sound level that would be present if all the variations in sound level occurring over a specified time period were smoothed out as to contain the same total sound energy.

3.1.2.3 Maximum Sound Level

The highest A-weighted sound level measured during a single event where the sound level changes value with time (e.g., an aircraft overflight) is called the maximum A-weighted sound level or L_{max}. During an aircraft overflight, the noise level starts at the ambient or background noise level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. L_{max} defines the maximum sound level occurring for a fraction of a second. For aircraft noise, the “fraction of a second” over which the maximum level is defined is generally 1/8 second (American National Standards Institute, 1988). In this EA, L_{max} was used in the analysis of aircraft comparison and speech interference.

3.1.2.4 Number of Events Above a Threshold Level

The “Number of Events Above a Threshold Level” metric provides the total number of noise events that exceed a selected noise level threshold during a specified period of time (DoD Noise Working Group, 2009). In this EA, the number of events per hour exceeding an L_{max} threshold is selected to analyze speech interference.

3.1.3 Noise Effects

Several categories of noise impacts that could be associated with the Proposed Action are summarized below.

3.1.3.1 Annoyance

As previously noted, the primary effect of aircraft noise on exposed communities is long-term annoyance, defined by USEPA as any negative subjective reaction on the part of an individual or group. The scientific community has adopted the use of long-term annoyance as a primary indicator of community response and there is a consistent direct relationship between DNL and the level of community annoyance (Federal Interagency Committee on Noise, 1992).

3.1.3.2 Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance for communities. Speech interference can cause disruption of routine activities, such as enjoyment of radio or television programs, telephone use, or family conversation, giving rise to frustration or irritation. In extreme cases, speech interference may cause fatigue and vocal strain to individuals who try to communicate over the noise. In this EA, speech interference is measured by the number of daily indoor events (from 7 a.m. to 10 p.m.) that exceed 50 dB L_{max} at selected locations. This metric also accounts for noise level reduction provided by buildings with windows open or closed.

3.1.3.3 Classroom Criteria

For school-aged children, noise interference with learning can interrupt communication or interfere with concentration. The DoD Noise Working Group recommends using an outdoor eight-hour equivalent sound level ($L_{eq(8hr)}$) during the school day of 60 dBA as an indicator that background noise levels indoors (i.e., in classrooms) are unacceptably high.

If locations have noise levels that exceed 60 dBA $L_{eq(8hr)}$, the working group then recommends an additional noise metric to supplement the analysis. In this scenario, it is recommended that the number of events per hour with the potential to interfere with speech be calculated (DoD Noise Working Group, 2013). In this EA, it is conservatively assumed that if a noise event exceeds 50 dBA L_{max}, then there is the potential for speech interference (DoD Noise Working Group, 2013).

3.1.4 Noise Modeling

Computer modeling provides a tool to assess potential noise impacts. DNL noise contours are generated by a computer model that draws from a library of actual aircraft noise measurements. Noise contours produced by the model allow a comparison of existing conditions and proposed changes or alternative actions, even when the aircraft studied are not currently operating from the installation. For these reasons, on-site noise monitoring is seldom used at military air installations, especially when the aircraft mix and operational tempo are not uniform.

The noise environment for this EA was modeled using NOISEMAP. NOISEMAP analyzes all the operational data (types of aircraft, number of operations, flight tracks, altitude, speed of aircraft, engine power settings, and engine maintenance run-ups), environmental data (average humidity and temperature), and surface hardness and terrain. The result of the modeling is noise contours (i.e., lines connecting points of equal value). Noise zones cover an area between two noise contours and are usually shown in 5 dB increments. At locations of interest, NOISEMAP calculates DNL to the nearest tenth of a dB. Changes in DNL that round to zero at the tenth-of-a-decibel level of precision are extremely minor and are described as “no measurable change” in this EA.

In January 2023, the Navy awarded a contract to develop the T-54A METS aircraft based on the Beechcraft King Air 260 (Chapman, 2023). NOISEMAP software does not include reference noise level data for the King Air 260; however, it does include data for the C-12, which is very similar to the proposed new aircraft. The C-12 and King Air 260 are both powered by two turboprop engines that each generate 850 shaft horsepower. Because the C-12 is very similar to the Beechcraft King Air 260, on which METS development would be based, C-12 noise levels are expected to be very similar to noise levels generated by METS aircraft; thus, the C-12 was used as the representative noise surrogate. It is worth noting that the C-12 is also the aircraft in the NOISEMAP database that is most similar to the T-44C and was also used as the surrogate for modeling T-44 noise levels under baseline conditions.

At international, regional, and publicly owned municipal airfields, a screening-level noise analysis was conducted with the specific goal of demonstrating the level of noise impacts associated with the Proposed Action. Inputs to the analysis are described in Appendix A, *Noise Methodology and Calculations*.

3.1.5 Regulatory Setting

The joint instruction, Chief of Naval Operations Instruction 11010.36C and Marine Corps Order 11010.16, Air Installations Compatible Use Zones Program, provides guidance administering the Air Installations Compatible Use Zones program, which recommends land uses that are compatible with aircraft noise levels. Per Chief of Naval Operations Instruction 11010.36C, NOISEMAP is to be used for developing noise contours and is the best noise modeling science available today for fixed-wing aircraft until the new Advanced Acoustic Model is approved and ready for use. The Advanced Acoustic Model was approved on November 28, 2022 but, to date, is only ready for use with AV-8B, F-22, and F-35A/B fixed-wing aircraft. Therefore, this EA used NOISEMAP.

Navy regulations do not establish specific quantitative noise impact significance thresholds, instead requiring that impacts be assessed in terms of potentially affected environment and degree pursuant to the definition of significance in the CEQ regulations. This analysis uses the primary noise metric (DNL) and supplemental noise metrics to assess noise impacts near Navy installations. As discussed in Section 3.1.4, *Noise Modeling*, a screening analysis was conducted to assess whether significant noise impacts could occur near municipal public-use airfields due to implementation of the action alternatives. Noise impacts would warrant additional analysis if any sensitive location would increase by 1.5 dBA DNL or greater to a noise level at or exceeding 65 dBA DNL. Although this screening criterion aligns with impact criteria established by the FAA, its application to this screening analysis does not imply Navy adoption of FAA criterion for use in other analyses. Rather, the criterion is useful as a point of reference for this screening analysis. Non-exceedance would indicate that impacts would be minimal and not be significant.

3.1.6 Affected Environment

3.1.6.1 Noise

The study area includes areas on and near NAS Corpus Christi, Naval Outlying Landing Field (NOLF) Cabaniss, and international, regional, and publicly owned municipal airfields where proposed activities would be audible. NAS Corpus Christi supports over 160,000 aircraft operations per year from aircraft including T-44, T-6, P-3, H-60, and AH-64 as well as a wide variety of transient aircraft types.

Baseline DNL contours are shown in Figure 3-2 and Figure 3-3 for NAS Corpus Christi and NOLF Cabaniss, respectively. Fifty acres of off-installation land and an estimated 91 residents near NAS Corpus Christi are exposed to 65 dBA DNL or greater under baseline conditions. No off-installation lands near NOLF Cabaniss are exposed to 65 dBA DNL or greater under baseline conditions. As discussed in Section 3.1.3, *Noise Effects*, people exposed to higher DNL are more likely to become highly annoyed by the noise, and at noise levels greater than 65 dBA DNL, the DoD considers noise to be sufficiently intrusive that some noise-sensitive land uses are considered to be incompatible. Quantitative analysis in this EA focused on areas exposed to levels greater than 65 dBA DNL. However, people outside the 65 dBA DNL contour do experience aircraft noise, and Figure 3-2 and Figure 3-3 show DNL contours in 5 dB increments ranging from 55 to 85 dBA DNL in order to reflect the noise environment more fully.

Representative noise-sensitive locations (e.g., neighborhoods, schools, churches, etc.) were chosen for additional detailed noise analysis. The locations selected are not intended to be an all-inclusive list of locations that could be considered noise sensitive, but rather are intended to be representative. Noise levels in nearby areas can be assumed to be similar to noise levels stated for the representative locations. Representative locations are shown in Figure 3-2 and Figure 3-3. As shown in Table 3-2, noise levels are below 65 dBA DNL at all the locations studied except for the mobile homes on Lexington Boulevard.

Table 3-2 DNL at Representative Locations under Baseline Conditions

ID	*Closest Installation*	*Location Description*	*DNL (dBA)[1]*
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	66.3
2		Oso Bay Wetlands Preserve	<45
3		Texas A&M University – Corpus Christi	48.1
1	NOLF Cabaniss	Cabaniss Athletic Complex	<45
2		Bowlero Bowling Alley	49.2
3		Camargo Park	49.1
4		Carroll High School	48.3
5		Church Unlimited	<45
6		Saint John Paul II High School	<45
7		Most Precious Blood Church	48.9

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level; ID = identification; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Noise levels below 45 dBA DNL are assumed to be below ambient sound levels and are listed as “<45.”

The number of indoor noise events per average daytime hour (7:00 a.m. to 10:00 p.m.) at representative locations with the potential to interfere with speech under baseline conditions is listed in Table 3-3. Disruptions in communication have a high likelihood of being annoying.

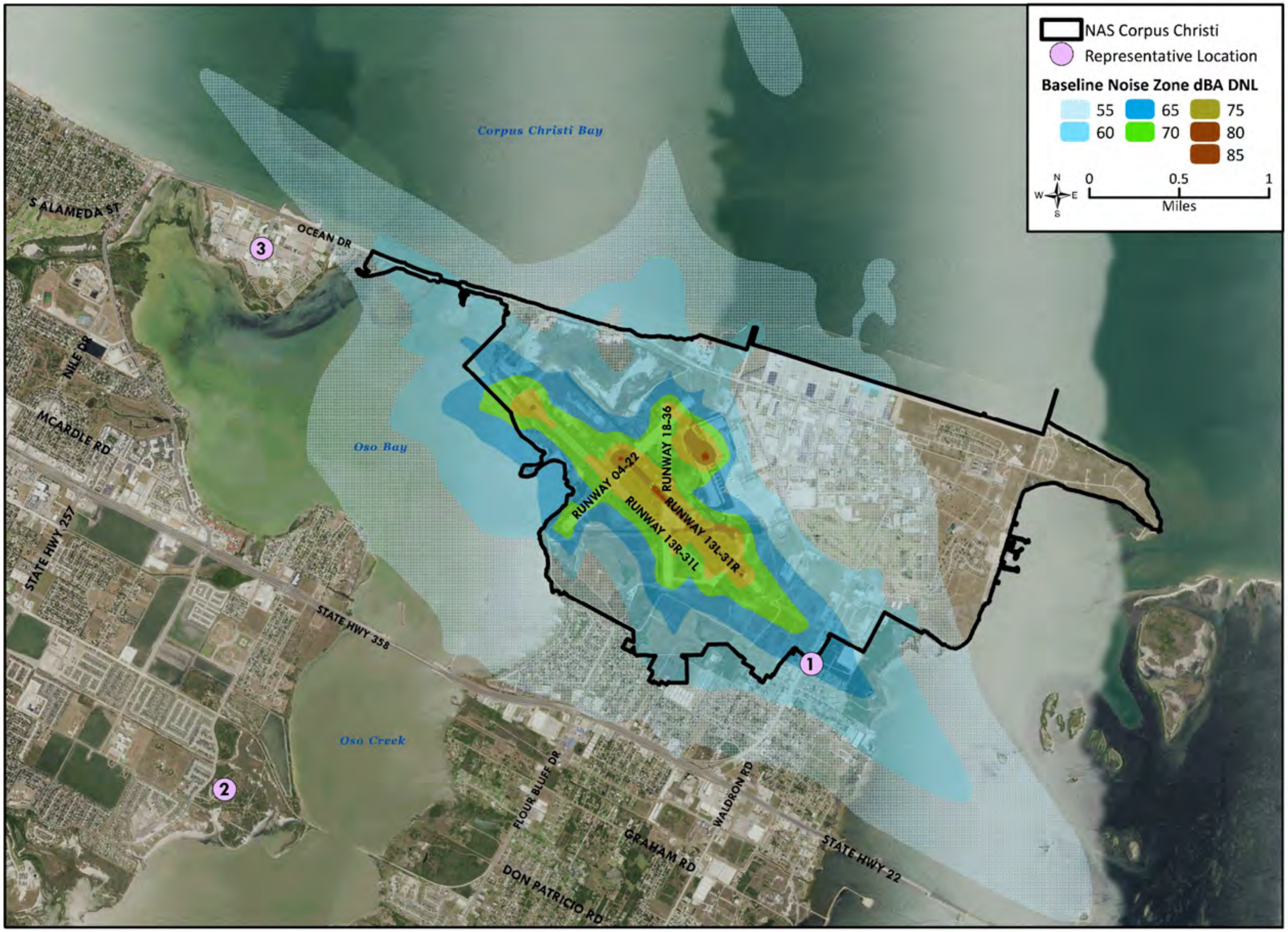

Figure 3-2 Baseline DNL Contours for NAS Corpus Christi

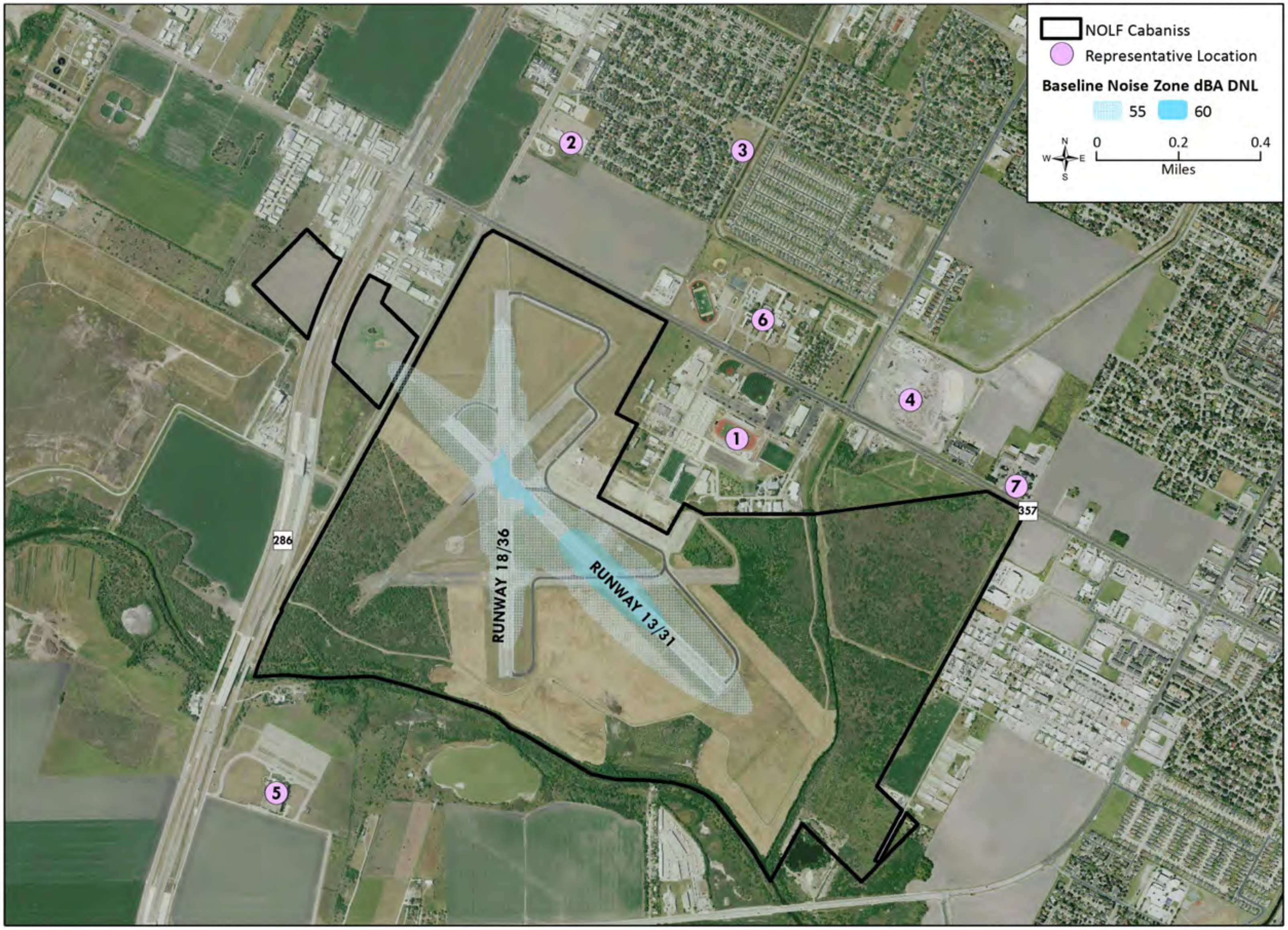

Figure 3-3 Baseline DNL Contours for NOLF Cabaniss

Table 3-3 Speech Interference Events Per Average Daytime Hour under Baseline Conditions

ID	Closest Installation	Location Description	Baseline		
			Windows Closed[1]	Windows Open[1]	Outdoor
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	6	13	18
2		Oso Bay Wetlands Preserve	0	0	1
3		Texas A&M University – Corpus Christi	0	3	10
1	NOLF Cabaniss	Cabaniss Athletic Complex	0	0	5
2		Bowlero Bowling Alley	1	2	5
3		Camargo Park	0	4	5
4		Carroll High School	0	5	5
5		Church Unlimited	0	0	5
6		Saint John Paul II High School	0	0	5
7		Most Precious Blood Church	0	5	5

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Value represents number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} rounds to zero.

Exterior $L_{eq(8hr)}$ at representative schools would remain below 60 dBA at all the schools studied (Table 3-4). The number of events per average hour during the school day that exceed 50 dBA L_{max} with windows open and closed is listed as supplemental information.

Table 3-4 Potential Classroom Interference under Baseline Conditions

ID	Closest Installation	Location Description	Baseline		
			Outdoor $L_{eq(8hr)}$ (dBA)[1]	Events per Hour, Windows Closed[2]	Events per Hour, Windows Open[2]
3	NAS Corpus Christi	Texas A&M University – Corpus Christi	49.2	0	3
4	NOLF Cabaniss	Carroll High School	48	0	5
6		Saint John Paul II High School	44.5	0	0

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; $L_{eq(8hr)}$ = eight-hour equivalent sound level; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. $L_{eq(8hr)}$ is calculated for an eight-hour typical school day from 8:00 a.m. to 4:00 p.m.
2. Value represents number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} rounds to zero.

The seven international, regional, and publicly owned municipal airfields proposed to be used regularly by T-54A aircraft range from very busy airports, such as Corpus Christi International Airport, to less-busy airports, such as Alice International Airport. Aircraft operating at the airfields include T-44 and T-6 aircraft based at NAS Corpus Christi, military aircraft based at other installations, and a wide variety of civilian aircraft types. The tempo of operations by various aircraft types and noise levels generated by these operations are described in Appendix A, *Noise Methodology and Calculations*. Screening noise analysis noise results generated using NOISEMAP are listed in Table 3-5. Noise levels at these locations remain below threshold levels that would generally be considered to cause widespread annoyance except at one location. This one location is near Corpus Christi International Airport and exceeds the 65 dBA DNL threshold by 0.4 dBA.

Table 3-5 Baseline Screening Analysis DNL at Representative Locations near International, Regional, and Publicly Owned Municipal Airfields

Municipal Public Use Airport	*Closest Noise Sensitive Locations*	*DNL (dBA)*
		Baseline
Alice International Airport	Residence 1	52.9
	Residence 2	49.6
Corpus Christi International Airport	Residence 1	52.6
	Residence 2	65.4
Valley International Airport	Valley International Military Academy	53.1
	Residence 1	50.3
Port Isabel-Cameron County Airport	Port Isabel AMI Kids (educational)	48.5
	Port Isabel Detention Center	50.7
Palacios Municipal Airport[1]	Bayside Recreational Vehicle Camp[1]	<45
	Golf Course	51.7
	City of Palacios (represented by Palacios Junior High School)	56.5
	Residence 1	48.4
Victoria Regional Airport	Dorothy O’Connor Pet Adoption Center	64.3
	Residence 1	52.2
Calhoun County Airport	Drifters (bar)	50.8
	Residence 1	53.1

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level.
Note:
1. Aircraft noise levels less than 45 dBA DNL can be assumed to be below ambient sound levels.

3.1.7 Environmental Consequences

Analysis of potential noise impacts includes estimating likely noise levels from the Proposed Action and determining potential effects to sensitive receptor sites.

3.1.7.1 No Action Alternative

Under the No Action Alternative, there would be no change to baseline noise levels. Therefore, no significant impacts to the noise environment would occur with implementation of the No Action Alternative.

3.1.7.2 Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative)

The study area for Alternative 1 includes areas on and near NAS Corpus Christi, NOLF Cabaniss, and international, regional, and publicly owned municipal airfields where proposed activities would be audible.

Short- and long-term construction projects for Navy support facilities at NAS Corpus Christi would occur in the flightline area, which is not noise sensitive and is regularly exposed to elevated aircraft noise levels. Construction noise would be localized to the areas immediately surrounding the construction site and would last only for the duration of the construction project. In this context, temporary construction noise would have no off-station impacts.

Noise Potential Impacts:

No Action Alternative:

- No change in existing conditions with 50 acres off-station land and 91 residents at or greater than 65 dBA DNL at NAS Corpus Christi and no off-station land or residents at NOLF Cabaniss at or greater than 65 dBA DNL.

Alternatives 1 and 2:

- Off-station land at 65 dBA DNL or greater at NAS Corpus Christi would increase by 1 acre, from 50 to 51 acres; estimated residents at or greater than 65 dBA DNL would remain the same as the No Action Alternative under Alternative 1, at 91, but would increase to 92 under Alternative 2.
- Noise levels would remain below 65 dBA DNL near NOLF Cabaniss.
- Noise levels at all schools studied would remain below 60 dBA $L_{eq(8hr)}$.
- Noise levels at noise-sensitive locations near international, regional, and publicly owned municipal airfields would remain well below 65 dBA DNL or would not change measurably relative to baseline conditions.
- The Navy has determined that there would be no environmental health and safety risks that would disproportionately affect children.

Under Alternative 1, T-54A aircraft would conduct approximately 10 percent more airfield operations annually than are conducted currently by T-44 aircraft at NAS Corpus Christi, NOLF Cabaniss, and international, regional, and publicly owned municipal airfields, as described in Table 2-3 and Table 2-4. T-54A aircraft would be expected to follow approximately the same flight paths, runway usage patterns, and altitude profiles as T-44 aircraft. The new aircraft would conduct the same percentage of total operations during the late-night period between 10:00 PM and 7:00 AM (approximately 7 percent) as are conducted by the T-44 currently. Other aircraft operations, such as based T-6 and transient fighter (e.g., F/A-18C), would continue at NAS Corpus Christi, as described in Appendix A, *Noise Methodology and Calculations*.

Maximum noise levels associated with individual overflights of T-44, T-54A, T-6, and transient F/A-18C aircraft at 1,000 feet above ground level (AGL) are listed in Table 3-6. As noted in Section 3.1.4, *Noise Modeling*, the C-12 aircraft was used as the noise modeling surrogate for both the T-54A and for the T-44C. Individual overflight noise levels for the T-54A and T-44C would be approximately the same. Both the T-54A and T-44C are not as loud as the T-6 and transient aircraft types such as the F/A-18C. At NOLF Cabaniss, only T-44C operations occur on a regular basis.

Alternative 1 DNL contours are shown in Figure 3-4 and Figure 3-5 for NAS Corpus Christi and NOLF Cabaniss, respectively. The number of off-station land acres near NAS Corpus Christi exposed to 65 dBA DNL or greater would increase from 50 to 51, and the estimated number of residents affected at these levels would remain at 91, as shown for the No Action Alternative. The minor change in noise contour extent reflects individual T-54A overflight noise levels being approximately the same as those generated by ongoing T-44C operations, as discussed previously. Changes in noise level would also be minimal because T-54A operations would occur in the context of ongoing operations of other aircraft types at NAS Corpus Christi such that the contribution of these aircraft to overall noise levels would be relatively minor. At NOLF Cabaniss, off-station aircraft noise levels would remain below 65 dBA DNL (Table 3-7).

People exposed to a higher DNL are more likely to become highly annoyed by the noise. At noise levels greater than 65 dBA DNL, the DoD considers noise to be sufficiently intrusive that some noise-sensitive land uses are considered to be incompatible. Quantitative analysis in this EA focused on areas exposed to levels greater than 65 dBA DNL. However, people outside the 65 dBA DNL contour do experience aircraft noise, and Figure 3-4 and Figure 3-5 also show 55 dBA and 60 dBA DNL contours in order to reflect the noise environment more fully.

Table 3-6 Individual Overflight Maximum Noise Levels

Aircraft	*Aircraft Configuration*	*Engine Power*	*L_{max} (dBA)*
T-44C (C-12 surrogate)	Takeoff (full power)	100% RPM	73
T-54A (C-12 Surrogate)		100% RPM	73
T-6		100% Torque	78
F/A-18C		96.7% NC (Afterburner)	115
T-44C (C-12 surrogate)	Cruise (intermediate power)	86% RPM	73
T-54A (C-12 surrogate)		86% RPM	73
T-6		54% Torque	75
F/A-18C		96.5% NC	108
T-44C	Arrival (low power)	30% RPM	70
T-54A (C-12 surrogate)		30% RPM	70
T-6		35% Torque	75
F/A-18C		88.5% NC	104

Source: SELcalc, version 3; standard acoustic conditions (59 degrees Fahrenheit and 70% relative humidity)

Key: % = percent; dBA = A-weighted decibels; L_{max} = maximum A-weighted sound level; NC = core engine speed; RPM = revolutions per minute.

Table 3-7 Off-Station Acres and Population Exposed to Elevated Noise Levels near NAS Corpus Christi and NOLF Cabaniss under Alternative 1

Location	*No Action Alternative 65–69 dBA DNL*		*Alternative 1 65–69 dBA DNL*		*Change*	
	Land Area (acres)[1]	*Residents[2]*	*Land Area (acres)[1]*	*Residents[2]*	*Land Area (acres)[1]*	*Residents[2]*
NAS Corpus Christi	50	91	51	91	+1	0
NOLF Cabaniss	0	0	0	0	0	0

Key: + = plus; dBA = A-weighted decibels; DNL = day-night average sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. Acreage presented does not include areas over water or lands owned by the U.S. Navy.
2. The affected populations were estimated based on U.S. Census data at the block group level with adjustments to remove nonresidential areas from calculations (USCB, 2020a).

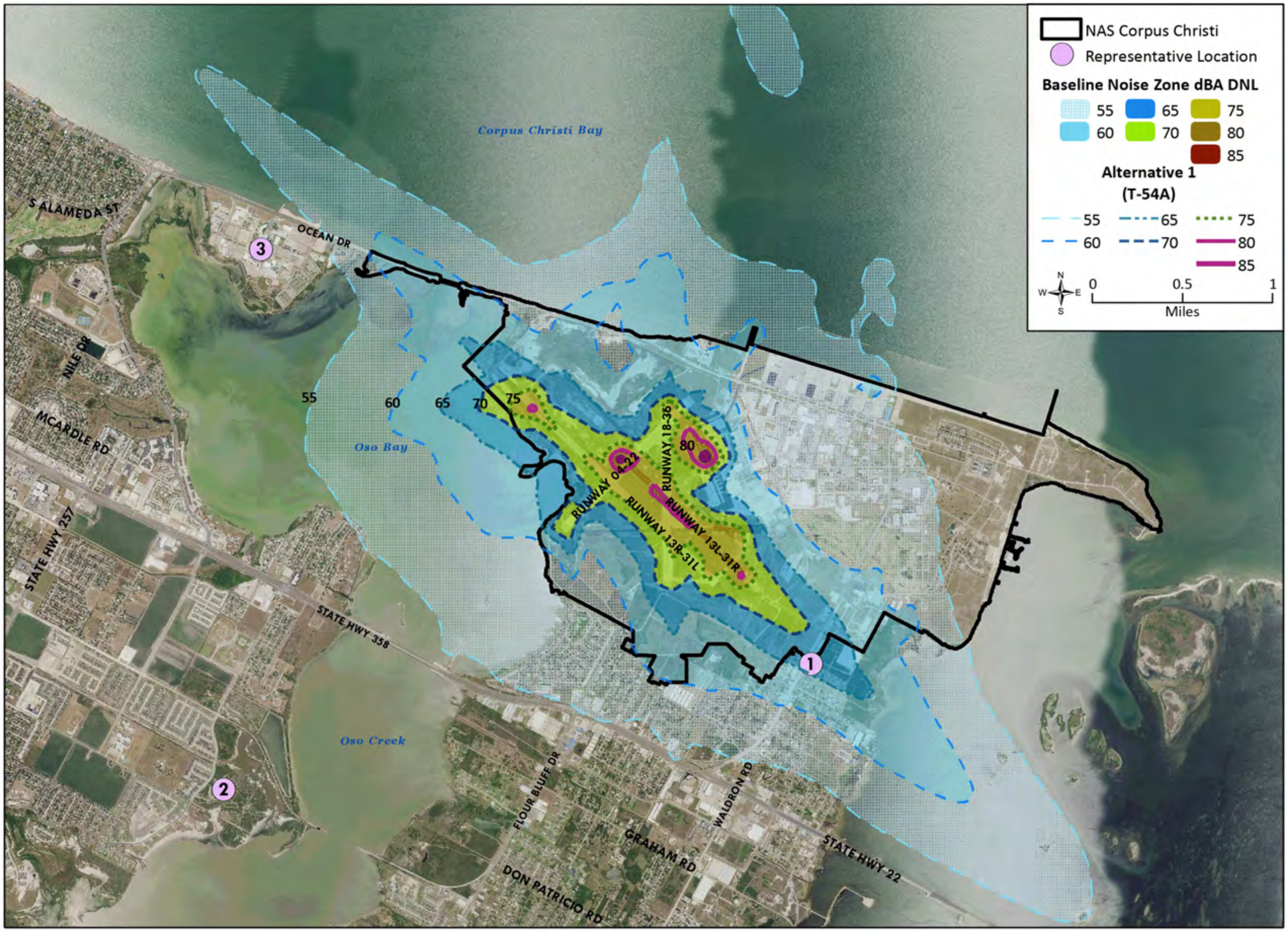

Figure 3-4 Baseline and Alternative 1 DNL Contours for NAS Corpus Christi

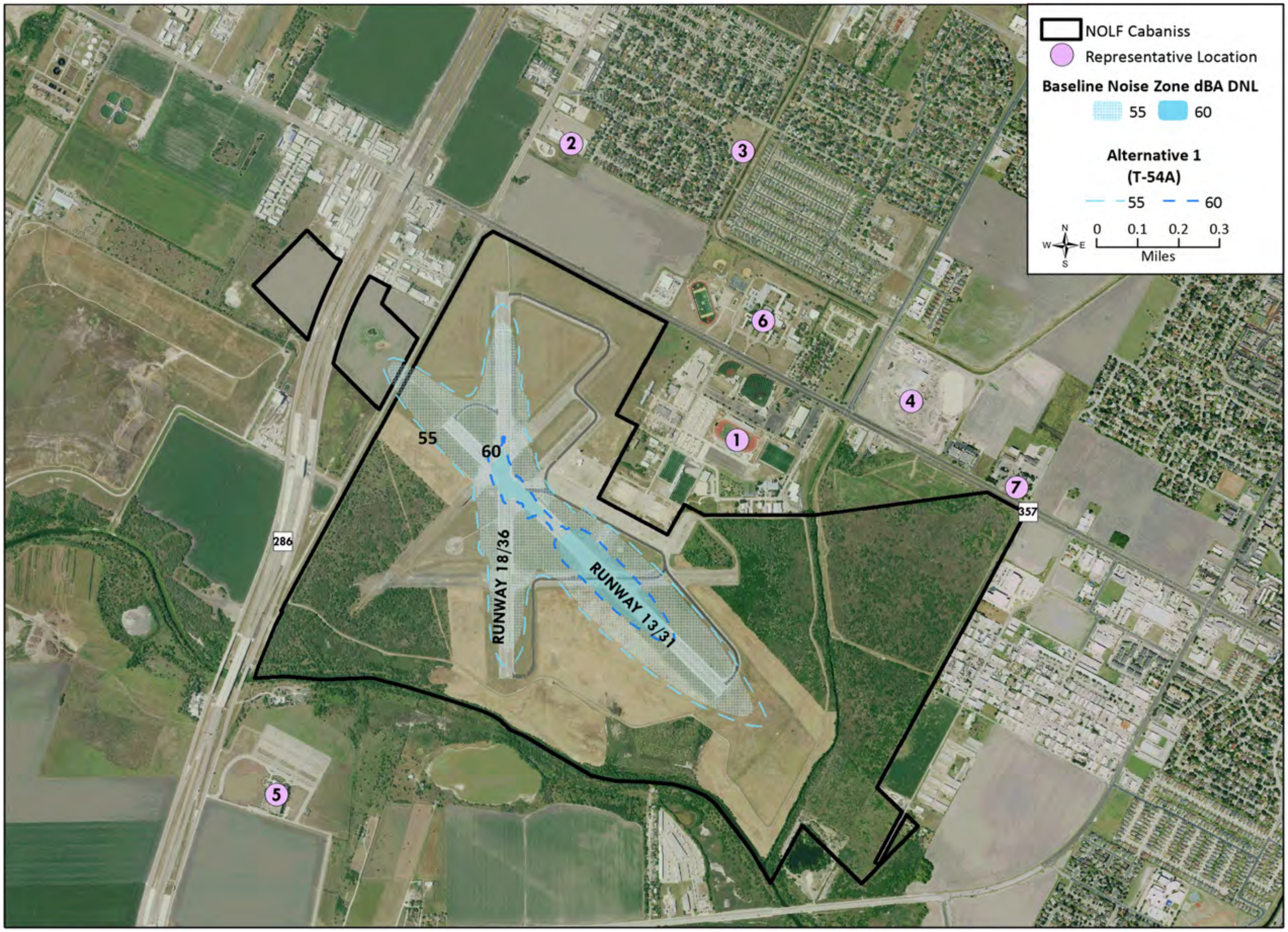

Figure 3-5 Baseline and Alternative 1 DNL Contours for NOLF Cabaniss

Under Alternative 1, there would be no measurable change in noise level (i.e., dBA DNL) at the locations studied near NAS Corpus Christi. Noise levels at locations studied near NOLF Cabaniss would increase by 0.5 dBA DNL or less (Table 3-8). The noise level at the mobile homes on Lexington Boulevard would remain just above 65 dBA DNL, while the levels at all other locations would remain below 65 dBA DNL. To put the DNL changes in perspective, a change in an instantaneous sound level of 3 dBA is barely perceptible (Table 3-1). Increases in DNL of 0.5 dBA or less at locations near NOLF Cabaniss would not be expected to be noticeable, and noise levels at all of the locations studied near NOLF Cabaniss would remain well below the 65 dBA DNL, which is compatible with residential land uses.

Table 3-8 DNL at Representative Locations under Alternative 1

ID	*Closest Installation*	*Location Description*	*DNL (dBA)*		
			No Action Alternative[1]	*Alternative 1*[1]	*Change*
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	66.3	66.3	0
2		Oso Bay Wetlands Preserve	<45	<45	0
3		Texas A&M University – Corpus Christi	48.1	48.1	0
1	NOLF Cabaniss	Cabaniss Athletic Complex	<45	45.2	0.2
2		Bowlero Bowling Alley	49.2	49.6	0.4
3		Camargo Park	49.1	49.5	0.4
4		Carroll High School	48.3	48.8	0.5
5		Church Unlimited	<45	<45	0
6		Saint John Paul II High School	<45	45.2	0.2
7		Most Precious Blood Church	48.9	49.4	0.5

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level; ID = identification; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Noise levels below 45 dBA DNL are assumed to be below ambient sound levels and are listed as "<45."

The number of indoor noise events per average daytime hour (7:00 a.m. to 10:00 p.m.) at representative locations with the potential to interfere with speech under Alternative 1 are listed in Table 3-9. The number of events would increase by one at the mobile homes on Lexington Boulevard if windows are closed but would remain the same if windows are open or if outdoors. The number of potential speech interference events indoors and outdoors at the other two locations near NAS Corpus Christi would remain the same as the No Action Alternative. At all locations studied near NOLF Cabaniss, the number of events would remain the same indoors but would increase by one event per hour outdoors at six locations. Increases in the frequency of disruptions in communication or activities (e.g., watching television) have a high likelihood of being annoying. However, the frequency of such disruptions would remain the same or increase only minimally under Alternative 1.

Exterior $L_{eq(8hr)}$ at representative schools would remain below 60 dBA at all the schools studied (Table 3-10). At both Carroll High School and Saint John Paul High School, $L_{eq(8hr)}$ would increase by 0.4 dBA but would remain well below the 60 dBA impact threshold (see Section 3.1.3.3, *Classroom Criteria*). The number of potential speech interference events per hour was calculated, as prescribed by the DoD Noise Working Group to supplement the analysis and was found to change by less than one at all the locations studied. Classroom noise impacts would be minimal.

Table 3-9 Speech Interference Events Per Average Daytime Hour under Alternative 1

ID	Closest Installation	Location Description	Alternative 1			Change Relative to No Action Alternative		
			Windows Closed[1]	Windows Open[1]	Outdoor	Windows Closed[1]	Windows Open[1]	Outdoor[1]
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	7	13	18	1	0	0
2		Oso Bay Wetlands Preserve	0	0	1	0	0	0
3		Texas A&M University – Corpus Christi	0	3	10	0	0	0
1	NOLF Cabaniss	Cabaniss Athletic Complex	0	0	6	0	0	1
2		Bowlero Bowling Alley	1	2	6	0	0	1
3		Camargo Park	0	4	6	0	0	1
4		Carroll High School	0	5	6	0	0	1
5		Church Unlimited	0	0	5	0	0	0
6		Saint John Paul II High School	0	0	6	0	0	1
7		Most Precious Blood Church	0	5	6	0	0	1

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Value represents number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} (or increase in the number of events) rounds to zero.

Table 3-10 Potential Classroom Interference under Alternative 1

ID	Closest Installation	Location Description	Alternative 1			Increase Relative to No Action Alternative		
			Outdoor $L_{eq(8hr)}$ (dBA)[1]	Events per Hour, Windows Closed[2]	Events per Hour, Windows Open[2]	Outdoor $L_{eq(8hr)}$ (dBA)[1]	Events per Hour, Windows Closed[2]	Events per Hour, Windows Open[2]
3	NAS Corpus Christi	Texas A&M University – Corpus Christi	49.2	0	3	0	0	0
4	NOLF Cabaniss	Carroll High School	48.4	0	5	0.4	0	0
6		Saint John Paul II High School	44.9	0	0	0.4	0	0

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; $L_{eq(8hr)}$ = eight-hour equivalent sound level; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. $L_{eq(8hr)}$ is calculated for an eight-hour typical school day from 8:00 a.m. to 4:00 p.m.
2. Value represents number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} rounds to zero.

At international, regional, and publicly owned municipal airfields, a screening-level analysis was conducted using NOISEMAP. Noise model inputs and specific results of the screening-level analysis are presented in Appendix A, Noise Methodology and Calculations. The analysis did not find any sensitive locations at which noise levels would increase by 1.5 dBA DNL or greater to a noise level at or exceeding 65 dBA DNL (Table 3-11). Therefore, noise impacts at international, regional, and publicly owned municipal airfields under Alternative 1 would not be significant.

Changes to noise levels at NAS Corpus Christi and NOLF Cabaniss associated with implementation of Alternative 1 would be minimal compared to the No Action Alternative. Changes to noise levels at international, regional, and publicly owned municipal airports were analyzed using a screening analysis, and no locations were identified that warranted further analysis. Therefore, implementation of Alternative 1 would not result in significant impacts to the noise environment.

3.1.7.3 Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations Potential Impacts

The study area for Alternative 2 would be the same as for Alternative 1, including all areas in which noise associated with the action would be audible.

As is the case for Alternative 1, construction noise would be localized within the flightline area. Because construction noise would be temporary and would occur in a non-noise-sensitive area that is regularly exposed to elevated aircraft noise levels under baseline conditions, no off-station noise impacts would be expected.

All aspects of Alternative 2 would be the same as Alternative 1, except for the tempo of T-54A aircraft operations, which would be 20 percent higher than the baseline T-44 operations tempo. As is the case under Alternative 1, T-54A aircraft flight paths, runway usage patterns, and altitude profiles would be approximately the same as are flown by T-44 aircraft currently, and the percentage of operations conducted late at night would not change.

Alternative 2 DNL contours for NAS Corpus Christi and NOLF Cabaniss are shown in Figure 3-6 and Figure 3-7, respectively. As shown in Table 3-12, the number of off-station land acres near NAS Corpus Christi exposed to 65 dBA DNL or greater would increase by 1 acre compared to the No Action Alternative. The estimated number of residents exposed to 65 dBA DNL or greater under Alternative 2 would increase by one relative to the No Action Alternative.

The minor changes in noise contour extent reflect individual T-54A overflight noise levels being approximately the same as those generated by ongoing T-44 operations. In the context of ongoing aircraft operations at NAS Corpus Christi, the contribution of T-54A aircraft-generated noise to overall noise levels would be relatively small, and the difference in noise levels associated with a slightly higher operations tempo under Alternative 2 compared to Alternative 1 is similarly minimal. People exposed to higher DNL are more likely to become highly annoyed by the noise, and at noise levels greater than 65 dBA DNL, the DoD considers noise to be sufficiently intrusive that some noise-sensitive land uses are considered to be incompatible with the noise.

Noise levels would remain below 65 dBA DNL at all the locations studied except for the mobile homes on Lexington Boulevard (Table 3-13). At Texas A&M University–Corpus Christi, the noise level would increase by 0.1 dBA DNL, but the noise levels at the other two locations near NAS Corpus Christi would remain the same. The locations near NOLF Cabaniss would experience increases in noise level of up to 0.8 dBA DNL or less, and all locations would remain well below the 65 dBA DNL land use compatibility guidelines.

Table 3-11 Alternative 1 Screening Analysis DNL at Representative Locations near International, Regional, and Publicly Owned Municipal Airfields

Municipal Public Use Airport	*Closest Noise Sensitive Locations*	*DNL (dBA)*			*Summary*		
		Baseline / No Action Alternative[1]	*Alternative 1*	*Change*	*Equals or Exceeds 65 dBA DNL*	*Change equals or exceeds 1.5 dBA*	*Potential Significant Impacts*
Alice International Airport	Residence 1	52.9	53	0.1	No	No	No
	Residence 2	49.6	49.7	0.1	No	No	No
Corpus Christi International Airport	Residence 1	52.6	52.6	0	No	No	No
	Residence 2	65.4	65.4	0	Yes	No	No
Valley International Airport	Valley International Military Academy	53.1	53.1	0	No	No	No
	Residence 1	50.3	50.4	0.1	No	No	No
Port Isabel-Cameron County Airport	Port Isabel AMI Kids (educational)	48.5	48.5	0	No	No	No
	Port Isabel Detention Center	50.7	50.7	0	No	No	No
Palacios Municipal Airport	Bayside Recreational Vehicle Camp[1]	<45	<45	0	No	No	No
	Golf Course	51.7	51.7	0	No	No	No
	City of Palacios (represented by Palacios Junior High School)	56.5	56.5	0	No	No	No
	Residence 1	48.4	48.5	0.1	No	No	No
Victoria Regional Airport	Dorothy O'Connor Pet Adoption Center	64.3	64.3	0	No	No	No
	Residence 1	52.2	52.2	0	No	No	No
Calhoun County Airport	Drifters (bar)	50.8	50.8	0	No	No	No
	Residence 1	53.1	53.1	0	No	No	No

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level.
Note:
1. Noise levels below 45 dBA DNL are assumed to be below ambient sound levels and are listed as "<45."

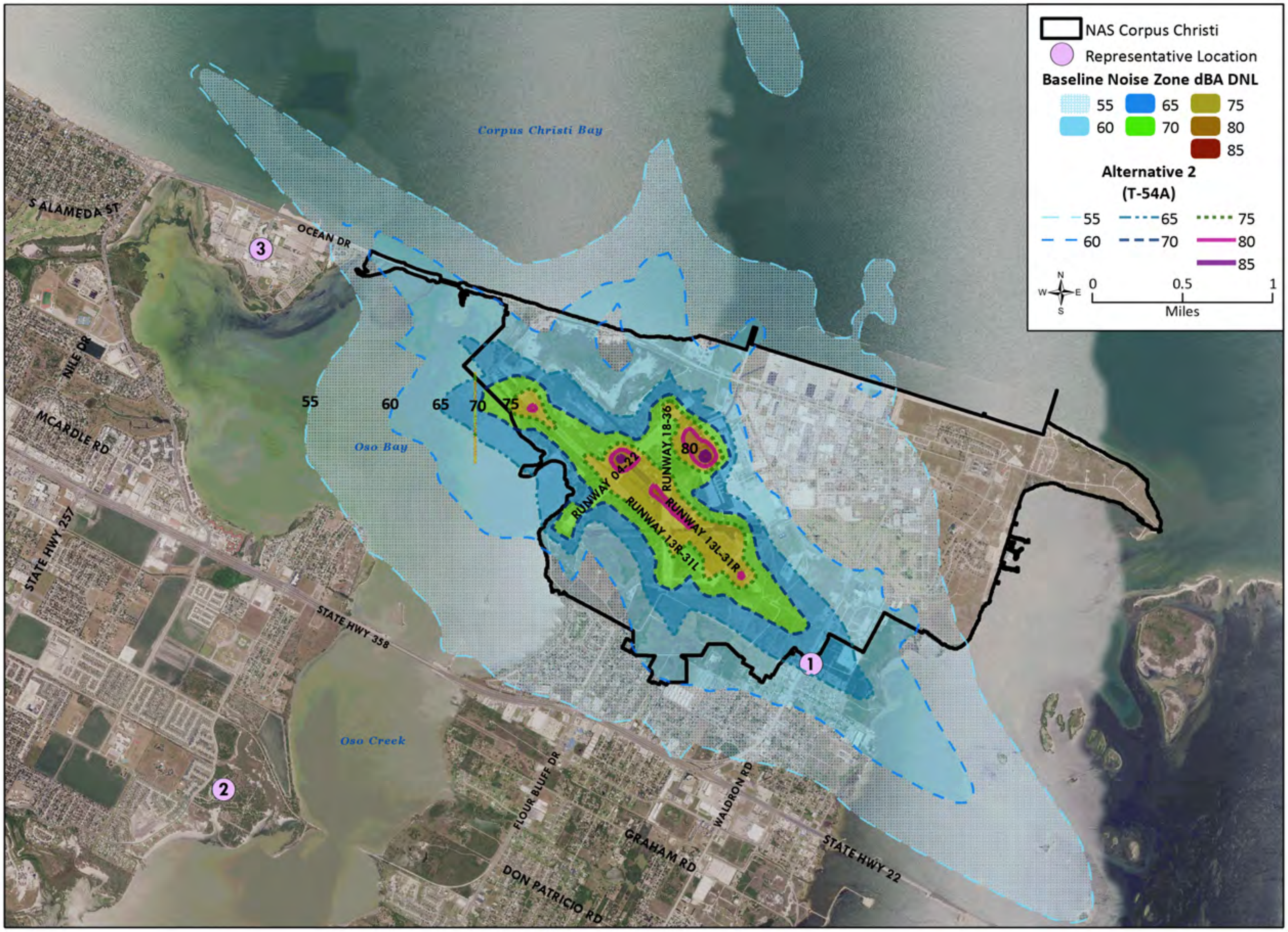

Figure 3-6 Baseline and Alternative 2 DNL Contours for NAS Corpus Christi

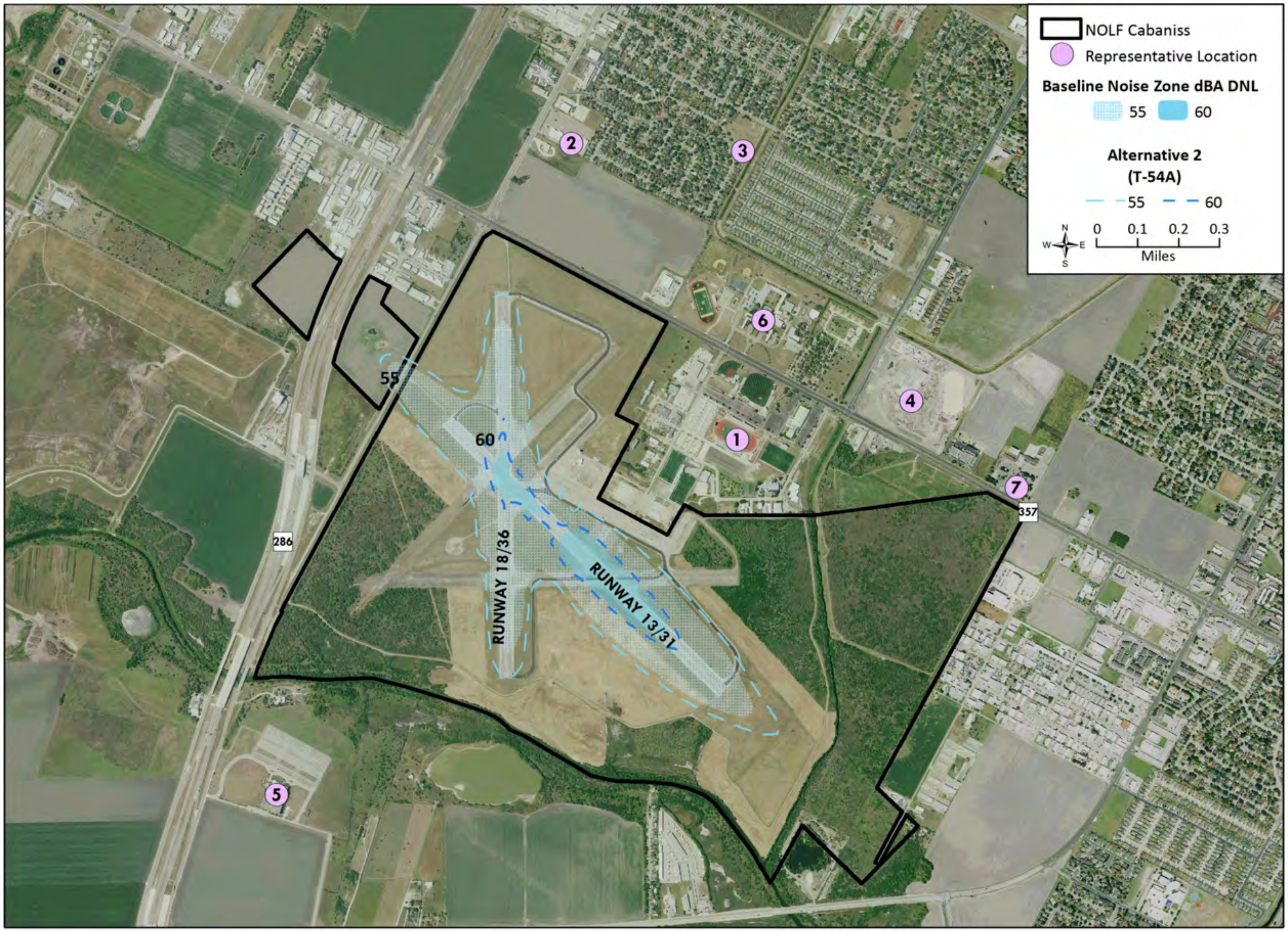

Figure 3-7 Baseline and Alternative 2 DNL Contours for NOLF Cabaniss

Table 3-12 Off-Station Acres and Population Exposed to Elevated Noise Levels near NAS Corpus Christi and NOLF Cabaniss under Alternative 2

Location	*No Action Alternative 65–69 dBA DNL*		*Alternative 2 65–69 dBA DNL*		*Change*	
	Land Area (acres)[1]	*Residents[2]*	*Land Area (acres)[1]*	*Residents[2]*	*Land Area (acres)[1]*	*Residents[2]*
NAS Corpus Christi	50	91	51	92	+1	+1
NOLF Cabaniss	0	0	0	0	0	0

Key: dBA = A-weighted decibels; DNL = day-night average sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. Acreage presented does not include areas over water or lands owned by the U.S. Navy.
2. The affected populations were estimated based on U.S. Census data at the block group level with adjustments to remove nonresidential areas from calculations (USCB, 2020a).

Table 3-13 DNL at Representative Locations under Alternative 2

ID	*Closest Installation*	*Location Description*	*DNL (dBA)*		
			No Action Alternative[1]	*Alternative 2[1]*	*Change*
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	66.3	66.3	0
2		Oso Bay Wetlands Preserve	<45	<45	0
3		Texas A&M University – Corpus Christi	48.1	48.2	0.1
1	NOLF Cabaniss	Cabaniss Athletic Complex	<45	45.6	0.6
2		Bowlero Bowling Alley	49.2	50	0.8
3		Camargo Park	49.1	49.9	0.8
4		Carroll High School	48.3	49.1	0.8
5		Church Unlimited	<45	<45	0
6		Saint John Paul II High School	<45	45.6	0.6
7		Most Precious Blood Church	48.9	49.7	0.8

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level; ID = identification; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Noise levels below 45 dBA DNL are assumed to be below ambient sound levels and are listed as "<45".

The number of indoor noise events per average daytime hour (7:00 a.m. to 10:00 p.m.) at representative locations with the potential to interfere with speech would increase by one or less under Alternative 2 (Table 3-14). The 20 percent increase in T-54A operations relative to baseline T-44C operations under Alternative 2 would result in 8 of the 10 locations studied experiencing one additional potential speech interference event per average hour outdoors (under Alternative 1, events per hour would increase by one at 6 of the locations). If windows are open, the average number of indoor potential speech interference events would increase at 4 of the 10 locations studied under Alternative 2 (no locations would increase under Alternative 1). If windows are closed, the number of potential speech interference events per hour would be the same under Alternative 2 as under Alternative 1. Any increases in the frequency of disruptions in communication have a high likelihood of being annoying. However, increases in the frequency of such events under Alternative 2 would be minor (i.e., one additional event or less per average hour).

Table 3-14 Speech Interference Events Per Average Daytime Hour under Alternative 2

ID	Closest Installation	Location Description	Alternative 2			Change Relative to No Action Alternative		
			Windows Closed[1]	Windows Open[1]	Outdoor	Windows Closed[1]	Windows Open[1]	Outdoor[1]
1	NAS Corpus Christi	Mobile Homes on Lexington Blvd	7	14	19	1	1	1
2		Oso Bay Wetlands Preserve	0	0	1	0	0	0
3		Texas A&M University – Corpus Christi	0	3	10	0	0	0
1	NOLF Cabaniss	Cabaniss Athletic Complex	0	0	6	0	0	1
2		Bowlero Bowling Alley	1	2	6	0	0	1
3		Camargo Park	0	5	6	0	1	1
4		Carroll High School	0	6	6	0	1	1
5		Church Unlimited	0	0	6	0	0	1
6		Saint John Paul II High School	0	0	6	0	0	1
7		Most Precious Blood Church	0	6	6	0	1	1

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Value represents number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} (or increase in the number of events) rounds to zero.

Exterior $L_{eq(8hr)}$ would remain below 60 dBA at all the schools studied under Alternative 2 (Table 3-15) Section 3.1.3.3, *Classroom Criteria*). The number of potential speech interference events per average hour would be the same under Alternative 2 as under Alternative 1 except at Carroll High School with windows open, where the number would increase to one per hour. Although the frequency of classroom speech interference events would increase under Alternative 2 relative to the No Action Alternative, noise levels would remain below the recommended 60 dBA exterior $L_{eq(8hr),}$ and impacts to learning would be expected to be minimal.

Results of a NOISEMAP screening analysis show that noise levels at sensitive locations near international, regional, and publicly owned municipal airfields would remain well below 65 dBA DNL or would not change measurably (Table 3-16). Noise model inputs and specific results of the screening-level analysis are presented in Appendix A, *Noise Methodology and Calculations*. Because the screening analysis found no increases of 1.5 dBA DNL or greater compared to the No Action Alternative, with noise levels of 65 dBA DNL or greater at the closest sensitive locations, noise impacts at the international, regional, and publicly owned municipal airfields under Alternative 2 would not be significant.

Noise impacts associated with implementation of Alternative 2 would be either minimal in the context of other flying operations, as is the case at locations near NAS Corpus Christi, or would remain below screening factors, as is the case at locations near NOLF Cabaniss. Therefore, implementation of Alternative 2 would not result in significant impacts to the noise environment.

Table 3-15 Potential Classroom Interference under Alternative 2

ID	Closest Installation	Location Description	Alternative 2			Increase Relative to No Action Alternative		
			Outdoor $L_{eq(8hr)}$ (dBA)[1]	Events per Hour, Windows Closed[2]	Events per Hour, Windows Open[2]	Outdoor $L_{eq(8hr)}$ (dBA)[1]	Events per Hour, Windows Closed[2]	Events per Hour, Windows Open[2]
3	NAS Corpus Christi	Texas A&M University – Corpus Christi	49.2	0	3	0	0	0
4	NOLF Cabaniss	Carroll High School	48.8	0	6	0.8	0	1
6		Saint John Paul II High School	45.3	0	0	0.8	0	0

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; $L_{eq(8hr)}$ = eight-hour equivalent sound level; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. $L_{eq(8hr)}$ is calculated for an eight-hour typical school day from 8:00 a.m. to 4:00 p.m.
2. Value represents number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} rounds to zero.

Table 3-16 Alternative 2 Screening Analysis DNL at Representative Locations near International, Regional, and Publicly Owned Municipal Airfields

Municipal Public Use Airport	Closest Noise Sensitive Locations	DNL (dBA)			Summary		
		Baseline / No Action	Alternative 2	Change	Equals or Exceeds 65 dBA DNL	Change equals or exceeds 1.5 dBA	Potential Significant Impacts
Alice International Airport	Residence 1	52.9	53.1	0.2	No	No	No
	Residence 2	49.6	49.8	0.2	No	No	No
Corpus Christi International Airport	Residence 1	52.6	52.7	0.1	No	No	No
	Residence 2	65.4	65.4	0	Yes	No	No
Valley International Airport	Valley International Military Academy	53.1	53.1	0	No	No	No
	Residence 1	50.3	50.4	0.1	No	No	No
Port Isabel-Cameron County Airport	Port Isabel AMI Kids (educational)	48.5	48.6	0.1	No	No	No
	Port Isabel Detention Center	50.7	50.8	0.1	No	No	No

Table 3-16 Alternative 2 Screening Analysis DNL at Representative Locations near International, Regional, and Publicly Owned Municipal Airfields

Municipal Public Use Airport	*Closest Noise Sensitive Locations*	*DNL (dBA)*			*Summary*		
		Baseline / No Action	*Alternative 2*	*Change*	*Equals or Exceeds 65 dBA DNL*	*Change equals or exceeds 1.5 dBA*	*Potential Significant Impacts*
Palacios Municipal Airport	Bayside Recreational Vehicle Camp[1]	<45	<45	0	No	No	No
	Golf Course	51.7	51.8	0.1	No	No	No
	City of Palacios (represented by Palacios Junior High School)	56.5	56.5	0	No	No	No
	Residence 1	48.4	48.5	0.1	No	No	No
Victoria Regional Airport	Dorothy O'Connor Pet Adoption Center	64.3	64.3	0	No	No	No
	Residence 1	52.2	52.2	0	No	No	No
Calhoun County Airport	Drifters (bar)	50.8	50.8	0	No	No	No
	Residence 1	53.1	53.1	0	No	No	No

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level.
Note:
1. Aircraft noise levels less than 45 dBA DNL can be assumed to be below ambient sound levels.

3.1.8 Protection of Children

This section discusses environmental health and safety risks to children. Environmental health and safety risks to children are defined as those that are attributable to products or substances a child is likely to come into contact with or ingest, such as air, food, water, soil, and products that children use or to which they are exposed. The primary impacts to resource areas resulting from the Proposed Action that affect children would be noise and air quality impacts.

3.1.8.1 Regulatory Setting

In accordance with Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (April 23, 1997), federal agencies are required to "make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that [their] policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks."

3.1.8.2 Affected Environment

Table 3-17 and Figure 3-8 present the number of children (under 18 years of age) of the population within the entire census tract and block groups that are partially under the 65 dBA DNL or greater noise zones at NAS Corpus Christi and under Alternatives 1 and 2. Block Group 2 has a lower percent of children (22.9 percent) compared to Nueces County. Block Group 3 has a slightly higher percentage (25.1 percent) of the total population that are children compared to Nueces County (24.6 percent).

Table 3-17 Population by Age for the Census Tract and Block Groups Potentially Affected by Noise

Location	*Total Population*	*Children (under 18 years)*	
		Number	*Percent*
CT 30.04	3,308	867	26.2%
BG 2	913	209	22.9%
BG 3	958	240	25.1%
Nueces County	362,151	88,993	24.6%
State of Texas	28,635,442	7,381,482	25.8%
United States	326,569,308	73,296,738	22.4%

Source: (USCB, 2020b)
Key: % = percent; BG = Block Group; CT = Census Tract.
Note:
1. Blue shading = block group percentage exceeds the percentage for the county.

3.1.8.3 Environmental Consequences

No Action Alternative

Under the No Action Alternative, there would be no change from existing conditions to children. Under existing conditions, there are children present within the noise region of influence (ROI). However, the largest contributors to time-averaged noise levels are other aircraft than the T-44C aircraft. Under the No Action Alternative, the T-44C aircraft would continue to operate and may contribute to the existing noise environment but would not be the largest contributor to time-averaged noise levels.

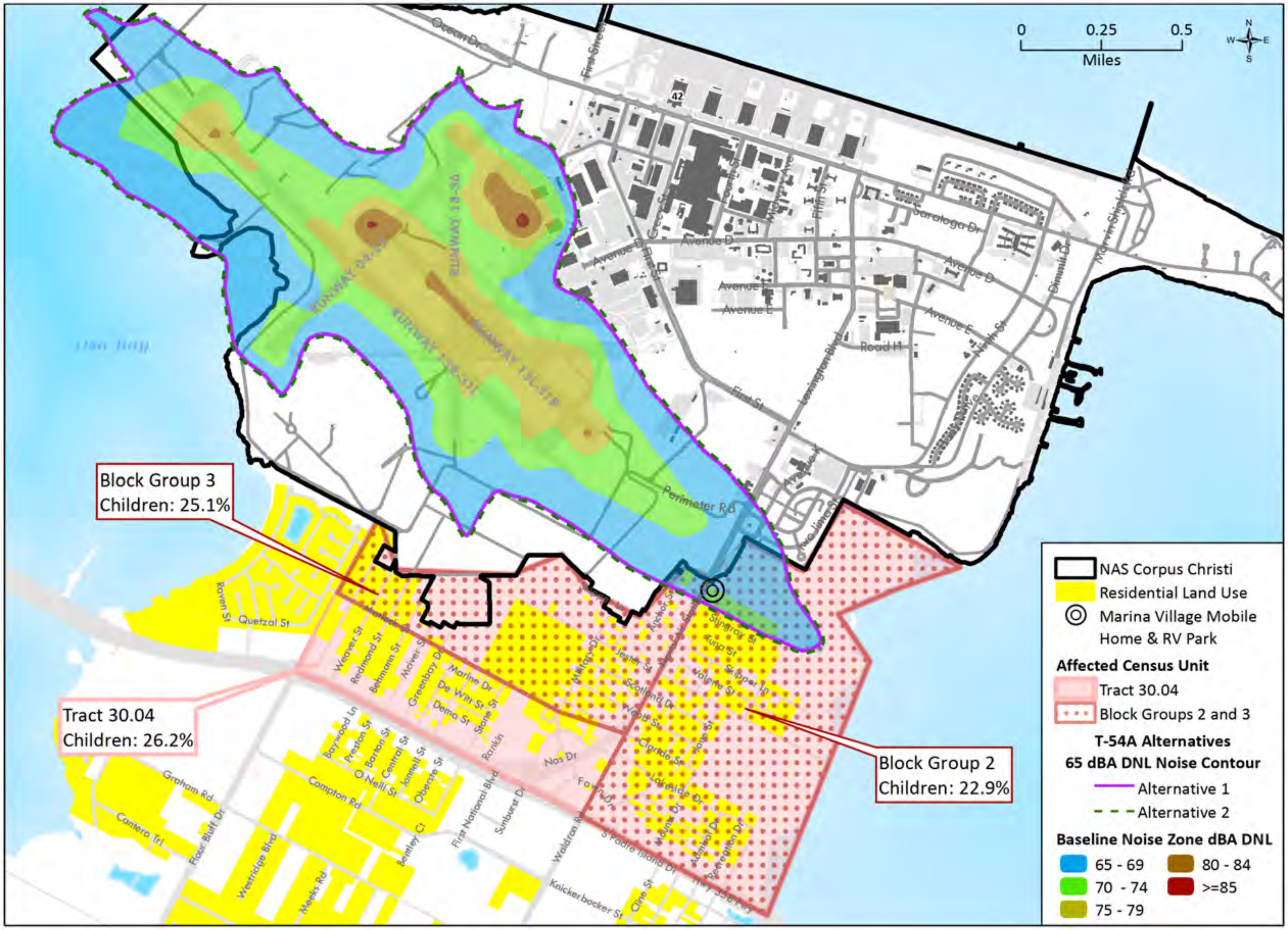

Figure 3-8 Baseline and Alternatives Noise Zones and Population of Children

There are also children located throughout the six counties within the air quality ROI. Each county is in attainment for primary and secondary National Ambient Air Quality Standards (NAAQS) thresholds, which would not change under the No Action Alternative. As such, the No Action Alternative would not result in disproportionate risks to children from environmental health risks or safety risks.

Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative)

Construction and renovation of Navy support facilities under this alternative would occur entirely at NAS Corpus Christi and, as noted in Section 3.1.7, *Environmental Consequences*, would be localized to areas on the station. Construction would not pose a risk to children since it would be located on a secure naval air station.

Table 3-18 shows the location of children within the greater than 65 dBA noise zones under all alternatives. Implementation of Alternative 1 would not result in any significant noise impacts compared to the No Action Alternative (Section 3.1.7, *Environmental Consequences*). Air emissions would increase as a result of the increase in flight operations but would be minor. As such, Alternative 1 would not result in disproportionate risks to children from environmental health risks or safety risks. In addition, the percentage of children is not meaningfully greater in Block Group 3 (25.2 percent) compared to Nueces County (24.6 percent). Therefore, no disproportionate risks to children that result from environmental health risks or safety risks would be anticipated under Alternative 1 from noise or air quality.

Table 3-18 Children within the 65 dBA DNL or Greater Noise Zones under All Alternatives

Area	*Within the Affected Area (65 dBA DNL or greater noise zones)*		
	Total Population	*Children (under 18 years)*	
		Number[1]	*Percent*[2]
No Action Alternative and Alternative 1			
CT 30.04, BG 2	78	18	22.9%
CT 30.04, BG 3	13	3	25.1%
TOTAL	91	21	23.2%
Alternative 2			
CT 30.04, BG 2	79	18	22.9%
CT 30.04, BG 3	13	3	25.1%
TOTAL	92	21	23.2%

Source: (USCB, 2020b)
Key: % = percent; BG = Block Group; CT = Census Tract; dBA = A-weighted decibels; DNL = day-night average sound level.
Notes:
1. Numbers are rounded to the nearest whole number, and totals may be subject to rounding errors.
2. Percentages are rounded to the nearest tenth, and totals may be subject to rounding errors.

Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations Potential Impacts

The study area for the protection of children analysis for the replacement of T-44C aircraft with T-54A aircraft with a 20 percent increase in operations under Alternative 2 is defined as the same study area as Alternative 1.

Alternative 2 includes the same aircraft replacement and implementation of short- and long-term projects to provide Navy support facilities as Alternative 1 but with an increase in aircraft operations of approximately 20 percent. Potential noise impacts would result in more frequent occurrences of noise events associated with an increase in operations, but noise levels would remain similar to those described under the No Action Alternative (see Section 3.1.7, *Environmental Consequences*) and would be considered minor. Air emissions would increase as a result of the increase in flight operations but would be minor. In addition, the percentage of children is not meaningfully greater in Block Group 3 (25.2 percent) compared to Nueces County (24.6 percent). Therefore, no disproportionate risks to children that result from environmental health risks or safety risks would be anticipated under Alternative 2 from noise or air quality.

3.2 Environmental Justice

USEPA defines Environmental Justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (USEPA, 2022a).

3.2.1 Regulatory Setting and Methodology

Consistent with EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (February 11, 1994), the Navy's policy is to identify and address any disproportionately high and adverse human health or environmental effects of its actions on minority and low-income populations.

The Navy followed the steps outlined in USEPA's 2016 Report, *Promising Practices for EJ Methodologies in NEPA Reviews* (USEPA, 2016), in order to determine if there would be disproportionately high and adverse effects on minority and low-income populations. These steps are summarized as follows:

- **Define the Affected Environment.** The environment of the area(s) to be affected or created by the alternatives under consideration was described.
- **Identify the Presence or Absence of Minority and Low-Income Populations.** The presence of minority and low-income populations was determined if the percentage residing within the selected geographic units of analysis (block groups) was equal to or greater than the percentage of individuals residing within the reference community (Nueces County). The low-income analysis used the Census Bureau data showing the poverty status of individuals in the past 12 months. The Census Bureau uses income thresholds that vary by family size and composition to determine who is in poverty.
- **Perform Impact Analysis.** The potential direct, indirect, and cumulative impacts on minority populations and low-income populations in the affected environment compared to the non-minority populations and non-low-income populations in the affected environment were determined that included both human health and environmental impacts from an agency's programs, policies, or activities.
- **Determine if there would be Disproportionately High and Adverse Effects on Minority and Low-Income Populations.** Disproportionately high and adverse effects were determined based on the impacts in one or more resource topics analyzed in the NEPA document. A comparison group different than the reference community was also selected to compare results.
- **Evaluate Mitigation and Monitoring.** If a potential adverse impact was identified, the agency may wish to evaluate practicable mitigating measures.

EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All* (April 21, 2023), supplements EO 12898 to address environmental justice. EO 14096 establishes a policy to pursue a whole-of-government approach to environmental justice. With respect to environmental reviews under NEPA, EO 14096 directs federal agencies to: (1) analyze direct, indirect, and cumulative effects of federal actions on communities with environmental justice concerns; (2) consider best available science and information on any disparate health effects (including risks) arising from exposure to pollution and other environmental hazards, such as information related to the race, national origin, socioeconomic status, age, disability, and sex of the individuals exposed; and (3) provide opportunities for early and meaningful involvement in the environmental review process by communities with environmental justice concerns potentially affected by a proposed action.

3.2.2 Affected Environment

3.2.2.1 Environmental Justice and Noise

This section identifies concentrations of low-income and minority populations that have the potential to be disproportionately impacted due to their proximity to the construction and operation of the Proposed Action. The affected environment, or ROI, for this environmental justice analysis regarding noise impacts includes the areas where airborne noise is equal to or greater than 65 dBA DNL associated with existing aircraft operations that extend beyond the station; NOLF; or international, regional, and publicly owned municipal airfield boundaries and into residential land use areas. DNL contours include aircraft using the air station and transient aircraft. Transient aircraft can include a variety of aircraft types, so surrogate aircraft are used to represent typical visiting aircraft.

As stated in DoD Instruction 4165.57, Air Installations Compatible Use Zones, the DoD considers some land uses to not be compatible at noise levels exceeding 65 dBA DNL. Under the Proposed Action, the 65 dBA DNL or greater noise zones would remain on Navy or airfield property for NOLF Cabaniss or any of the international, regional, and publicly owned airfields. Therefore, these facilities are not discussed further for noise impacts. This section focuses on NAS Corpus Christi (Figure 3-9). Table 3-19 presents the ethnic and poverty characteristics of the population within Block Groups 2 and 3 of Census Tract 30.04 as being partially within the 65 dBA DNL noise contour at NAS Corpus Christi. Demographic information is also presented for Nueces County, the State of Texas, and the United States. The data presented is from the U.S. Census Bureau American Community Survey (ACS) 5-year estimates from 2016 to 2020 (USCB, 2020c; USCB, 2020d). For low-income populations, the U.S. Census statistics were used in this analysis because of their ability to provide poverty estimates down to the block group level, which was not available from other sources and was consistent with the block group–level population data that were used in the noise analysis. Both populations for whom poverty status is determined and Hispanic or Latino populations by race data were collected for the analysis.

The presence of minority and low-income populations under baseline conditions was determined by comparing whether the percentage of minority and low-income individuals residing within the selected geographic units of analysis (block groups) is equal to or greater than the percentage of low-income individuals residing within the reference community (Nueces County). As shown in Table 3-19, Block Group 2 (72.4 percent) has a higher percentage of minority population compared to Nueces County (71.0 percent). Block Group 2 (23.2 percent) and Block Group 3 (40.2 percent) of Census Track 30.04 have a higher percentage of low-income individuals compared to Nueces County (16.2 percent). Therefore, minority and low-income populations are present.

Noise impacts would occur for residents living within the 65 dBA DNL or greater noise zones. An estimate of the number of residents impacted is shown in Table 3-20. Only the 65 dBA DNL noise contour is located off station property. There is a mobile home / recreational vehicle park located within the affected area where noise levels may reach up to 66.3 dBA DNL under existing conditions. Manufactured homes should be built to the Manufactured Home Construction and Safety Standards (HUD, 2022), 24 Code of Federal Regulations (CFR) part 3280, and incorporate features of conventional homes, but acoustical performance varies due to differences in roof construction, air infiltration rates, and noise-reduction standard windows and doors.

The largest contributors to time-averaged noise levels are aircraft other than the T-44C aircraft (i.e., other civilian and military aircraft operating within the noise ROI). Under the baseline conditions, the T-44C aircraft contribute to the existing noise environment but would not constitute the largest contributor to time-averaged noise levels.

Table 3-19 Demographic Data for the Block Groups Affected by the 65 dBA DNL Noise Contour

Area	*Within the Entire Area[1]*					
	Total Population	*Minority*		*Low-Income*		
		Number[1]	*Percent*	*Population for Whom Poverty is Calculated[2]*	*Number[1]*	*Percent*
BG 2, CT 30.04	913	661	72.4%	913	212	23.2%
BG 3, CT 30.04	958	576	60.1%	958	385	40.2%
CT 30.04	3,308	1,943	58.7%	3,272	986	30.1%
Nueces County	362,151	257,172	71.0%	353,849	57,299	16.2%
State of Texas	28,635,442	16,784,965	58.6%	28,013,446	3,984,260	14.2%
United States	326,569,308	130,317,933	39.9%	318,564,128	40,910,326	12.8%

Sources: (USCB, 2020c; USCB, 2020d)

Key: % = percent; BG = Block Group; CT = Census Tract; dBA = A-weighted decibels; DNL = day-night average sound level.

Notes:

1. The “number” of persons was determined by applying the percentages for each area to the total population for that area.
2. “Population for Whom Poverty is Calculated” may differ from the total population shown because it does not take into account institutionalized persons, persons in military group quarters and in college dormitories, and unrelated individuals under 15 years old.
3. Blue shading = block group percentage exceeds the percentage for the county.

Table 3-20 Environmental Justice Communities within the 65 dBA DNL Noise Contour under Baseline Conditions

Area	*Within the Affected Area*	*(65 dBA DNL or greater Noise Zones)*			
	Total Population	*Minority*		*Low-Income*	
		Number[1]	*Percent[2]*	*Number[1]*	*Percent[2]*
BG 2, CT 30.04	78	56	72.4%	18	23.2%
BG 3, CT 30.04	13	8	60.1%	5	40.2%
TOTAL	91	64	70.3%	23	25.3%

Key: % = percent; BG = Block Group; CT = Census Tract; dBA = A-weighted decibels; DNL = day-night average sound level.

Notes:

1. Numbers are rounded to the nearest whole number, and totals may be subject to rounding errors.
2. Percentages are rounded to the nearest tenth, and totals may be subject to rounding errors.

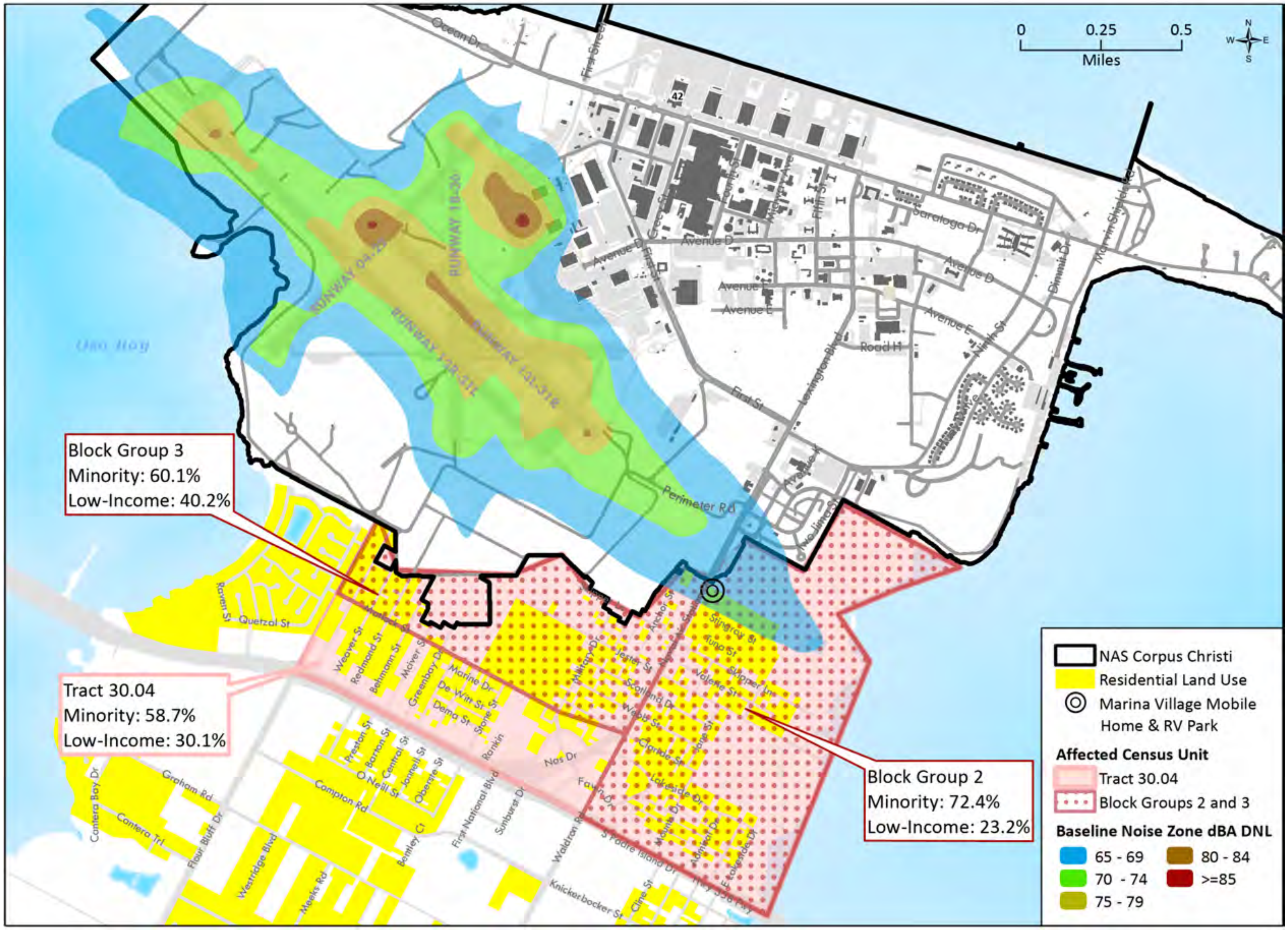

Figure 3-9 Environmental Justice Communities in the ROI at NAS Corpus Christi

To determine if disproportionately high and adverse impacts to minority populations and low-income populations would occur, a comparison group was selected to provide context for the analysis of human health effects, environmental effects, and the hazard exposure to minority and low-income populations as compared to non-environmental justice communities. Since only the 65 dBA DNL noise contour is located off station and it does not impact any non-environmental justice communities, another census tract located within noise zones was selected (Census Tract 27.08) for comparison Figure 3-10. Portions of this comparison group are located within the greater than 55 dBA DNL noise zones; it has mobile home residential land use and medium- and low-density residential land use similar to Census Tract 30.04. Table 3-21 provides the demographic data for the comparison group.

Table 3-21 Demographic Data for the Comparison Group (Census Tract 27.08) and Census Tract 30.04

Area	*Within the Entire Area*[1]					
	Total Population	*Minority*		*Low-Income*		
		Number[1]	*Percent*	*Population for Whom Poverty is Calculated*[2]	*Number*[1]	*Percent*
Comparison Group CT 27.08	4,069	2,040	50.1%	4,024	1,365	33.9%
CT 30.04	3,308	1,943	58.7%	3,272	986	30.1%
Nueces County	362,151	257,172	71.0%	353,849	57,299	16.2%

Source: (USCB, 2020e)
Key: % = percent; CT = Census Tract.
Notes:
1. The "number" of persons was determined by applying the percentages for each area to the total population for that area.
2. "Population for Whom Poverty is Calculated" may differ from the total population shown because it does not take into account institutionalized persons, persons in military group quarters and in college dormitories, and unrelated individuals under 15 years old.

USEPA's EJScreen tool was used to determine if there would be the potential for cumulative environmental justice burdens (USEPA, 2023). The tool identifies the extent to which selected areas are currently impacted by various environmental pollutants and contaminants or the extent to which selected areas are at risk of environmental impacts or have demographic populations that could be at greater risk of impacts relative to other areas statewide or nationally. This review compared the 12 EJScreen environmental justice indexes and socioeconomics indicators for Census Tract 30.04 to the characteristics of Texas. An initial filter of the environmental justice indexes identified that traffic proximity ranked in the 85th percentile, which could also contribute to noise impacts. Under current conditions, the number of off-station residents exposed to 65 dBA DNL would not change, and the contribution of T-44C aircraft to overall noise levels would remain relatively minor. Consequently, noise levels would not change under current conditions; therefore, there would not be an amplification of environmental or health effects.

Aircraft noise impacts minority and low-income populations as well as non-environmental justice communities as shown with the comparison group under existing conditions. Therefore, the Navy concludes that under baseline conditions there would not be disproportionately high and adverse effects on minority and low-income populations.

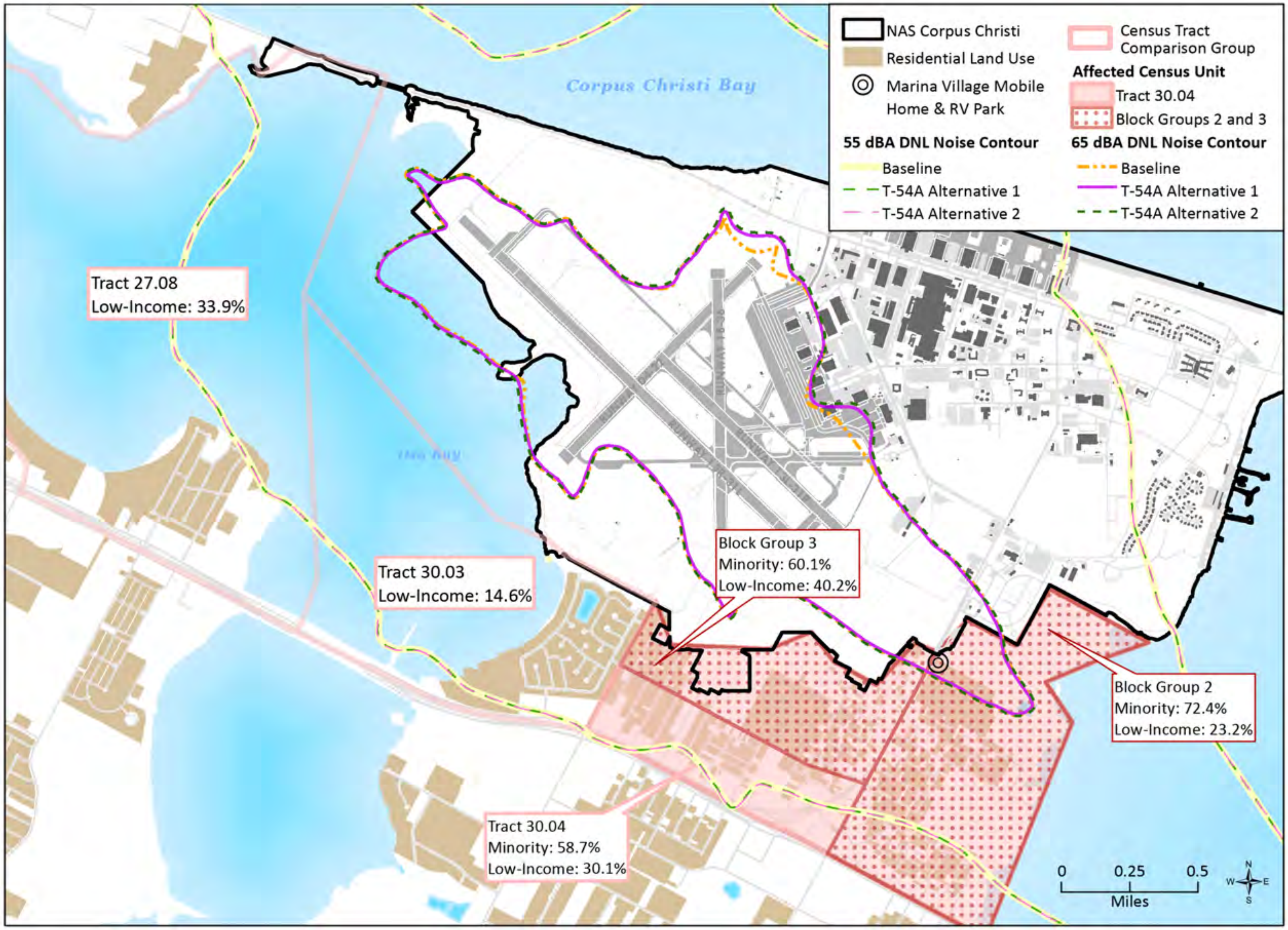

Figure 3-10 Location of Census Tracts and 55 dBA DNL or Greater Noise Zones

3.2.2.2 Environmental Justice – Air Quality

As mentioned in the analysis for noise, only the 65 dBA DNL noise contour at NAS Corpus Christi is located off-station under baseline conditions. As a result, the environmental justice air quality analysis focuses on potential air quality impacts for those block groups (Table 3-19) compared to Nueces County. Minority and low-income populations were determined to be present. To determine whether minority and low-income populations are exposed to disproportionately high and adverse impacts, a comparison group (Census Tract 27.08) was selected to provide context for the analysis of human health effects, environmental effects, and the hazard exposure to minority and low-income populations to non-environmental justice communities. Aircraft emissions impact minority and low-income populations as well as non-environmental justice communities as shown with the comparison group under existing conditions. Therefore, the Navy concluded that under baseline conditions, there would not be disproportionately high and adverse air quality effects on minority and low-income populations.

For NOLF Cabaniss and the other non-Navy airfields, the air quality section used the county as the ROI and analyzed air quality at the county level. The ethnic and poverty characteristics for each county are shown in Table 3-22. Cameron County, Jim Wells County, and Nueces County have a higher percentage of the population identified as minority than the state of Texas (USCB, 2020c). All counties within the air quality ROI, with the exception of Calhoun County, have a higher percentage of the population considered low income than the state (USCB, 2020d). Under baseline conditions all counties are in attainment for USEPA's primary and secondary NAAQS (see Section 3.5, *Air Quality*).

Table 3-22 Environmental Justice Communities within the Air Quality ROI

Area	*Within the Entire County*[1]					
	Total Population	*Minority*		*Low-Income*		
		Number	*Percent*	*Population for Whom Poverty is Calculated*[2]	*Number*	*Percent*
Calhoun County	21,470	12,551	58.5%	21,177	2,134	10.1%
Cameron County	422,135	385,192	91.2%	419,023	111,802	26.7%
Jim Wells County	40,796	33,539	82.2%	40,287	8,697	21.6%
Matagorda County	36,791	20,944	56.9%	36,375	6,519	17.9%
Nueces County	362,151	257,172	71.0%	353,849	57,299	16.2%
Victoria County	92,044	51,464	55.9%	90,520	14,221	15.7%
State of Texas	28,635,442	16,784,965	58.6%	28,103,446	3,984,260	14.2%

Sources: (USCB, 2020c; USCB, 2020d)
Key: % = percent; ROI = region of influence.
Notes:
1. Blue shading = county that has a higher percent than the state.
2. "Population for Whom Poverty is Calculated" may differ from the total population shown because it does not take into account institutionalized persons, persons in military group quarters and in college dormitories, and unrelated individuals under 15 years old.

The emissions from aircraft operations that occur under the mixing height of 3,000 AGL have the potential to affect ground-level air quality (FAA, 2005). However, aircraft and associated mobile ground-support equipment at airports produce similar emissions to on-road (automobile) and off-road (construction equipment) engines while the aircraft engines are running on the ground and during the minutes when the aircraft departs and takes off to altitude or returns to ground for a landing. Due to the direction of the prevailing winds, the ground-level emissions from aircraft takeoffs and landings would be quickly entrained downwind to the north and west. This would result in potential impacts similar to vehicle emissions along a highway, where concern would be focused on sensitive receptors immediately adjacent (within 0.25 mile) to the emission sources. The nearest sensitive receptors are located approximately 1 mile south of the proposed construction area and 0.5 mile southeast of the southernmost tip of the runway.

USEPA's EJScreen tool was used to determine if there would be the potential for cumulative environmental justice burdens (USEPA, 2023). An initial filter of the environmental justice indexes identified that particulate matter and lead paint ranked in the 80th percentile. Under current conditions, air emissions would not change; therefore, there would not be an amplification of environmental or health effects.

Air emissions would affect minority and low-income populations as well as non-environmental justice communities living close to the runways. Therefore, the Navy concludes that under baseline conditions there would not be disproportionately high and adverse effects on minority and low-income populations.

3.2.3 Environmental Consequences

This analysis focuses on whether there are disproportionately high and adverse impacts to specific off-station population groups from the Proposed Action.

3.2.3.1 No Action Alternative

Environmental Justice and Noise

Under the No Action Alternative, there would be no change to current conditions for minority and low-income populations. Therefore, there would be no disproportionately high and adverse noise impacts to minority and low-income populations with implementation of the No Action Alternative.

Environmental Justice and Air Quality

Under the No Action Alternative, there would be no change to current conditions for minority and low-income populations. Therefore, there would be no disproportionately high and adverse air quality impacts to minority and low-income populations with implementation of the No Action Alternative.

3.2.3.2 Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative)

Environmental Justice and Noise

The affected area and reference community used to determine the minority population under the affected environment and No Action Alternative is the same under Alternative 1. Alternative 1 would increase T-54A aircraft operations by 10 percent. The noise analysis (Section 3.1.7*, Noise, Environmental Consequences*) shows that there would be minor changes to noise levels (i.e., dBA DNL) at the locations studied near NAS Corpus Christi. As under the No Action Alternative, the noise levels at the mobile homes on Lexington Boulevard would remain just above 65 dBA DNL, while the noise levels at all other locations would remain below 65 dBA DNL. The number of residents within the greater than 65 dBA DNL or greater noise zones would not change compared to the No Action Alternative and would remain at 91 people (Table 3-23 and Figure 3-11). Table 3-9 shows that speech interference events per average daytime hour would increase by one or less at the locations studied.

Table 3-23 Environmental Justice Communities within the 65 dBA DNL or Greater Noise Zones under All Alternatives

Area	*Within the Affected Area (65 dBA DNL or greater Noise Zones)*				
	Total Population	*Minority*		*Low-Income*	
		Number[1]	*Percent[2]*	*Number[1]*	*Percent[2]*
No Action Alternative and Alternative 1					
CT 30.04, BG 2	78	56	72.4%	18	23.2%
CT 30.04, BG 3	13	8	60.1%	5	40.2%
TOTAL	91	64	70.3%	23	25.3%
Alternative 2					
CT 30.04, BG 2	79	57	72.4%	18	23.2%
CT 30.04, BG 3	13	8	60.1%	5	40.2%
TOTAL	92	65	70.3%	23	25.3%

Sources: (USCB, 2020c; USCB, 2020d)
Key: % = percent; BG = Block Group; CT = Census Tract; dBA = A-weighted decibels; DNL = day-night average sound level.
Notes:
1. Numbers are rounded to the nearest whole number, and totals may be subject to rounding errors.
2. Percentages are rounded to the nearest tenth, and totals may be subject to rounding errors.

This analysis shows that there are minority and low-income populations present within the greater than 65 dBA DNL noise zones near NAS Corpus Christi. Although T-54A aircraft operations would increase, only minor increases to noise levels would occur. To evaluate if noise impacts would be disproportionately high and adverse to minority and low-income populations, the impacts of the environmental justice populations in the affected environment were evaluated with a comparison group. Environmental justice communities and non-environmental justice communities would experience a minor increase in noise levels. The Navy concluded that, under Alternative 1, there would not be disproportionately high and adverse effects on minority and low-income populations.

USEPA's EJScreen tool was used to determine if there would be the potential for cumulative environmental justice burdens (USEPA, 2023). The tool identified traffic proximity ranked in the 85th percentile, which could also contribute to noise impacts. Although the aircraft and traffic noise could pose cumulative burdens, the number of off-station residents exposed to 65 dBA DNL would stay the same as under the No Action Alternative. In addition, changes in noise levels would also be minimal, because T-54A operations would occur in the context of ongoing operations of other aircraft types at NAS Corpus Christi such that the contribution of these aircraft to overall noise levels would be relatively minor. As a result, Alternative 1 would not likely pose an amplification of environmental or health effects.

With the presence of minority and low-income populations, the Navy was engaged in outreach methods, including posting the Draft EA on the project website; providing hard copies of the Draft EA in 10 libraries, some of which are located near the affected neighborhoods; and placing newspaper ads in local newspapers.

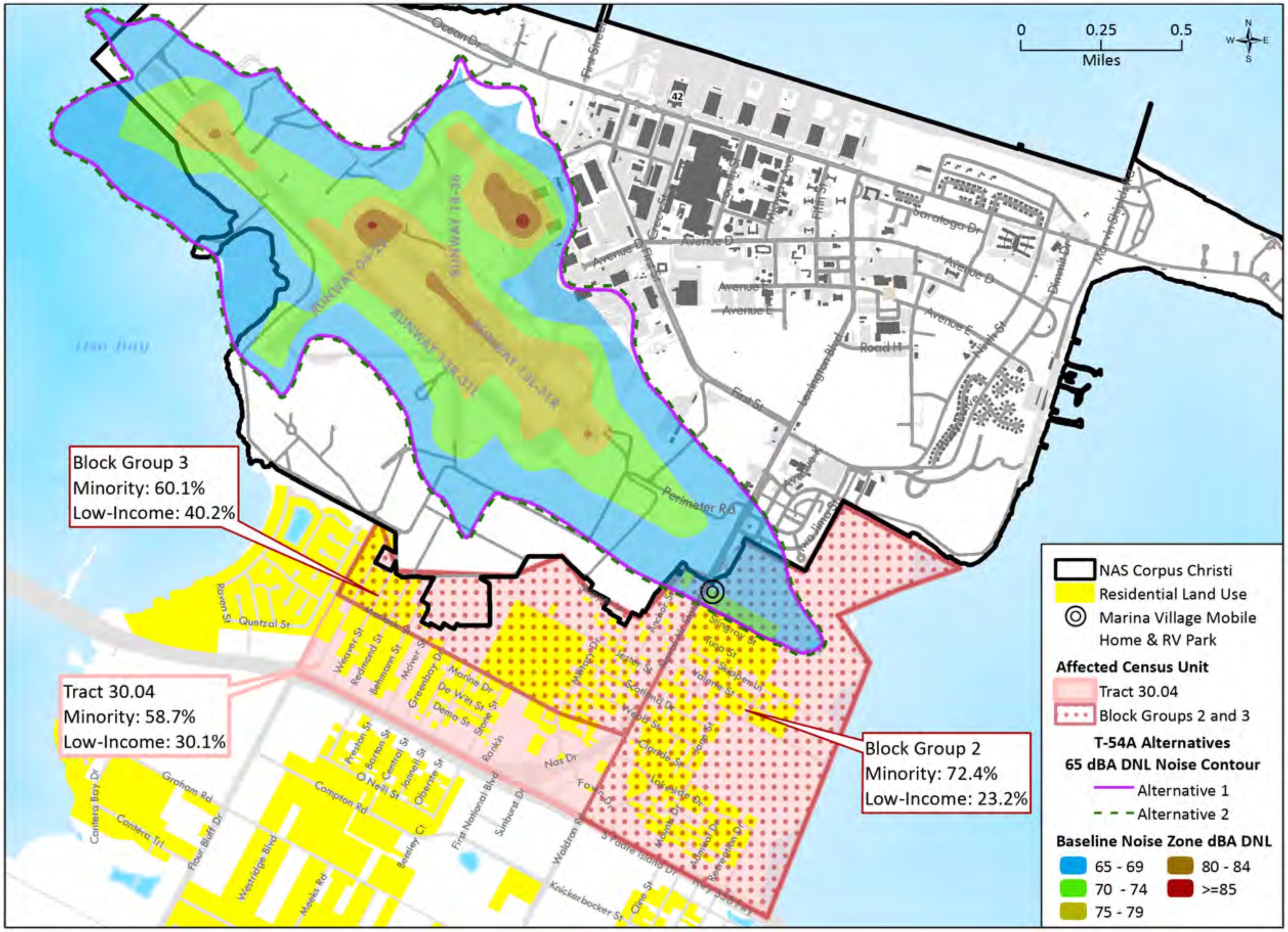

Figure 3-11 Environmental Justice Communities within the 65 dBA DNL or Greater Noise Zones under the Alternatives

Environmental Justice and Air Quality

The location of the block groups in reference to the NAS Corpus Christi temporary construction projects and long-term runway use and wind direction were evaluated to determine if air emissions would be localized in these areas. Construction air emissions would be short term and localized near the station. Due to the direction of the prevailing winds, the ground-level emissions would be anticipated to be quickly entrained downwind to the north and west of where construction would occur and away from the minority and low-income populations. The closest residential areas to the proposed construction project at Hangar 58 include the following:

- Anchor Street located approximately 1 mile south
- Lexington Boulevard located approximately 1 mile to the southeast

Implementation of Alternative 1 would result in an increase in long-term emissions from aircraft operations but would not result in emissions exceeding NAAQS thresholds. As discussed under the affected environment, a comparison group was selected to determine if impacts would be disproportionate.

In addition, the EJScreen tool was used to determine if there would be cumulative burdens (USEPA, 2023). The tool listed particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$) as an environmental index indicator for Census Tract 30.04 that was in the 85th percentile compared to Texas. The net change in $PM_{2.5}$ emissions was projected to be net less than 1 ton per year (tpy) and would not likely result in amplification of environmental or health effects. Modeled aircraft emissions would be similar to the No Action Alternative, as presented in Section 3.5.3, *Air Quality*, *Environmental Consequences*. As such, there would not be disproportionate environmental or health effects to minority and low-income populations from air quality.

3.2.3.3 Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations Potential Impacts

Environmental Justice and Noise

All aspects of Alternative 2 would be similar to that of Alternative 1, except for the tempo of T-54A aircraft operations, which would be 20 percent higher than the baseline T-44C operations tempo. As shown in Section 3.2.2, *Affected Environment*, there are minority and low-income populations present within the 65 dBA noise contour near NAS Corpus Christi. There would be minor changes to noise levels and number of residents within the 65 dBA noise contour under Alternative 2 compared to the No Action Alternative. Under Alternative 2, the estimated number of residents exposed to 65 dBA DNL noise contour would increase by 1 (92 people) compared to the No Action Alternative (91 people). Table 3-14 shows that speech interference events per average daytime hour would increase by one or less at the locations studied.

To evaluate if disproportionately high and adverse impacts to minority populations and low-income populations would occur, the impacts of the environmental justice population in the affected environment were evaluated with a comparison group. All populations would experience a minor increase in noise levels compared to the No Action Alternative. As a result, there would not be disproportionately high and adverse effects on minority and low-income populations.

USEPA's EJScreen tool was used to determine if there would be the potential for cumulative environmental justice burdens (USEPA, 2023). The tool identified traffic proximity ranked in the 85th percentile, which could also contribute to noise impacts. Although the aircraft and traffic noise could pose cumulative burdens, the number of off-station residents exposed to 65 dBA DNL would only slightly increase compared to the No Action Alternative. In addition, changes in noise levels would also be minimal, because T-54A operations would occur in the context of ongoing operations of other aircraft types at NAS Corpus Christi such that the contribution of these aircraft to overall noise levels would be relatively minor. As a result, Alternative 2 would not likely pose an amplification of environmental or health effects.

Environmental Justice and Air Quality

Under Alternative 2, there would be a temporary increase in air emissions within Nueces County during construction at NAS Corpus Christi and during aircraft operations. However, construction would be short term and localized near the station. As mentioned under Alternative 1, proposed construction projects would be located approximately 1 mile from the closest environmental justice populations.

Implementation of Alternative 2 would result in an increase in aircraft emissions based on the number of aircraft operations but would not result in emissions exceeding NAAQS thresholds.

The EJScreen tool was used to determine if there would be the potential for cumulative environmental justice burdens (USEPA, 2023). The tool listed $PM_{2.5}$ as an environmental index indicator for Census Tract 30.04 that was in the 85th percentile compared to Texas. The net change in $PM_{2.5}$ emissions was projected to be 1.56 tpy and would not likely result in amplification of environmental or health effects. Modeled aircraft emissions from the T-54A aircraft show a minor increase over the No Action Alternative as presented in Section 3.5.3, *Air Quality*, *Environmental Consequences.* As such, there would not be disproportionate environmental or health effects to minority or low-income populations from air quality.

3.3 Biological Resources

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal.

Within this EA, biological resources analysis focuses on terrestrial wildlife. Threatened, endangered, and other special status species are discussed in their respective categories. The Proposed Action would not disturb or build on any natural or vegetated areas. All ground disturbance and construction would occur on previously developed land. Flight components of the Proposed Action would not affect vegetation. Therefore, terrestrial vegetation was not analyzed in this EA.

3.3.1 Regulatory Setting

3.3.1.1 Federal Regulations

Special status species, for the purposes of this assessment, are those species listed as threatened or endangered under the Endangered Species Act (ESA) and species afforded federal protection under the Bald and Golden Eagle Protection Act (BGEPA) and the Migratory Bird Treaty Act (MBTA).

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species or result in the destruction or adverse modification of designated critical habitat. Critical habitat cannot be designated on any areas owned, controlled, or designated for use by the DoD where an Integrated Natural Resources Management Plan has been developed that, as determined by the Department of Interior, provides a benefit to the terrestrial species subject to critical habitat designation.

Bald (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are protected by the BGEPA. This act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald and golden eagles, including their parts, nests, or eggs. The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

Birds, both migratory and most native-resident bird species, are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186, *Migratory Bird Conservation*. Under the MBTA it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation. The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of birds protected by the MBTA during authorized military readiness activities. "Military readiness activity" is defined in the Authorization Act to include all training and operations of the Armed Forces that relate to combat, and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. The final rule authorizing the DoD to take birds protected by the MBTA in such cases includes a requirement that the Armed Forces must confer with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the proposed action if the action will have a significant negative effect on the sustainability of a population of a bird species protected by the MBTA.

3.3.1.2 State Regulations

Texas Parks and Wildlife Department (TPWD) regulations prohibit the taking, possession, transportation, or sale of any of the animal species designated by state law as endangered or threatened without the issuance of a permit. Some species listed as threatened or endangered under state law are also listed under federal regulations.

State-listed species are protected under Title 31, Texas Administrative Code, and Chapters 67 and 68 of the TPWD Code. Texas's endangered species laws are preempted by the ESA as applied to the federal government and are not binding upon the Navy. However, through implementation of the NAS Corpus Christi Integrated Natural Resources Management Plan (Navy, 2016), the Navy recognizes and takes actions to protect state-listed species on its installations when practicable and compatible with mission readiness. In accordance with the Chief of Naval Operations Manual OPNAV M-5090.1 (Series), Chapter 12, potential effects on state-listed species and their habitats shall be evaluated and mitigations proposed in environmental planning documents as appropriate.

3.3.2 Affected Environment

The following provides a description of the existing conditions for biological resources at NAS Corpus Christi, NOLF Cabaniss, and international, regional, and publicly owned municipal airfields. The ROI for biological resources includes NAS Corpus Christi, NOLF Cabaniss, Alice International Airport, Calhoun County Airport, Corpus Christi International Airport, Palacios Municipal Airport, Port Isabel-Cameron County Airport, Valley International Airport, Victoria Regional Airport, and the transit flights between them.

3.3.2.1 Terrestrial Wildlife

The term wildlife includes all animal species (e.g., insects and other invertebrates, fish, amphibians, reptiles, birds, and mammals). Analysis of impacts to wildlife focuses on the species and habitat features of greatest importance or interest—in this case, wildlife that inhabits or occurs at the airfields. Because most birds are protected by the MBTA, birds are discussed in Section 3.3.2.2, *Special Status Species and Habitats*. Impacts to wildlife from aircraft noise, construction, recapitalization, and demolition (and associated noise) are also evaluated.

Airfields are utilized as habitat by wildlife for a number of reasons, such as breeding, hiding from predators, resting, and finding water. However, the primary attractant is food (DeVault & Washburn, 2013). Mammalian species that occur or may occur on or around the airfield at NAS Corpus Christi and NOLF Cabaniss likely include common commensal and nuisance species such as coyote (*Canis latrans*), eastern cottontail rabbit (*Sylvilagus floridanus*), rodents (e.g., Norway rat [*Rattus norvegicus*], roof rat [*R. rattus*], house mouse [*Mus musculus*]), whitetail deer (*Odocoileus virginianus)*, javelina (*Tayassu tajucu*), and wild hogs (*Sus scrofa*) (Navy, 2016). Maritime pocket gophers (*Geomys personatus maritimus*) occur in or around the airfield at NAS Corpus Christi. Wildlife at NAS Corpus Christi and NOLF Cabaniss would be exposed to the greatest baseline noise conditions. As NAS Corpus Christi and NOLF Cabaniss have been in operation for some time (since 1941), it is assumed that the wildlife at these airfields would have some degree of acclimatization and tolerance to airfield operations.

Terrestrial wildlife at the international, regional, and publicly owned airports is likely limited to similar animals that are found on NAS Corpus Christi, as land use surrounding the airfields consists primarily of agricultural and developed lands, with the exception of Port Isabel-Cameron County Airport, which is bordered to the northeast by the Laguna Atascosa National Wildlife Refuge. However, all of the airfields are fenced to exclude wildlife, and the vegetation within the airfields is maintained to deter wildlife use.

BASH data obtained for NAS Corpus Christi, NOLF Cabaniss, Corpus Christi International Airport, Palacios Municipal Airport, Valley International Airport, and Victoria Regional Airport from August 2020 through July 2022 (24 months) did not record non-bird terrestrial wildlife struck by aircraft.

3.3.2.2 Special Status Species and Habitats

Birds Covered by the Migratory Bird Treaty Act

As part of the Central Flyway of North America, the Texas coastal region is used by North American birds protected by the MBTA that overwinter in Central and South America. During the spring migration, the Texas coastal forests, grasslands, and marshes are important resting and feeding locations for many bird species. Texas coastal and grassland habitats provide important nesting and feeding areas for more than 330 species of songbirds, waterfowl, raptors, wading birds, and shorebirds. Surveys have identified 103 bird species at NAS Corpus Christi, and approximately 235 more bird species have the potential to occur (Navy, 2016).

NAS Corpus Christi implements a BASH Plan to reduce the potential for collisions and encompasses all actions that may identify, reduce, or eliminate bird and animal hazards to aviation. The BASH Plan also includes habitat alterations near the airfield to make the area less attractive to birds (Navy, 2016).

The most common types of birds struck by Navy aircraft at Navy airfields are gulls and terns (family Laridae); waterfowl (ducks, geese, and swans [family Anatidae]); long-legged wading birds (herons and egrets [family Ardeidae]); raptors (hawks, kites, and eagles [family Accipitridae]); falcons [family Falconidae]; vultures (family Cathartidae); wild turkey, quail, and pheasants (family Phasianidae); sandpipers and shorebirds (family Scolopacidae); owls (families Strigidae and Tytonidae); goatsuckers, nighthawks, whippoorwills, and nightjars (family Caprimulgidae); woodpeckers (family Picidae); flycatchers (family Tyrannidae); horned larks (family Alaudidae); swallows (family Hirundinidae); swifts (family Apodidae); crows and ravens (family Corvidae); blackbirds, grackles, meadowlarks, and cowbirds (family Icteridae); starlings (family Sturnidae); and house sparrows (family Passeridae) (Navy, 2016). Many of these birds, with a few exceptions, are protected by the MBTA.

BASH data collected at NAS Corpus Christi and NOLF Cabaniss from August 2020 through July 2022 (24 months) recorded 294 bird strikes. Of remains that could be identified, "perching birds" made up 57 percent of strikes, followed by gulls and terns (14 percent); hummingbirds (10 percent); doves and pigeons (9 percent); hawks, kites, and eagles (2 percent); a nightjar; a bobwhite quail; and an egret. The T-44C aircraft was attributed to 91 of these incidents. Assuming all strikes occurred during airfield operations (some were recorded as occurring in flight), and using combined annual operations numbers for NAS Corpus Christi and NOLF Cabaniss of 218,000, approximately one bird strike occurs for every 1,483 airfield operations (Block, 2022).

The international, regional, and publicly owned municipal airfields would be expected to present similar BASH hazards to wildlife as NAS Corpus Christi and NOLF Cabaniss. Due to their proximity to and location within the Central Flyway, these airfields would be expected to feature similar species to those found at NAS Corpus Christi and NOLF Cabaniss. A review of wildlife strike data submitted to the FAA for Corpus Christi International Airport for the same time period shows that 257 birds were struck (used maximum number, since FAA reporting uses a range for the number of birds [e.g., 2 to 10, 11 to 100]). Palacios Municipal Airport recorded 45 birds struck, Valley International Airport reported 45, and Victoria Regional Airport reported 12 for the same time period (FAA, 2022). No data was available for the other airfields used for T-44C aircraft training.

The FAA requires airport sponsors to maintain a safe operating environment, which includes conducting Wildlife Hazard Assessments and preparing Wildlife Hazard Management Plans when there has been a significant wildlife strike. The Wildlife Hazard Management Plan identifies the specific actions the airport takes to mitigate the risk of wildlife strikes on or near the airport.

Birds of Conservation Concern, Bald and Golden Eagles

The USFWS Information for Planning and Consultation (IPaC) web application also identifies birds of conservation concern because they occur either on the USFWS Birds of Conservation Concern list or because they warrant special attention in the ROI. The Birds of Conservation Concern list identifies the migratory and nonmigratory bird species (beyond those already designated as federally threatened or endangered) that represent the highest conservation priorities. The list is based on an assessment of several factors including population abundance and trends, threats on breeding and nonbreeding grounds, and size of breeding and nonbreeding ranges. The IPaC identified 47 species within the ROI. Appendix B, *Special Status Species Documentation*, contains the IPaC report that features the complete list of birds of conservation concern. Of note, one species, painted bunting (*Passerina ciris*), has been documented as occurring at NOLF Cabaniss (Navy, 2016) but was not included on the IPaC-generated list. This species is a USFWS bird of conservation concern species for the region, is globally secure, and apparently secure at the state level (USFWS, 2021a; NatureServe Explorer, 2022). Of the recorded/reported bird strikes from August 2020 through July 2022, only one was a bird of conservation concern, a single American golden plover (*Pluvialis dominica*), which was struck in flight on April 2021 by a T-6 aircraft at NAS Corpus Christi (Block, 2022).

Golden eagles are not expected to occur regularly in the ROI and do not nest in the ROI. Golden eagles typically occur in the Texas panhandle and western Texas (Texas A&M, 2022). Bald eagles do occur and do nest in the ROI. No bald eagles or their nests have been recorded at NAS Corpus Christi or NOLF Cabaniss. Bald eagle nests have been identified in the vicinity of Victoria Regional Airport, Palacios Municipal Airport, and Calhoun County Airport, but none are closer than 7 miles from these airfields (iNaturalist, 2022).

Federal Threatened and Endangered Species

The USFWS IPaC web application was used to identify federally threatened, endangered, proposed, and candidate species that could potentially occur within the ROI (USFWS, 2022a). Table 3-24 lists these federally listed species along with their state status.

Of the 22 federally listed species that have the potential to occur in the ROI, only two avian species, the piping plover (*Charadrius melodus*) and the red knot (*Calidris canutus rufa*), have been observed at NAS Corpus Christi. These species have not been observed at NOLF Cabaniss (no protected species have been recorded at NOLF Cabaniss) (Navy, 2016). No threatened or endangered species were recorded in BASH data for NAS Corpus Christi or NOLF Cabaniss or any of the airports that had FAA data (Block, 2022; FAA, 2022). In their wintering areas, piping plovers and red knots typically prefer coastal marine and estuarine habitats with areas of exposed intertidal sediments.

The piping plover is a federally threatened bird that is known to inhabit sandy beaches in San Patricio and Nueces Counties, Texas. This species is threatened throughout much of its range primarily due to the loss of its preferred nesting sites as a result of human activities. A small number of these birds have been observed regularly along the western side of Oso Bay, adjacent to the eastern boundary of NAS Corpus Christi. In July 2001, the USFWS designated 142 areas as critical habitat for wintering populations of the piping plover (66 FR 36038-36086). Two of these areas are located in Oso Bay adjacent to the station. Piping plover critical habitat is also found elsewhere in the ROI (Figure 3-12).

The federally threatened red knot faces threats from habitat loss and from several pervasive, climate-driven ecosystem changes. Additional threats include hunting, algal blooms, predation, human disturbance, and development (USFWS, 2020). Critical habitat has been proposed for this species in the ROI (86 FR 37410-37668) and will largely overlap with piping plover critical habitat (Figure 3-12); however, it has not been finalized and map data is not yet available.

Four other federally listed avian species have the potential to occur in the ROI, the northern aplomado falcon (*Falco femoralis septentrionalis*), whooping crane (*Grus americana*), eastern black rail (*Laterallus jamaicensis* spp. *Jamaicensis),* and Attwater's greater prairie-chicken (*Tympanuchus cupido attwateri*). The northern aplomado falcon and whooping crane may migrate through or stop over the airfields and are at risk of potential collision impacts with aircraft. The Attwater's greater prairie-chicken was listed in the USFWS IPaC report for Victoria Regional Airport; however, according to other USFWS resources, it occurs in the wild at only three locations: (1) the Attwater Prairie Chicken National Wildlife Refuge (Colorado County, Texas), (2) the Texas City Prairie Preserve (Galveston County, Texas), and (3) a private ranch in Goliad County, Texas (USFWS, 2021b). All of these locations are far removed from the Proposed Action airfields. No federally listed species were recorded in the bird strike data for NAS Corpus Christi or NOLF Cabaniss and the Proposed Action airports that reported data to the FAA from August 2020 through July 2022 (Block, 2022; FAA, 2022). The northern aplomado falcon, eastern black rail, and Attwater's greater prairie-chicken do not have designated critical habitat. The whooping crane has designated critical habitat within the ROI (Figure 3-12).

Table 3-24 Threatened, Endangered, Proposed, and Candidate Species that Could Potentially Occur within the ROI

Common Name	***Scientific Name***	***Federal Listing Status[1]***	***State Listing Status[2]***	***Critical Habitat Within the ROI?[3]***	***Potential Occurrence (by Airport Code)***
Plants					
Black lace cactus	*Echinocereus reichenbachii* var. *albertii*	Endangered	Endangered	-	ALI, NGW, NGP, CRP
Slender rushpea	*Hoffmannseggia tenella*	Endangered	Endangered	-	NGW, NGP, CRP
South Texas ambrosia	*Ambrosia cheiranthifolia*	Endangered	Endangered	-	ALI, NGW, NGP, CRP, PIL, HRL
Texas ayenia	*Ayenia limitaris*	Endangered	Endangered	-	PIL, HRL
Invertebrates					
Monarch butterfly	*Danaus plexippus*	Candidate	-	-	ALI, NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
False spike clam	*Fusconaia mitchelli*	Proposed Endangered	-	-	PKV
Guadalupe orb clam	*Cyclonaias necki*	Proposed Endangered	Threatened	-	VCT, PKV
Birds					
Attwater's greater prairie-chicken	*Tympanuchus cupido attwateri*	Endangered	Endangered	-	VCT
Eastern black rail	*Laterallus jamaicensis* spp. *jamaicensis*	Threatened	Threatened	-	NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
Northern aplomado falcon	*Falco femoralis septentrionalis*	Endangered	Endangered	-	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Piping plover	*Charadrius melodus*	Threatened	Threatened	Yes	ALI, NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
Red knot	*Calidris canutus rufa*	Threatened	Threatened	Yes (Proposed)	ALI, NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
Whooping crane	*Grus americana*	Endangered	Endangered	Yes	ALI, NGP, NGW, PKV, CRP, PSX, VCT
Mammals					
Gulf coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	Endangered	Endangered	-	PIL, HRL
Ocelot	*Leopardus pardalis*	Endangered	Endangered	-	ALI, CRP, NGP, NGW, PIL, HRL

Table 3-24 Threatened, Endangered, Proposed, and Candidate Species that Could Potentially Occur within the ROI

Common Name	*Scientific Name*	*Federal Listing Status*[1]	*State Listing Status*[2]	*Critical Habitat Within the ROI?*[3]	*Potential Occurrence (by Airport Code)*
Tricolored bat	*Perimyotis subflavus*	Proposed Endangered	-	-	ALI, PKV, PIL, PSX, CRP, NGP, NGW, VCT
West Indian manatee	*Trichechus manatus*	Endangered	Endangered	None	CRP, NGP, NGW, PKV, PSX, PIL
Reptiles					
Green sea turtle	*Chelonia mydas*	Threatened	Threatened	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	Endangered	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	Endangered	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	Endangered	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Loggerhead sea turtle	*Caretta caretta*	Threatened	Threatened	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL

Sources: (TPWD, 2022a; USFWS, 2022a)

Key: ALI = Alice International Airport; CRP = Corpus Christi International Airport; HRL = Valley International Airport; NGP = NAS Corpus Christi; NGW = Naval Outlying Landing Field Cabaniss; PIL = Port Isabel-Cameron County Airport; PKV = Calhoun County Airport; PSX = Palacios Municipal Airport; ROI = region of influence; VCT = Victoria Regional Airport.

Blue shading indicates that the species is being carried forward for analysis.

Notes:

1. Federally listed species are those designated as threatened, endangered, or candidate species by the Endangered Species Act. These species and locations were determined based on the U.S. Fish and Wildlife Service Information for Planning and Conservation tool (USFWS, 2022a).
2. State-listed species are those designated as threatened or endangered by the Texas Parks and Wildlife Department (TPWD). These species statuses and locations were determined based on the TPWD Annotated County Lists of Rare Species (TPWD, 2022a).
3. If blank (-), then Critical Habitat has not been designated for the species. If "None," then Critical Habitat has been designated, but it is not located within the ROI.

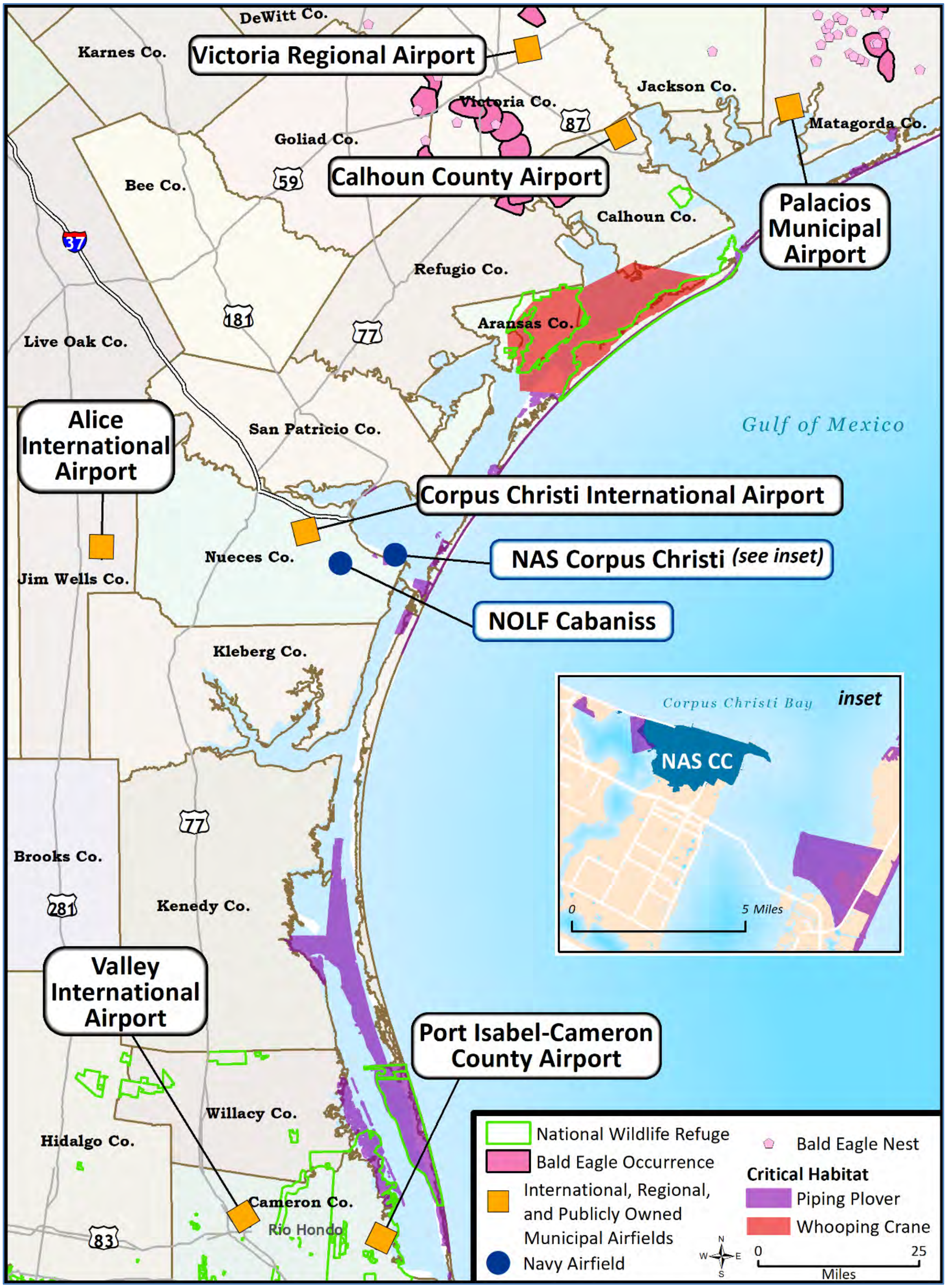

Figure 3-12 Location of Navy, International, Regional, and Publicly Owned Municipal Airfields and Bird Critical Habitats in the ROI

Of the non-bird federally listed species, four are plants, two are clams, one is an insect, five are sea turtles, one is a marine mammal, and three are land mammals. The plants, clams, insect, sea turtles, and marine mammal are not present within the Proposed Action airfields. One of the land mammals, the jaguarundi (*Herpailurus yagouaroundi cacomitli*), is extinct in Texas, and the other, the ocelot (*Leopardus pardalis*), is believed to have fewer than 100 individuals in two separate populations in southern Texas—one in Laguna Atascosa National Wildlife Refuge in Cameron County and the other on private ranchland in Willacy County. Automobile collisions make up 40 percent of ocelot mortalities for the Laguna Atascosa National Wildlife Refuge population. No records of ocelot aircraft strikes at Port Isabel-Cameron County Airport, which abuts the Laguna Atascosa National Wildlife Refuge, were located.

State-Listed Species

The TPWD Annotated County List of Rare Species was accessed to identify species protected under TPWD Code and Sections 69.01–69.9 (Endangered, Threatened, and Protected Native Plants) of the Texas Administrative Code that could potentially occur within the ROI (TPWD, 2022a). The complete lists of special status species found in the counties where the airfields are located are included in Appendix B, *Special Status Species Documentation*. Species that have been confirmed to occur at NAS Corpus Christi include the white-tailed hawk (*Geranoaetus albicaudatus*), reddish egret (*Egretta rufescens*), and white-faced ibis (*Plegadis chihi*), which are listed as threatened in the State of Texas.

The painted bunting, listed as threatened, has been recorded at NOLF Cabaniss (Navy, 2016). Two threatened reptile species are also known to occur at NAS Corpus Christi, including the Texas tortoise (*Gopherus berlandieri*) and Texas horned lizard (*Phrynosoma cornutum*). None of these species were recorded in the bird strike data from August 2020 through July 2022 (Block, 2022; FAA, 2022). No other data confirming presence of state-listed species for the other airfields was located.

3.3.2.3 Species Not Carried Forward for Impact Analysis

Twenty-two federally listed species have the potential to occur in the Action Area. This EA analyzes potential impacts to six species (the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat). Species not carried forward for impact analysis and the reasons why are described below.

The plants identified in Table 3-24 do not occur within any of the affected environment airfields and would not be affected by overflights of the T-44C or T-54A. Therefore, there would be no effect on the black lace cactus, the slender rushpea, the south Texas ambrosia, and the Texas avenia.

Similarly, the two clam species do not occur within any of the affected environment airfields and would not be affected by overflights of the T-44C or T-54A. Therefore, the affected environment would have no effect on the false spike clam and the Guadalupe orb clam.

Habitat for the Monarch butterfly, which requires a diverse assemblage of nectar resources as well as milkweed for laying eggs and larval sustenance, does not occur on the affected environment airfields and this species is not expected to be affected by T-44C or T-54A flights. Therefore, the affected environment would have no effect on the Monarch butterfly.

Nesting habitat for the five sea turtle species does not exist at any of the affected environment airfields. In addition, the most intense underwater noise from subsonic aircraft is less than the behavioral response threshold for sea turtles (166 dB RMS re 1 µPa)[1] (Laney & Cavanagh, 2000). Note that the modeled subsonic aircraft from Laney & Cavanagh (2000) was an F-18 flying subsonic, which is much louder than a T-54A at any speed. Additionally, the sound frequencies associated with these pressures would possibly be below the in-air and in-water hearing sensitivity ranges for sea turtles (Bartol & Ketten, 2006; Piniak et al., 2016), reducing the likelihood of a behavioral reaction. Finally, the sound profiles of the T-44C or the new aircraft (T-54A) would be virtually the same; therefore, the affected environment would have no effect on the green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles.

The Attwater's prairie chicken is found in three locations in Texas: the Attwater's Prairie Chicken National Wildlife Refuge (Colorado County, Texas), the Texas City Prairie Preserve (Galveston County, Texas), and a private ranch in Goliad County, Texas (USFWS, 2021a). All of these locations are far removed from the affected environment airfields. Therefore, there would be no effect on the Attwater's prairie chicken.

West Indian manatees are infrequent visitors to the ROI and are considered extralimital. Individuals occurring are likely vagrants from the Mexico or Florida populations (Schmidly & Bradley, 2023). Overflights of the T-44C or T-54A would not be expected to disturb West Indian manatees, as flights would be conducted at altitudes higher than those shown to elicit responses in this species (over 600 feet AGL) (Rathbun, 1988). Therefore, there would be no effect on the West Indian manatee.

The ocelot is believed to have fewer than 100 individuals in two separate populations in southern Texas—one in Laguna Atascosa National Wildlife Refuge in Cameron County and the other on private ranchland in Willacy County. In south Texas, ocelots occupy dense thornscrub communities (USFWS, 2016). Primary threats facing ocelots include habitat loss, conversion, fragmentation, and commercial exploitation and hunting (USFWS, 2016). Automobile collisions make up 40 percent of ocelot mortalities within the Laguna Atascosa National Wildlife Refuge population (Blackburn et al., 2021). The Port Isabel-Cameron County Airport directly abuts the Laguna Atascosa National Wildlife Refuge, one of two locations where populations of the ocelot exist in Texas. Records of aircraft ocelot strikes have not been recorded in the literature, and aircraft noise would not be expected to affect ocelots at the refuge. Aircraft noise has not been named as a stressor or threat for this species. The greatest threat to ocelots at the Laguna Atascosa National Wildlife Refuge is collisions with automobiles. Therefore, there would be no effect on the ocelot.

The final species not carried forward, the jaguarundi, is extinct in Texas (Schmidly & Bradley, 2023). The last verified sighting of a jaguarundi in Texas occurred in 1986. A survey for jaguarundis from 2003 to 2021 across southern Texas and northern Tamaulipas, Mexico, did not record any jaguarundis in Texas and concluded that jaguarundis were likely extirpated from Texas (Lombardi et al., 2022). Therefore, there would be no effect on the jaguarundi.

3.3.3 Environmental Consequences

The following discussion and analysis focus on impacts from increases in flight operations and the construction of short- and long-term construction projects for Navy support facilities at NAS Corpus

[1] Underwater sound threshold is measured in decibels using root-mean-square (RMS) pressure as referenced to a pressure of 1 microPascal (µPa) (University of Rhode Island and Inner Space Center, 2021).

Christi. As stated in Section 3.3.2, *Affected Environment*, the ROI for biological resources includes NAS Corpus Christi, NOLF Cabaniss, Alice International Airport, Calhoun County Airport, Corpus Christi International Airport, Palacios Municipal Airport, Port Isabel-Cameron County Airport, Valley International Airport, Victoria Regional Airport, and the transit flights between them.

Biological Resource Potential Impacts:

No Action Alternative

- No change in existing aircraft operations or BASH impacts on birds covered by the MBTA.

Alternatives 1 and 2

- Construction projects would include demolishing or recapitalizing buildings that may contain active bird nests within the buildings or on the rooftop. Construction, to the extent feasible, would take place outside of the breeding season. If work must be conducted during the bird breeding season, a qualified biologist must confirm that no active nest would be impacted by these actions. Therefore, with implementation of these measures, construction activities would avoid or minimize incidental takes of birds protected under the MBTA (including Birds of Conservation Concern) or their active nests.
- Minor increase in aircraft operations. No changes to existing flight paths, procedures, or habitat. Operations would be conducted in accordance with BASH Plan to minimize impacts.
- For aircraft operations, takes of birds covered under the MBTA would be incidental from military readiness activities and would not result in significant adverse impacts on their population.
- May affect, but is not likely to adversely affect, the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat. For all other federally listed species identified with potential to occur within the ROI, the Navy has determined that there would be no effect.

3.3.3.1 No Action Alternative

Under the No Action Alternative, there would be no change to current conditions for biological resources. Therefore, no significant impacts to biological resources would occur with implementation of the No Action Alternative.

3.3.3.2 Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative)

The ROI for the analysis of effects to biological resources associated with Alternative 1 includes NAS Corpus Christi, NOLF Cabaniss, Alice International Airport, Calhoun County Airport, Corpus Christi International Airport, Palacios Municipal Airport, Port Isabel-Cameron County Airport, Valley International Airport, Victoria Regional Airport, and the transit flights between them.

Terrestrial Wildlife

Construction noise and activity would be localized, short term, and only during daylight hours. The project area is developed military industrial land subject to high noise and activity levels. Wildlife in or immediately adjacent to the project area are exposed to elevated noise under baseline conditions from aircraft operations, ground vehicle operations (fueling trucks, tractors, fire trucks, airfield vegetation maintenance vehicles [tractors and mowers], light duty vehicles, etc.), and other activities typical of busy airfields. The temporary addition of localized construction noise and activity would not reduce the suitability of the project area for wildlife at NAS Corpus Christi.

Air operations under Alternative 1 would increase by 10 percent. Terrestrial species at NAS Corpus Christi, NOLF Cabaniss, and the international, regional, and publicly owned municipal airfields proposed for increased operations are already exposed to noise from existing air operations. As indicated in Section 3.1, *Noise*, there would be extremely small changes in noise associated with the proposed increase in airfield operations at any of the locations as compared with baseline conditions and ambient noise levels would not significantly increase. As described in Section 3.1, *Noise*, noise levels would slightly increase (0.4 dBA DNL) over baseline conditions at NOLF Cabaniss, indicating a perhaps imperceptible increase in noise exposure for wildlife. However, noise levels would not exceed ambient levels (e.g., typically around 40 to 55 dBA DNL) except on the airfield itself (both developed areas and vegetated areas where the vegetation is currently managed in accordance with the BASH Plan in order to deter wildlife).

The preceding discussion focused on DNL noise levels; however, the DNL metric is used to reflect a person's cumulative exposure to sound over a 24-hour period and not wildlife. Individual sound events may be more relevant when discussing impacts on wildlife and are discussed here, notably maximum noise events associated with airfield operations (low-level flights). However, because of the similarity between the two aircraft, maximum noise levels associated with individual overflights of the T-54A would be the same at the T-44C. Reactions of wildlife to noise from overflights from the T-54A would be assumed to be the same as reactions to overflights from the T-44C. The T-54A would not be as loud as the T-6B or transient aircraft such as the F/A-18C.

Not all species have been studied for their behavioral or physiological responses to noise. The following presents a literature review on the general effects of flight noise and noise in general from which a general understanding may be attained on the potential effects to exposed species.

For wildlife, an animal's response to unusual sounds (above ambient levels) may include displacement or avoidance of affected areas, increased vigilance, changes in foraging behavior, habitat selection, mate attraction, and parental investment (Frid & Dill, 2002; Shannon et al., 2016), in addition to changes in the animal's sound sensing and response behavior. While difficult to measure in the field, behavioral responses are assumed to be accompanied by some form of physiological response (Frid & Dill, 2002). Noise and other disturbances can also distract wildlife, taking their attention away from other key functions and behaviors, such as predator awareness (Chan & Blumstein, 2011; Francis & Barber, 2013).

Studies addressing reptile responses to noise, especially aircraft noise, are extremely limited. In general, reptiles have narrower hearing ranges than mammals and birds but are highly sensitive to vibrations (Bowles, 1995). Desert tortoises (*Gopherus agassizii*), a close relative of the Texas tortoise, are one of only a few reptiles for which aircraft disturbance effects have been studied (Bowles et al., 1999; Efroymson et al, 2001). Desert tortoises became motionless in response to being startled but habituated to aircraft noises quickly. No significant physiological changes in response to noise were documented.

There are a wide variety of terrestrial mammals in the ROI, ranging from small rodents to large game animals such as white-tailed deer. The hearing capabilities of these species vary, but, generally, larger animals tend to have better hearing at lower frequencies, while smaller animals often have better hearing at high frequencies (Heffner et al., 2001; D'Angelo, 2007). A review by Shannon et al. (2016) of the research documenting the effects of noise on wildlife indicates that the response of terrestrial mammals depends on a number of factors, including the life history characteristics of the species, characteristics of the noise-generating activities, habitat type, and the species' previous exposure to the noise source. Several other studies indicate a strong tendency for many species to acclimate or habituate to noise disturbances (Black et al., 1984; Ellis et al., 1991; Grubb & King, 1991; Conomy et al., 1998).

Wildlife inhabiting these highly disturbed and human-maintained areas in the ROI would be expected to be habituated to human disturbances to some degree. The nonsignificant increases in noise would not be expected to significantly affect terrestrial wildlife species. Overflights by T-54A aircraft outside of the airfields along flight paths would not be expected to affect any terrestrial wildlife species, as there would be negligible noise and visual stimuli due to the aircraft operating at several thousand feet in altitude and no strike risk. Therefore, there would be no significant impacts to terrestrial wildlife from aircraft operations under Alternative 1.

Birds Covered by the Migratory Bird Treaty Act (Including Birds of Conservation Concern) and Bald and Golden Eagles

Under Alternative 1, proposed construction projects would demolish buildings that may contain active bird nests within the buildings or on the rooftop. Pursuant to EO 13186, the USFWS and DoD entered into a Memorandum of Understanding (MOU) to promote the conservation of migratory birds. This MOU does not authorize take of birds covered by the MBTA but specifically pertains to evaluating the likelihood of an action to affect migratory birds. This MOU means to protect against the take of birds for installation support functions, including utilities maintenance, construction, and demolition. The executing agent/contractor would coordinate with the NAS Corpus Christi Wildlife Biologist to ensure that work would avoid impacting birds protected under the MBTA (including Birds of Conservation Concern). Building demolition work and tree removal (if any) would, to the extent feasible, take place outside of the bird breeding season. If this work must be conducted during the bird breeding season, a qualified biologist must confirm that no active nest would be impacted by these actions. The qualified biologist would be hired by the project proponent and approved by the NAS Corpus Christi Wildlife Biologist. The qualified biologist must survey the area within 72 hours of commencing work to determine if active nests are present. If an active nest is found in the project area at any time during project work, work would be halted immediately, and the NAS Corpus Christi Wildlife Biologist would be contacted. Any removal action must be overseen by the NAS Corpus Christi Wildlife Biologist. The NAS Corpus Christi Wildlife Biologist, in coordination with the qualified biologist, must confirm that there would be no impacts to active nests before construction work could resume. With implementation of these measures, construction activities associated with Alternative 1 would avoid or minimize incidental takes of birds protected under the MBTA (including Birds of Conservation Concern) or their active nests.

The average sound source levels in and around the airfield environment (and away from potential disturbance and strike hazards) may result in masking (the inability of an individual to hear important environmental signals), though it is also possible that some bird species could habituate to repeated aircraft noise and no longer exhibit behavioral responses (National Park Service, 1994; Larkin et al., 1996; Conomy et al., 1998; Plumpton, 2006). Other impacts due to airfield environment noise may include physiological stress and behavioral reactions. Researchers have documented a range of bird behavioral responses to noise, including no response, head turn, alert behavior, startle response, flying or swimming away, diving into the water, increased vocalizations, reduced frequency (kilohertz) of vocalizations, and increased aggression (Burger, 1981; National Park Service, 1994; Larkin et al., 1996; Stalmaster & Kaiser, 1997; Brown et al., 1999; Pytte et al., 2003; Plumpton, 2006; Wolfenden et al., 2019). Songbirds living near airports have altered timing of their songs to avoid overlap with aircraft noise (Gil et al., 2015). Some behavioral responses may be accompanied by physiological responses, such as increased activation of the neural and endocrine systems, causing changes such as increased blood pressure, available glucose, and blood levels of hormones (Manci et al., 1988; Partecke et al., 2006). It is possible that individuals would return to normal almost immediately after short-term or transient exposure, and the individual's metabolism and energy budget would not be affected in the long term.

Studies have shown that depending on a number of factors, including the bird species and the frequency of and proximity to exposure, birds habituate to noise following frequent exposure and cease to respond behaviorally to the noise (National Park Service, 1994; Bowles, 1995; Larkin et al., 1996; Plumpton, 2006). Whereas chronic exposure to acoustic disturbance may compromise the general health and reproductive success of some birds (Kight et al., 2012), a physiological stress response is not necessarily indicative of negative consequences to individual birds or to populations due to aforementioned factors (National Park Service, 1994; Larkin et al., 1996; Butler et al., 2009).

The majority of studies regarding low-altitude (500 feet AGL or less) subsonic military flights and bird behavior have found minimal to no meaningful response (Black et al., 1984; Ellis et al., 1991; Conomy et al., 1998; Hillman et al., 2015) or a response more related to visual stimuli (Ellis, 1981; Brown, 1990). Fixed-wing aircraft flights outside of the airfield environment are mostly conducted at altitudes greater than 600 feet AGL.

Under Alternative 1, there would be a minor increase in aircraft strike potential for birds and other wildlife corresponding to the increase in the number of operations compared to the No Action Alternative. The potential for interactions between aircraft and birds would be increased proportionally to the increase in aircraft operations (4 percent increase overall for all aircraft, military and civilian, at all airfields). Aircraft collisions with birds are more likely to occur during aircraft takeoffs and landings than when the aircraft is in transit or enroute to another location. FAA data taken from 1990 to 2020 demonstrates that 71 percent of bird and aircraft collisions occurred below 500 feet AGL (Dolbeer et al., 2021). This altitude typically corresponds to phases of flight associated with takeoffs and landings (e.g., takeoff, climb, approach, and landing roll). These phases of flight accounted for 93 percent of reported phases of flight at time of occurrence of bird strikes with civil aircraft from 1990 to 2020 (Dolbeer et al., 2021). Strike risk would not be affected by the change in aircraft, as the T-54A is close in size to the T-44C and would fly in substantially the same way.

There is no evidence of any local or population-level impacts to any bird species, including raptors, due to bird/aircraft collisions or disturbance from flight activities. Bird/aircraft collisions are not an acknowledged population level stressor for any bird species and are not mentioned in the literature regarding sources of direct anthropogenic mortality. Collisions between planes and birds are estimated to account for a small percentage of all bird deaths per year (USFWS, 2022b). Kelly and Allen (2006) concluded that it is likely that mortalities from bird aircraft collisions are not additive (i.e., in excess of what would occur naturally) and, therefore, are not of conservation concern. Population-level anthropogenic sources of mortality commonly cited for birds include cats, buildings, automobiles, powerlines, wind turbines, pesticides, gill nets, oil and gas activities, and marine longlines/trawls (Loss et al., 2015; Kelly & Allan, 2006).

From August 2020 through July 2022, the Proposed Action airfields that recorded BASH data reported between 214 and 327 bird strikes per year total. A wide range of bird species were struck, including representatives of many of the bird types previously described, though the identity of numerous impacted birds was unknown.

Due to the low number of strikes when compared to the overall operations numbers (341,000 annual operations for the airfields reporting strike data) and the information presented above, additional strikes resulting from the 10 percent increase in flight operations under Alternative 1 would not pose population-level risks for any bird species.

Continued implementation of the BASH Plan at NAS Corpus Christi and NOLF Cabaniss would reduce BASH risk. International, regional, and publicly owned municipal airfields also implement measures to mitigate BASH risk by adhering to FAA regulations, including conducting required Wildlife Hazard Assessments and implementing Wildlife Hazard Management Plans. Therefore, there would be no significant impacts to birds coved by the MBTA under Alternative 1.

For T-54 aircraft operations and compliance with the MBTA, the Navy has determined that Alternative 1 may result in the incidental "take" of native birds protected by the MBTA. The definition of "take," as defined by the MBTA is "pursue, hunt, shoot, wound, kill, trap, capture, or collect" (see Section 3.3.1.1, *Federal Regulations*, for more information). Under the MBTA's regulations that are applicable to military readiness activities (50 CFR part 21), the USFWS has promulgated a rule that authorizes the incidental take of MBTA-listed birds, provided it does not result in significant adverse effects on their population. Alternative 1 is not expected to result in adverse impacts to populations of species covered by the MBTA with current standard operating procedures (SOPs) (e.g., BASH Plan and Wildlife Hazard Management Plans).

The term "take," as defined by the USFWS for BGEPA purposes, means to "pursue, shoot, shoot at, poison, wound, kill, trap, capture, trap, collect, molest or disturb" (see Section 3.3.1.1, *Federal Regulations*, for more information). Although there is no exemption for military readiness activities from the BGEPA, a prohibited "take" is unlikely due to lack of previous takes of eagles by historical operation of T-44C aircraft, implementation of the BASH Plan at NAS Corpus Christi, implementation of local airfield Wildlife Hazard Management Plans, and the absence of eagle nests in the vicinity of Proposed Action airfields. Alternative 1 does not require an eagle take permit (USFWS - Chesapeake Bay Field Office, 2021).

Pursuant to the MBTA, no prohibited take of any MBTA-protected birds would occur under Alternative 1. Pursuant to the BGEPA and implementing guidance, prohibited take of an eagle is unlikely due to the measures taken to avoid impacts to nesting habitat. Consequently, no MBTA or BGEPA permit is required.

Threatened and Endangered Species

As mentioned in Section 3.3.2.2, *Special Status Species and Habitats*, only the piping plover and red knot have been observed at NAS Corpus Christi, and no federally listed species have been observed at NOLF Cabaniss. While critical habitat has been designated within NAS Corpus Christi, piping plovers have not been recorded within the boundaries of the station; however, a small number of these birds have been observed regularly along the western side of Oso Bay, adjacent to the eastern boundary of NAS Corpus Christi. Critical habitat has also been proposed for the red knot, which largely overlaps with the piping plover. These species may occur in the ROI where overflights by T-54A could possibly occur. Listed non-bird species would not be expected to occur at the international, regional, and publicly owned municipal airfields and airports due to the developed nature of the airfields as well as the vegetation management that is implemented in the non-developed portions of the airfields to specifically deter wildlife and increase flight safety.

Air operations under Alternative 1 would increase by 10 percent. Threatened and endangered terrestrial species in the ROI consisting of NAS Corpus Christi, NOLF Cabaniss, and international, regional, and publicly owned municipal airfields proposed for increased operations are already exposed and potentially habituated to aircraft operations. As indicated in Section 3.1.7.2, *Noise*, *Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative)*, there would be no significant change in noise associated with the proposed increase in airfield operations as compared with baseline conditions and ambient noise levels would not significantly increase.

However, there could be a minor increase in aircraft strike potential for threatened and endangered birds. The potential for interactions between aircraft and birds that migrate through the ROI would be increased proportionally to the increase in aircraft operations (4 percent increase overall for T-54A aircraft, military and civilian, at all airfields). T-54A aircraft operations would increase from 184,672 to 203,000 on an annual basis. Continued implementation of the BASH Plan at NAS Corpus Christi and NOLF Cabaniss would reduce BASH risk, and area airfields also implement measures to mitigate BASH risk as well by adhering to FAA regulations, including conducting the required Wildlife Hazard Assessments and Wildlife Hazard Management Plans.

Strikes involving threatened or endangered species have not been recorded while operating the T-44C aircraft; therefore, strikes involving T-54A aircraft would be unlikely because the aircraft would operate in a similar manner (e.g., same training operations at the same locations and within the same airspace). Accordingly, the Navy has determined that Alternative 1 may affect, but is not likely to adversely affect, the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat, as these species are at risk, although negligible, of potential aircraft strike during flight. The Navy has entered into informal consultation with the USFWS regarding potential effects to the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat. The USFWS concurred with the Navy's determination on August 2, 2023. Results of this consultation are included in Appendix B, *Special Status Species Documentation*.

Based on review of Alternative 1 by the USFWS, the following measures were agreed upon to prevent or minimize potential adverse effects to the northern aplomado falcon and whooping crane species to the extent practicable:

- Northern aplomado falcon. Low-level aircraft routes (less than 500 feet AGL) should avoid northern aplomado falcon nesting platforms and territories on Mustang and Matagorda Islands by at least 1 mile to reduce potential noise and human disturbance effects. Maintaining a distance of 1,500 feet AGL is preferable.
- Whooping crane. Whooping cranes are not expected in the project area. Report sightings of whooping cranes to the Texas Coastal Ecological Services Field Office in Corpus Christi at 361-533-6765.

Impacts to state-listed threatened and endangered terrestrial wildlife species that have the potential to occur within the ROI of Alternative 1 would be similar to those described for terrestrial wildlife. Impacts to state-listed threatened and endangered bird species that are not cross-listed with the federally listed species would be the same as those described for birds in the general *Terrestrial Wildlife* and *Birds*

Covered by the Migratory Bird Treaty Act (Including Birds of Conservation Concern) and Bald and Golden Eagles sections.

Based on the above analysis and measures to prevent or minimize potential adverse effects for terrestrial wildlife and special status species, implementation of Alternative 1 would not result in significant impacts to biological resources.

3.3.3.3 Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations Potential Impacts

The ROI for the analysis of effects to biological resources under Alternative 2 is the same study area described under Alternative 1.

Terrestrial Wildlife

Impacts to terrestrial wildlife under Alternative 2 for construction activities would be similar to those described under Alternative 1. Although Alternative 2 would increase aircraft operations over Alternative 1 (20 percent versus 10 percent), impacts to terrestrial wildlife would be minor. Terrestrial species in the ROI are already exposed and potentially habituated to aircraft operations. As indicated in Section 3.1.7.3, *Noise*, *Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations Potential Impacts*, there would be no significant change in noise associated with the proposed increase in airfield operations as compared with baseline conditions, and ambient noise levels would not significantly increase. Therefore, there would be no significant impacts to terrestrial wildlife under Alternative 2.

Birds Covered by the Migratory Bird Treaty Act (Including Birds of Conservation Concern) and Bald and Golden Eagles

Construction projects under Alternative 2 would be the same as those considered under Alternative 1. With implementation of the mitigation measures as described under Alternative 1, construction activities associated with Alternative 2 would avoid or minimize incidental takes of birds protected under the MBTA (including Birds of Conservation Concern) or their active nests.

Impacts to birds covered by the MBTA for T-54A aircraft operations would be similar to those described for Alternative 1; however, the potential for interactions between aircraft and birds would be increased proportionally to the increase in aircraft operations (9 percent increase overall for all aircraft, military and civilian, at all airfields). T-54A aircraft operations would increase from 184,672 to 221,500 on an annual basis. Continued implementation of the BASH Plan at NAS Corpus Christi and NOLF Cabaniss, and FAA requirements for the international, regional, and publicly owned municipal airfields (including conducting the required Wildlife Hazard Assessments and Wildlife Hazard Management Plans), would reduce BASH risk.

For T-54A aircraft operations and compliance with the MBTA, the Navy has determined that Alternative 2 may result in the incidental "take" of native birds protected by the MBTA. The term "take," as defined by the USFWS for MBTA purposes, means to "pursue, hunt, shoot, wound, kill, trap, capture, or collect" (see Section 3.3.1.1, *Federal Regulations*, for more information). Under the MBTA's regulations that are applicable to military readiness activities (50 CFR part 21), the USFWS has promulgated a rule that authorizes the incidental take of MBTA-listed birds, provided it does not result in significant adverse effects on their population. Alternative 2 is not expected to result in adverse impacts to populations of species covered by the MBTA with current SOPs (e.g., BASH Plan).

The term "take," as defined by the USFWS for BGEPA purposes, means to "pursue, shoot, shoot at, poison, wound, kill, trap, capture, trap, collect, molest or disturb" (see Section 3.3.1.1, *Federal Regulations*, for more information). Although there is no exemption for military readiness activities from the BGEPA, a prohibited "take" is unlikely due to lack of previous takes of eagles by historical operation of T-44C aircraft, implementation of the BASH Plan at NAS Corpus Christi, implementation of local airfield Wildlife Hazard Management Plans, and the absence of eagle nests in the vicinity of Proposed Action airfields. Alternative 2 does not require an eagle take permit (USFWS - Chesapeake Bay Field Office, 2021).

Pursuant to the MBTA, no prohibited take of any MBTA-protected birds would occur under Alternative 2. Pursuant to the BGEPA and implementing guidance, prohibited take of an eagle is unlikely due to the measures taken to avoid impacts to nesting habitat. No MBTA or BGEPA permit is therefore required.

Threatened and Endangered Species

Impacts to threatened and endangered species would be similar to those described for Alternative 1; however, increase of aircraft strike potential is commensurate with a 20 percent increase of operations over baseline. Because strikes involving threatened or endangered species have not been recorded while operating the T-44C aircraft, strikes involving a T-54A aircraft are unlikely because the aircraft would operate in a similar manner (e.g., same training operations at the same locations and within the same airspace). Accordingly, the Navy has determined that Alternative 2 may affect, but is not likely to adversely affect, the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat, as these species are at risk of potential aircraft strike during flight.

There would be no significant impacts on threatened and endangered species, and no formal consultation between the Navy and the USFWS or National Oceanic and Atmospheric Administration Fisheries would be required.

Impacts to state-listed threatened and endangered terrestrial wildlife species that have the potential to occur within the ROI of Alternative 2 would be similar to those described for terrestrial wildlife under Alternative 1. Impacts to state-listed threatened and endangered bird species that are not cross-listed with the federally listed species would be the same as those described for birds in the general *Birds Covered by the Migratory Bird Treaty Act and Bald and Golden Eagles* section.

Based on the above analysis for terrestrial wildlife and special status species, implementation of Alternative 2 would not result in significant impacts to biological resources.

3.4 Cultural Resources

This discussion of cultural resources includes prehistoric and historic archaeological sites; historic buildings, structures, and districts; and physical entities and human-made or natural features important to a culture, a subculture, or a community for traditional, religious, or other reasons.

3.4.1 Regulatory Setting

Cultural resources are governed by federal laws and EOs, including the Archeological and Historic Preservation Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act, EO 13007, Native American Graves Protection and Repatriation Act, and National Historic Preservation Act (NHPA). For the purposes of this analysis, the term "cultural resource" refers to all resources of cultural importance protected by these federal laws and EOs.

Federal agencies' responsibility for protecting historic properties is defined primarily by Sections 106 and 110 of the NHPA. Section 106 requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. Through consultation with interested parties, the federal agency identifies historic properties potentially affected by the undertaking, assesses effects, and seeks ways to avoid, minimize, or mitigate any adverse effects on historic properties. Section 110 of the NHPA requires federal agencies to establish—in conjunction with the Secretary of the Interior—historic preservation programs for the identification, evaluation, and protection of historic properties and to avoid adversely affecting National Historic Landmarks.

3.4.2 Affected Environment

In compliance with the NHPA, the Navy consults with regulators, Indian tribes, and other interested parties to identify historic properties and other cultural resources that may be affected by the Proposed Action. The NHPA defines historic properties as any district, site, building, structure, or object listed in, or eligible for listing in, the National Register of Historic Places (NRHP). For the purposes of this analysis, historic properties can be divided into three major categories:

- Archaeological resources (prehistoric and historic) include the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these material remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.
- Traditional cultural properties include properties associated with cultural practices and beliefs of a living community that are (a) rooted in the community's history and (b) important to maintaining the continuing cultural identity of the community.

The Navy has conducted inventories of cultural resources at NAS Corpus Christi to identify historic properties that are listed or potentially eligible for listing in the NRHP (Navy, 2014).

For the purposes of cultural resources analysis, the ROI is considered equivalent to the Area of Potential Effects (APE), as defined by NHPA Section 106 implementing regulations, 36 CFR section 800.16(d). The APE for cultural resources is the geographic area or areas within which an undertaking (project, activity, program, or practice) may cause changes in the character or use of any historic properties present. The APE is influenced by the scale and nature of the undertaking and may be different for various kinds of effects caused by the undertaking. For this Proposed Action, the Navy determined that the APE includes 213.2 acres and includes the following:

- the area where building demolition, renovation, and construction projects would occur
- a quarter-mile visual buffer around the proposed new hangar where it is estimated the proposed new hangar could be visible

3.4.2.1 Archaeological Resources

In 1994, a cultural resources investigation was conducted on NAS Corpus Christi, NOLF Cabaniss, and NOLF Waldron. This project covered 582.5 acres of the 4,442 acres (13.11 percent of the combined installations). The remaining 3,859.5 acres within these installations were considered disturbed and were not surveyed (Navy, 2014).

As a result of this survey, two sites with cultural resources were identified on NAS Corpus Christi. Site 41NU274 was recommended for additional work to determine NRHP eligibility. The remaining site (41NU273) was determined not eligible for the NRHP (Navy, 2014). Neither of these sites are located within the APE for the Proposed Action. In 2016 and 2017, the Navy conducted cultural resources investigations of three areas for a proposed geothermal facility, totaling approximately 51 acres. Shovel test probes were systematically placed in each of the areas, and no archaeological resources were identified (Navy, 2018).

3.4.2.2 Architectural Resources

Four historic architectural surveys have documented a total of 239 buildings and structures at NAS Corpus Christi evaluated for eligibility for listing in the NRHP (Navy, 2014). All Cold War buildings have been assessed. Of the facilities surveyed, Building 252 and seven historic districts have been determined eligible for listing in the NRHP (Navy, 2014).

Historic properties in the APE include the Landplane Hangars Historic District, the western-most portion of the Warehouse/Industrial Historic District, and Hangar 42 within the Seaplane Hangars/Ramps Historic District (Figure 3-13; Table 3-25). The Landplane Hangars Historic District is located on the east side of the NAS Corpus Christi airfield and consists of five aircraft hangars (Hangars 51, 55, 56, 57, and 58) and six Navy support facilities (51A, 56A, 56B, 57A, 57B, and 58A) (Figure 3-13); this historic district is related directly to the station’s primary mission as a flight training center and was determined eligible for inclusion in the NRHP under Criterion A for its contribution to naval aviation training from World War II to 1947. The Warehouse/Industrial Historic District is a concentration of aircraft support facilities located between the landplane and the seaplane hangars (Figure 3-13); this historic district contains infrastructure and repair facilities directly related to the station’s prime mission as a naval aviation training center and is eligible for inclusion in the NRHP under Criterion A. Elements of the Warehouse/Industrial Historic District within the APE are illustrated in Figure 3-13.

The Seaplane Hangars/Ramps Historic District is a large L-shaped area that includes most of NAS Corpus Christi’s waterfront property; contributing properties include 7 hangars and 17 ramps that supported seaplane operations at NAS Corpus Christi. The Seaplane Hangars/Ramps Historic District is directly related to the station’s primary mission as flight training and is eligible for inclusion in the NRHP under Criterion A for its contribution to naval aviation training efforts from World War II to 1947. Table 3-26 lists the NRHP-eligible buildings within each historic district that would be affected by the Proposed Action.

Table 3-25 Historic Properties in the APE at NAS Corpus Christi

Facility	*Name*	*Year Built*	*NRHP Status*	*Proposed Action*
Warehouse/Industrial Historic District				
19	Public Works	1941	Contributing	None
20	Public Works, Shop/BSVE	1941	Contributing	None
27	Flammable Storage	1942	Contributing	None
164	Transformer Vault	1941	Contributing	None
Seaplane Hangars/Ramps Historic District				
42	Hangar 42, Maintenance Hangar	1941	Contributing	Interior Renovation
Landplane Hangars Historic District				
51	Hangar 51, Maintenance Hangar/AIMD	1942	Contributing	None
51A	Flammable Storage	1978	Contributing	None
55	Hangar 55, VT-35	1941	Contributing	Demolition
56	Hangar 56, VT-27/VT-28	1941	Contributing	Demolition
56A	Storage Locker/VT-28	1941	Contributing	Demolition
56B	Ready Magazine/VT-28	1942	Contributing	Demolition
57	Hangar 57, VT-31	1941	Contributing	None
57A	Operations/Hazardous/Flammable Storage VT-28	1941	Contributing	None
57B	Ready Magazine/VT-28	1942	Contributing	None
58	Hangar 58, Air Operations Hangar	1941	Contributing	None
58A	Flammable Storage	1941	Contributing	None

Key: AIMD = Aircraft Intermediate Maintenance Department; APE = Area of Potential Effects; BSVE = Base Support Vehicles and Equipment; NAS = Naval Air Station; NRHP = National Register of Historic Places; VT- = Navy Training Aircraft Squadron.

Table 3-26 NRHP Status of Buildings within Historic District Boundaries Proposed for Demolition or Renovation

Facility	*Name*	*Year Built*	*NRHP Status*	*Historic District*	*Proposed Action*
42	Hangar 42, Maintenance Hangar	1941	Contributing	Seaplane Hangars/Ramps Historic District	Interior Renovation
57	Hangar 57, VT-31	1941	Contributing	Landplane Hangars Historic District	Long-Term Options: • Recapitalization • Demolition
57A	Hazardous/Flammable Storehouse	1941	Contributing	Landplane Hangars Historic District	Demolition
57B	Storage – Hangar 57	1942	Contributing	Landplane Hangars Historic District	Demolition

Table 3-26 NRHP Status of Buildings within Historic District Boundaries Proposed for Demolition or Renovation

Facility	*Name*	*Year Built*	*NRHP Status*	*Historic District*	*Proposed Action*
57C	Anchor Display at Hangar 57	1995	Not Eligible	Landplane Hangars Historic District	Demolition
58	Hangar 58 Air Operations	1941	Contributing	Landplane Hangars Historic District	Short-Term: • Interior renovation Long-Term Options: • Recapitalization • Demolition
58A	Hazardous/Flammable Storehouse	1941	Contributing	Landplane Hangars Historic District	Demolition
58C	Electrical Switching Building at Hangar 58	2013	Not Eligible	Landplane Hangars Historic District	Demolition
60	Ground Electronics Maintenance Division Shop	1984	Not Eligible[1]	Landplane Hangars Historic District	Demolition
62	General Building at Building 60	1984	Not Eligible[1]	Landplane Hangars Historic District	Demolition
67	Compressor Building at Hangar 57	1995	Not Eligible	Landplane Hangars Historic District	Demolition
1238	General Building at Hangar 58	1957	Not Eligible	Landplane Hangars Historic District	Demolition
1244	Operational Facility at Hangar 58	1953	Not Eligible	Landplane Hangars Historic District	Demolition

Key: NRHP = National Register of Historic Places; VT- = Navy Training Aircraft Squadron.
Note:
1. Facility is not eligible under Criteria Consideration G; it is likely not eligible when 50 years old (Navy, 2014).

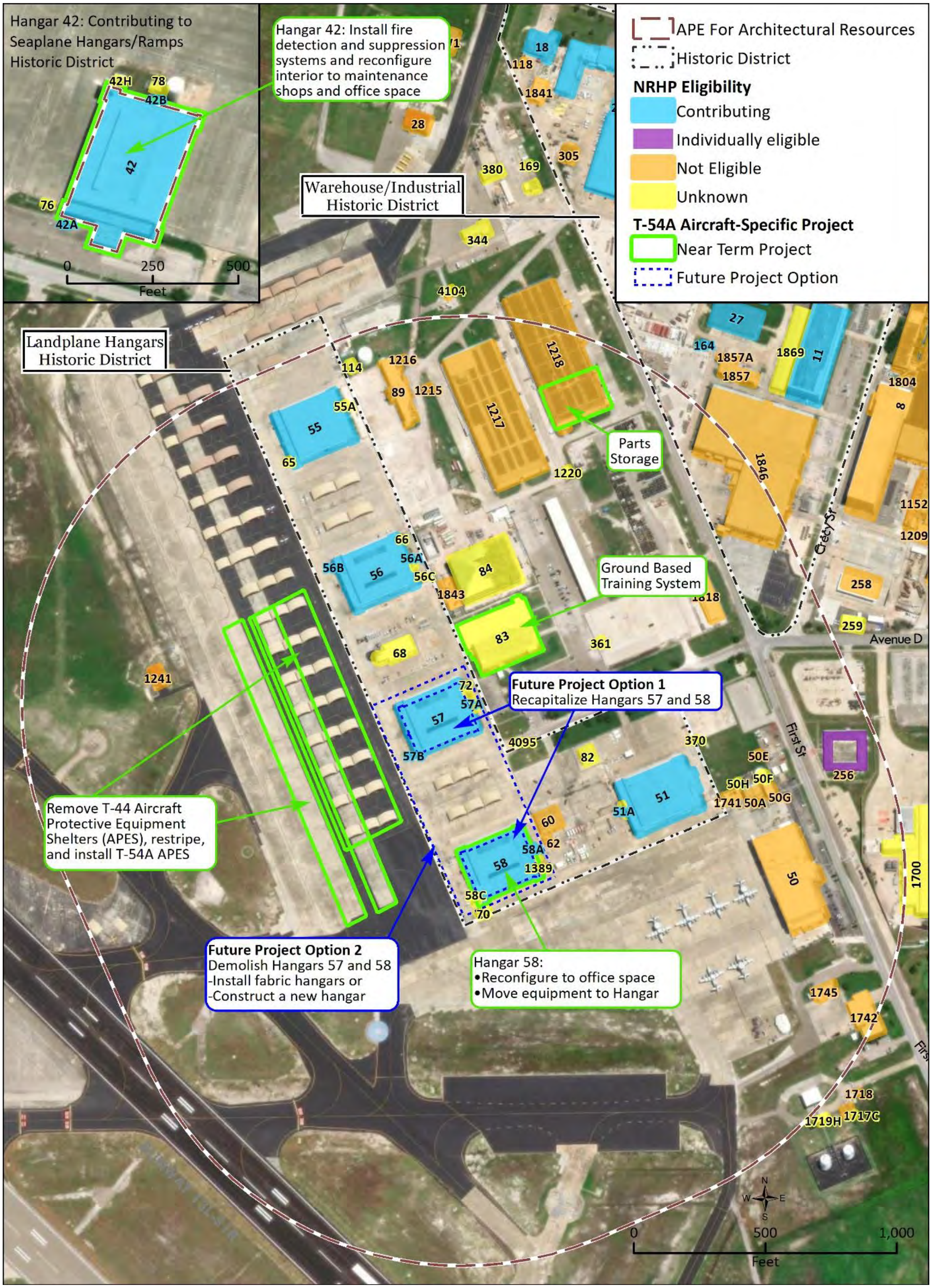

Figure 3-13 Historic Properties in the APE at NAS Corpus Christi

3.4.2.3 Resources of Importance to Tribes

There are no traditional cultural properties or sacred sites identified on NAS Corpus Christi. The Navy sent letters to the Comanche Nation, Delaware Nation, Kickapoo Traditional Tribe of Texas, Kiowa Indian Tribe of Oklahoma, Mescalero Apache Tribe of the Mescalero Reservation, Tonkawa Tribe of Indians of Oklahoma, and the United Keetoowah Band of Cherokee Indians in Oklahoma on April 19, 2023, requesting information about any traditional cultural properties (Appendix D, *Tribal Government-to-Government Documentation*). The Delaware Nation indicated that Nueces County is outside of their area of interest. No other tribes submitted comments on the Proposed Action. Should an inadvertent discovery occur during the course of the project that may require consultation, all work will cease, and the project's contracting officer and the Installation Environmental Program Director will be notified in accordance with the NAS Corpus Christi Integrated Cultural Resources Management Plan SOP #5, Inadvertent Discoveries, and SOP #8, Management of Historic Properties.

3.4.3 Environmental Consequences

Analysis of potential impacts to cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the importance of the resource; introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting); or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect effects to historic properties are those caused by the undertaking that are later in time or farther removed in distance but are still reasonably foreseeable.

Cultural Resources Potential Impacts:

No Action Alternative

- No change to existing conditions.

Alternatives 1 and 2

- Adverse effects to the Landplane Hangars Historic District from building recapitalization or demolition.
- No adverse effects to the Warehouse/Industrial Historic District and the Seaplane Hangars/Ramps Historic District from building recapitalization or demolition.

3.4.3.1 No Action Alternative

Under the No Action Alternative, there would be no effects to cultural resources. There would be no short- and long-term construction needed to support the aircraft replacement. Aircraft and operations would remain the same as under baseline conditions.

3.4.3.2 Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative)

Alternative 1 would implement the short- and long-term construction projects described in Section 2.1.4, *Construction Projects*, and listed in Table 2-5 and Table 2-6. The buildings within the boundaries of the historic districts that would be subject to recapitalization or demolition under Alternative 1 are listed in Table 3-26**.** The buildings proposed for demolition that are not eligible for the NRHP would not result in any adverse effects to the historic districts.

Recapitalization or demolition of buildings contributing to the Landplane Hangars Historic District, including Hangars 57 and 58, and their associated support facilities (57A, 57B, and 58A) would remove two of the five contributing hangars in the historic district, which would be an adverse effect to the historic district (see Appendix C, *National Historic Preservation Act Section 106 Documentation*). There would be no adverse effect from demolition of Buildings 57C, 58C, 60, 62, 1238, and 1244 that are non-contributing resources to the Landplane Hangars Historic District. Construction of new hangar space to accommodate the METS platform in the space now occupied by Hangars 57 and 58 would introduce a new visual element to the Landplane Hangars Historic District and the western-most portion of the adjacent Warehouse/Industrial Historic District but would not impact the Warehouse/Industrial Historic District, which is decidedly industrial in appearance.

The Navy has consulted with the Texas State Historic Preservation Officer (SHPO) pursuant to Section 106 of the NHPA, and its implementing regulations of 36 CFR part 800, to develop and execute a Memorandum of Agreement (MOA) to mitigate the adverse effects to the Landplane Hangars Historic District resulting from the loss of the five contributing resources (two hangars and three supporting facilities) (see Appendix C, *National Historic Preservation Act Section 106 Documentation*). Stipulations contained in the MOA for Hangars 57 and 58 include that the Navy will conduct the following:

- Notify the SHPO when program funding is received and a final decision is made on demolishing or recapitalizing.
- Coordinate the salvage and removal of select structural elements for potential use in extant World War II hangars at NAS Corpus Christi or other installations in the southeastern area of responsibility.
- Locate and curate original as-built drawings.
- Locate and convey historic photographs to the SHPO.
- Undertake digital photographic documentation and subject to review by the SHPO.
- Provide the history in text and photographs on the NAS Corpus Christi public website.
- Erect a commemorative sign(s) in the Landplane Hangars Historic District that depicts the roles of the hangars in the World War II mission.

Renovations to Hangar 42, a contributing resource to the Seaplane Hangars/Ramps Historic District, would be confined to the interior only and consist of converting interior space to accommodate maintenance offices and additional shop support spaces currently in Hangar 58 and installing fire detection and suppression systems. The proposed renovations to Hangar 42 would be conducted within the non-contributing interior of the hangar and would have no adverse effect on the characteristics of the hangar that convey its historic value and qualify it as eligible for the NRHP.

There would be no adverse effects to historic properties from the 10 percent increase in flight operations and the associated incremental increase in noise. NRHP eligibility of the historic properties is based, in large part, on their association with an active NAS at which aircraft routinely, and historically, operate(d), resulting in an elevated noise environment. An incremental increase in noise would not affect any of the attributes of the historic properties that contribute to their NRHP eligibility status.

Under NEPA, impacts to the Landplane Hangars Historic District due to implementation of Alternative 1 would be significant; however, impacts would be mitigated by adhering to the stipulations contained within the MOA described above. Therefore, there would be no significant impact to cultural resources with implementation of Alternative 1.

3.4.3.3 Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations Potential Impacts

Potential impacts to cultural resources under this alternative would be similar to those described under Alternative 1. Under this alternative, the Navy would implement the same building demolition, renovation, and construction projects as Alternative 1, with the same consequences. The 10 percent increase in operations over Alternative 1 (20 percent total over the No Action Alternative) and the associated incremental increase in noise would also have no adverse effects to historic properties. NRHP eligibility of the historic properties is based, in large part, on their association with an active naval air station at which aircraft routinely, and historically, operate(d), resulting in an elevated noise environment. An incremental increase in noise would not affect any of the attributes of the historic properties that contribute to their NRHP eligibility status.

3.5 Air Quality

This discussion of air quality includes criteria pollutants, standards, sources, permitting, and greenhouse gases (GHGs). Air quality in a given location is defined by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions.

Most air pollutants originate from human-made sources, including mobile sources (e.g., cars, trucks, buses) and stationary sources (e.g., factories, refineries, power plants), as well as indoor sources (e.g., some building materials and cleaning solvents). Air pollutants are also released from natural sources such as volcanic eruptions and forest fires.

3.5.1 Regulatory Setting

3.5.1.1 Criteria Pollutants and National Ambient Air Quality Standards

The principal pollutants defining the air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide, nitrogen dioxide, ozone, suspended particulate matter less than or equal to 10 microns in diameter, fine $PM_{2.5}$, and lead. CO, sulfur dioxide, lead, and some particulates are emitted directly into the atmosphere from emissions sources. Ozone, nitrogen dioxide, and some particulates are formed through atmospheric chemical reactions that are influenced by weather, ultraviolet light, and other atmospheric processes.

Under the Clean Air Act (CAA), USEPA has established NAAQS (40 CFR part 50) for these criteria pollutants. NAAQS are classified as primary or secondary. Primary standards protect against adverse health effects; secondary standards protect against welfare effects, such as damage to farm crops and vegetation and damage to buildings. Some pollutants have long-term and short-term standards. Short-term standards are designed to protect against acute, or short-term, health effects, while long-term standards were established to protect against chronic health effects.

If the air quality in a geographic area meets or is cleaner than the national standard, it is called an attainment area (designated "attainment/unclassifiable"). Areas that violate a federal air quality standard are designated as nonattainment areas. Areas that have transitioned from nonattainment to attainment are designated as maintenance areas and are required to adhere to maintenance plans to ensure continued attainment. In some cases, USEPA is not able to determine an area's status after evaluating the available information and those areas are designated "unclassifiable."

In addition to the NAAQS for criteria pollutants, national standards exist for hazardous air pollutants (HAPs), which are regulated under Section 112(b) of the 1990 CAA Amendments. The *National Emission Standards for Hazardous Air Pollutants* regulate HAP emissions from stationary sources (40 CFR part 61).

3.5.1.2 Mobile Sources

HAPs emitted from mobile sources are called Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and non-road equipment that are known or suspected to cause cancer or other serious health and environmental effects. In 2001, USEPA issued its first MSAT Rule, which identified 201 compounds as being HAPs that require regulation. A subset of six of the MSAT compounds was identified as having the greatest influence on health and included benzene, butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter. USEPA issued a second MSAT Rule in February 2007, which generally supported the findings in the first rule and provided additional recommendations of compounds having the greatest impact on health. The rule also identified several engine emission certification standards that must be implemented (40 CFR parts 59, 80, 85, and 86; Federal Register Volume [Vol.] 72, Number (No.) 37, pages (pp.) 8427–8570, 2007). The final Tier 3 Motor Vehicle Emission Standards were published on April 28, 2014 (Federal Register Vol. 79, No. 81, pp. 23414–23886, 2014) and established both tailpipe and evaporative emission standards for on-road vehicles to reduce a variety of pollutants, including the primary MSATs. Unlike the criteria pollutants, there are no NAAQS for benzene and other HAPs. The primary control methodologies for these pollutants for mobile sources involve reducing their content in fuel and altering the engine operating characteristics to reduce the volume of pollutant generated during combustion.

MSATs would be the primary HAPs emitted by mobile sources during construction. The equipment used during construction would likely vary in age and have a range of pollution reduction effectiveness. Construction equipment, however, would be operated intermittently for the duration of construction, and would generate negligible ambient HAPs in a localized area. Additionally, small quantities of HAPs would be generated by aircraft flying below 3,000 feet AGL. For all mobile sources, emissions of air toxics are small compared to emissions of criteria pollutants and would be dispersed across large distances. Therefore, MSAT emissions are not considered further in this analysis.

3.5.1.3 General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. The General Conformity Rule does not apply to this action because all affected counties are in attainment.

3.5.1.4 Stationary Sources

Stationary sources of air pollution, such as boilers, power plants, or refineries emit different air pollutants and are regulated by different permitting processes.

New Source Review (Preconstruction Permit)

New stationary sources to be introduced to NAS Corpus Christi would require permitting under the CAA New Source Review Program. The minor New Source Review program is for pollutants from stationary sources that do not require Prevention of Significant Deterioration (PSD) or nonattainment New Source Review permits. The purpose of minor New Source Review permits is to prevent the construction of sources that would interfere with attainment or maintenance of a NAAQS limit or violate the control strategy in nonattainment areas. Also, minor New Source Review permits often contain permit conditions to limit a source's emissions to avoid PSD or nonattainment New Source Review. New Source Review requirements are typically rolled into Title V Operating Permits during renewal.

Title V (Operating Permit)

The Title V Operating Permit Program consolidates all CAA requirements applicable to the operation of a source, including requirements from the State Implementation Plan, preconstruction permits, and the air toxics program. It applies to stationary sources of air pollution that exceed the major stationary source emission thresholds, as well as other non-major sources specified in a particular regulation. The program includes a requirement for payment of permit fees to finance the operating permit program whether implemented by USEPA or a state or local regulator. Navy installations subject to Title V permitting shall comply with the requirements of the Title V Operating Permit Program, which are detailed in 40 CFR part 70, and all specific requirements contained in their individual permits.

3.5.1.5 Greenhouse Gases

GHGs are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is producing negative economic and social consequences across the globe, such as increased wildfire and droughts or ocean warming and acidification, which impact natural habitats and the communities that depend on these ecosystems for economic livelihoods.

The primary driver of climate change is GHG emissions, which result from the burning of fossil fuels for energy, deforestation, emissions released by landfills, the production of certain industrial products, the application of agricultural fertilizers, and the raising of livestock. These GHGs include carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases including nitrogen trifluoride and hydrofluorinated ethers (USEPA, 2022b).

Each GHG is assigned a global warming potential, which refers to the ability of a gas or aerosol to trap heat in the atmosphere. The GHGs with larger global warming potentials cause more heat to be retained per unit mass. This additional heat can disrupt the natural balance of global energy inputs, which leads to various changes in long-term atmospheric conditions (i.e., climate), depending on the resulting environmental feedback mechanisms (e.g., changes in snow and ice cover) (Intergovernmental Panel on Climate Change, 2013). The global warming potential rating system is standardized to CO_2, which has a value of one. The equivalent CO_2 rate of various GHGs is calculated by multiplying the emissions of each GHG by its global warming potential and adding the results together to produce a single, combined emissions rate representing all GHGs, referred to as the CO_2 equivalent, abbreviated as CO_2e. In the United States, federal agencies and state governments have implemented programs and policies in an attempt to reduce GHG emissions to mitigate the extent of climate change and adapt to the impacts that are likely to occur.

The potential effects of GHG emissions are by nature global and cumulative, and it is impractical to attribute climate change effects to individual projects. Therefore, the impact of GHG emissions associated with this project is discussed in the context of cumulative impacts in Chapter 4, *Cumulative Effects*.

Federal Policies Related to Climate Change

The regulation of GHG emissions under PSD and Title V permitting programs was initiated by a USEPA rulemaking issued on June 3, 2010, known as the GHG Tailoring Rule (Federal Register Vol. 75, No. 106, pp. 31514–31608, 2010). GHG emissions thresholds for permitting of stationary sources are an increase of 75,000 tpy of CO_2e at existing major sources and facility-wide emissions of 100,000 tpy of CO_2e for a new source or a modification of an existing minor source. The 100,000 tpy of CO_2e threshold defines a major GHG source for both construction (PSD) and operating (Title V) permitting, respectively. These regulations do not apply if GHGs are the only pollutant that the source emits or has the potential to emit above the major source thresholds, or for which there is a significant emissions increase and a significant net emissions increase from a modification.

On January 9, 2023, the CEQ published the interim guidance, National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (Federal Register Vol. 88, No. 5, pp. 1196–1212, 2023). This interim guidance has been incorporated into this analysis. The guidance explains how agencies should apply NEPA principles and existing best practices to their climate change analyses. Key changes in the interim guidance for agencies preparing NEPA documentation are listed below:

- Leverage early planning processes to integrate GHG emissions and climate change considerations into the identification of proposed actions, reasonable alternatives (as well as the no-action alternative), and potential mitigation and resilience measures.
- Quantify a proposed action’s projected GHG emissions or reductions for the expected lifetime of the action, considering available data and GHG quantification tools that are suitable for the proposed action.
- Provide additional context for GHG emissions, including through the use of the best available social cost of GHG estimates, to translate climate impacts into the more accessible metric of dollars; allow decision-makers and the public to make comparisons; help evaluate the significance of an action’s climate change effects; and better understand the tradeoffs associated with an action and its alternatives.
- Discuss methods to appropriately analyze reasonably foreseeable direct, indirect, and cumulative GHG emissions.
- Consider reasonable alternatives and mitigation measures, as well as addressing short- and long-term climate change effects.
- Use the best available information and science when assessing the potential future state of the affected environment in NEPA analyses, and provide up-to-date examples of existing sources of scientific information.
- Use the information developed during the NEPA review to consider reasonable alternatives that would make the actions and affected communities more resilient to the effects of a changing climate.
- Incorporate environmental justice considerations into their analyses of climate-related effects, consistent with EOs 12898 and 14008.

Department of Defense Policies Related to Climate Change

The DoD and the Navy have established various directives pertaining to climate change. DoD Directive 4715.21, *Climate Change Adaptation and Resilience*, from January 2016, integrates climate change considerations into all aspects of the department. DoD components are charged with assessing and managing risks, and mitigating the effects of climate change on natural and cultural resource management, force structure, basing, and training and testing activities in the field environment. The Department of the Navy Climate Action 2030 (Navy, 2022) describes the Navy goals to meet the requirements of EO 14008, *Tackling the Climate Crisis at Home and Abroad*, and EO 14057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability* (Federal Register Vol. 86, No. 236, pp. 70935–70943, 2021). These goals include 65 percent reductions in scope 1 and 2 GHG emissions by 2030, acquiring 100 percent zero-emission light-duty vehicles by 2027, achieving a 50 percent reduction in GHG emissions from buildings by 2032, diverting at least 50 percent of nonhazardous solid waste from landfills by 2025, instituting nature-based resilience to reduce GHG emissions, and establishing energy resilience to ensure mission accomplishment.

According to 10 United States Code section 101(e)(8), military installation resilience "means the capability of a military installation to avoid, prepare for, minimize the effect of, adapt to, and recover from extreme weather events, or from anticipated or unanticipated changes in environmental conditions, that do, or have the potential to, adversely affect the military installation or essential transportation, logistical, or other necessary resources outside of the military installation that are necessary in order to maintain, improve, or rapidly reestablish installation mission assurance and mission-essential functions."

Additionally, 10 United States Code section 2864 (2020) requires commanders of major military installations to identify, assess, and develop plans to address military installation resilience and environmental risks and threats to assets, infrastructure, and mission.

State and Local Policies Related to Climate Change

The State of Texas has not established statewide goals for GHG emissions, but seven Texas cities have released climate action plans: Plano, Frisco, McKinney, Austin, Houston, San Antonio, and Dallas. However, none of the airfields listed below in Table 3-27 are located in these cities with established climate action plans.

3.5.2 Affected Environment

The Texas Commission on Environmental Quality is responsible for implementing and enforcing state and federal air quality regulations in Texas. The ROI for assessing air quality impacts is comprised of the counties where the Navy and non-Navy airfields are located. Table 3-27 presents the counties where the Navy and non-Navy airfields are located and their attainment status. All counties where the Navy and non-Navy airfields are located are in attainment of the NAAQS and therefore a General Conformity evaluation is not required for federal actions in these counties.

Table 3-27 Navy and Non-Navy Airfields Proposed for METS Activity – Area NAAQS Status

Name	*County*	*Intrastate AQCR*	*County Attainment Status*
NAS Corpus Christi	Nueces	Corpus Christi-Victoria[1]	Attainment and/or unclassifiable for all criteria pollutants
NOLF Cabaniss	Nueces	Corpus Christi-Victoria[1]	Attainment and/or unclassifiable for all criteria pollutants
Alice International Airport	Jim Wells	Corpus Christi-Victoria[1]	Attainment and/or unclassifiable for all criteria pollutants
Calhoun County Airport	Calhoun	Corpus Christi-Victoria[1]	Attainment and/or unclassifiable for all criteria pollutants
Corpus Christi International Airport	Nueces	Corpus Christi-Victoria[1]	Attainment and/or unclassifiable for all criteria pollutants
Palacios Municipal Airport	Matagorda	Metropolitan Houston-Galveston[2]	Attainment and/or unclassifiable for all criteria pollutants
Port Isabel-Cameron County Airport	Cameron	Brownsville-Laredo[3]	Attainment and/or unclassifiable for all criteria pollutants
Valley International Airport	Cameron	Brownsville-Laredo[3]	Attainment and/or unclassifiable for all criteria pollutants
Victoria Regional Airport	Victoria	Corpus Christi-Victoria[1]	Attainment and/or unclassifiable for all criteria pollutants

Key: AQCR = Air Quality Control Region; METS = Multi-Engine Training System; NAAQS = National Ambient Air Quality Standards; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. There are 18 counties in the Corpus Christi-Victoria AQCR, but only Victoria, Nueces, Jim Wells, and Calhoun are associated with the Proposed Action.
2. There are 13 counties included in the Metropolitan Houston-Galveston AQCR, but only Matagorda is associated with the Proposed Action.
3. There are seven counties included in the Brownsville-Laredo AQCR, but only Cameron is associated with the Proposed Action.

Emissions of GHGs (CO2) for the counties where the Navy and non-Navy fields are located are presented in Table 3-28. Volatile organic compound (VOC) and nitrogen oxides emissions are used to represent ozone generation because they are precursors of ozone.

Table 3-28 Air Emissions Inventory (2017) for Counties with Airfields Proposed for METS Activity

Location	*NO_x (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
Nueces County	17,068	21,077	45,656	935	14,630	4,268	17,073,260
Jim Wells County	2,241	7,013	7,269	31	5,374	979	391,335
Calhoun County	6,693	12,619	15,762	531	3,452	1,312	5,451,934
Matagorda County	5,089	34,339	89,973	469	11,480	7,165	879,838
Cameron County	7,134	24,503	66,212	429	7,891	3,414	2,127,338
Victoria County	6,196	14,059	20,769	192	7,177	1,991	2,080,096

Source: (USEPA, 2022c)

Key: CO = carbon monoxide; CO_2 = carbon dioxide; METS = Multi-Engine Training System; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Note: CO_2 from fires (prescribed and wildfires) were excluded from county totals.

Table 3-29 presents the most recently published design values based on the most current ambient monitoring levels (2021) for the region and demonstrates that emissions levels are below the most stringent NAAQS. A design value is a statistic that describes the air quality status of a given location relative to the NAAQS. Design values are computed and published annually by USEPA's Office of Air Quality Planning and Standards and reviewed in conjunction with the USEPA Regional Offices (USEPA, 2023a). The nearest stations are located west of NAS Corpus Christi (stations: Corpus Christi Huisache and Corpus Christi State School [Airport Road]), south of Valley International Airport and Port Isabel-Cameron County Airport (station: Brownsville), west of the Valley International Airport (station: Harlingen Teege), and south of the Victoria Regional Airport and west of the Calhoun County and Palacios Municipal Airports (station: Victoria) (USEPA, 2023b).

Table 3-29 Design Values Based on 2021 Ambient Air Quality Montoring Data

Pollutant[1]	*Averaging Time*	*NAAQS*	*Maximum Design Values (Station)*	*% of NAAQS*
$PM_{2.5}$	24-hour	35 µg/m^3	23 µg/m^3 (Corpus Christi Huisache)	66
			28 µg/m^3 (Brownsville)	80
	Annual	12 µg/m^3	8.2 µg/m^3 (Corpus Christi Huisache)	68
			9.7 µg/m^3 (Brownsville)	81
O_3	8-hour	0.070 ppm	0.062 ppm (Corpus Christi State School [Airport Road])	89
			0.061 ppm (Victoria)	87
			0.056 ppm (Harlingen Teege)	80
SO_2	1-hour	75 ppb	5 ppb (Corpus Christi State School [Airport Road])	7
			9.7 ppb (Brownsville)	13

Source: (USEPA, 2023b)

Key: % = percent; µg/m^3 =microgram per cubic meter; CO = carbon monoxide; EA = Environmental Assessment; NAAQS = National Ambient Air Quality Standards; NO_2 = nitrogen dioxide; O_3 = ozone; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; ppb = parts per billion; ppm = parts per million; SO_2 = sulfur dioxide.

Note:

1. There are no CO, NO_2, or PM_{10} monitoring sites near Corpus Christi or the Navy Outlying Landing Fields included in this EA.

Table 3-30 shows criteria pollutant and GHG emissions from flight operations of the T-44C aircraft at NAS Corpus Christi, NOLF Cabaniss, and seven non-Navy airfields under baseline conditions. These operations include engine maintenance operations and estimates for interfacility flight, which would occur at or below 3,000 feet AGL. GHG emissions shown in the table are for the entire flight operation (including above 3,000 feet AGL).

Table 3-30 Baseline Annual Air and GHG Emissions at Navy and Non-Navy Airfields Proposed for METS Activity

Year	*NO_x (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
NAS Corpus Christi	44.45	319.09	148.38	5.12	1.95	1.78	15,410
NOLF Cabaniss	5.29	37.51	18.99	1.08	0.39	0.35	3,250
ALI - Alice International	6.49	62.51	33.13	1.51	0.69	0.62	4,538
PKV - Calhoun County	1.05	8.20	5.24	0.24	0.12	0.11	734
CRP - Corpus Christi International	4.51	65.53	24.25	1.08	0.40	0.36	3,258
PSX - Palacios Municipal	1.57	10.69	7.62	0.36	0.19	0.17	1,089

Table 3-30 Baseline Annual Air and GHG Emissions at Navy and Non-Navy Airfields Proposed for METS Activity

Year	*NO_x (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
PIL - Port Isabel	3.10	19.34	14.68	0.71	0.38	0.34	2,138
HRL - Valley International	6.48	45.13	32.86	1.53	0.82	0.74	4,586
VCT - Victoria Regional	1.72	13.24	8.73	0.40	0.21	0.19	1,211
Total	74.66	581.25	293.89	12.05	5.14	4.67	36,215

Key: CO = carbon monoxide; CO_2 = carbon dioxide; GHG = greenhouse gas; METS = Multi-Engine Training System; NAS = Naval Air Station; NO_x = nitrogen oxides; NOLF = Naval Outlying Landing Field; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Note: Baseline emissions are estimated from operational data collected in 2021 for T-44C flight operations only at all airfields and from intra-facility flights.

The GHG emissions for the counties where the METS activity would occur totaled 28,003,801 tons in 2017, as reported by the USEPA's National Emissions Inventory and shown in (Table 3-28). As shown, the total CO_2 emissions under baseline conditions from T-44C operations (36,215 tpy) is a small component of overall CO_2 emissions for the counties where T-44C aircraft operate (0.13 percent).

3.5.3 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the action alternatives. The ROI for assessing air quality impacts is comprised of the counties where the Navy and non-Navy airfields are located (refer to Table 3-27), all of which are classified by USEPA as unclassified/attainment for all criteria pollutants. Thus, the CAA General Conformity Rule is not applicable. Other federal laws, such as NEPA and its implementing regulations, require the analysis of the significance of air quality impacts. The air quality analysis considers the degree of effects to the local air quality at each of the locations under consideration and evaluates short- and long-term effects, beneficial and adverse effects, effects on public health and safety as they relate to air quality, and effects that would violate federal, state, tribal, or local laws protecting the environment.

This analysis evaluates criteria pollutant emissions based on the most recent design values for the region to assess changes in ambient concentrations for criteria pollutants and their effects on compliance with ambient air quality standards. There are no applicable or relevant thresholds for GHG emissions.

3.5.3.1 No Action Alternative

Under the No Action Alternative, there would be no change to baseline air quality. Therefore, no significant impacts to air quality or air resources would occur with implementation of the No Action Alternative.

3.5.3.2 Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative)

Construction

Under Alternative 1, the Navy would replace the existing 54 T-44C aircraft with 58 T-54A aircraft, increase operations by 10 percent, and implement short- and long-term projects to provide Navy support facilities at NAS Corpus Christi. The short-term construction projects would occur beginning in 2024 and long-term construction projects would begin in 2027; emissions are conservatively assumed to be completed within the same year construction activities begin. Emissions calculated for these two years of construction are shown in Table 3-31, and more information is contained in Appendix F, *Air Quality Methodology and Calculations*.

Air Quality Potential Impacts:

No Action Alternative

- The Proposed Action would not be implemented, and the affected environment would remain unchanged; therefore, no significant impacts to air quality would result.

Alternative 1

- No significant impacts to air quality would occur. The six counties where Navy and non-Navy airfield operations would occur are in attainment of the NAAQS and thus General Conformity does not apply.
- Emissions of criteria pollutants and GHGs above the No Action Alternative would occur from the construction projects and the planned 10 percent increase in operations of the T-54A. However, the increases would be minor relative to each county's overall emissions and would not result in significant impacts to air quality.

Alternative 2

- No significant impacts to air quality would occur. Emissions would be slightly higher than those under Alternative 1, as annual flight operations would increase 20 percent above No Action Alternative levels and there would be 33 additional personnel and their families commuting to NAS Corpus Christi and the surrounding areas. However, the increases would be minor relative to each county's overall emissions and would not result in significant impacts to air quality.

Operations

The renovated facilities, including the recapitalized Hangars 57 and 58 or the newly constructed larger hangar, once operational, would be a source of air emissions, but the equipment would be similar to what is currently in use under existing conditions. These stationary sources would likely include boilers and/or water heaters, emergency generators, and solvent or paint usage. The specific equipment for the hangar would require evaluation to verify exemption and/or inclusion as a permitted stationary source.

The transition of aircraft from the T-44C to the T-54A was evaluated using a surrogate aircraft, the C-12 Huron, which uses two Pratt & Whitney PT6A-60A engines. Emissions factor data is not currently available for the PT6A-52 engines that the T-54A would be equipped with; thus, the PT6A-60A engine was used to estimate emissions for the T-54A. Data on emissions from landings and takeoffs were obtained from the flight profiles developed for the Noise Study for this project and emissions factors from the *U.S. Air Force Air Emissions Guide for Mobile Sources* (Air Force Civil Engineer Center, 2021). Table 3-32 contains the estimated annual steady state for flight operations. Detailed calculations are provided in Appendix F, *Air Quality Methodology and Calculations*.

The net change in emissions from ongoing flight operations under Alternative 1 at each location would be minor relative to their county's overall emissions (refer to Table 3-29) and thus would not result in significant impacts to air quality.

Table 3-31 Construction Air Emissions at NAS Corpus Christi under Alternative 1

Year	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
Short-Term Construction Projects – 2024	2.25	0.29	1.28	0.00	0.50	0.21	530
Long-Term Construction Projects – 2027	2.26	0.24	2.70	0.00	1.95	0.42	868

Key: CO = carbon monoxide; CO_2 = carbon dioxide; NAS = Naval Air Station; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Table 3-32 Average Annual Flight Operations and Engine Maintenance Air Emissions for Alternative 1 at Navy and Non-Navy Airfields

Location	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
NAS Corpus Christi[1] –Baseline	44.45	319.09	148.38	5.12	1.95	1.78	15,410
NAS Corpus Christi[1] – Alternative 1	51.38	351.69	184.61	6.20	2.35	2.14	18,655
Net Change	6.92	32.61	36.24	1.08	0.40	0.36	3,245
NOLF Cabaniss – Baseline	5.29	37.51	18.99	1.08	0.39	0.35	3,250
NOLF Cabaniss – Alternative 1	5.82	41.26	20.89	1.19	0.43	0.39	3,575
Net Change	0.53	3.75	1.90	0.11	0.04	0.04	325
Alice International Airport – Baseline	6.49	62.51	33.13	1.51	0.69	0.62	4,538
Alice International Airport – Alternative 1	7.14	68.76	36.45	1.66	0.75	0.68	4,992
Net Change	0.65	6.25	3.31	0.15	0.07	0.06	454
Calhoun County Airport – Baseline	1.05	8.20	5.24	0.24	0.12	0.11	734
Calhoun County Airport – Alternative 1	1.15	9.02	5.77	0.27	0.14	0.12	807
Net Change	0.10	0.82	0.52	0.02	0.01	0.01	73
Corpus Christi International Airport – Baseline	4.51	65.53	24.25	1.08	0.40	0.36	3,258
Corpus Christi International Airport – Alternative 1	4.96	72.09	26.68	1.19	0.44	0.39	3,584
Net Change	0.45	6.55	2.43	0.11	0.04	0.04	326
Palacios Municipal Airport – Baseline	1.57	10.69	7.62	0.36	0.19	0.17	1,089
Palacios Municipal Airport – Alternative 1	1.72	11.76	8.38	0.40	0.21	0.19	1,198
Net Change	0.16	1.07	0.76	0.04	0.02	0.02	109
Port Isabel Airport – Baseline	3.10	19.34	14.68	0.71	0.38	0.34	2,138
Port Isabel Airport – Alternative 1	3.41	21.28	16.15	0.78	0.41	0.37	2,352
Net Change	0.31	1.93	1.47	0.07	0.04	0.03	214

Table 3-32 Average Annual Flight Operations and Engine Maintenance Air Emissions for Alternative 1 at Navy and Non-Navy Airfields

Location	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
Valley International Airport – Baseline	6.48	45.13	32.86	1.53	0.82	0.74	4,586
Valley International Airport – Alternative 1	7.13	49.65	36.15	1.68	0.90	0.82	5,045
Net Change	0.65	4.51	3.29	0.15	0.08	0.07	459
Victoria Regional Airport – Baseline	1.72	13.24	8.73	0.40	0.21	0.19	1,211
Victoria Regional Airport – Alternative 1	1.89	14.57	9.60	0.44	0.23	0.21	1,332
Net Change	0.17	1.32	0.87	0.04	0.02	0.02	121

Key: CO = carbon monoxide; CO_2 = carbon dioxide; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Notes:

1. Table includes engine maintenance operations that occur at NAS Corpus Christi.
2. Table presents emissions from T-54A flight operations only at all airfields. Emissions for all pollutants were calculated for operations occurring below the mixing height (3,000 feet), with the exception of CO_2 (includes emissions for the entire flight path, even those above 3,000 feet).

Table 3-33 presents the maximum emissions from both construction and aircraft operations occurring simultaneously at NAS Corpus Christi. During construction, ambient air concentrations of pollutants would increase slightly in the areas where construction activities would occur. Additionally, the emissions from aircraft operations that occur under the mixing height of 3,000 AGL have the potential to affect ground-level air quality (FAA, 2005). However, aircraft and associated mobile ground-support equipment at airports produce similar emissions to on-road (automobile) and off-road (construction equipment) engines while the aircraft engines are running on the ground and during the minutes when the aircraft departs and takes off to altitude or returns to ground for a landing. As described in Section 3.2.3.2, *Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations Potential Impacts (Preferred Alternative*), the nearest sensitive receptors are located approximately 1 mile south of the proposed construction area and 0.5 mile southeast of the southernmost tip of the runway. Wind conditions vary throughout the year, and instantaneous wind speed and direction vary more widely than hourly averages. Wind experienced at any given location is highly dependent on local topography and other factors. In Corpus Christi, it is generally windier during the months of October through July, with average wind speeds of 10.8 miles per hour. Wind most often comes from the south between February and August and between October and December; it most often comes from the east between September and October (Weather Spark, 2023). Due the direction of the prevailing winds, the ground-level emissions are anticipated to be quickly entrained downwind to the north and west of where construction would occur. This would result in potential impacts similar to vehicle emissions along a highway, where concern would be focused on sensitive receptors immediately adjacent (within 0.25 mile) to the emission sources.

Relative to the No Action Alternative, selection of T-54A aircraft to replace the T-44C aircraft under Alternative 1, and associated construction projects, would result in an increase in emissions of all criteria pollutants and GHG emissions. Proportionately, the greatest increase would be CO and VOC emissions. The impact of GHG emissions associated with Alternative 1 are discussed in the context of cumulative impacts in Section 4.4.5, *Cumulative Effects Analysis, Air Quality*. However, as the ambient criteria pollutant concentrations in the region are well below the NAAQS (Table 3-29), anticipated air quality changes from construction and flight operations are not expected to interfere with the attainment of NAAQS. Therefore, Alternative 1 is not anticipated to result in a significant deterioration of regional air quality from construction or flight training operations.

Table 3-33 Maximum Construction and Annual Flight Operations Including Engine Maintenance Air Emissions for Alternative 1 at NAS Corpus Christi (2027)

Year	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
Long-Term Construction Projects - 2027	2.26	0.24	2.70	0.00	1.95	0.42	868
Flight Operations (Net Change)	6.92	32.61	36.24	1.08	0.40	0.36	3,245
Total Emissions	9.19	32.85	38.94	1.08	2.34	0.78	4,113

Key: CO = carbon monoxide; CO_2 = carbon dioxide; NAS = Naval Air Station; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Note: The T-54A aircraft would arrive between the years 2024 and 2026. Proposed construction of short-term projects would begin in 2024 and is conservatively assumed to occur within 1 calendar year; the same assumption would apply to the long-term construction projects that would be constructed in 2027. As shown in Table 3-31, the maximum year of construction emissions would occur in 2027; thus, the maximum year of combined construction and aircraft flight operations emissions are assumed to occur in 2027.

Alternative 1 Impact Conclusion

Under Alternative 1, emissions of criteria pollutants associated with construction and flight training operations would increase relative to the No Action Alternative. The ROI is currently in attainment for all NAAQS. Emissions from construction and emission increases from flight training operations under Alternative 1 would not be considered significant.

3.5.3.3 Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations Potential Impacts

Under Alternative 2, the Navy would replace the existing 54 T-44C aircraft with 58 T-54A aircraft, increase operations by 20 percent and add 33 personnel to support operations at NAS Corpus Christi, and implement short- and long-term projects to provide Navy support facilities at NAS Corpus Christi.

Construction

Emissions during construction would be the same as Alternative 1 (refer to Table 3-31), and more information is contained in Appendix F, *Air Quality Methodology and Calculations*. Thus, construction emissions from Alternative 2 would not result in significant impacts to air quality in Nueces County.

Operations

Table 3-34 contains the estimated annual steady state emissions associated with the use of the T-54A under Alternative 2 as compared to the No Action Alternative. Detailed calculations are provided in Appendix F, *Air Quality Methodology and Calculations*.

The net change in emissions from ongoing flight operations under Alternative 2 at each location would be minor relative to their county's overall emissions (refer to Table 3-28) and, thus, would not result in significant impacts to air quality.

Table 3-35 presents the maximum emissions from construction and aircraft operations and the additional worker commutes simultaneously occurring at NAS Corpus Christi. Relative to the No Action

Alternative, Alternative 2 would result in an increase in emissions of all criteria pollutants and GHG emissions. Similar to Alternative 1, the greatest increase would be in CO and VOC emissions. Impacts of GHG emissions associated with Alternative 2 are discussed in context of cumulative impacts in Section 4.4.5, Cumulative Effects Analysis, Air Quality. As with Alternative 1, since ambient criteria pollutant concentrations in the region are well below the NAAQS (refer to Table 3-29), anticipated air quality changes from construction activities, worker commutes, and aircraft operations are not expected to interfere with the attainment of NAAQS. Therefore, Alternative 2 is not anticipated to result in a significant deterioration of regional air quality from construction, flight training operations, or emissions from the additional worker commutes.

Table 3-34 Average Annual Flight Operations and Engine Maintenance Air Emissions for Alternative 2 at Navy and Non-Navy Airfields

Location	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
NAS Corpus Christi[1] –Baseline	44.45	319.09	148.38	5.12	1.95	1.78	15,410
NAS Corpus Christi[1] – Alternative 2	56.05	383.66	201.40	6.77	2.56	2.34	20,351
Net Change	11.59	64.58	53.02	1.64	0.61	0.55	4,941
NOLF Cabaniss – Baseline	5.29	37.51	18.99	1.08	0.39	0.35	3,250
NOLF Cabaniss – Alternative 2	6.35	45.01	22.79	1.30	0.47	0.43	3,900
Net Change	1.06	7.50	3.80	0.22	0.08	0.07	650
Alice International Airport – Baseline	6.49	62.51	33.13	1.51	0.69	0.62	4,538
Alice International Airport – Alternative 2	7.79	75.01	39.76	1.81	0.82	0.74	5,446
Net Change	1.30	12.50	6.63	0.30	0.14	0.12	908
Calhoun County Airport – Baseline	1.05	8.20	5.24	0.24	0.12	0.11	734
Calhoun County Airport – Alternative 2	1.26	9.84	6.29	0.29	0.15	0.13	881
Net Change	0.21	1.64	1.05	0.05	0.02	0.02	147
Corpus Christi International Airport – Baseline	4.51	65.53	24.25	1.08	0.40	0.36	3,258
Corpus Christi International Airport – Alternative 2	5.42	78.64	29.10	1.30	0.48	0.43	3,910
Net Change	0.90	13.11	4.85	0.22	0.08	0.07	652
Palacios Municipal Airport – Baseline	1.57	10.69	7.62	0.36	0.19	0.17	1,089
Palacios Municipal Airport – Alternative 2	1.88	12.83	9.15	0.44	0.23	0.21	1,307
Net Change	0.31	2.14	1.52	0.07	0.04	0.03	218
Port Isabel Airport – Baseline	3.10	19.34	14.68	0.71	0.38	0.34	2,138
Port Isabel Airport – Alternative 2	3.72	23.21	17.62	0.85	0.45	0.41	2,565
Net Change	0.62	3.87	2.94	0.14	0.08	0.07	428
Valley International Airport – Baseline	6.48	45.13	32.86	1.53	0.82	0.74	4,586
Valley International Airport – Alternative 2	7.78	54.16	39.43	1.83	0.99	0.89	5,504
Net Change	1.30	9.03	6.57	0.31	0.16	0.15	917

Table 3-34 Average Annual Flight Operations and Engine Maintenance Air Emissions for Alternative 2 at Navy and Non-Navy Airfields

Location	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
Victoria Regional Airport – Baseline	1.72	13.24	8.73	0.40	0.21	0.19	1,211
Victoria Regional Airport – Alternative 2	2.06	15.89	10.47	0.48	0.25	0.23	1,454
Net Change	0.34	2.65	1.75	0.08	0.04	0.04	242

Key: CO = carbon monoxide; CO_2 = carbon dioxide; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Notes:

1. Includes engine maintenance operations that occur at NAS Corpus Christi.
2. Table presents emissions at all airfields from T-54A flight operations only. Emissions for all pollutants were calculated for operations occurring below the mixing height (3,000 feet), with the exception of CO_2 (includes emissions for the entire flight path, even those above 3,000 feet).

Table 3-35 Maximum Construction and Annual Flight Operations Including Engine Maintenance and Additional Worker Commute Air Emissions for Alternative 2 at NAS Corpus Christi (2027)

Year	*NOx (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*	*CO_2 (tpy)*
Long-term Construction Projects - 2027	2.26	0.24	2.70	0.00	1.95	0.42	868
Additional Worker Commutes	0.02	0.01	1.29	0.00	1.30	0.20	108
Flight Operations (Net Change)	11.59	64.58	53.02	1.64	0.61	0.55	4,941
Total Emissions	13.88	64.83	57.02	1.65	3.86	1.17	5,917

Key: CO = carbon monoxide; CO_2 = carbon dioxide; NAS = Naval Air Station; NO_x = nitrogen oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; SO_2 = sulfur dioxide; tpy = tons per year; VOC = volatile organic compound.

Note: The T-54A aircraft would arrive between the years 2024 and 2026. Proposed construction of short-term projects would begin in 2024 is conservatively assumed to occur within one calendar year, and the same assumption would apply to the long-term construction projects that would be constructed in 2027. As shown in Table 3-31, the maximum year of construction emissions would occur in 2027; thus, the maximum year of combined construction and aircraft flight operations emissions are assumed to occur in 2027.

Alternative 2 Impact Conclusion

Under Alternative 2, emissions of criteria pollutants associated with construction, increased flight training operations, and additional worker commutes would increase relative to the No Action Alternative. Emissions for Alternative 2 would be slightly higher than those described for Alternative 1 due to the increased flight operations at Navy and non-Navy airfields and additional personnel at NAS Corpus Christi. The ROI is currently in attainment for all NAAQS, and changes in mobile emissions from construction, worker commutes, and aircraft flight operations would not be considered significant. Overall, implementation of Alternative 2 would not result in significant impacts to air quality.

3.6 Summary of Potential Impacts to Resources and Impact Avoidance and Minimization

A summary of the potential impacts associated with each of the action alternatives and the No Action Alternative and impact avoidance and minimization measures are presented in Table 3-36 and Table 3-37, respectively.

Table 3-36 Summary of Potential Impacts to Resource Areas

Resource Area	***No Action Alternative***	***Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)***	***Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations***
Noise	• Operations would not change relative to baseline conditions, and no additional noise impacts would occur. Aircraft noise levels in excess of 65 dBA DNL would continue to affect 50 acres of off-installation land and an estimated 91 residents near NAS Corpus Christi. • No off-station land would exceed 65 dBA DNL near NOLF Cabaniss. • Aircraft noise levels near international, regional, and publicly owned municipal airfields are variable with some airfields experiencing frequent jet aircraft noise (e.g., Corpus Christi International) and other airfields being used relatively infrequently (e.g., Palacios).	• The number of off-station land acres exposed to 65 dBA DNL or greater at NAS Corpus Christi would increase by one, from 50 to 51, and the estimated number of off-installation residents exposed to 65 dBA DNL or greater would remain at 91. Noise levels would not increase at representative locations near NAS Corpus Christi. • Noise levels near NOLF Cabaniss would increase by 0.5 dBA DNL or less and would remain below 65 dBA DNL. • Speech interference events per average daytime hour would increase by one or less at the locations studied. • Noise levels at all schools studied would remain below 60 dBA $L_{eq(8hr)}$. • Aircraft noise levels near international, regional, and publicly owned municipal airfields would remain below 65 dBA DNL at nearby sensitive locations or would not change measurably (i.e., change would be less than 0.1 dBA DNL and rounds to zero) at representative sensitive locations. • The Navy has determined that there would be no environmental health	• The number of off-station land acres exposed to 65 dBA DNL or greater at NAS Corpus Christi would increase by the same amount as under Alternative 1, but the estimated number of residents exposed would increase by one, from 91 to 92. Noise levels would increase by 0.1 dBA DNL or less near NAS Corpus Christi. • Noise levels near NOLF Cabaniss would increase by as much as 0.8 dBA DNL but would remain below 65 dBA DNL. • Speech interference events per average daytime hour would increase by one or less at the locations studied. • Noise levels at all schools studied would remain below 60 dBA $L_{eq(8hr)}$. • Aircraft noise levels near international, regional, and publicly owned municipal airfields would remain below 65 dBA DNL at nearby sensitive locations or would not change measurably at sensitive locations. • The Navy has determined that there would be no environmental health and safety risks that would disproportionately affect children.

Table 3-36 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)*	*Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations*
		and safety risks that would disproportionately affect children.	
Environmental Justice	• The Navy determined that there are minority and low-income populations present within the greater than 65 dBA DNL noise zones at NAS Corpus Christi. There would be no change in existing conditions for minority or low-income populations within the greater than 65 dBA DNL noise zones.	• The Navy determined that there are minority and low-income populations present within the greater than 65 dBA DNL noise zones at NAS Corpus Christi. • For NAS Corpus Christi, the total affected population within the greater than 65 dBA DNL noise zones would remain the same as under the No Action Alternative (91 people). • Impacts to minority and low-income populations would be minor, similar to the No Action Alternative, and would not be significant.	• The Navy determined that there are minority and low-income populations present within the greater than 65 dBA DNL noise zones at NAS Corpus Christi. • For NAS Corpus Christi, the total affected population within the greater than 65 dBA DNL noise zones would increase by one compared to the No Action Alternative (from 91 to 92 people). • Impacts to minority and low-income populations would be minor and would not be significant.
Biological Resources	• There would be no change in existing aircraft operations or BASH impacts on migratory birds.	• There would be a 10 percent increase in aircraft operations at NAS Corpus Christi, NOLF Cabaniss, and international, regional, and publicly owned municipal airfields (from 184,672 to 203,000 annual operations). No changes to existing flight paths, procedures, or habitat would occur. The Navy would continue to manage airfield environments in accordance with its BASH Plan in order to reduce the likelihood of aircraft collisions with federally and state-protected species. • Alternative 1 would demolish buildings that may contain active bird	• There would be a 20 percent increase in aircraft operations at NAS Corpus Christi, NOLF Cabaniss, and international, regional, and publicly owned municipal airfields (from 184,672 to 221,500 annual operations). No changes to existing flight paths, procedures, or habitat would occur. The Navy would continue to manage airfield environments in accordance with its BASH Plan in order to reduce the likelihood of aircraft collisions with federally and state-protected species. • Alternative 2 would demolish buildings that may contain active bird

Table 3-36 Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)*	*Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations*
		nests within the buildings or on the rooftop. Building demolition work and tree removal (if any) would, to the extent feasible, take place outside of the breeding season. If this work must be conducted during the bird breeding season, a qualified biologist must confirm that no active nest would be impacted by these actions. Alternative 1 would not result in a significant adverse effect on active nests or populations of species covered under the MBTA, including Birds of Conservation Concern. • The Navy has determined that Alternative 1 may result in the incidental "take" of native birds protected by the MBTA by operation of the T-54A aircraft. Under the MBTA's regulations that are applicable to military readiness activities (50 CFR part 21), the USFWS has promulgated a rule that authorizes the incidental take of MBTA-listed birds, provided they do not result in significant adverse effects on their population. This alternative is not expected to result in any adverse impacts on any migratory bird species populations	nests within the buildings or on the rooftop. Building demolition work and tree removal (if any) would, to the extent feasible, take place outside of the breeding season. If this work must be conducted during the bird breeding season, a qualified biologist must confirm that no active nest would be impacted by these actions. Alternative 2 would not result in a significant adverse effect on active nests or populations of species covered under the MBTA, including Birds of Conservation Concern. • The Navy has determined that Alternative 2 may result in the incidental "take" of native birds protected by the MBTA by operation of the T-54A aircraft. Under the MBTA's regulations that are applicable to military readiness activities (50 CFR part 21), the USFWS has promulgated a rule that authorizes the incidental take of MBTA-listed birds, provided they do not result in significant adverse effects on their population. This alternative is not expected to result in any adverse impacts on any migratory bird species populations

Table 3-36 Summary of Potential Impacts to Resource Areas

Resource Area	***No Action Alternative***	***Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)***	***Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations***
		with current standard operating procedures (BASH Plan). • This alternative may affect but is not likely to adversely affect the northern aplomado falcon, piping plover, red knot, eastern black rail, and whooping crane. For all other federally listed species identified with potential to occur within the ROI, the Navy has determined that there would be no effect. • The Navy consulted with the USFWS, and the agency concurred with the Navy's findings in a letter dated August 2, 2023 (Appendix B, *Special Status Species Documentation*). Recommended measures to prevent or minimize potential adverse effects to the northern aplomado falcon and whooping crane were added to this Final EA.	with current standard operating procedures (BASH Plan). • This alternative may affect but is not likely to adversely affect the northern aplomado falcon, piping plover, red knot, eastern black rail, and whooping crane. For all other federally listed species identified with potential to occur within the ROI, the Navy has determined that there would be no effect.
Cultural Resources	• There would be no change to existing conditions.	• No adverse effects from building renovations or new construction would occur to the Warehouse/Industrial Historic District and the Seaplane Hangars/Ramps Historic District. • Adverse effects to the Landplane Hangars Historic District would occur from building demolition or recapitalization.	• No adverse effects from building renovations or new construction would occur to the Warehouse/Industrial Historic District and the Seaplane Hangars/Ramps Historic District. • Adverse effects to the Landplane Hangars Historic District would occur from building demolition or recapitalization.

Table 3-36 Summary of Potential Impacts to Resource Areas

Resource Area	***No Action Alternative***	***Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10 Percent Increase in Operations (Preferred Alternative)***	***Alternative 2: Replace T-44C Aircraft with T-54A Aircraft with a 20 Percent Increase in Operations***
		• Adverse effects would be resolved through consultation with the SHPO and development of a MOA. • The Navy consulted with the Texas SHPO, and a MOA was signed on August 21, 2023 (Appendix C, *National Historic Preservation Act Section 106 Documentation*).	• Adverse effects would be resolved through consultation with the SHPO and development of a MOA.
Air Quality	• There would be no change to existing conditions.	• No significant impacts to air quality would occur. The six counties where Navy and non-Navy airfield operations would occur are in attainment of the NAAQS and, thus, General Conformity does not apply. • Emissions of criteria pollutants and GHGs above the No Action Alternative would occur from the construction projects and the planned 10 percent increase in operations of the T-54A. However, the increases would be minor relative to each county's overall emissions and would not result in significant impacts to air quality.	• No significant impacts to air quality would occur. The six counties where Navy and non-Navy airfield operations would occur are in attainment of the NAAQS and, thus, General Conformity does not apply. • Emissions would be slightly higher than those under Alternative 1, as annual flight operations would increase 20 percent above No Action Alternative levels, and there would be 33 additional personnel and their families commuting to NAS Corpus Christi and the surrounding areas. However, the increases would be minor relative to each county's overall emissions and would not result in significant impacts to air quality.

Key: BASH = Bird/Animal Aircraft Strike Hazard; CFR = Code of Federal Regulations; dBA = A-weighted decibels; DNL = day-night average sound level; EA = Environmental Assessment; GHG = greenhouse gas; $L_{eq(8hr)}$ = eight-hour equivalent sound level; MBTA = Migratory Bird Treaty Act; MOA = Memorandum of Agreement; NAAQS = National Ambient Air Quality Standards; NAS = Naval Air Station; Navy = U.S. Navy; NOLF = Naval Outlying Landing Field; ROI = region of influence; SHPO = State Historic Preservation Officer; USFWS = U.S. Fish and Wildlife Service.

Table 3-37 Impact Avoidance and Minimization Measures

Measure	*Anticipated Benefit / Evaluating Effectiveness*	*Implementing and Monitoring*	*Responsibility*	*Estimated Completion Date*
Alternative 1: Replace T-44C Aircraft with T-54A Aircraft with a 10-Percent Increase in Operations (Preferred Alternative)				
Biological Resources				
Conduct recapitalization or demolition outside of bird breeding season, to the extent feasible.	Prevent impacts to active nests.	Monitor during the construction period.	NAS Corpus Christi Wildlife Biologist	Estimated construction to be complete by the end of 2027.
If recapitalization or demolition occurs during bird breeding season, a qualified biologist will conduct a nest survey 72 hours before work begins.	Prevent impacts to any active nests.	Monitor during the construction period.	NAS Corpus Christi Wildlife Biologist	Estimated construction to be complete by the end of 2027.
If an active nest is found, work will be halted and the NAS Corpus Christi Wildlife Biologist will be notified and determine further action (e.g., removal).	Prevent impacts to active nests.	Monitor during the construction period.	NAS Corpus Christi Wildlife Biologist	Estimated construction to be complete by the end of 2027.
Cultural Resources				
Comply with stipulations contained in the Memorandum of Agreement.	Resolve adverse effect to the Landplane Hangars Historic District from building recapitalization or demolition.		NAVFAC SE Historic Preservation Officer	Estimated construction to be complete by the end of 2027.

Key: NAS = Naval Air Station; NAVFAC = Naval Facilities Engineering Systems Command; SE = Southeast.

4 Cumulative Effects

This section (1) defines cumulative effects; (2) describes past, present, and reasonably foreseeable future actions relevant to cumulative effects; (3) analyzes the incremental interaction the proposed action may have with other actions; and (4) evaluates cumulative effects potentially resulting from these interactions.

4.1 Definition of Cumulative Effects

The approach taken in the analysis of cumulative effects follows the objectives of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations, and CEQ guidance. Cumulative effects are defined in 40 Code of Federal Regulations section 1508.1 as "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time."

To determine the scope of environmental impact analyses, agencies shall consider cumulative actions, which when viewed with other proposed actions have cumulatively significant effects and should therefore be discussed in the same impact analysis document.

In addition, CEQ and the U.S. Environmental Protection Agency have published guidance addressing implementation of cumulative effects analyses—Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (CEQ, 2005) and the U.S. Environmental Protection Agency's Consideration of Cumulative Impacts in EPA Review of NEPA Documents (1999). CEQ guidance entitled Considering Cumulative Impacts Under NEPA (1997) states that cumulative impact analyses should "…determine the magnitude and significance of the environmental consequences of the proposed action in the context of the cumulative impacts of other past, present, and future actions…identify significant cumulative impacts…[and]…focus on truly meaningful impacts."

Cumulative effects are most likely to arise when a relationship or synergism exists between a proposed action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or close to the proposed action would be expected to have more potential for a relationship than those more geographically separated. Similarly, relatively concurrent actions would tend to offer a higher potential for cumulative effects. To identify cumulative effects, the analysis needs to address the following three fundamental questions.

- Does a relationship exist such that affected resource areas of the proposed action might interact with the affected resource areas of past, present, or reasonably foreseeable actions?
- If one or more of the affected resource areas of the proposed action and another action could be expected to interact, would the proposed action affect or be affected by impacts of the other action?
- If such a relationship exists, then does an assessment reveal any potentially significant impacts not identified when the proposed action is considered alone?

4.2 Scope of Cumulative Effects Analysis

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For this Environmental Assessment (EA), the study area delimits the geographic extent of the cumulative effects analysis. In general, the study area will include those areas previously identified in Chapter 3, Affected Environment and Environmental Consequences, for the respective resource areas. The time frame for cumulative effects centers on the timing of the proposed action.

Another factor influencing the scope of cumulative effects analysis involves identifying other actions to consider. Beyond determining that the geographic scope and time frame for the actions interrelate to the proposed action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for Environmental Impact Statements and EAs, management plans, land use plans, and other planning related studies.

4.3 Past, Present, and Reasonably Foreseeable Actions

This section will focus on past, present, and reasonably foreseeable future projects at and near the Proposed Action locale. In determining which projects to include in the cumulative effects analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable action. Specifically, using the first fundamental question included in Section 4.1, Definition of Cumulative Effects, it was determined if a relationship exists such that the affected resource areas of the Proposed Action (included in this EA) might interact with the affected resource area of a past, present, or reasonably foreseeable action. If no such potential relationship exists, the project was not carried forward into the cumulative effects analysis. In accordance with CEQ guidance (CEQ, 2005), these actions considered but excluded from further cumulative effects analysis are not catalogued here as the intent is to focus the analysis on the meaningful actions relevant to informed decision-making. Projects included in this cumulative effects analysis are listed in Table 4-1 and briefly described in the following subsections. Figure 4-1 shows the location of the Proposed Action and potential cumulative projects.

Table 4-1 Cumulative Action Evaluation

Action	*Level of NEPA Analysis Completed*
Past Actions	
Construct Wastewater Treatment Plant	Categorical Exclusion
Construct Tennis and Basketball Courts	Categorical Exclusion
Construct Mary Carroll High School	NA
Present and Reasonably Foreseeable Future Actions	
Construct Building 84	Categorical Exclusion
Renovate Hangar 47	Categorical Exclusion
Construct T-6B Facilities	TBD
Construct 300-Unit Apartments	NA
City of Corpus Christi Military Compatibility Area Overlay Districts	NA
Repairs and Resurfacing at NOLF Cabaniss	EA
Future Trend	
Climate Change	NA

Key: EA = Environmental Assessment; NA = not applicable; NEPA = National Environmental Policy Act; NOLF = Naval Outlying Landing Field; TBD = to be determined.

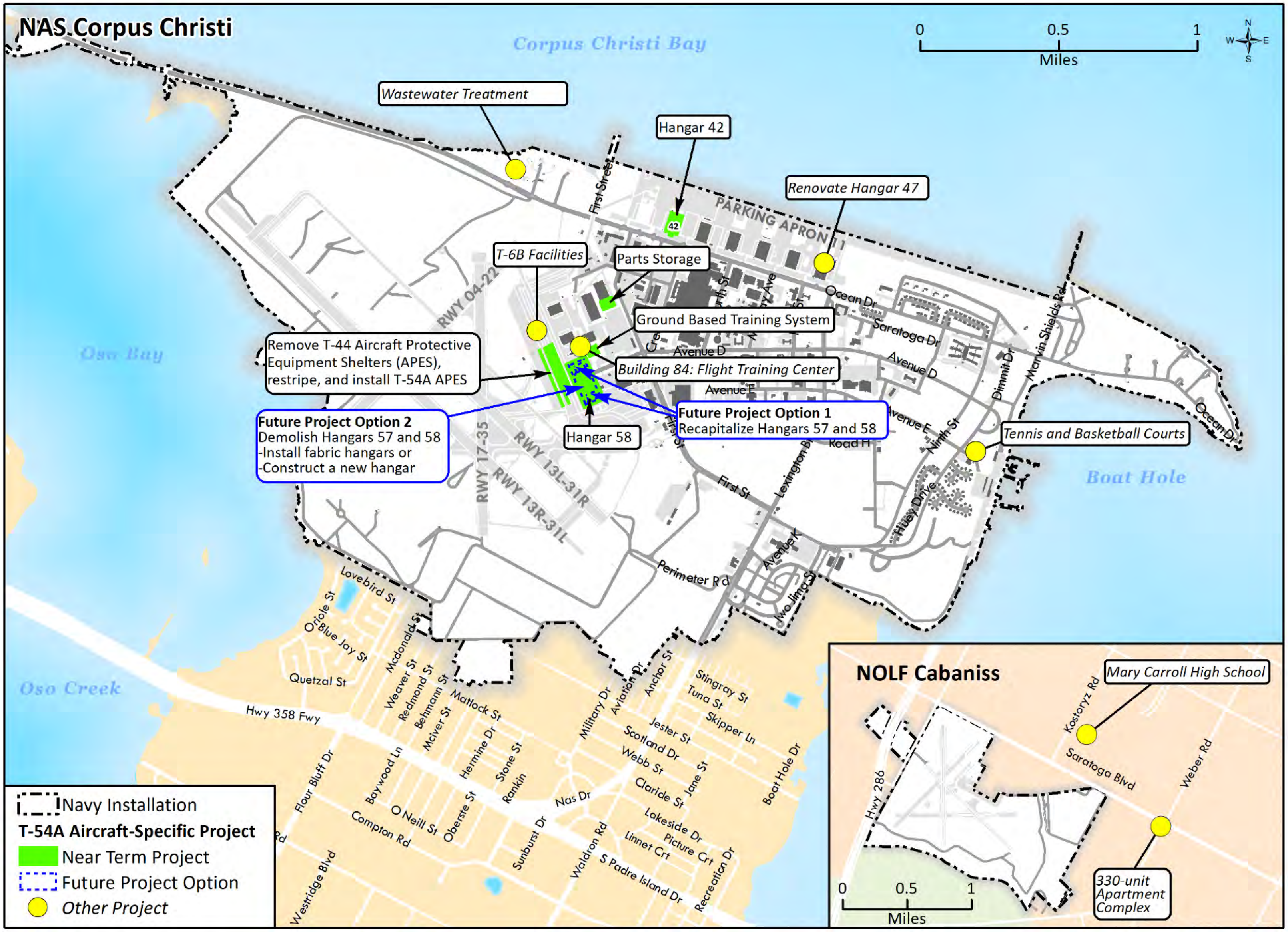

Figure 4-1 Location of Proposed Action and Potential Cumulative Projects

4.3.1 Past Actions

Wastewater Treatment Plant (WWTP). The Naval Air Station (NAS) Corpus Christi WWTP opened in 2021 and replaced an outdated facility that had been in service since 1941. The new WWTP replaced two outdated plants and combines domestic and industrial wastewater (Kieschnick, 2021).

Tennis and Basketball Courts. The Navy constructed two new tennis courts and a basketball court adjacent to the NAS Corpus Christi housing office. The previous courts were west of the on-base Fitness Center. The project was completed in November 2021 and is located adjacent to the Housing Office (Kieschnick, 2021).

Mary Carroll High School. The Corpus Christi Independent School District constructed a new high school on the corner of Saratoga Boulevard and Kostoryz Road, located north of Naval Outlying Landing Field (NOLF) Cabaniss. The new school opened for the 2022–23 school year. It is estimated to be 450,000 square feet and can accommodate 2,400 students (Garza, 2022).

4.3.2 Present and Reasonably Foreseeable Actions

Building 84. Building 84 is the three-story Consolidated Squadron Operations, Academic and Flight Training Facility at NAS Corpus Christi. It will be the new Training Air Wing Four (TRAWING 4) Headquarters and is currently under construction and almost complete. It is located next to Building 83 and will be 110,000 square feet.

Hangar 47. NAS Corpus Christi awarded a design build contract in August 2021 for stabilization, repair, and renovation of the hangar currently occupied by the Corpus Christi Army Depot. The scope of the work includes structural stabilization, removal and replacement of the exterior envelope, renovation of the hangar bay for industrial occupancy, renovation of the office lean-to wings, the provision of two elevators, and removal and replacement of the building systems to include heating, ventilation, and air conditioning; power and lighting; and telecommunication systems. The estimated completion date is November 2023 (Brink, 2021).

T-6B Facilities. In the future, T-6B aircraft operated by TRAWING 4 out of NAS Corpus Christi may require upgraded facilities similar to the T-54A aircraft such as a new hangar, overhead space, maintenance control, and a paraloft (parachute maintenance facility). This project would require funding and a separate NEPA review.

300-Unit Apartments. The City of Corpus Christi has approved development of an apartment complex at the intersection of Saratoga Boulevard and Weber Road. The property is zoned for multifamily residential and is located within the accident potential zone of NOLF Cabaniss. The developer plans to build a 300-unit apartment complex (Chandler, 2022).

City of Corpus Christi Military Compatibility Area Overlay Districts. In August 2022, the City of Corpus Christi passed a zoning ordinance to preserve and protect local Navy installations by limiting development in clear zones and accident potential zones. The Military Compatibility Area Overlay Districts protect the lands surrounding NAS Corpus Christi, NOLF Cabaniss, and NOLF Waldron. The overlay districts regulate land use, density, noise, light, and vertical obstructions to prevent development that is not compatible with the military mission.

Small Repairs and Resurfacing at NOLF Cabaniss. Small projects at NOLF Cabaniss including control tower repair and vegetation clearing and removal along the fence have been awarded. Future projects could include replacing the fencing, pavement maintenance for the runways and parking apron, installing taxiway lighting, and relocating signage.

Climate Change. Since 2000, Texas has had 19 named storms, including 8 destructive hurricanes, with Hurricane Harvey (Category 4), Hurricane Rita (Category 3), and Hurricane Ike (Category 2) causing the most damage (National Oceanic and Atmospheric Administration, 2022). The expected rise in sea level estimated from 1 to 4 feet by 2100 will result in an increase in the frequency of nuisance flooding and the potential for greater damage from storm surge (National Oceanic and Atmospheric Administration, 2022).

4.4 Cumulative Effects Analysis

Where feasible, the cumulative effects were assessed using quantifiable data; however, for many of the resources included for analysis, quantifiable data is not available, and a qualitative analysis was undertaken. In addition, where an analysis of potential environmental effects for future actions has not been completed, assumptions were made regarding cumulative effects related to this EA where possible. The analytical methodology presented in Chapter 3, *Affected Environment and Environmental Consequences*, which was used to determine potential impacts to the various resources analyzed in this document, was also used to determine cumulative effects.

4.4.1 Noise

4.4.1.1 Description of Geographic Study Area

The Proposed Action would take place at NAS Corpus Christi in Texas and its associated training locations at NOLF Cabaniss; at international, regional, and publicly owned municipal airfields; and in the Federal Aviation Administration National Airspace System throughout South Texas.

4.4.1.2 Relevant Past, Present, and Future Actions

Projects that could interact with Proposed Action noise impacts include demolition, construction, and renovation projects on NAS Corpus Christi and NOLF Cabaniss. These projects include the future construction of T-6B facility upgrades, the ongoing renovation of Hangar 47, and construction of a new training facility (Building 84). Projects on NOLF Cabaniss that are either ongoing or expected to occur soon include several projects for the renovation or repair of existing infrastructure.

Projects that could increase noise sensitivity of areas near NAS Corpus Christi and NOLF Cabaniss would be relevant to cumulative effects. This includes the recent opening of Mary Carroll High School near NOLF Cabaniss and the proposed construction of a 300-unit apartment complex at the intersection of Saratoga Boulevard and Weber Road.

4.4.1.3 Cumulative Effect Analysis

Past, present, and reasonably foreseeable demolition, construction, and renovation projects on NAS Corpus Christi and NOLF Cabaniss are, were, or will be associated with localized and temporary construction noise similar in nature to construction noise levels described for the Proposed Action (see Section 3.1.7, *Noise*, *Environmental Consequences*). In the context of a busy military installation where aircraft noise is very common, temporary and localized construction noise is not typically of concern even if multiple construction projects were to occur in the same time period and locale.

Continued development of land near NAS Corpus Christi and NOLF Cabaniss increases the number of people that would experience elevated aircraft noise levels. Construction of 300-unit apartments at the intersection of Saratoga Boulevard and Weber Road (near NOLF Cabaniss) would result in additional people being exposed to elevated aircraft noise levels, but noise levels would remain below land use compatibility guidelines (i.e., 65 A-weighted decibels [dBA] day-night average sound level [DNL]) under Alternatives 1 and 2.

The updated zoning ordinance for Military Compatible Area Overlay Districts would pose beneficial cumulative noise effects by reducing the potential for incompatible development with the military mission, such as limiting further residential construction within the greater than 65 dBA DNL noise zones. Implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future projects, would not result in exceedances of impact guidelines and would not result in significant noise effects within the region of influence (ROI).

4.4.2 Environmental Justice

4.4.2.1 Description of Geographic Study Area

The ROI for noise impacts on environmental justice communities includes Block Groups 2 and 3 of Census Tract 30.04 located in Nueces County, Texas. The ROI for air quality impacts on environmental justice communities includes Calhoun County, Cameron County, Jim Wells County, Matagorda County, Nueces County, and Victoria County in the State of Texas.

Past, present, and future economic activities that have and will continue to contribute to population growth in these areas would also result in additional noise and air quality impacts. Relevant past, present, and future actions in the ROI include construction and maintenance activities at NAS Corpus Christi, such as the renovation of Hangar 47, the future construction of T-6B facility upgrades, and construction of the new TRAWING 4 Headquarters (Building 84). Construction, maintenance, and repair activities at NOLF Cabaniss and within the community, including 300-unit apartments, would support economic growth through employment opportunities and income-generating activities. Additional housing availability, economic growth, and opportunities would benefit populations. In addition, the Corpus Christi City Council approval of the Military Compatible Area Overlay Districts in August 2022 is expected to further limit incompatible development within the greater than 65 dBA noise zones and Accident Potential Zones.

4.4.2.2 Cumulative Effect Analysis

The Navy has determined that noise from aircraft operations under the Proposed Action at NAS Corpus Christi under Alterative 1 would affect the same number of residents as under the No Action Alternative. Under Alternative 2, one additional resident would be affected. Noise levels at the one representative location near NAS Corpus Christi (mobile home / recreational vehicle park) have baseline conditions that are currently above the greater than 65 dBA noise zones and would remain the same. Under Alternative 2, one location would experience noise levels of 0.1 dBA greater than under the No Action Alternative. Representative locations near NOLF Cabaniss would experience an increase of up to 0.5 dBA DNL under Alternative 1 and up to 0.8 dBA DNL under Alternative 2. International, regional, or publicly owned airfields would all remain below 65 dBA DNL using the screening criteria. Relevant past, present, and future actions would not occur in this area and would not likely result in additional noise impacts to the representative locations studied near NAS Corpus Christi, NOLF Cabaniss, or any of the international, regional, or publicly owned airfields. Noise levels at noise-sensitive locations near international, regional, and publicly owned municipal airfields would remain well below 65 dBA DNL or would not change measurably relative to baseline conditions. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects would not result in cumulative effects to environmental justice communities.

4.4.3 Biological Resources

4.4.3.1 Description of Geographic Study Area

The ROI for cumulative biological resources includes NAS Corpus Christi in Texas and its associated training locations at NOLF Cabaniss; at international, regional, and publicly owned municipal airfields; and in the Federal Aviation Administration's National Airspace System throughout South Texas.

4.4.3.2 Relevant Past, Present, and Future Actions

Under the Proposed Action, construction would occur on previously disturbed areas with high human activity. Buildings that would be demolished could contain active bird nests within the buildings or on the rooftop. Other projects that could involve building demolition include the T-6B facility upgrades. The Proposed Action and T-6B facility upgrades would comply with the Memorandum of Understanding with the U.S. Fish and Wildlife Service to protect against the take of birds for installation support functions, including utilities maintenance, construction, and demolition. As a result, cumulative effects could occur but would likely be prevented in compliance with the Memorandum of Understanding. None of the other proposed projects would result in the potential of increased flight operations and would not affect Bird/Animal Aircraft Strike Hazard potential. The only potential for cumulative effects would be climate change.

4.4.3.3 Cumulative Effect Analysis

Climate is an important environmental influence on ecosystems. Changing climate affects ecosystems in a variety of ways. For instance, warming may force species to migrate to higher latitudes or higher elevations where temperatures are more conducive to their survival. Similarly, as sea level rises, saltwater intrusion into a freshwater system may force some key species to relocate or die, thus removing predators or prey that are critical in the existing food chain.

Ecosystems can serve as natural buffers from extreme events such as wildfires, flooding, and drought. Climate change and human modification may restrict ecosystems' ability to temper the impacts of extreme conditions and thus may increase vulnerability to damage. Examples include reefs and barrier islands that protect coastal ecosystems from storm surges, wetland ecosystems that absorb floodwaters, and cyclical wildfires that clear excess forest debris and reduce the risk of dangerously large fires.

During tropical storms or hurricanes, terrestrial wildlife species typically leave the area when severe weather occurs and then return when the weather improves.

Ecosystem structure and function, resilience, and natural adaptive capacity and shifts in seasonal timing have been reported in the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2022a). The biodiversity factsheet indicates that climate change has altered marine, terrestrial, and freshwater ecosystems and caused local species losses, increases in disease, and mortality of plants and animals, resulting in changes to ecosystems. Unique and threatened ecosystems are expected to be at high risk in the very near term due to tree mortality, coral reef bleaching, and mortality events from heat waves (IPCC, 2022b). Sea level rise is expected to increase the risk of coastal erosion, submergence of coastal land, and the loss of coastal habitat and ecosystems, while worsening potential salinization of groundwater and compromising coastal ecosystems (IPCC, 2022b). As a result, climate change could affect the use of and training at Navy facilities located in coastal areas such as Corpus Christi, including more frequent access limitations due to flooding and adverse weather causing delays in training schedules. The Navy is integrating climate change considerations and tracking climate investments throughout the planning, programming, budget justification, and ranking processes (Navy, 2022). The Navy has updated its Planning Criteria for Navy/Marine Corps Installations (Unified Facilities Criteria 2-000-05N) to address proper planning, space allocation, and basic facility requirements for installation mission assurance and mission-essential functions to improve resiliency. Military construction projects need to address proper planning, space allocation, and basic facility requirements for installation mission assurance and mission-essential functions to improve resiliency. Space planning allocation takes into account energy, climate, sea level change, and continuity of operations for mission critical assets and protection of high-value equipment. As a result of incorporating resiliency planning as part of military construction efforts, no significant cumulative effects to biological resources would occur within the ROI.

4.4.4 Cultural Resources

4.4.4.1 Description of Geographic Study Area

The ROI is equivalent to the Area of Potential Effects and includes 213.2 acres. The area includes the footprint of building demolition, renovation, and construction projects that would occur, as well as a quarter-mile visual buffer around the proposed new hangar where it is estimated the proposed new hangar could be visible.

4.4.4.2 Relevant Past, Present, and Future Actions

Relevant past, present, and future actions would include demolition, renovation, and new construction projects on the flightline that could affect historic properties or historic districts.

4.4.4.3 Cumulative Effect Analysis

Cumulative historic property effects from past, present, and future actions within the ROI and in combination with the Proposed Action could result in cumulative effects on historic properties. There are no past or present projects that could result in cumulative effects on historic properties. The only reasonably foreseeable action that could pose cumulative effects would be the future T-6B facilities upgrades. This project has not been funded, designed, or subject to NEPA compliance to date. If historic properties would potentially be affected, National Historic Preservation Act Section 106 consultation would be undertaken and any adverse effects would be resolved. Rehabilitation and reuse of Hangars 42 and 47 would pose beneficial cumulative effects to historic properties. Therefore, implementation of the Proposed Action, combined with the past, present, and reasonably foreseeable future projects, could pose cumulative effects, but any adverse effects would be resolved. Rehabilitation of historic properties would offset some potential cumulative effects, and therefore impacts would not be significant.

4.4.5 Air Quality

4.4.5.1 Description of Geographic Study Area

The ROI comprises the six counties in Texas where the Navy and non-Navy airfields are located (refer to Table 3-27), which are in attainment for all criteria pollutants.

4.4.5.2 Relevant Past, Present, and Future Actions

All the present and reasonably foreseeable future actions have the potential to interact with Alternatives 1 or 2 and affect air quality.

4.4.5.3 Cumulative Effect Analysis

The construction of additional projects on NAS Corpus Christi and NOLF Cabaniss may overlap with the construction projects occurring in 2024 and 2027 under Alternatives 1 or 2. Emissions from these projects would be temporary and would not result in the short- or long-term degradation of regional air quality in Nueces County. One project near NOLF Cabaniss—the residential construction project that is not yet constructed—would add additional tailpipe emissions from people in the community commuting to these locations within Nueces County, which would result in a minor increase in long-term transportation-related emissions. However, based on the project descriptions, the impacts of these projects in conjunction with the implementation of either Alternative 1 or 2 would not likely have a significant impact on air quality in Nueces County.

Greenhouse Gases

When considering effects, both short- and long-term adverse and beneficial effects should be considered withing the scope of reasonable foreseeability (CEQ, 2023). For greenhouse gases (GHGs), the impacts are cumulative and global, and the analysis evaluates emissions considering the baseline or No Action Alternative and both of the Proposed Action Alternatives. The evaluation considers both near-term impacts and those within an estimated life cycle. While the T-44C airframe has been active for over 40 years, the analysis of life-cycle GHG emissions from the replacement aircraft looks at only 25 years, as it is possible that a newer and more sustainable replacement aircraft design would be available for use within 25 years. The training tempo is assumed to be unchanged over the course of the 25-year life span.

Implementation of Alternative 1 or Alternative 2 would contribute directly to emissions of GHGs from the combustion of fossil fuels. For both alternatives, construction would generate approximately 1,398 tons (1,268 metric tons) of carbon dioxide (CO_2). The operation of new facilities may result in a small increase in installation-related GHG emissions, primarily through the consumption of electricity. Construction of new stationary sources requiring fossil fuel, such as boilers or water heaters is unlikely based on the Navy goal of reducing building GHG emissions 50 percent by 2032. Once the transition to the T-54A occurs, routine activities such as flight training operations that generate mobile source emissions would generate a net annual addition of approximately 3,245 tons (2,944 metric tons) of CO_2 each year for Alternative 1. Routine activities under Alternative 2 would generate a somewhat greater annual amount of net emissions of CO_2 each year, at 4,941 tons (4,482 metric tons), from flight operations and the increase of 33 workers commuting regularly to NAS Corpus Christi. Total GHG emissions are presented in Table 4-2 and detailed in Appendix F, *Air Quality Methodology and Calculations*. Both alternatives would generate GHG emissions on an annual basis, and, in combination with past and future emissions from all other sources, contribute incrementally to the global warming that produces the adverse effects of climate change.

The Navy has established goals to achieve net-zero emissions economy-wide by 2050 (Navy, 2022), including, but not limited to, the following:

- Achieve a 65 percent reduction in GHG direct emissions from controlled sources and indirect emissions from generation or purchase by 2030.
- Achieve 100 percent carbon pollution-free electricity by 2030, at least half of which will be locally supplied clean energy to meet demand.
- Acquire 100 percent zero-emission vehicles by 2035, including 100 percent zero-emission light-duty vehicle acquisitions by 2027.
- Achieve a 50 percent reduction in emissions from buildings by 2032.

As described in Section 3.5, *Air Quality*, while GHG emissions generated from the proposed construction activities and routine operations under Alternatives 1 or 2 alone would not be enough to cause climate change, in combination with past and future emissions from all other sources, they would contribute incrementally to climate change. Therefore, considering overall emission reduction goals and resiliency planning as part of military construction efforts, implementation of Alternatives 1 or 2 combined with the past, present, and reasonably foreseeable future projects would not result in significant cumulative effects within the ROI.

Table 4-2 Comparison of No Action Alternative, Alternative 1, and Alternative 2 Lifetime GHG Emissions

Activity	*No Action Alternative (tpy)*	*Alternative 1 CO_2 (tpy)*	*Alternative 1 Compared to NAA (tpy)*	*Alternative 2 CO_2 (tpy)*	*Alternative 2 Compared to NAA (tpy)*
Construction (2 separate years)	0	1,398	1,398	1,398	1,398
Additional worker commutes (every year)	0	0	0	108	108
Flight operations (every year)	15,410	18,655	3,245	20,351	4,941
Lifetime (25-year) operations plus construction emissions	385,251	467,774	82,523	512,872	127,621

Key: CO_2 = carbon dioxide; GHG = greenhouse gas; NAA = No Action Alternative; tpy = tons per year.
Note:
1. CO_2 emissions presented above include emissions for the entire flight path, even those above 3,000 feet.

4.5 Summary of Cumulative Effects

The Proposed Action would contribute effects to noise, environmental justice, biological resources, cultural resources, and air quality (Table 4-3). When considering other past, present, and reasonably foreseeable future projects, there could be an overlap spatially and temporally with the Proposed Action, resulting in potential cumulative effects.

Table 4-3 Summary of Cumulative Effects

Project	*Resource*				
	Noise	*Environmental Justice*	*Biological*	*Cultural*	*Air*
Wastewater Treatment Plant					
Tennis and Basketball Courts					
Building 84	√				√
Hangar 47	√				√
T-6B Facility Upgrades	√			√	√
Mary Carroll High School	√				
Military Compatible Area Overlay District	√				
300-Unit Apartments	√	√			√
Climate Change			√		√

Note: √ is used to identify which resource could pose a cumulative effect from the specified project.

As shown, projects could pose cumulative impacts to noise, environmental justice, biological resources, cultural resources, and air quality. Past construction projects (WWTP, tennis and basketball courts, and the Mary Carroll High School) have already occurred; therefore, these actions would not have additional future effects on environmental resources due to construction. Temporary construction noise and air quality cumulative effects could occur but may be reduced since cumulative projects may not occur during the same time frame. No cumulative projects would increase aircraft operations; therefore, no long-term changes in noise or air quality would occur. Operation of the WWTP and school would continue to pose cumulative effects when considered with the Proposed Action. The updated zoning ordinance for Military Compatible Area Overlay Districts poses beneficial cumulative effects. Avoiding incompatible development within the 65 dBA DNL or greater noise zones would reduce noise impacts to all residents, including minority and low-income, and would preserve the military mission. Any projects that would result in adverse effects on historic properties would be resolved with agreements with the regulatory agencies and consulting parties.

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5 Other Considerations Required by the National Environmental Policy Act

5.1 Consistency with Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with 40 Code of Federal Regulations section 1502.16(5), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state, tribal, and local land use plans, policies, and controls. Table 5-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action, and describes briefly how compliance with these laws and regulations would be accomplished.

Table 5-1 Principal Federal and State Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
NEPA; Council on Environmental Quality regulations implementing NEPA; Navy procedures for implementing NEPA	This EA has been prepared in accordance with NEPA, Council on Environmental Quality regulations implementing NEPA, and Navy NEPA procedures.
Clean Air Act	The air quality analysis in the EA concludes that no de minimis thresholds would be exceeded. Calculations are included in Appendix F, *Air Quality Methodology and Calculations*. The Proposed Action is compliant with the Clean Air Act.
Coastal Zone Management Act	The Navy consulted with the Texas Coastal Management Program. A concurrence letter dated July 28, 2023, is included in Appendix E, *Coastal Consistency Determination*.
National Historic Preservation Act	The Navy consulted with the Texas SHPO. A Memorandum of Agreement was signed on August 21, 2023 (Appendix C, *National Historic Preservation Act Section 106 Documentation*).
Endangered Species Act	The Proposed Action may affect, but is not likely to adversely affect, the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat. For all other federally listed species identified with potential to occur within the region of influence, the Navy has determined that there would be no effect. The Navy consulted with the USFWS, and the agency concurred with the Navy's findings in a letter dated August 2, 2023 (Appendix B, *Special Status Species Documentation*). Recommended measures to prevent or minimize potential adverse effects to the northern aplomado falcon and whooping crane were added to this Final EA.
Migratory Bird Treaty Act	The Proposed Action may result in the incidental "take" of native birds protected by the MBTA by operation of the T-54A aircraft. Under the MBTA's regulations applicable to military readiness activities (50 CFR part 21), the USFWS authorizes the incidental take of MBTA-listed birds, provided it does not result in significant adverse effects on their population. The Proposed Action is not expected to result in any adverse impacts to populations and is compliant with the MBTA.

Table 5-1 Principal Federal and State Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
Bald and Golden Eagle Protection Act	Under the Proposed Action, a prohibited "take" is unlikely due to lack of previous takes of eagles by historical operation of T-44C aircraft, implementation of the BASH Plan at NAS Corpus Christi, implementation of local airfield Wildlife Hazard Management Plans, and the absence of eagle nests in the vicinity of the Proposed Action airfields. An eagle take permit is not required. The Proposed Action is compliant with the Bald and Golden Eagle Protection Act.
Emergency Planning and Community Right-to-Know Act	The Proposed Action would not change the emergency planning, response, or organizational procedures. The types of hazardous and toxic chemicals stored, used, and emitted would remain similar to current conditions. All reporting would be updated to reflect any changes. Therefore, the Proposed Action would be compliant with this act.
Resource Conservation and Recovery Act	The Proposed Action would result in the generation of solid and hazardous wastes resulting from construction and maintenance. These wastes would be managed in full compliance with this act.
Toxic Substances Control Act	Any asbestos and lead-based paint in buildings to be renovated or demolished would be abated; therefore, the Proposed Action is compliant with the Toxic Substances Control Act.
EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*	This EA analyzes impacts to minority and low-income populations. The Proposed Action is compliant with this EO.
EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*	This EA analyzes environmental health and safety risks to children. The Proposed Action is compliant with this EO.
EO 13175, *Consultation and Coordination with Indian Tribal Governments*	The Navy consulted with potentially interested tribes. The Proposed Action is compliant with this EO.
EO 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All*	The Navy provided opportunities for meaningful engagement of communities with environmental justice concerns who are potentially affected by the Proposed Action. This environmental review was carried out in a manner that analyzed effects on communities with environmental justice concerns and considered best available science and information on any impacts to such communities. The Proposed Action is in compliance with this EO.

Key: BASH = Bird/Animal Aircraft Strike Hazard; CFR = Code of Federal Regulations; EA = Environmental Assessment; EO = Executive Order; MBTA = Migratory Bird Treaty Act; NAS = Naval Air Station; Navy = U.S. Navy; NEPA = National Environmental Policy Act; SHPO = State Historic Preservation Officer; USFWS = U.S. Fish and Wildlife Service.

5.2 Irreversible or Irretrievable Commitments of Resources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources such as metal and fuel, and natural or cultural resources. These resources are irretrievable in that they would be used for this project when they could have been used for other purposes. Human labor is also considered an irretrievable resource. Another impact that falls under this category is the unavoidable destruction of natural resources that could limit the range of potential uses of that particular environment.

Implementation of the Proposed Action would involve human labor and the consumption of fuel, oil, and lubricants for construction vehicles. No loss of natural resources would occur with construction on the previously disturbed flightline. The potential for Bird/Animal Aircraft Strike Hazard (BASH) could increase along with increased air operations. Measures to reduce BASH are ongoing at Naval Air Station Corpus Christi and Naval Outlying Landing Field Cabaniss and the international, regional, and publicly owned airports. As a result, implementing the Proposed Action would not result in significant irreversible or irretrievable commitment of resources.

5.3 Unavoidable Adverse Impacts

This Environmental Assessment has determined that the alternatives considered would not result in any significant impacts. Implementing the alternatives would result in the following unavoidable environmental impacts:

- Minor increase in noise levels in the vicinity of the airfields and airports
- Recapitalization or demolition of buildings that may contain active bird nests within the buildings or on the rooftop
- Potential increase in BASH associated with increased operations
- Adverse effect to the Landplane Hangars Historic District from building recapitalization or demolition

5.4 Relationship between Short-Term Use of the Environment and Long-Term Productivity

The National Environmental Policy Act requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of the environment are of particular concern. This refers to the possibility that choosing one development site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself resulting in temporary noise and air quality impacts. Construction projects are located along the flightline of Naval Air Station Corpus Christi. In the long-term, aircraft operations would increase noise levels and air emissions in the vicinity of the Navy airfields or international, regional, and publicly owned airfields. The replacement of aircraft would provide advanced instrumentation for communication, navigation, and tracking aircraft health to facilitate maintenance planning and efficiency. The short- and long-term construction projects for Navy support facilities and increased operations would not significantly impact the long-term natural resource productivity of the area. The Proposed Action would not result in any impacts that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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Appendix A
Noise Methodology and Calculations

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FINAL

NOISE REPORT

For Multi-Engine Training System
Naval Air Station Corpus Christi, Texas

June 2023

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FINAL
NOISE STUDY
For
Multi-Engine Training System
At
Naval Air Station Corpus Christi, Texas

June 2023

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Abstract

Designation:	Noise Study
Title of Proposed Action:	Multi-Engine Training System
Project Location:	Naval Air Station Corpus Christi
Lead Agency for the Environmental Assessment:	Department of the Navy
Cooperating Agency:	None
Affected Region:	Nueces County, Texas, and airfields in the surrounding region
Action Proponent:	U.S. Fleet Forces Command on behalf of Chief of Naval Air Training
Point of Contact:	Sara Goodwin Naval Facilities Engineering Systems Command Atlantic 6506 Hampton Boulevard Norfolk, VA 23508-1278 sara.r.goodwin.civ@us.navy.mil
Date:	June 2023

This Noise Study documents noise modeling methods, inputs, and results associated with proposed replacement of the over 40-year-old T-44C Pegasus aircraft used for multi-engine maritime flight training at Naval Air Station Corpus Christi. The 54 T-44C Pegasus aircraft would be replaced with 58 new T-54A aircraft. The Navy selected the Beechcraft King Air 260 to replace the T-44C aircraft. To estimate potential impacts of the aircraft replacement, the Navy used a representative surrogate aircraft, the C-12 Huron, because the modeling software does not include reference noise data for the King Air 260. The new aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. Operational scenarios modeled include a 10 percent increase over current T-44C operations tempo (Alternative 1) and a 20 percent increase over current T-44C operations tempo (Alternative 2). Under Alternative 1 or Alternative 2, the area of off-station land near Naval Air Station Corpus Christi exposed to 65 A-weighted decibels day-night average sound level or greater would increase from 50 to 51 acres. Under Alternative 1, the estimated number of off-installation residents exposed to 65 A-weighted decibels day-night average sound level or greater would remain at 91, but under Alternative 2, the estimated number of residents would increase to 92. At Naval Outlying Landing Field Cabaniss, off-station aircraft noise levels would remain below 65 A-weighted decibels day-night average sound level. A screening-level analysis was conducted for operations of the T-54A aircraft at seven international, regional, and publicly owned municipal airfields that are used for training. Noise impact significance criteria established by the Federal Aviation Administration in Order 1050.1F are not exceeded at any of the non-Navy airfields.

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Final

Description of Proposed Action and Alternatives

Multi-Engine Training System

Naval Air Station Corpus Christi, Texas

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Abbreviations and Acronyms

Acronym	*Definition*
%	Percent
dB	Decibels
dBA	A-weighted decibels
DNL	Day-night average sound level
DoD	Department of Defense
FAA	Federal Aviation Administration
FICUN	Federal Interagency Committee on Urban Noise
$L_{eq(8hr)}$	Eight-hour equivalent sound level
L_{max}	Maximum sound level
METS	Multi-Engine Training System
n/a	Not applicable
NAS	Naval Air Station
NOLF	Naval Outlying Landing Field

1 Introduction

This noise analysis supports the United States Fleet Forces Command on behalf of Chief of Naval Air Training (hereinafter, jointly referred as the Navy) preparation of an Environmental Assessment for the replacement of T-44C Pegasus aircraft based at Naval Air Station (NAS) Corpus Christi with new T-54A aircraft. The T-54A aircraft would be the aircraft component of the multi engine training system (METS). The Proposed Action would replace ongoing T-44C operations with T-54A operations at NAS Corpus Christi, Naval Outlying Landing Field (NOLF) Cabaniss, and several international, regional, and publicly owned municipal airfields in South Texas. The locations of the affected airfields are shown in Figure 1-1.

This study presents the detailed noise impacts as modeled with NOISEMAP at NAS Corpus Christi and NOLF Cabaniss. To assess noise impacts at the international, regional, and publicly owned municipal airfields (Alice International, Corpus Christi International, Valley International, Port Isabel-Cameron County, Palacios, Victoria Regional, and Calhoun County Airports), a screening-level analysis was conducted using NOISEMAP to determine changes in noise levels and whether significance thresholds were met or exceeded.

Table 1-1 shows the current number of T-44C operations (i.e., baseline conditions or No Action Alternative) and the number of T-54A aircraft operations that would occur at NAS Corpus Christi and NOLF Cabaniss under action alternatives. At NAS Corpus Christi, T-44C aircraft conduct 20 percent of the approximately 162,000 airfield operations conducted annually. The operations of other aircraft types, which include based T-6, P-3, H-60, and H-64 aircraft as well as a wide range of transient aircraft types, would not change under the action alternatives. The T-44C is the only aircraft type that conducts regular aircraft operations at NOLF Cabaniss.

Figure 1-1 Training Airfields Location Map

Table 1-1 Current and Projected Use of Navy Training Facilities

Name	*FAA Identifier*	*T-44C Aircraft Operations*	*Alternative 1 Projected T-54A Operations*	*Alternative 2 Projected T-54A Operations*
NAS Corpus Christi	NGP	32,760	36,000	39,300
NOLF Cabaniss	NGW	56,012	61,600	67,200
TOTAL		88,772	97,600	106,500

Key: FAA = Federal Aviation Administration; NOLF = Naval Outlying Landing Field.

As shown in Table 1-2, the percentage of T-54A operations conducted at each of the international, regional, and publicly owned municipal airfields would be the same as the percentage of total T-44C operations being conducted currently. Approximately 95,900 T-44C operations are conducted annually at the non-Navy airfields. Under Alternative 1, the total number of operations conducted would increase by 10 percent to approximately 105,400. The total number of operations conducted under Alternative 2 would increase by 20 percent to approximately 115,000.

Table 1-2 Current and Projected Use of International, Regional, and Publicly Owned Municipal Airfields

Name	*T-44C Aircraft Current Operations*		*Projected T-54A Operations Alternative 1*[2]		*Projected T-54A Operations Alternative 2*[2]	
	Percent	*Number*	*Percent*	*Number*	*Percent*	*Number*
Alice International Airport	29	28,200	29	31,000	29	33,800
Calhoun County Airport	4	3,600	4	3,900	4	4,300
Corpus Christi International Airport	22	20,800	22	22,900	22	25,000
Palacios Municipal Airport	5	5,200	5	5,700	5	6,200
Port Isabel-Cameron County Airport	11	11,000	11	12,000	11	13,100
Valley International Airport	15	14,800	15	16,300	15	17,800
Victoria Regional Airport	4	4,900	4	5,400	4	5,900
Other[1]	8	7,400	8	8,200	8	8,900
Total	**100%**	**95,900**	**100%**	**105,400**	**100%**	**115,000**

Key: % = percent.

Notes:

1. Other refers to several airports located in the region each with relatively small numbers of T-54A operations.
2. Numbers are rounded to nearest hundred. Alternative 1 includes a 10 percent increase in operations, while Alternative 2 includes a 20 percent increase in operations.

The Federal Interagency Committee on Urban Noise (FICUN), formed in 1979, published *Guidelines for Considering Noise in Land-Use Planning and Control* (FICUN, 1980). These guidelines complement federal agency criteria by providing for the consideration of noise in all land-use planning and interagency/intergovernmental processes. The FICUN established day-night average sound level (DNL) is the most appropriate descriptor for all noise sources. In 1982, the U.S. Environmental Protection Agency (USEPA) published *Guidelines for Noise Impact Analysis* to provide all types of decision-makers with analytic procedures to uniformly express and quantify noise impacts (USEPA, 1982). The American National Standards Institute (ANSI) endorsed DNL in 1990 as the "acoustical measure to be used in assessing compatibility between various land uses and outdoor noise environment" (ANSI, 2003). In 1992, the Federal Interagency Committee on Noise reaffirmed the use of DNL as the principal aircraft noise descriptor in the document entitled *Federal Agency Review of Selected Airport Noise Analysis*

Issues (Federal Interagency Committee on Noise, 1992). In general, scientific studies and social surveys have found a high correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL (Schultz, 1974; Fidell et al., 1991; Finegold et al., 1994).

Chapter 1, *Introduction*, of this report provides an overview of the study's objective and goals. Chapter 2, *Noise Metrics, Impact, and Modeling*, summarizes the noise metrics used to describe the noise environment, the noise effects, and noise modeling methods used in this analysis. Chapter 3, *Aircraft Operations*, provides a description of the current and projected aircraft operations at each airfield. Chapter 4, *Noise Results*, provides noise results for the No Action Alternative and action alternatives.

2 Noise Metrics, Impacts, and Modeling

2.1 Noise Metrics

All sounds have a spectral content, which means the magnitude or level changes with frequency, where frequency is measured in cycles per second or Hertz. To mimic the human ear's nonlinear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies to replicate human sensitivity. It is common to add the "A" to the measurement unit to identify that the measurement has been made with this filtering process (dBA). In this document, the decibel (dB) unit refers to A-weighted sound levels.

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment. The noise metrics used in this study are described below. While the DNL is the most commonly used metric for analyzing noise generated at an airfield, supplemental metrics provide more detailed noise exposure information for the decision process. The Department of Defense (DoD) Noise Working Group product, *Improving Aviation Noise Planning, Analysis and Public Communication with Supplemental Metrics* (DoD Noise Working Group, 2009) was used to determine the appropriate metrics and analysis tools for the noise study.

2.1.1 Maximum Sound Level (L_{max})

The highest A-weighted integrated sound level measured during a single noise event in which the sound level changes with time (e.g., an aircraft overflight) is called the maximum A-weighted sound level or maximum sound level. During an aircraft overflight, the noise level starts at the ambient or background sound level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. L_{max} defines the maximum sound level occurring for a fraction of a second during the event. For aircraft noise, the "fraction of a second" over which the maximum level is defined is generally 1/8th of a second. The maximum sound level is important in judging the interference caused by a noise event with conversation, TV or radio listening, sleep, or other common activities. Although L_{max} provides some measure of the intrusiveness of the event, it does not completely describe the total event, because it does not include the period of time over which the sound is heard.

2.1.2 Day/Night Average Sound Level (DNL)

DNL is a complex metric that sums all noise events in a 24-hour period. An additional 10 dB are applied to nighttime events to account for the added intrusiveness of sounds that occur during normal sleeping hours, both because of the increased sensitivity to noise during those hours and because ambient sound levels during nighttime are typically about 10 dB lower than during daytime hours. DNL is an average quantity mathematically representing the continuous A-weighted sound level that would be present if all the variations in sound level that occur over a 24-hour period were smoothed out so as to contain the same total sound energy. DNL accounts for the maximum noise levels, the duration of the events (operations), the number of events, and the timing of occurrence over a 24-hour period. DNL does not represent the sound level heard at any particular time but quantifies the total sound energy received. While it is normalized as an average, it represents all the sound energy, and is therefore a cumulative measure.

Although DNL provides a single measure of the overall noise impact, it does not provide specific information on the number of noise events or the individual sound levels that occur during the 24-hour period. For example, a daily average sound level of 65 dB could result from very few noisy events or a large number of relatively quieter events.

2.1.3 Equivalent Sound Level

A cumulative noise metric useful in describing noise is the equivalent sound level. The equivalent sound level is the continuous sound level that would be present if all the variations in sound level occurring over a specified time period were smoothed out as to contain the same total sound energy.

2.1.4 Numbers of Events Above a Threshold Level

The "Number of Events Above a Threshold Level" metric provides the total number of noise events that exceed a selected noise level threshold during a specified period of time (DoD Noise Working Group, 2009). In this study, the numbers of events per hour exceeding an L_{max} threshold are selected to analyze speech interference.

2.2 Noise Effects

Several categories of noise impacts that could be associated with the Proposed Action are summarized below.

2.2.1 Annoyance

As previously noted, the primary effect of aircraft noise on exposed communities is long-term annoyance, defined by the U.S. Environmental Protection Agency as any negative subjective reaction on the part of an individual or group. The scientific community has adopted the use of long-term annoyance as a primary indicator of community response and there is a consistent relationship between DNL and the level of community annoyance (Federal Interagency Committee on Noise, 1992).

2.2.2 Speech Interference

Speech interference associated with aircraft noise is a primary cause of annoyance for communities. Speech interference can cause disruption of routine activities, such as enjoyment of radio or television programs, telephone use, or family conversation, giving rise to frustration or irritation. In extreme cases, speech interference may cause fatigue and vocal strain to individuals who try to communicate over the noise. In this analysis, speech interference is measured by the number of daily indoor events (from 7 a.m. to 10 p.m.) that exceed 50 dB L_{max} at selected locations. This metric also accounts for noise level reduction provided by buildings with windows open or closed.

2.2.3 Classroom Criteria and Noise Effects on Children

For school-aged children, noise can interrupt communication or interfere with concentration. The DoD Noise Working Group recommends using an outdoor eight-hour equivalent sound level ($L_{eq(8hr)}$) during the school day of 60 dBA as an indicator that background noise levels indoors (i.e., in classrooms) are unacceptably high.

If locations have noise levels that exceed 60 dBA $L_{eq(8hr)}$, the working group recommends an additional noise metric to supplement the analysis. In this scenario, it is recommended that the number of events per hour with the potential to interfere with speech be calculated (DoD Noise Working Group, 2013). In this analysis, it is conservatively assumed that there is the potential for speech interference if a noise event exceeds 50 dBA L_{max}.

2.3 Noise Modeling

Modeling of aircraft noise exposure for this study was accomplished by using the program NOISEMAP. NOISEMAP allows noise predictions without the actual implementation of the operations and noise monitoring of those actions. Per Chief of Naval Operations Instruction 11010.36C, NOISEMAP is to be used for developing fixed-wing noise contours, and it is the best noise-modeling science available today for fixed-wing aircraft until the new Advanced Acoustic Model is approved and ready for use. The Advanced Acoustic Model was approved on November 28, 2022, but to date is only ready for use with AV-8B, F-22, and F-35A/B fixed wing aircraft. Therefore, this analysis used NOISEMAP. Rotary-wing and tilt-rotor aircraft operations are to be modeled using the Rotorcraft Noise Model, which is functionally equivalent to the Advanced Acoustic Model in calculations of rotorcraft noise. Specifically, this noise analysis used the latest NOISEMAP package of computer programs, which consists of BASEOPS Version 7 (Wasmer & Maunsell, 2006a), OMEGA10, OMEGA11 (Mohlman, 1983), NOISEMAP Version 7.3, Rotorcraft Noise Model, NMPlot (Wasmer & Maunsell, 2006b), and the latest issue of NOISEFILE. NOISEFILE is the DoD noise database originating from noise measurements of controlled flyovers at prescribed power, speed, and drag configurations for many models of aircraft. The data input module BASEOPS was used to enter the runway coordinates, airfield information, flight tracks, and flight profiles along each track by each aircraft, numbers of flight operations conducted during an average annual day, run-up coordinates, run-up profiles, and run-up operations conducted during an average annual day. The elevation and ground impedance were developed from U.S. Geological Survey National Elevation Dataset and National Land Cover Database 2001 files.

This noise study uses the DNL noise metric to evaluate the noise impacts of the No Action Alternative and action alternatives. After the operational parameters are defined, NOISEMAP calculates DNL values on a grid of ground locations on and around the facility. The NMPlot program draws contours of equal DNL for overlay onto land-use maps. For noise studies, as a minimum, DNL contours of 65, 70, and 75 dB are developed. NOISEMAP was also used to calculate the number of events exceeding threshold L_{max} values (as an indication of potential speech interference) and $L_{eq(8hr)}$ values (as an indicator of classroom interference).

NOISEMAP is most accurate for comparing "before-and-after" community noise effects, which would result from the implementation of proposed changes or alternative noise control actions when the calculations are made in a consistent manner. NOISEMAP allows prediction of noise levels for the Proposed Action prior to implementing and noise monitoring of the action. The noise modeling results of these computer programs, along with noise impact guidelines, provide a relative measure of noise effects around air facilities. The operational data for this analysis were obtained through interviews with NAS Corpus Christi instructor pilots and other personnel. The modeled flight tracks and flight profiles at each airfield were reviewed and revised based on follow-on discussions with operators of the T-44C and T-6.

At international, regional, and publicly owned municipal airfields, a combination of Federal Aviation Administration (FAA) data and inputs from NAS Corpus Christi aircrews were used to conduct a screening-level noise analysis with the specific intent of demonstrating whether or not significant noise impacts would occur as a result of the Proposed Action. The Houston Air Route Traffic Control Center generously provided Performance Data Analysis and Reporting System data for each of the municipal airports studied in Calendar Year 2019. The data provided were useful as a source of information on aircraft types and time-of-day of operations but did not include specific locations for aircraft flight tracks. Therefore, a set of nominal flight tracks was used for noise modeling at each airfield. The FAA Air Traffic Activity System was the source for overall flight activity levels. Parameters for NAS Corpus Christi-based T-44C and T-6 aircraft were developed through pilot interviews.

In January 2023, the Navy awarded a contract to develop the T-54A aircraft based on the Beechcraft King Air 260 (Chapman, 2023). Although NOISEMAP software does not include reference noise level data for the Beechcraft King Air 260, it does include data for the C-12, which is very similar to the Beechcraft King Air 260. The C-12 and Beechcraft King Air 260 are both powered by two turboprop engines that each generate 850 shaft horsepower. Because the C-12 is very similar to the Beechcraft King Air 260 on which the T-54A development will be based, C-12 noise levels are expected to be very similar to noise levels generated by T-54A aircraft, and the C-12 was used as the noise surrogate. It is worth noting that the C-12 is also the aircraft in the NOISEMAP database that is most similar to the T-44C and was therefore also used as the surrogate for modeling T-44C noise levels.

3 Aircraft Operations

This section describes the modeled aircraft operations. Each time a single aircraft departs the airfield and later returns, this combined event is referred to as a sortie. All sorties include one departure operation and one arrival operation. Some sorties also include pattern operations. Pattern operations are complete circuits including takeoff, maneuvering to set up for an approach, and then landing. Visual patterns are flown by aircrews using visual reference points. Instrument closed patterns are conducted in accordance with specific guidance provided by Air Traffic Control.

T-54A aircraft operations would follow the same flight paths, runway usage patterns, and pattern altitudes as ongoing T-44C operations. The T-54A aircraft operational scenarios would differ from T-44C in the specific way in which the aircraft is flown (i.e., altitude/engine power setting/airspeed profiles) and in operational tempo (i.e., 10 percent higher under Alternative 1 and 20 percent higher under Alternative 2). Operational parameters are summarized below and described in greater detail in Appendices A through D.

3.1 NAS Corpus Christi

As shown in Table 3-1, NAS Corpus Christi is used for approximately 33,000 T-44C airfield operations annually while other aircraft types make up the remainder of the approximately 162,000 total annual airfield operations. At NAS Corpus Christi, visual patterns typically involve maneuvering to set up for a second approach by flying parallel to the runway at approximately 1 nautical mile horizontally offset distance (also referred to as 'abeam') from the runway. Modeled instrument patterns at NAS Corpus Christi involve maneuvering for a second approach at approximately 5 nautical miles abeam the runway. NAS Corpus Christi flight tracks and altitude/engine power setting/airspeed profiles are shown in Appendix A and detailed information on the frequency of operations is presented in Appendix D.

Table 3-1 NAS Corpus Christi Annual Operations

Group	*Departures*	*Arrivals*	*Visual Pattern Operations*	*Instrument Pattern Operations*	*Total Operations*
Based Aircraft Annual Operations					
T-44C	10,920	10,920	764	10,156	32,760
T-6B	25,000	25,000	56,250	18,750	125,000
P-3C	364	364	728	0	1,456
HH/UH-60 (modeled as SH-60)	486	486	0	0	972
AH-64 (modeled as SH-60)	54	54	0	0	108
	TOTAL:				**160,296**
Transient Aircraft					
H-60 (modeled as SH-60)	38	38	0	0	76
AH-64 (modeled as SH-60)	22	22	0	0	44
CH-47 (modeled as CH-46)	4	4	0	0	8
Learjet (small jets) C-21	9	9	0	0	18
F/A-18C/D (and other fighter jets)	60	60	0	360	480
T-38 (and other trainer jets)	90	90	0	720	900
C-130 (and other cargo)	24	24	0	0	48
C-12 (and other props)	28	28	0	0	56

Table 3-1 NAS Corpus Christi Annual Operations

Group	*Departures*	*Arrivals*	*Visual Pattern Operations*	*Instrument Pattern Operations*	*Total Operations*
				TOTAL:	***1,630***
				GRAND TOTAL (including based and transient aircraft):	***161,926***

Key: NAS = Naval Air Station.

3.2 NOLF Cabaniss

NOLF Cabaniss supports approximately 56,000 T-44C operations annually (Table 3-2). The airfield supports only visual flying operations. Flight tracks and profiles at NOLF Cabaniss are shown in Appendix B and detailed information on the frequency of operations is presented in Appendix D.

Table 3-2 NOLF Cabaniss Annual Operations

Group	*Departures*	*Arrivals*	*Visual Pattern Operations*	*Instrument Pattern Operations*	*Total Operations*
T-44C	1,474	1,474	53,064	0	56,012
				TOTAL:	***56,012***

Key: NOLF = Naval Outlying Landing Field.

3.3 International, Regional and Publicly Owned Municipal Airfields

T-44C are one of several users at the seven non-Navy airfields analyzed (see Table 3-3). T-6 aircraft based at NAS Corpus Christi also make use of each of the airfields. Other military users of the airfields include T-1, T-38, T-45, and C-12 aircraft and similar aircraft types. Civilian aircraft using the non-Navy airfields are recorded by the FAA as air carrier, air taxi, or general aviation operations. "Air carrier" aircraft include large commercial aircraft types such as the Boeing 737 and Boeing 767. Smaller commercial aircraft that have a maximum seating capacity of 60 seats or maximum payload of 18,000 pounds are categorized as "air taxi." Aircraft types operating as air taxis include jets such as the Bombardier Challenger 601 and propeller-driven aircraft such as the Beechcraft King Air. "General aviation" aircraft are used for private transportation and recreation and include a wide a variety of jet-powered and propeller-driven aircraft types.

Table 3-3 Current Operations at International, Regional, and Publicly Owned Municipal Airfields

Airfield	*T-44C*	*T-6 and Other Military Aircraft*	*Civilian Air Carrier*	*Civilian Air Taxi*	*Civilian General Aviation*
Alice International Airport	28,153	5,000	0	0	6,600
Corpus Christi International Airport	20,805	37,428	7,531	8,818	17,107
Valley International Airport	14,848	5,000	7,817	3,120	15,955
Port Isabel-Cameron County Airport	10,948	5,052	0	20	13,400
Palacios Municipal Airport	5,183	2,500	0	0	5,600
Victoria Regional Airport	4,896	39,544	1	3,809	7,670

Table 3-3 Current Operations at International, Regional, and Publicly Owned Municipal Airfields

Airfield	*T-44C*	*T-6 and Other Military Aircraft*	*Civilian Air Carrier*	*Civilian Air Taxi*	*Civilian General Aviation*
Calhoun County Airport	3,557	7,500	0	0	7,200

In addition to arrival and departure operations, flight pattern operations at the non-Navy airfields include but are not limited to:

- Visual closed patterns at 800 above ground level and approximately 1-nautical mile abeam distance
- Instrument closed patterns at 1,500 above ground level and approximately 5-nautical mile abeam distance
- Civilian aircraft practice approaches

Modeled nominal flight tracks at each international, regional, and publicly owned municipal airfield and representative profiles for each surrogate aircraft are shown in Appendix C. Detailed information on the frequency of operations is presented in Appendix D.

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4 Noise Results

4.1 NAS Corpus Christi and NOLF Cabaniss

This section compares detailed noise results for NAS Corpus Christi and NOLF Cabaniss under Alternatives 1 and 2 to the No Action Alternative. Results are presented using the DNL, maximum sound level, number of events exceeding maximum sound level, and $L_{eq(8hr)}$.

4.1.1 Alternative 1

Maximum noise levels associated with individual overflights of T-44C, T-54A, T-6, and transient F/A-18C aircraft at 1,000 feet above ground level (AGL) are listed in Table 4-1. As noted in Section 2.3, *Noise Modeling*, the C-12 aircraft was used as the noise modeling surrogate for both the T-54A and for the T-44C. Individual overflight noise levels for the T-54A and T-44C would be approximately the same. Both the T-54A and the T-44C are not as loud as the T-6 and transient aircraft types such as the F/A-18C. At NOLF Cabaniss, only T-44C operations occur on a regular basis.

Table 4-1 Individual Overflight Maximum Noise Levels Generated by T-44, T-45A, and Other Aircraft

Aircraft	*Aircraft Configuration*	*Engine Power*	*L_{max} (dBA)*
T-44C (C-12 surrogate)	Takeoff (full power)	100% RPM	73
T-54A (C-12 surrogate)		100% RPM	73
T-6		100% torque	78
F/A-18C		96.7% NC (afterburner)	115
T-44C (C-12 surrogate)	Cruise (intermediate power)	86% RPM	73
T-54A (C-12 surrogate)		86% RPM	73
T-6		54% torque	75
F/A-18C		96.5% NC	108
T-44C (C-12 surrogate)	Arrival (low power)	30% RPM	70
T-54A (C-12 surrogate)		30% RPM	70
T-6		35% torque	75
F/A-18C		88.5% NC	104

Source: SELcalc, version 3; standard acoustic conditions (59 degrees Fahrenheit and 70% relative humidity)
Key: % = percent; dBA = A-weighted decibels; NC = core engine speed; RPM = revolutions per minute.

The T-54A would follow the same flight procedures and patterns of flight (e.g., runway usage) as the T-44C and would accomplish climbs and descents at approximately the same rate. Alternative 1 would differ from the No Action Alternative in that T-54A aircraft would conduct approximately 10 percent more airfield operations annually than are conducted currently by T-44C aircraft at NAS Corpus Christi, NOLF Cabaniss, and international, regional, and publicly owned municipal airfields.

Alternative 1 DNL contours are shown in Figure 4-1 and Figure 4-2 for NAS Corpus Christi and NOLF Cabaniss, respectively. The number of off-station land acres near NAS Corpus Christi exposed to 65 dBA DNL or greater would increase from 50 to 51, and the estimated number of residents affected at these levels would remain at 91. At NOLF Cabaniss, off-station aircraft noise levels would remain below 65 dBA DNL (Table 4-2).

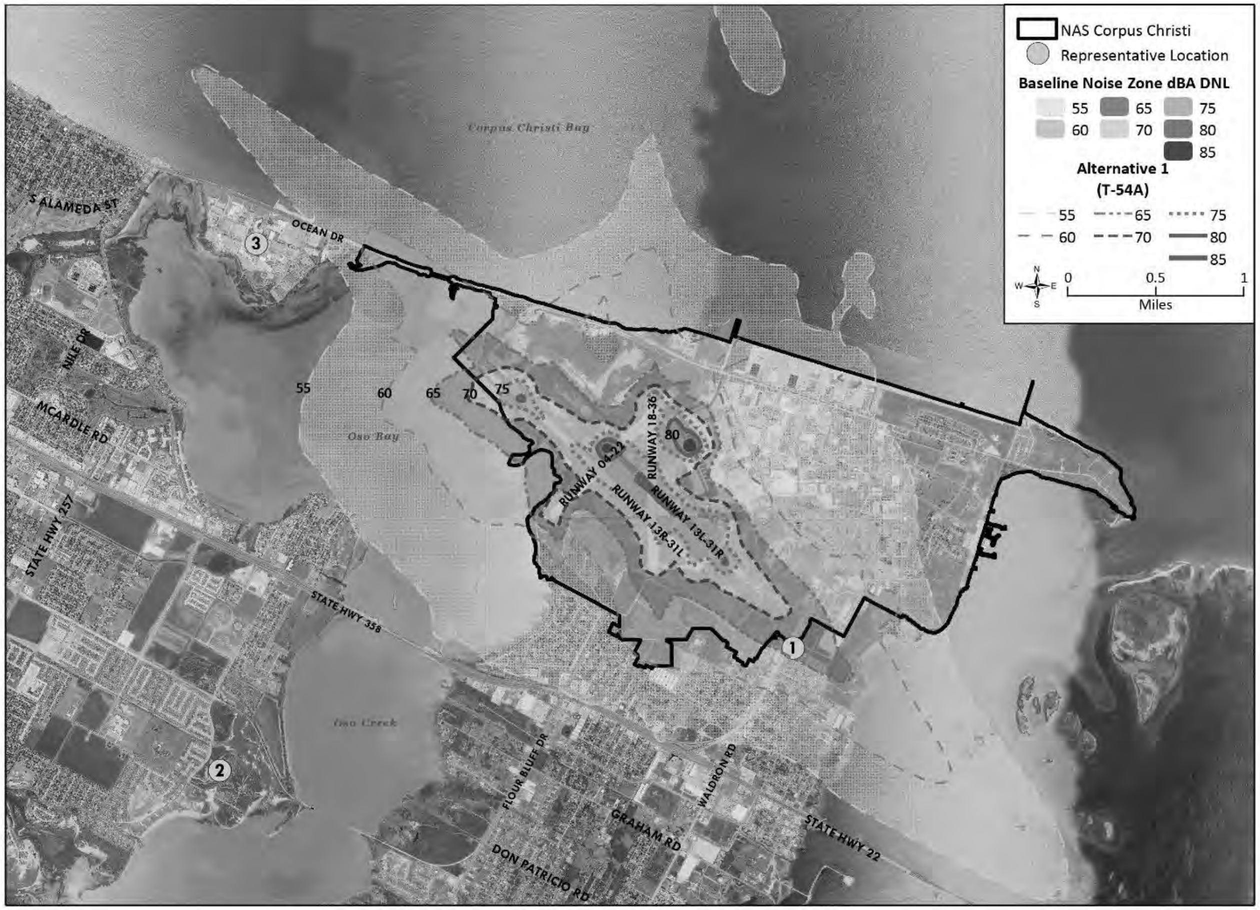

Figure 4-1 Baseline and Alternative 1 DNL Contours for NAS Corpus Christi

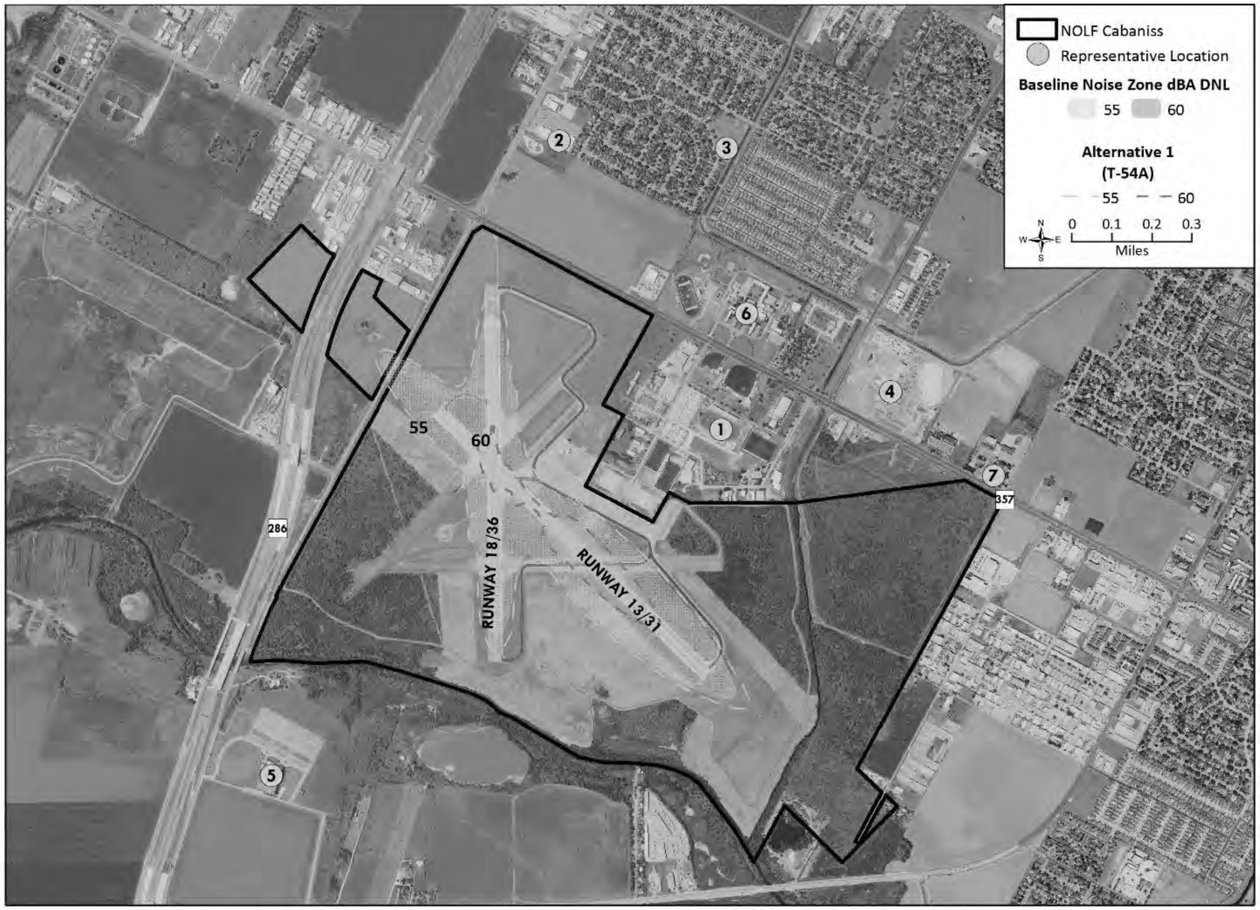

Figure 4-2 Baseline and Alternative 1 DNL Contours for NOLF Cabaniss

Table 4-2 Off-Station Acres and Population Exposed to Elevated Noise Levels near NAS Corpus Christi and NOLF Cabaniss under Alternative 1

Location	*No Action Alternative 65–69 dBA DNL*		*Alternative 1 65–69 dBA DNL*		*Change*	
	Land Area (acres)[1]	*Residents*[2]	*Land Area (acres)*[1]	*Residents*[2]	*Land Area (acres)*[1]	*Residents*[2]
NAS Corpus Christi	50	91	51	91	+1	0
NOLF Cabaniss	0	0	0	0	0	0

Key: dBA = A-weighted decibels; DNL = day-night average sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. Acreage presented does not include areas over water or lands owned by the U.S. Navy.
2. The affected populations were estimated based on U.S. Census data at the block group level with adjustments to remove nonresidential areas from calculations (U.S. Census Bureau, 2020).

Under Alternative 1, there would be no measurable change in noise level (i.e., dB DNL) at the locations studied near NAS Corpus Christi, and noise levels at locations studied near NOLF Cabaniss would increase by 0.5 dB DNL or less (Table 4-3). Increases in DNL of 0.5 dB or less at locations near NOLF Cabaniss would not be expected to be noticeable, and noise levels at all of the locations studied near NOLF Cabaniss would remain well below the 65 dB DNL land use compatibility threshold.

Table 4-3 DNL at Representative Locations under Alternative 1

ID	*Closest Installation*	*Location Description*	*DNL (dBA)*		
			No Action Alternative[1]	*Alternative 1*[1]	*Change*
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	66.3	66.3	0
2		Oso Bay Wetlands Preserve	<45	<45	0
3		Texas A&M University – Corpus Christi	48.1	48.1	0
1	NOLF Cabaniss	Cabaniss Athletic Complex	<45	45.2	0.2
2		Bowlero Bowling Alley	49.2	49.6	0.4
3		Camargo Park	49.1	49.5	0.4
4		Carroll High School	48.3	48.8	0.5
5		Church Unlimited	<45	<45	0
6		Saint John Paul II High School	<45	45.2	0.2
7		Most Precious Blood Church	48.9	49.4	0.5

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level; ID = identification; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Noise levels below 45 dBA DNL are assumed to be below ambient sound levels and are listed as "<45."

The numbers of indoor noise events per average daytime hour (7:00 a.m. to 10:00 p.m.) at representative locations with the potential to interfere with speech under Alternative 1 are listed in Table 4-4. The number of events would increase by one at the mobile homes on Lexington Boulevard if windows are closed but would remain the same if windows are open and if outdoors. The number of potential speech interference events indoors and outdoors at the other two locations near NAS Corpus Christi would remain the same as the No Action Alternative. At all locations studied near NOLF Cabaniss, the number of events would remain the same indoors but would increase by one event per hour outdoors at six locations. Increases in the frequency of disruptions in communication or activities (e.g., watching television) have a high likelihood of being annoying. However, the frequency of such disruptions would remain the same or increase only minimally under Alternative 1.

Table 4-4 Speech Interference Events per Average Daytime Hour under Alternative 1

ID	Closest Installation	Location Description	Alternative 1			Change Relative to No Action Alternative		
			Windows Closed[1]	Windows Open[1]	Outdoor	Windows Closed[1]	Windows Open[1]	Outdoor[1]
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	7	13	18	1	0	0
2	NAS Corpus Christi	Oso Bay Wetlands Preserve	0	0	1	0	0	0
3	NAS Corpus Christi	Texas A&M University – Corpus Christi	0	3	10	0	0	0
1	NOLF Cabaniss	Cabaniss Athletic Complex	0	0	6	0	0	1
2	NOLF Cabaniss	Bowlero Bowling Alley	1	2	6	0	0	1
3	NOLF Cabaniss	Camargo Park	0	4	6	0	0	1
4	NOLF Cabaniss	Carroll High School	0	5	6	0	0	1
5	NOLF Cabaniss	Church Unlimited	0	0	5	0	0	0
6	NOLF Cabaniss	Saint John Paul II High School	0	0	6	0	0	1
7	NOLF Cabaniss	Most Precious Blood Church	0	5	6	0	0	1

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. Number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} (or increase in the number of events) rounds to zero.

Exterior $L_{eq(8hr)}$ at representative schools would remain below 60 dBA at all the schools studied (Table 4-5). At both Carroll High School and Saint John Paul II High School, $L_{eq(8hr)}$ would increase by 0.4 dBA, but would remain well below the 60 dBA impact threshold (see Section 2.2.3, *Classroom Criteria and Noise Effects on Children*). The number of potential speech interference events per hour was calculated, as prescribed by the DoD Noise Working Group, and was found to change by less than one at all the locations studied. Classroom noise impacts would be minimal.

Table 4-5 Potential Classroom Interference under Alternative 1

ID	Closest Installation	Location Description	*Alternative 1*			*Increase Relative to No Action Alternative*		
			Outdoor $L_{eq(8hr)}$ (dBA)[1]	*Events per Hour, Windows Closed*[2]	*Events per Hour, Windows Open*[2]	*Outdoor $L_{eq(8hr)}$ (dBA)*[1]	*Events per Hour, Windows Closed*[2]	*Events per Hour, Windows Open*[2]
3	NAS Corpus Christi	Texas A&M University – Corpus Christi	49.2	0	3	0	0	0
4	NOLF Cabaniss	Carroll High School	48.4	0	5	0.4	0	0
6		Saint John Paul II High School	44.9	0	0	0.4	0	0

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; $L_{eq(8hr)}$ = eight-hour equivalent sound level; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. $L_{eq(8hr)}$ calculated for eight-hour typical school day from 8:00 a.m. to 4:00 p.m.
2. Number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} rounds to zero.

4.1.2 Alternative 2

All aspects of Alternative 2 would be the same as Alternative 1, except for the tempo of T-54A aircraft operations, which would be 20 percent higher than the baseline T-44C operations tempo. As is the case under Alternative 1, T-54A aircraft flight paths, runway usage patterns, and altitude profiles would be approximately the same as are flown by T-44C aircraft currently, and the percentage of operations conducted late at night would not change.

Alternative 2 DNL contours for NAS Corpus Christi and NOLF Cabaniss are shown in Figure 4-3 and Figure 4-4, respectively. The number of off-station land acres near NAS Corpus Christi exposed to 65 dBA DNL or greater would be the same under Alternative 2 as under Alternative 1. The estimated number of off-installation residents exposed to levels exceeding 65 dBA DNL would remain the same under Alternative 1 but would increase from 91 to 92 under Alternative 2. The extremely minor changes in noise contour extent reflect individual T-54A overflight noise levels being approximately the same as those generated by ongoing T-44C operations. In the context of ongoing aircraft operations at NAS Corpus Christi, the contribution of T-54A aircraft-generated noise to overall noise levels would be relatively small, and the difference in noise levels associated with a slightly higher operations tempo under Alternative 2 relative to Alternative 1 is similarly minimal. People exposed to higher DNL are more likely to become highly annoyed by the noise, and at noise levels greater than 65 dBA DNL, the DoD considers noise to be sufficiently intrusive that some noise-sensitive land uses are considered to be incompatible with the noise.

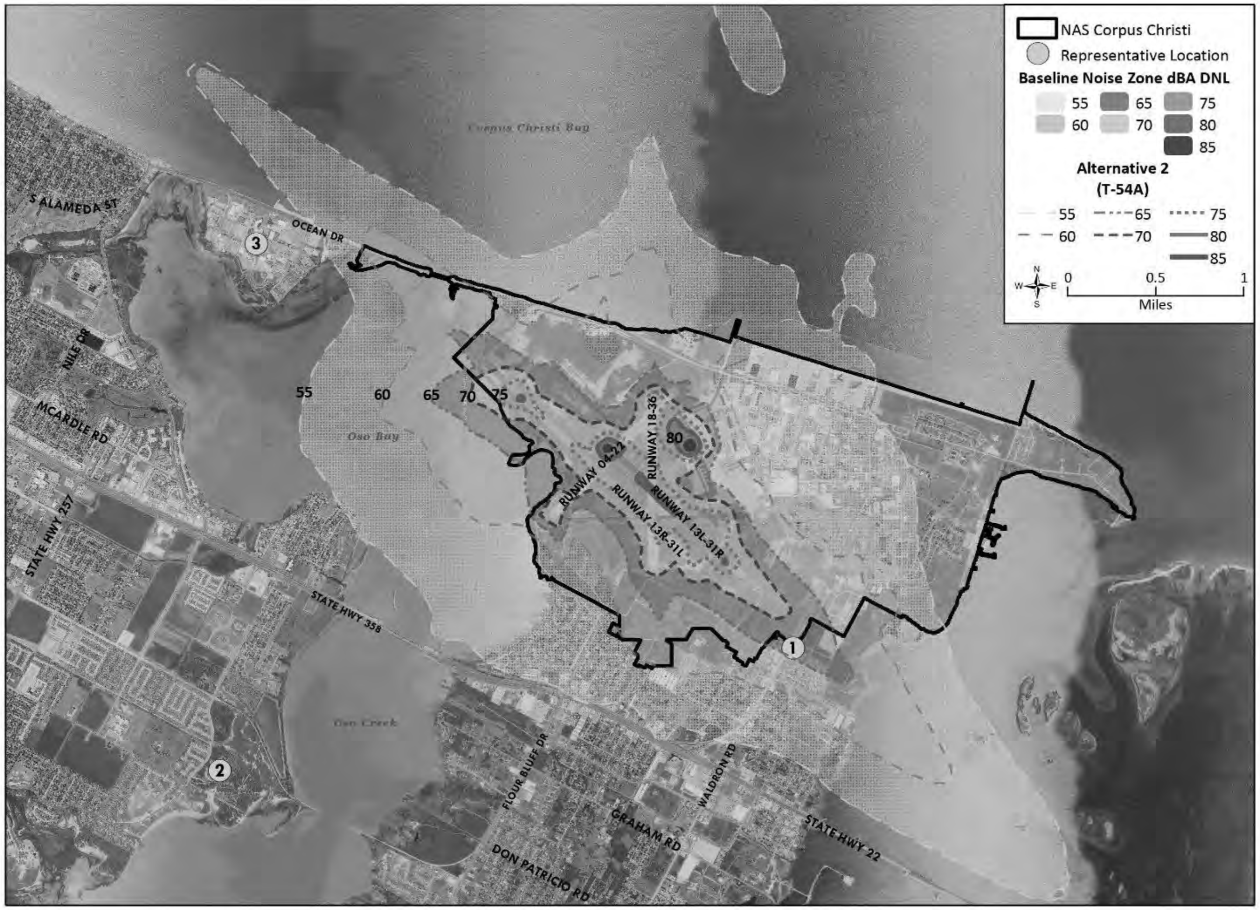

Figure 4-3 Baseline and Alternative 2 DNL Contours for NAS Corpus Christi

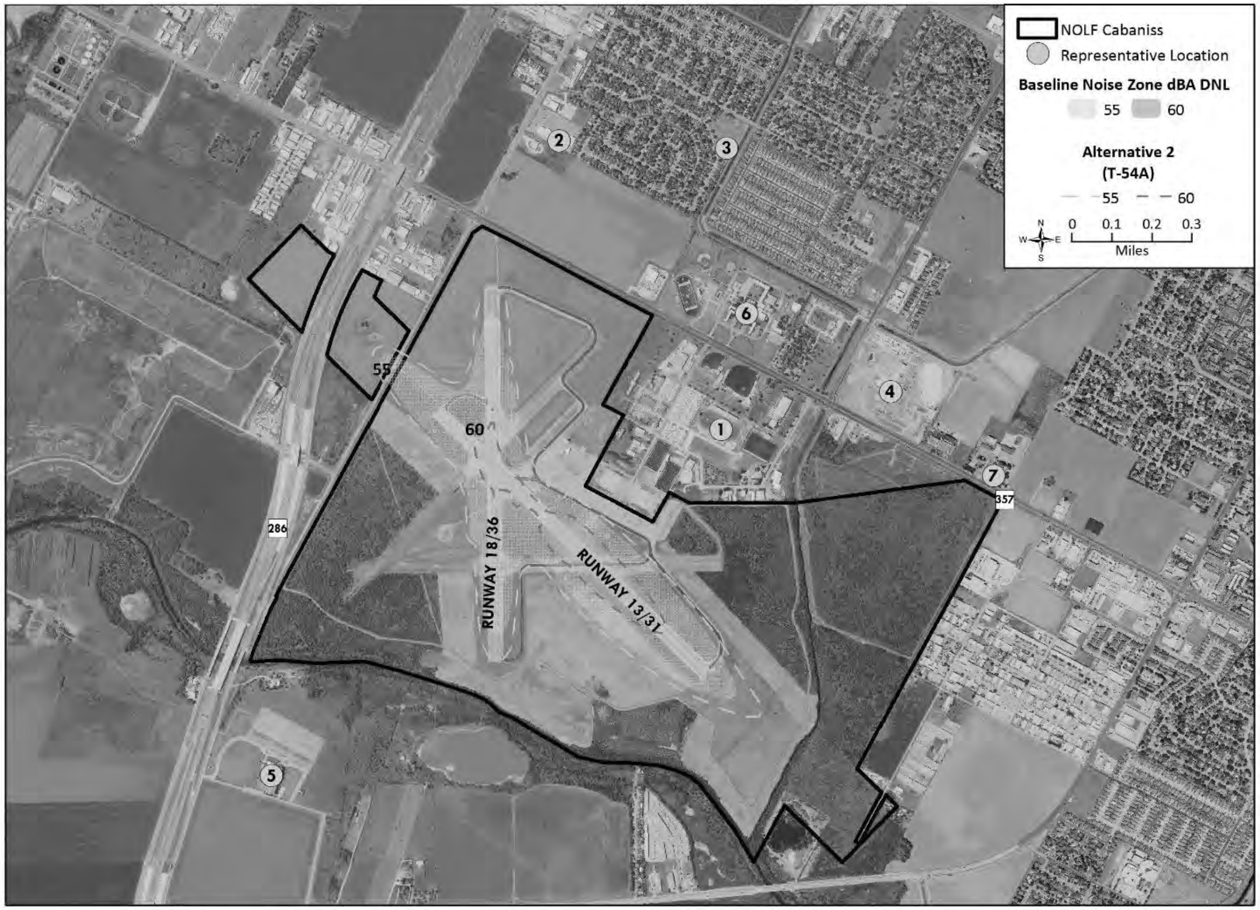

Figure 4-4 Baseline and Alternative 2 DNL Contours for NOLF Cabaniss

Noise levels would remain below 65 dBA DNL at all the locations studied except for the mobile homes on Lexington Boulevard (Table 4-6). At Texas A&M University – Corpus Christi, the noise level would increase by 0.1 dBA DNL, but the noise levels at the other two locations near NAS Corpus Christi would remain the same. The locations near NOLF Cabaniss would experience increases in noise level of 0.8 dBA DNL or less, and all locations would remain well below the 65 dB DNL land use compatibility threshold.

Table 4-6 DNL at Representative Locations under Alternative 2

ID	*Closest Installation*	*Location Description*	*DNL (dBA)*		
			No Action Alternative[1]	*Alternative 2*[1]	*Change*
1	NAS Corpus Christi	Mobile Homes on Lexington Boulevard	66.3	66.3	0
2		Oso Bay Wetlands Preserve	<45	<45	0
3		Texas A&M University – Corpus Christi	48.1	48.2	0.1
1	NOLF Cabaniss	Cabaniss Athletic Complex	<45	45.6	0.6
2		Bowlero Bowling Alley	49.2	50	0.8
3		Camargo Park	49.1	49.9	0.8
4		Carroll High School	48.3	49.1	0.8
5		Church Unlimited	<45	<45	0
6		Saint John Paul II High School	<45	45.6	0.6
7		Most Precious Blood Church	48.9	49.7	0.8

Key: < = less than; dB = decibels; dBA = A-weighted decibels; DNL = day-night average sound level; ID = identification; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Note:

1. Noise levels below 45 dB DNL are assumed to be below ambient sound levels and are listed as "<45."

The number of indoor noise events per average daytime hour (7:00 a.m. to 10:00 p.m.) at representative locations with the potential to interfere with speech would increase by one or less under Alternative 2 (Table 4-7). Any increases in the frequency of disruptions in communication have a high likelihood of being annoying. However, increases in the frequency of such events under Alternative 2 would be minor.

Exterior $L_{eq(8hr)}$ would remain below 60 dBA at all the schools studied under Alternative 2 (Table 4-8) (see Section 2.2.3, *Classroom Criteria and Noise Effects on Children*). $L_{eq(8hr)}$ would remain the same at Texas A&M Corpus Christi and would increase by 0.8 dB at both Carroll High School and Saint John Paul II High School. The number of potential speech interference events per average hour would increase by one or less. Although the frequency of classroom speech interference events would increase under Alternative 2 relative to the No Action Alternative, noise levels would remain below the recommended 60 dBA exterior $L_{eq(8hr)}$ and impacts to learning would be expected to be minimal.

Table 4-7 Speech Interference Events per Average Daytime Hour under Alternative 2

ID	Closest Installation	Location Description	Alternative 2			Change Relative to No Action Alternative		
			Windows Closed[1]	Windows Open[1]	Outdoor	Windows Closed[1]	Windows Open[1]	Outdoor[1]
1	NAS Corpus Christi	Mobile Homes on Lexington Blvd	7	14	19	1	1	1
2		Oso Bay Wetlands Preserve	0	0	1	0	0	0
3		Texas A&M University – Corpus Christi	0	3	10	0	0	0
1	NOLF Cabaniss	Cabaniss Athletic Complex	0	0	6	0	0	1
2		Bowlero Bowling Alley	1	2	6	0	0	1
3		Camargo Park	0	5	6	0	1	1
4		Carroll High School	0	6	6	0	1	1
5		Church Unlimited	0	0	6	0	0	1
6		Saint John Paul II High School	0	0	6	0	0	1
7		Most Precious Blood Church	0	6	6	0	1	1

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. Number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} (or increase in the number of events) rounds to zero.

Table 4-8 Potential Classroom Interference under Alternative 2

ID	Closest Installation	Location Description	Alternative 2			Increase Relative to No Action Alternative		
			Outdoor $L_{eq(8hr)}$ (dBA)[1]	Events per Hour, Windows Closed[2]	Events per Hour, Windows Open[2]	Outdoor $L_{eq(8hr)}$ (dBA)[1]	Events per Hour, Windows Closed[2]	Events per Hour, Windows Open[2]
3	NAS Corpus Christi	Texas A&M University – Corpus Christi	49.2	0	3	0	0	0
4	NOLF Cabaniss	Carroll High School	48.8	0	6	0.8	0	1
6		Saint John Paul II High School	45.3	0	0	0.8	0	0

Key: dB = decibels; dBA = A-weighted decibels; ID = identification; $L_{eq(8hr)}$ = eight-hour equivalent sound level; L_{max} = maximum A-weighted sound level; NAS = Naval Air Station; NOLF = Naval Outlying Landing Field.

Notes:

1. $L_{eq(8hr)}$ calculated for eight-hour typical school day from 8:00 a.m. to 4:00 p.m.
2. Number of events per hour exceeding 50 dBA L_{max}; standard structural noise attenuation levels are assumed: 25 dB with windows closed and 15 dB with windows open. Zero indicates that the number of aircraft noise events per hour exceeding 50 dBA L_{max} rounds to zero.

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4.2 International, Regional, and Publicly Owned Municipal Airfields

This section describes the results of the screening analysis at each of the international, regional, and publicly owned municipal airfields under Alternatives 1 or 2 using methods described in Chapter 2, *Noise Metrics, Impacts, and Modeling*.

Figure 4-5 through Figure 4-11 show DNL contours for the No Action, Alternative 1, and Alternative 2 scenarios at each of the non-Navy airports. Changes in noise levels at all of the non-Navy airports are minimal and difficult to distinguish at map scale. At Alice International, Port Isabel – Cameron County, Palacios, and Calhoun County Airports, the screening analysis shows noise levels under any operational scenario would only exceed 65 dBA DNL on and immediately adjacent to the runways (Figure 4-5, Figure 4-8, Figure 4-9, and Figure 4-11). At Corpus Christi International, Valley International, and Victoria Regional airports, the screening analysis shows noise levels exceeding 65 dBA DNL at locations beyond the immediate vicinity of the runways, but there would not be a change in the extent of the 65 dBA DNL contour that is visible at map scale under any scenario (Figure 4-6, Figure 4-7, and Figure 4-10).

DNL changes at representative noise-sensitive locations near each airfield would not exceed significance criteria established by the FAA in Order 1050.1F (Table 4-9). Specifically, there would be no increases of 1.5 dBA DNL or greater to an end-state level of 65 dBA DNL or greater at any noise-sensitive locations. Although this screening criterion aligns with impact criteria established by the FAA, its application to this screening analysis does not imply Navy adoption of FAA criterion for use in other analyses. Rather, the criterion is useful as a point of reference for this screening analysis. Non-exceedance impacts would be minimal and would not be significant.

Table 4-9 DNL at Representative Locations near International, Regional, and Publicly Owned Municipal Airfields under Alternatives 1 and 2

Municipal Public Use Airport	ID	Closest Noise Sensitive Locations	DNL (dBA) Under Each Scenario			Summary (Highest-Impact Scenario)				
			Baseline / No Action[1]	Alternative 1	Change	Alternative 2	Change	Exceeds 65 dBA DNL	Change equals or exceeds 1.5 dBA	Potential Significant Impacts
Alice International Airport	1	Residence 1	52.9	53	0.1	53.1	0.2	No	No	No
	2	Residence 2	49.6	49.7	0.1	49.8	0.2	No	Yes	No
Corpus Christi International Airport	1	Residence 1	52.6	52.6	0	52.7	0.1	No	No	No
	2	Residence 2	65.4	65.4	0	65.4	0	Yes	No	No
Valley International Airport	1	Valley International Military Academy	53.1	53.1	0	53.1	0	No	No	No
	2	Residence 1	50.3	50.4	0.1	50.4	0.1	No	No	No
Port Isabel-Cameron County Airport	1	Port Isabel AMI Kids (educational)	48.5	48.5	0	48.6	0.1	No	No	No
	2	Port Isabel Detention Center	50.7	50.7	0	50.8	0.1	No	No	No
Palacios Municipal Airport	1	Bayside Recreational Vehicle Camp[1]	<45	<45	0	<45	0	No	No	No
	2	Golf Course	51.7	51.7	0	51.8	0.1	No	No	No
	3	City of Palacios (represented by Palacios Junior High School)	56.5	56.5	0	56.5	0	No	No	No
	4	Residence 1	48.4	48.5	0.1	48.5	0.1	No	No	No
Victoria Regional Airport	1	Dorothy O'Connor Pet Adoption Center	64.3	64.3	0	64.3	0	No	No	No
	2	Residence 1	52.2	52.2	0	52.2	0	No	No	No
Calhoun County Airport	1	Drifters (bar)	50.8	50.8	0	50.8	0	No	No	No
	2	Residence 1	53.1	53.1	0	53.1	0	No	No	No

Key: < = less than; dBA = A-weighted decibels; DNL = day-night average sound level; ID = identification.
Note:
1. Aircraft noise levels less than 45 dB DNL can be assumed to be below ambient sound levels.

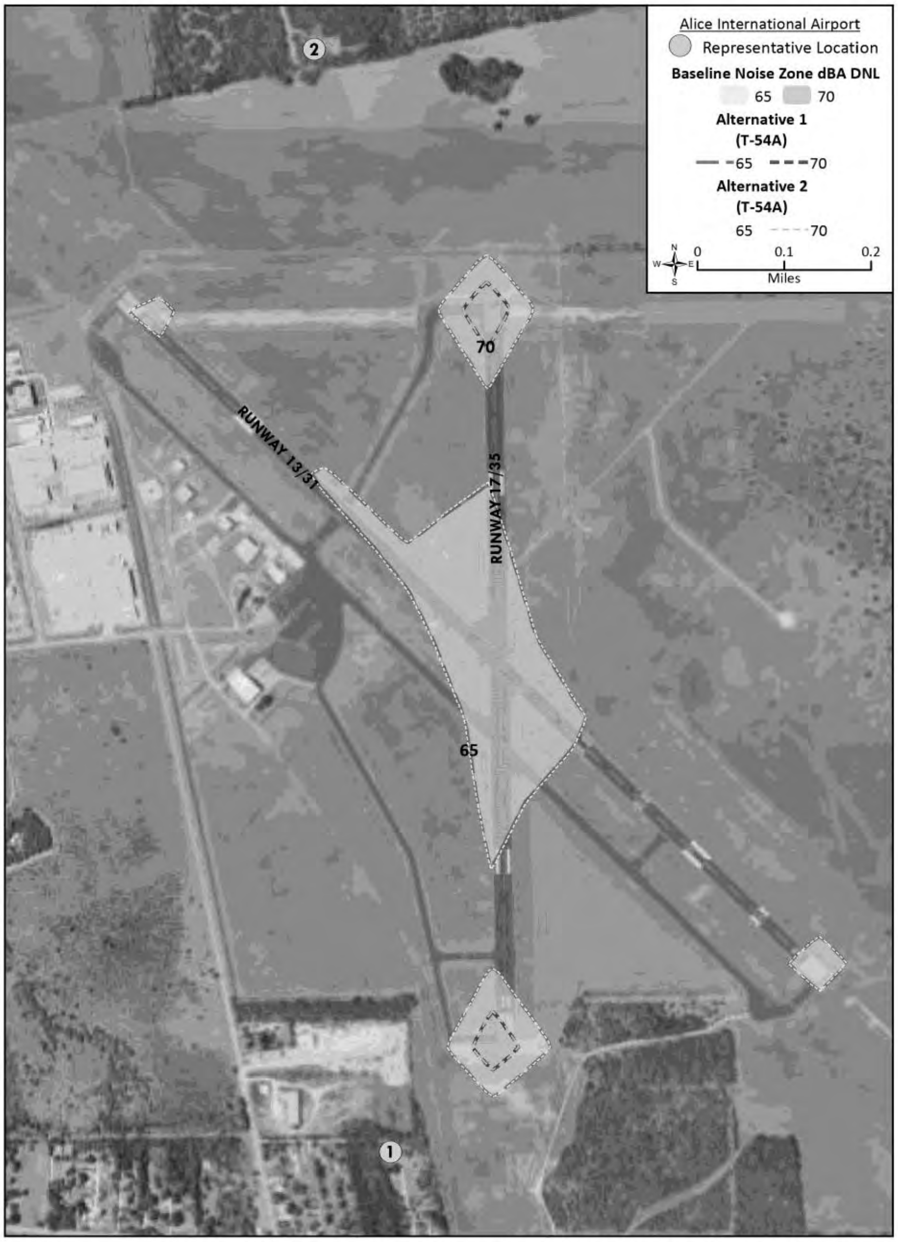

Figure 4-5 No Action, Alternative 1, and Alternative 2 Screening Analysis DNL Contours for Alice International Airport

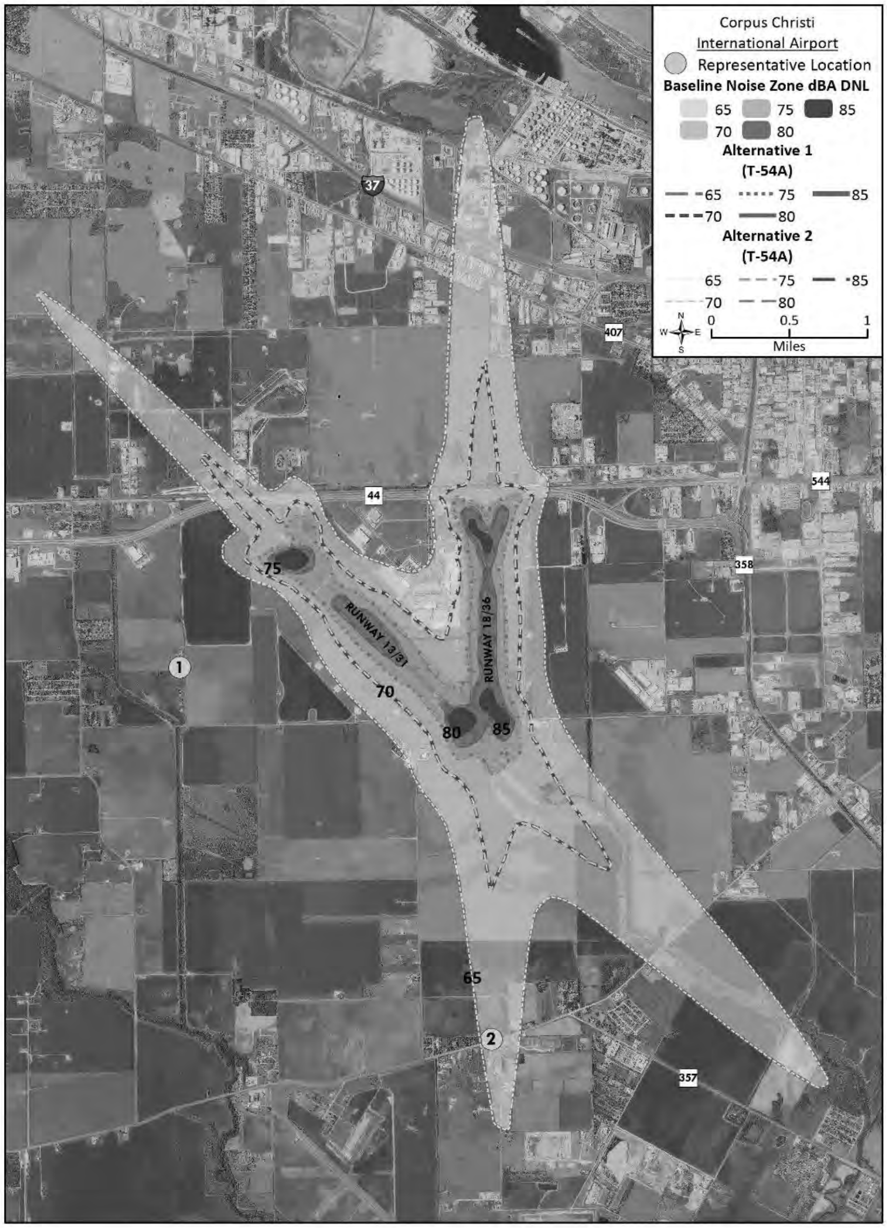

Figure 4-6 No Action, Alternative 1, and Alternative 2 Screening Analysis DNL Contours for Corpus Christi International Airport

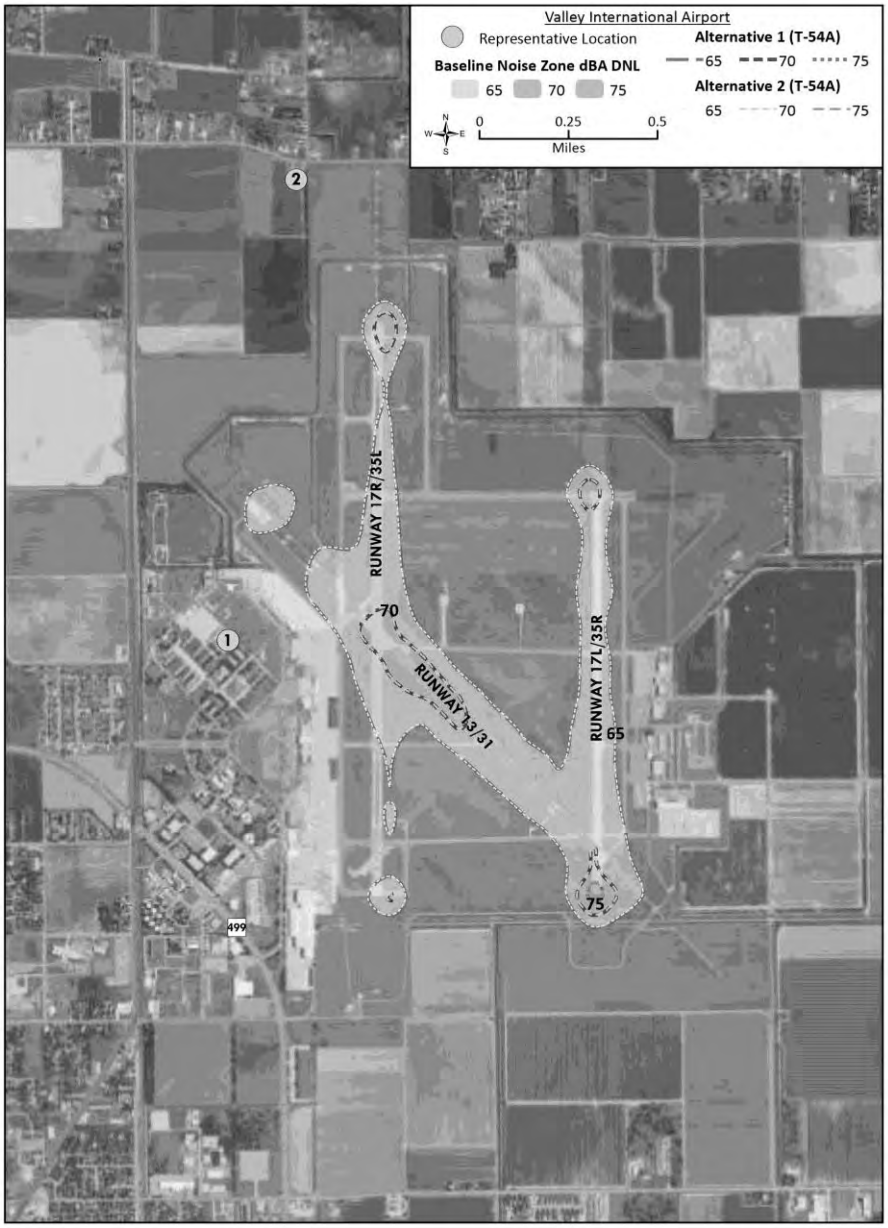

Figure 4-7 No Action, Alternative 1, and Alternative 2 Screening Analysis DNL Contours for Valley International Airport

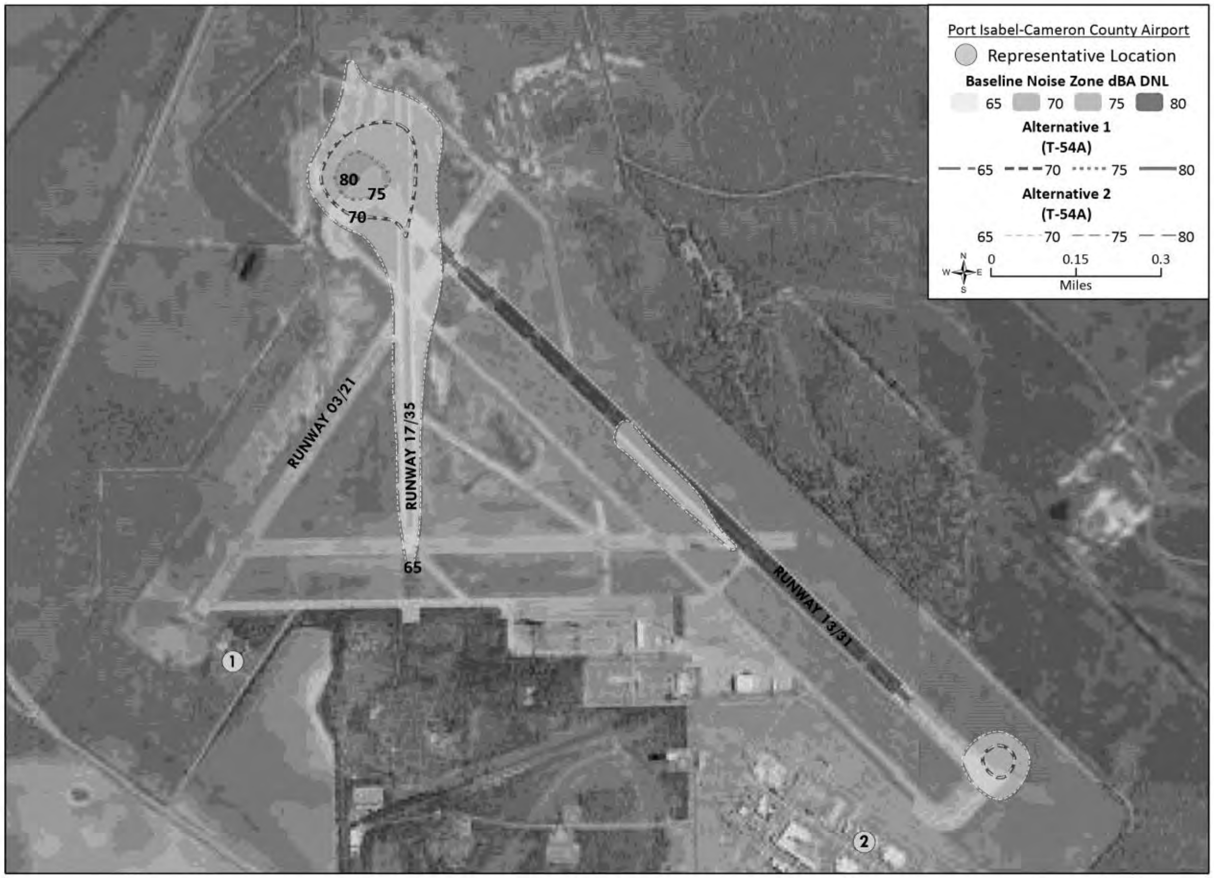

Figure 4-8 No Action, Alternative 1, and Alternative 2 Screening Analysis DNL Contours for Port Isabel-Cameron County International Airport

Figure 4-9 No Action, Alternative 1, and Alternative 2 Screening Analysis DNL Contours for Palacios Municipal Airport

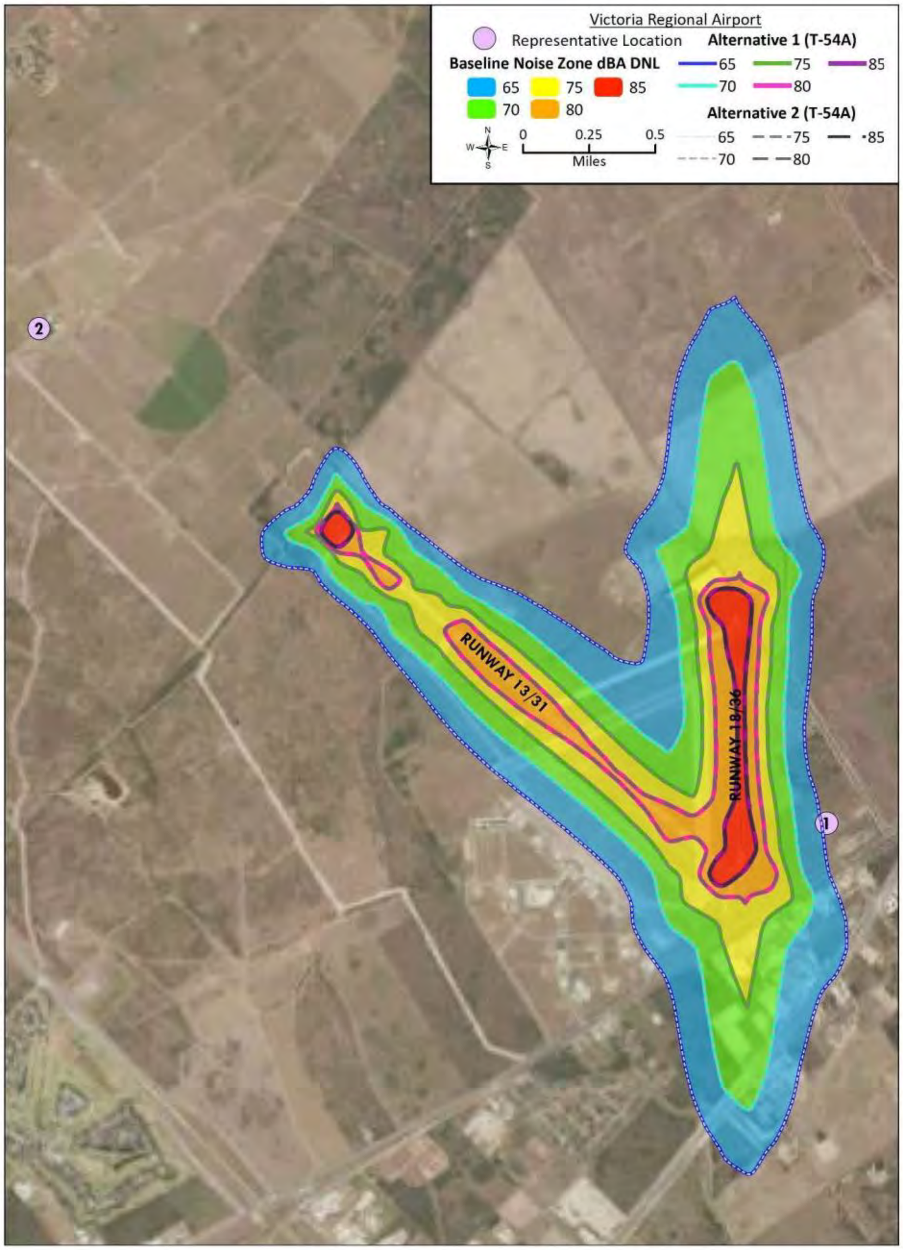

Figure 4-10 No Action, Alternative 1, and Alternative 2 Screening Analysis DNL Contours for Victoria Regional Airport

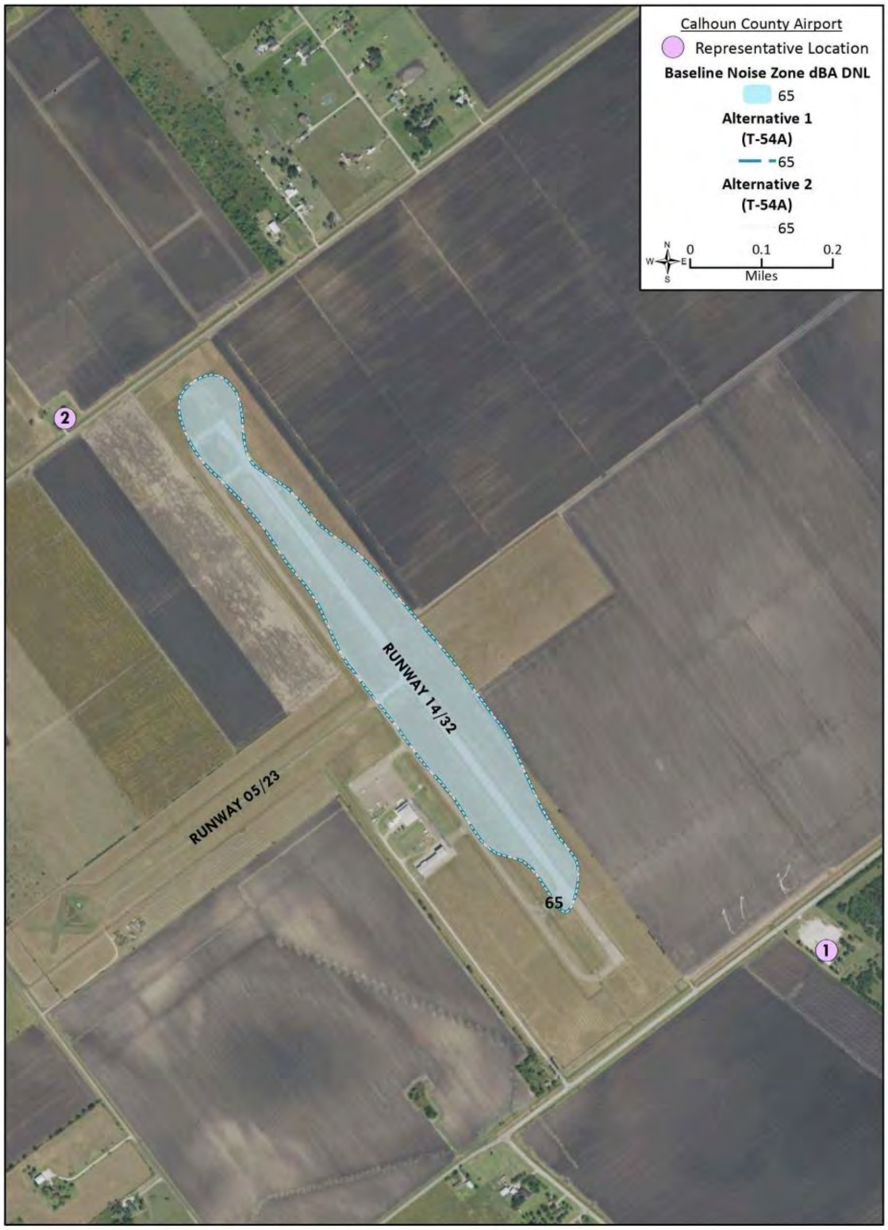

Figure 4-11 No Action, Alternative 1, and Alternative 2 Screening Analysis DNL Contours for Calhoun County Airport

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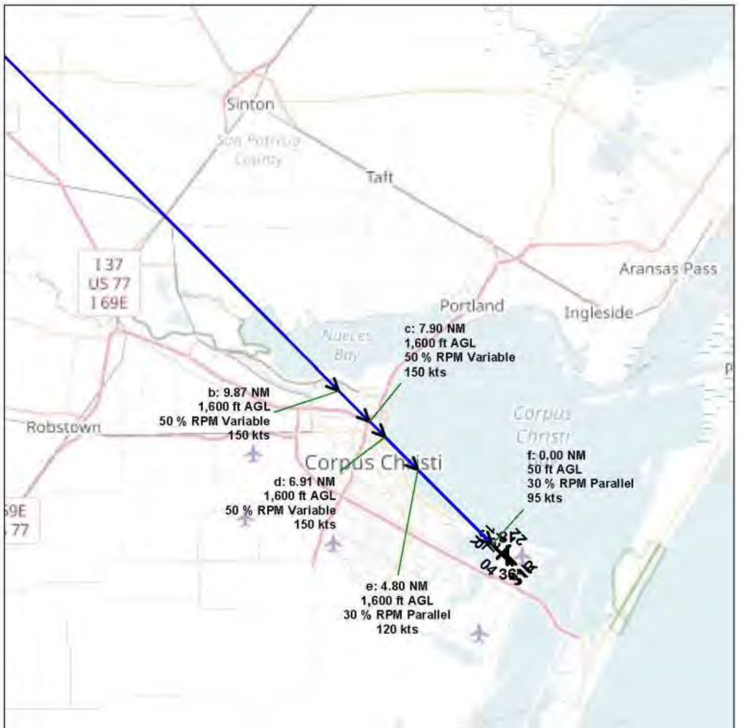
Appendix A
Profile and Flight Tracks for T-44C (equivalent to T-54A profiles) at NAS Corpus Christi

Appendix A displays representative flight profile and summary flight tracks for T-44C aircraft at NAS Corpus Christi. The T-44C profiles shown are equivalent to profiles that would be used by T-54A aircraft, which are also referred to in this appendix as the Multi-Engine Training System(METS). Flight profiles and tracks were developed based on inputs from operational subject matter experts and then reviewed/validated to ensure accuracy.

Each category of aircraft profile is shown only once. Representative profiles shown are applicable to all tracks of the particular category (i.e., Instrument Flight Rules approach) for that aircraft. Each figure includes a table of flight parameters describing the flight trajectory along the flight track. The parameters are varied linearly between the points denoted by the corresponding letter. For departure and pattern profiles, the trajectories proceed as the aircraft flies. However, for arrivals, the trajectories are described in reverse. Please note that some of the following profiles depicted have trajectories that extend beyond the map range.

There are some modeling parameters that are important to note. First, the terms "Variable" and "Parallel" refer to noise interpolation codes that are used to distinguish between clean and dirty configurations, respectively when the noise data is significantly different between the configurations for an individual aircraft. (The "dirty" configuration has flaps and landing gear extended.) The engine power settings are also limited to certain ranges for each aircraft based on the reference noise data.

T-44 Representative Flight Profiles



Flight Profile T44AI02

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	32.92	1,600 AGL	50 Variable	170	0.0	0	518	
b	9.87	1,600 AGL	50 Variable	150	0.0	0	47	
c	7.90	1,600 AGL	50 Variable	150	0.0	0	24	
d	6.91	1,600 AGL	50 Variable	150	0.0	0	56	
e	4.80	1,600 AGL	30 Parallel	120	-3.0	-600	161	FAF configure
f	0.00	50 AGL	30 Parallel	95				

T-44 Flight Profile T44AI02
IFR Arrival/Straight In

0 20,000 40,000 60,000 80,000 100,000 120,000 140,000

Scale in Feet 1:422,000 (1 inch = 35,200 feet)

N

Flight Profile T44AO01

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	32.92	1,500 AGL	61 Variable	170	-0.2	-100	577	
b	5.68	1,000 AGL	61 Variable	170	0.0	0	44	
c	3.62	1,000 AGL	30 Variable	170	0.0	0	30	
d	2.30	1,000 AGL	30 Parallel	150	-5.7	-1400	4	
e	2.14	900 AGL	30 Parallel	120	-1.3	-300	21	adjusted altitude and airspeed
f	1.43	800 AGL	30 Parallel	120	-5.1	-1000	23	adjusted power
g	0.69	400 AGL	30 Parallel	110	-5.1	-1000	17	adjusted altitude and power
h	0.20	130 AGL	30 Parallel	105	-3.8	-700	7	adjusted altitude and power
i	0.00	50 AGL	24 Parallel	95				

T-44 Flight Profile T44AO01

Overhead Break Arrival

Scale in Feet 1:143,000 (1 inch = 11,900 feet)

Flight Profile T44AV01

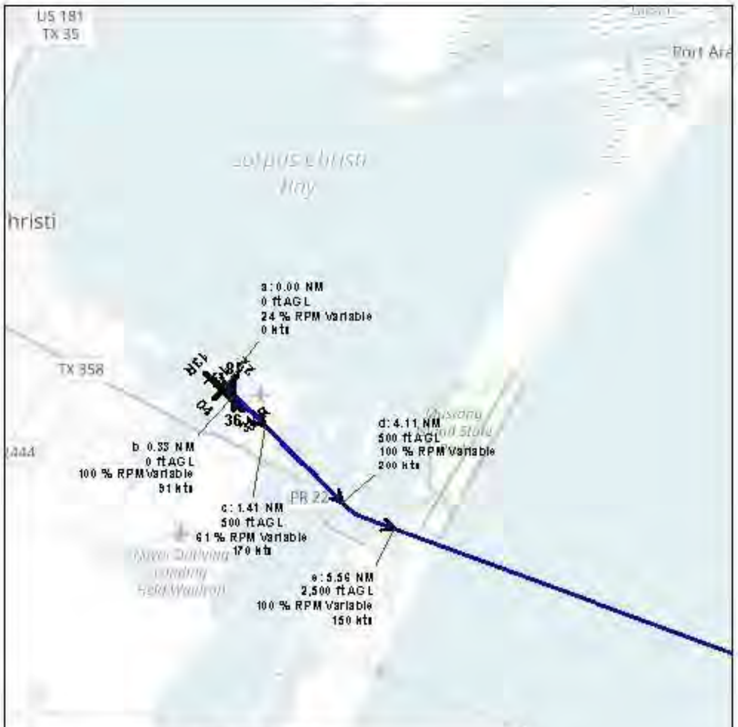
Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	32.92	1,600 AGL	50 Variable	170	0.0	0	518	
b	9.87	1,600 AGL	50 Variable	150	0.0	0	47	
c	7.90	1,600 AGL	50 Variable	150	0.0	0	24	
d	6.91	1,600 AGL	50 Variable	150	0.0	0	37	
e	5.53	1,600 AGL	30 Parallel	120	-2.6	-500	185	configure
f	0.00	50 AGL	30 Parallel	95				

T-44 Flight Profile T44AV01
VFR Arrival/Straight In

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000 44,000 48,000 52,000

Scale in Feet 1:152,000 (1 inch = 12,700 feet)

N



Flight Profile T44D01

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle	Climb Rate fpm	Duration sec
a	0.00	0 AGL	24 Variable	0	0.0	0	26
b	0.33	0 AGL	100 Variable	91	4.4	1000	30
c	1.41	500 AGL	61 Variable	170	0.0	0	53
d	4.11	500 AGL	100 Variable	200	12.8	4000	30
e	5.56	2,500 AGL	100 Variable	150	2.6	700	615
f	32.92	10,000 AGL	61 Variable	170			

T-44 Flight Profile T44D01
VFR Departure

Scale in Feet 1:229,000 (1 inch = 19,100 feet)

Flight Profile T44D04

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	0 AGL	24 Variable	0	0.0	0	26
b	0.33	0 AGL	100 Variable	91	9.5	1900	15
c	0.82	500 AGL	86 Variable	140	7.8	2000	33
d	2.14	1,600 AGL	86 Variable	150	0.0	0	67
e	5.14	1,600 AGL	100 Variable	170	1.6	500	414
f	24.69	5,000 AGL	86 Variable	170			

T-44 Flight Profile T44D04
IFR Departure

Scale in Feet 1:91,700 (1 inch = 7,640 feet)

Flight Profile T44CI01

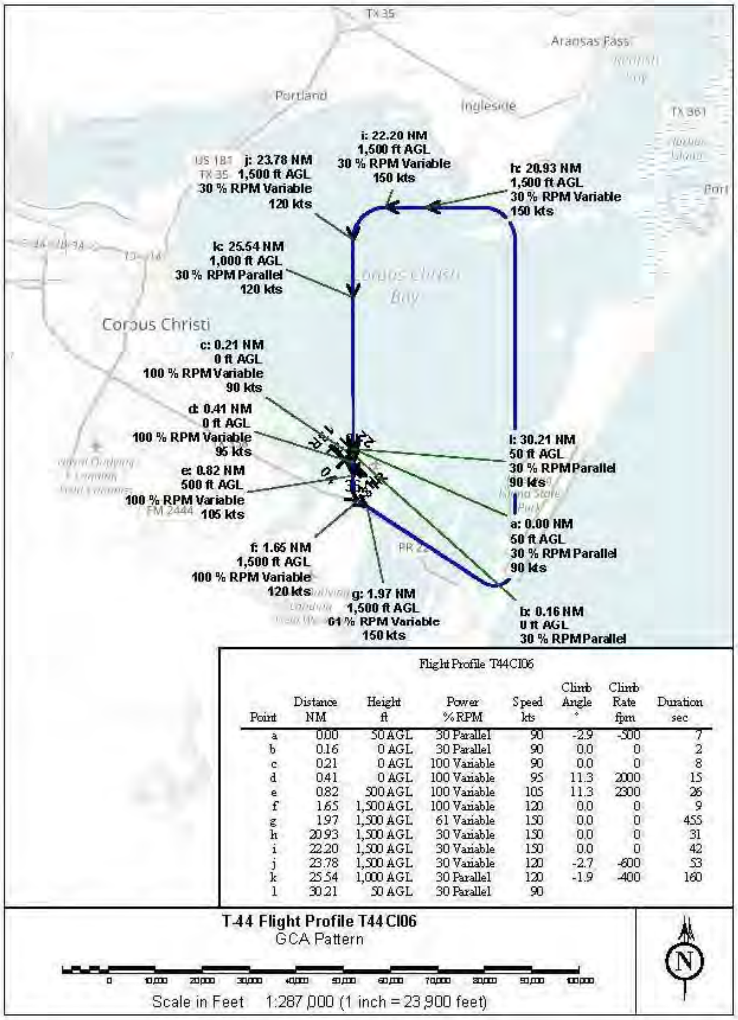
Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	30 Parallel	90	-2.9	-500	7
b	0.16	0 AGL	30 Parallel	90	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	11.3	2000	15
e	0.82	500 AGL	100 Variable	105	11.3	2300	26
f	1.65	1,500 AGL	100 Variable	120	0.0	0	9
g	1.97	1,500 AGL	61 Variable	150	0.0	0	490
h	22.38	1,500 AGL	30 Variable	150	0.0	0	48
i	24.38	1,500 AGL	30 Variable	150	0.0	0	26
j	25.37	1,500 AGL	30 Variable	120	-2.4	-500	59
k	27.35	1,000 AGL	30 Parallel	120	-1.9	-300	166
l	32.18	50 AGL	30 Parallel	90			

T-44 Flight Profile T44CI01
GCA Pattern

0 10,000 20,000 30,000 40,000 50,000 60,000 70,000 80,000 90,000 100,000

Scale in Feet 1:287,000 (1 inch = 23,900 feet)

N



Flight Profile T44CI06

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	30 Parallel	90	-2.9	-500	7
b	0.16	0 AGL	30 Parallel	90	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	11.3	2000	15
e	0.82	500 AGL	100 Variable	105	11.3	2300	26
f	1.65	1,500 AGL	100 Variable	120	0.0	0	9
g	1.97	1,500 AGL	61 Variable	150	0.0	0	455
h	20.93	1,500 AGL	30 Variable	150	0.0	0	31
i	22.20	1,500 AGL	30 Variable	150	0.0	0	42
j	23.78	1,500 AGL	30 Variable	120	-2.7	-600	53
k	25.54	1,000 AGL	30 Parallel	120	-1.9	-400	160
l	30.21	50 AGL	30 Parallel	90			

Flight Profile T44CV01

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6	
b	0.16	0 AGL	24 Parallel	95	0.0	0	2	
c	0.21	0 AGL	100 Parallel	90	0.0	0	8	
d	0.41	0 AGL	100 Parallel	95	9.1	1600	15	
e	0.82	400 AGL	68 Parallel	105	3.8	700	17	
f	1.32	600 AGL	70 Parallel	110	1.9	400	31	
g	2.30	800 AGL	46 Parallel	120	0.0	0	15	
h	2.80	800 AGL	46 Parallel	120	0.0	0	12	
i	3.21	800 AGL	30 Parallel	120	-4.6	-900	26	adjusted power
j	4.03	400 AGL	30 Parallel	110	-4.0	-800	21	adjusted altitude and power
k	4.67	130 AGL	30 Parallel	105	-3.8	-700	7	adjusted altitude and power
l	4.87	50 AGL	24 Parallel	95				

T-44 Flight Profile T44CV01
Touch and Go Normal

0 2,000 4,000 6,000 8,000 10,000
Scale in Feet 1:35,700 (1 inch = 2,980 feet)

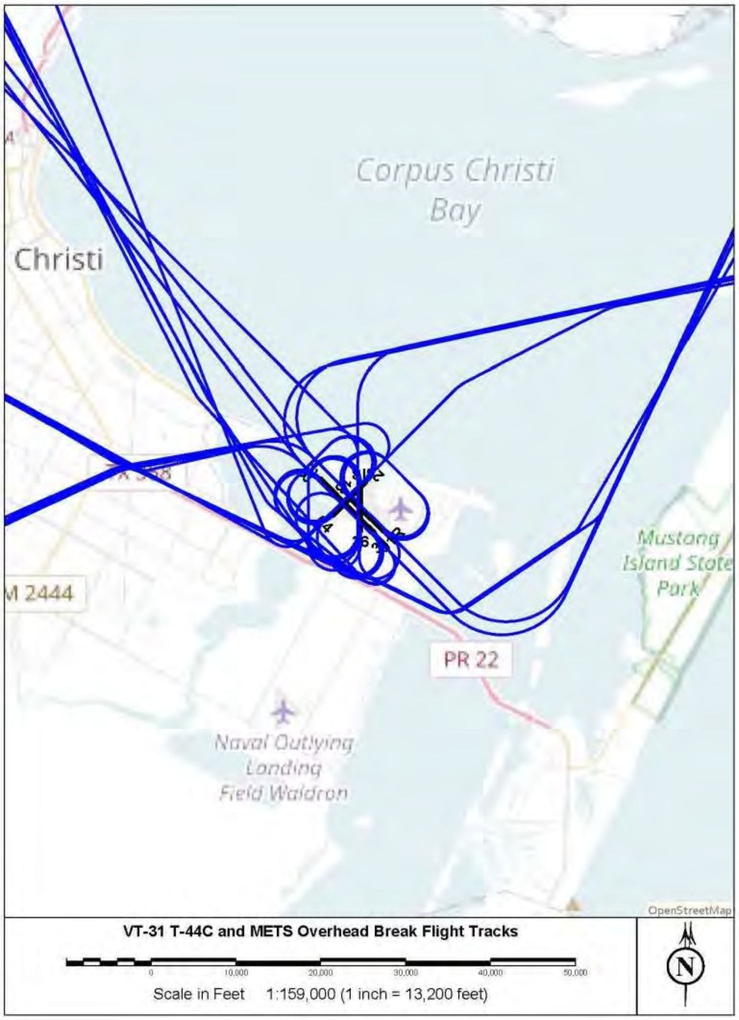
Flight Profile T44CV08

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6	
b	0.16	0 AGL	24 Parallel	95	0.0	0	2	
c	0.21	0 AGL	100 Parallel	90	0.0	0	8	
d	0.41	0 AGL	100 Parallel	95	9.1	1600	15	
e	0.82	400 AGL	68 Parallel	105	3.8	700	17	
f	1.32	600 AGL	70 Parallel	110	1.9	400	31	
g	2.30	800 AGL	46 Parallel	120	0.0	0	75	
h	4.79	800 AGL	46 Parallel	120	0.0	0	13	
i	5.21	800 AGL	30 Parallel	120	-4.6	-900	26	adjusted power
j	6.03	400 AGL	30 Parallel	110	-4.0	-800	21	adjusted altitude and power
k	6.67	130 AGL	30 Parallel	105	-4.0	-700	7	adjusted altitude and power
l	6.86	50 AGL	24 Parallel	95				

T-44 Flight Profile T44CV08
Touch and Go Extended

Scale in Feet 1:68,100 (1 inch = 5,680 feet)

T-44 and MET Flight Tracks



VT-31 T-44C and METS Overhead Break Flight Tracks

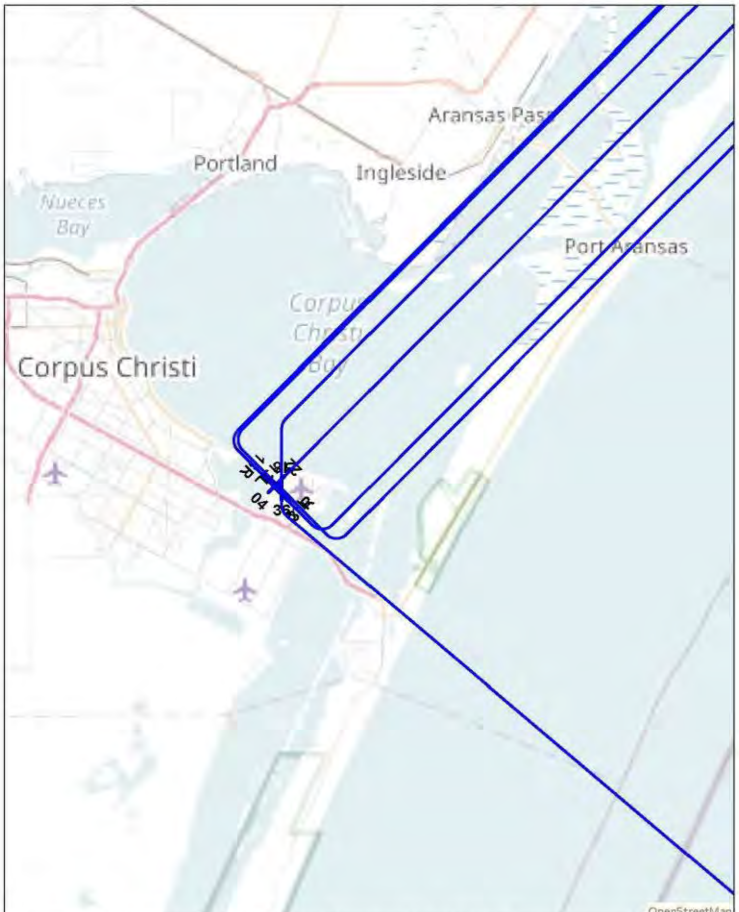
Scale in Feet 1:159,000 (1 inch = 13,200 feet)

VT-31 T-44C and METS IFR Arrival Flight Tracks

Scale in Feet 1:45,500 (1 inch = 3,790 feet)

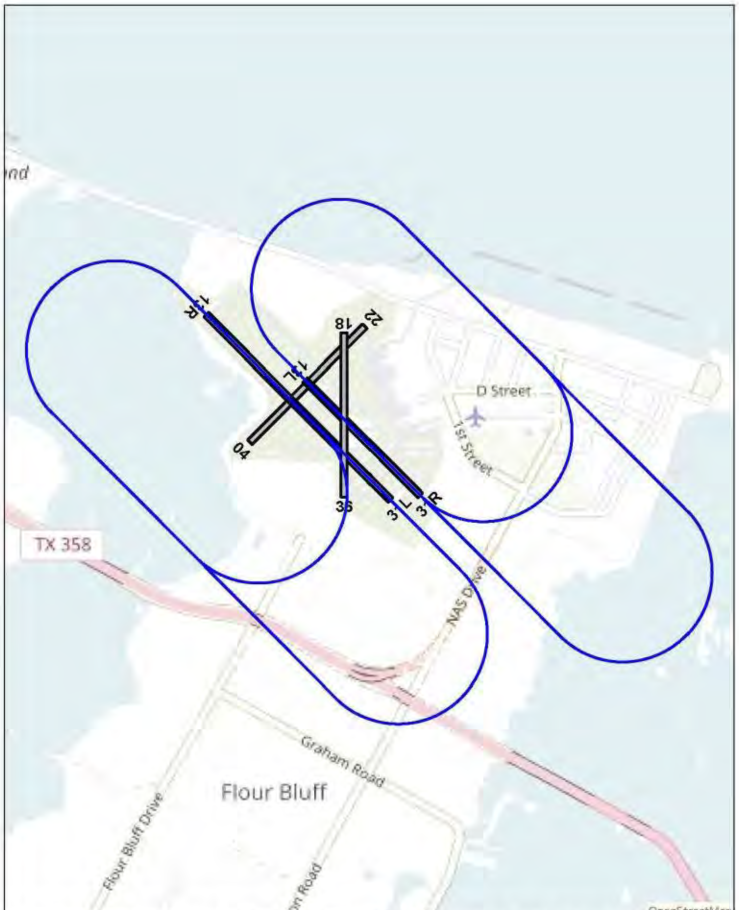
VT-31 T-44C and METS VFR Departure Flight Tracks

Scale in Feet 1:245,000 (1 inch = 20,400 feet)



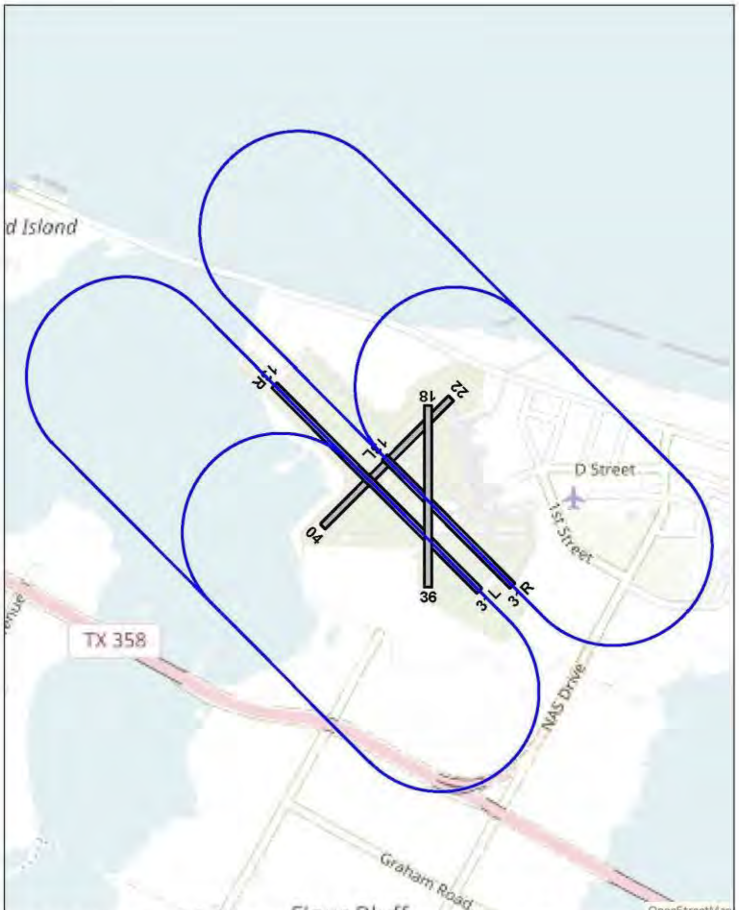
VT-31 T-44C and METS IFR Departure Flight Tracks

Scale in Feet 1:324,000 (1 inch = 27,000 feet)



VT-31 T-44C and METS Rwy 13L and 13R VFR Closed Pattern Flight Tracks

Scale in Feet 1:46,700 (1 inch = 3,890 feet)

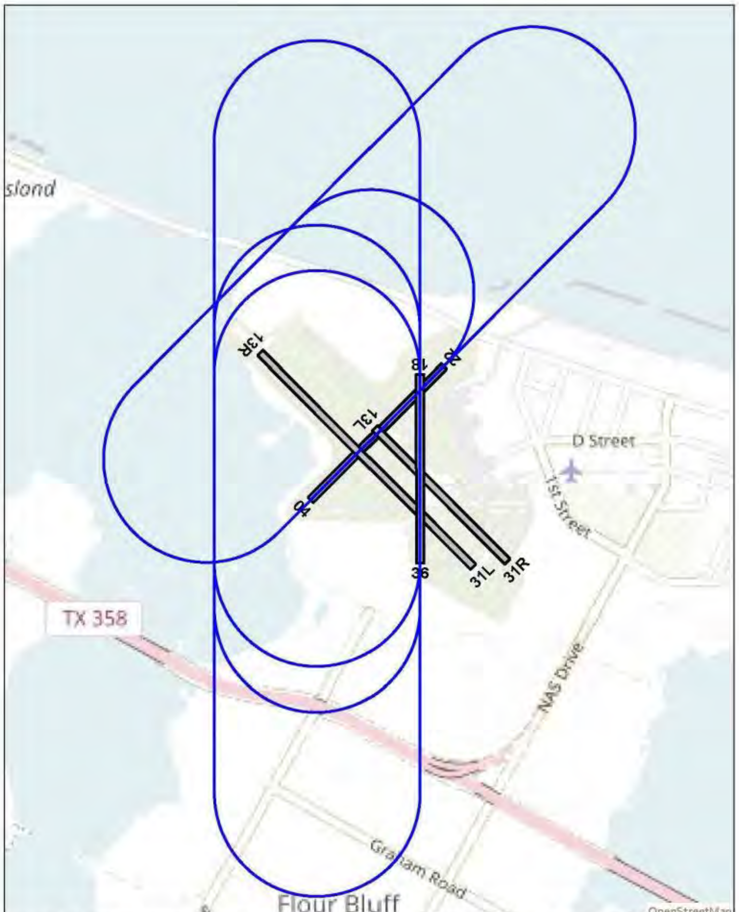


VT-31 T-44C and METS Rwy 31L and 31R VFR Closed Pattern Flight Tracks

0 2,000 4,000 6,000 8,000 10,000 12,000 14,000

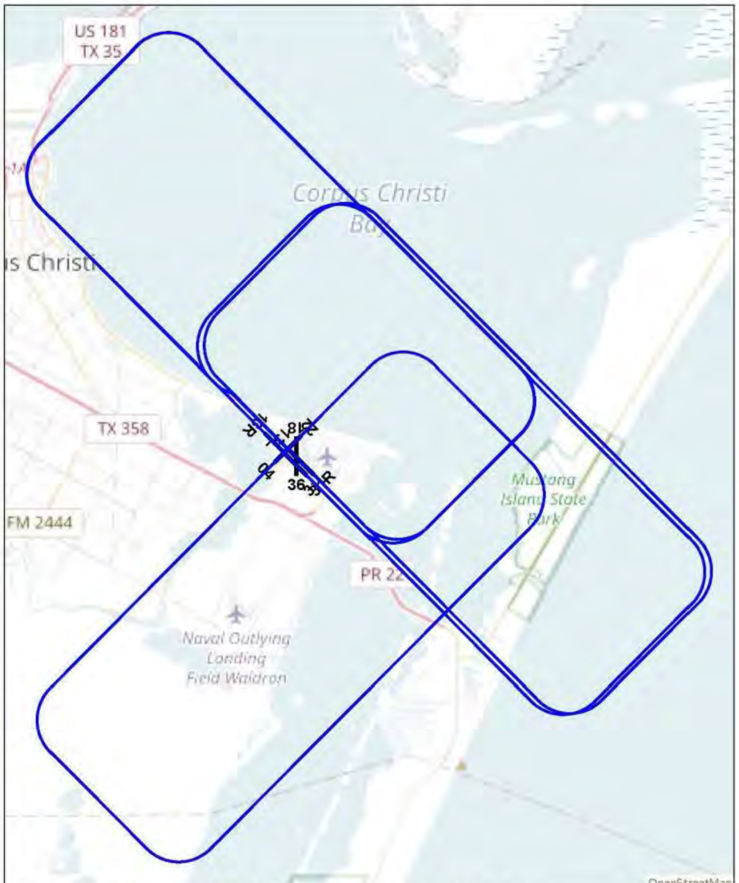
Scale in Feet 1:42,000 (1 inch = 3,500 feet)

N



VT-31 T-44C and METS Rwy 04, 18, and 36 VFR Closed Pattern Flight Tracks

Scale in Feet 1:40,400 (1 inch = 3,370 feet)



VT-31 T-44C and METS GCA Box Closed Pattern Flight Tracks
Runway 18 GCA Box Pattern is the only one that is not a rectangle. It turns before crossing the highway.

Scale in Feet 1:204,000 (1 inch = 17,000 feet)

Appendix B
Profile and Flight Tracks for T-44C (equivalent to T-54A profiles) at NOLF Cabaniss

Appendix B displays representative flight profile and summary flight tracks for T-44C aircraft at NOLF Cabaniss. The T-44C profiles shown are equivalent to profiles that would be used by T-54A aircraft, which are also referred to in this appendix as METS. Flight profiles and tracks were developed based on inputs from operational subject matter experts and then reviewed and validated to ensure accuracy.

NOLF Cabaniss Representative T-44C Flight Profiles

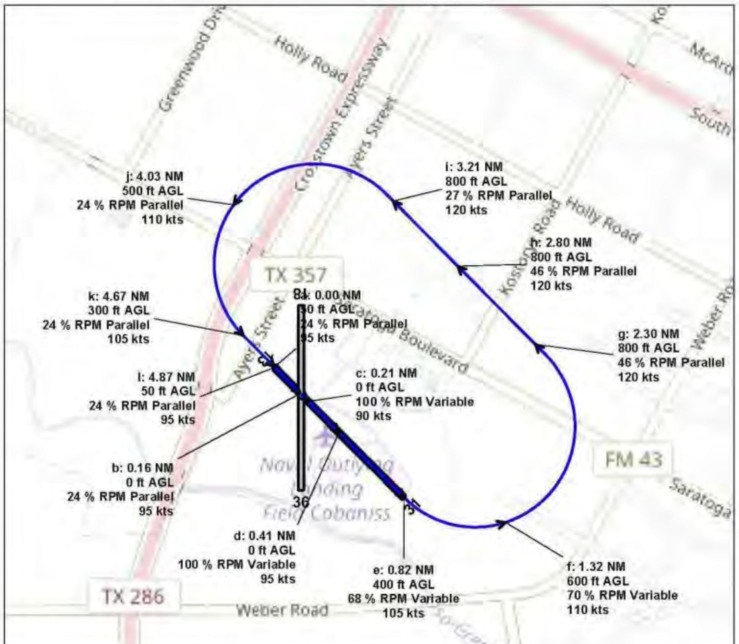
Flight Profile C105

Point	Distance NM	Height ft	Power %RPM	Speed kt	Climb Angle	Climb Rate fpm	Duration sec
a	32.92	1,500 AGL	61 Variable	170	-0.2	-100	580
b	5.51	1,000 AGL	61 Variable	170	0.0	0	40
c	3.62	1,000 AGL	30 Variable	170	0.0	0	30
d	2.30	1,000 AGL	30 Parallel	150	-11.3	-2800	4
e	2.14	800 AGL	30 Parallel	130	0.0	0	20
f	1.43	800 AGL	46 Parallel	120	-3.8	-800	23
g	0.69	500 AGL	24 Parallel	110	-3.8	-700	17
h	0.20	300 AGL	24 Parallel	105	-11.8	-2100	7
i	0.00	50 AGL	24 Parallel	95			

OpenStreetMap

NOLF Cabaniss T-44C Flight Profile C105
NASCC Overhead Runway 13

Scale in Feet 1:110,000 (1 inch = 9,190 feet)



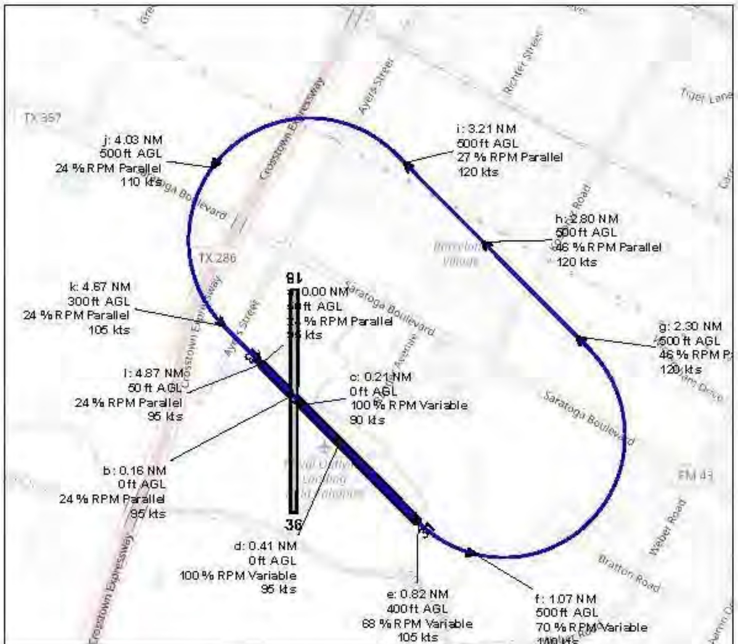
Flight Profile C129

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6
b	0.16	0 AGL	24 Parallel	95	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	9.1	1600	15
e	0.82	400 AGL	68 Variable	105	3.8	700	17
f	1.32	600 AGL	70 Variable	110	1.9	400	31
g	2.30	800 AGL	46 Parallel	120	0.0	0	15
h	2.80	800 AGL	46 Parallel	120	0.0	0	12
i	3.21	800 AGL	27 Parallel	120	-3.4	-700	26
j	4.03	500 AGL	24 Parallel	110	-2.9	-600	21
k	4.67	300 AGL	24 Parallel	105	-11.8	-2100	7
l	4.87	50 AGL	24 Parallel	95			

NOLF Cabaniss T-44C Flight Profile C129

Touch and Go Runway 13 - short 800 ft AGL pattern

Scale in Feet 1:41,500 (1 inch = 3,460 feet)



Flight Profile C130

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6
b	0.16	0 AGL	24 Parallel	95	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	9.1	1600	15
e	0.82	400 AGL	68 Variable	105	3.8	700	8
f	1.07	500 AGL	70 Variable	110	0.0	0	39
g	2.30	500 AGL	46 Parallel	120	0.0	0	15
h	2.80	500 AGL	46 Parallel	120	0.0	0	12
i	3.21	500 AGL	27 Parallel	120	0.0	0	26
j	4.03	500 AGL	24 Parallel	110	-2.9	-600	21
k	4.67	300 AGL	24 Parallel	105	-11.8	-2100	7
l	4.87	50 AGL	24 Parallel	95			

NOLF Cabaniss T-44C Flight Profile C130

Touch and Go Runway 13 - short 500 ft AGL pattern

Scale in Feet 1:34,300 (1 inch = 2,860 feet)

Flight Profile C131

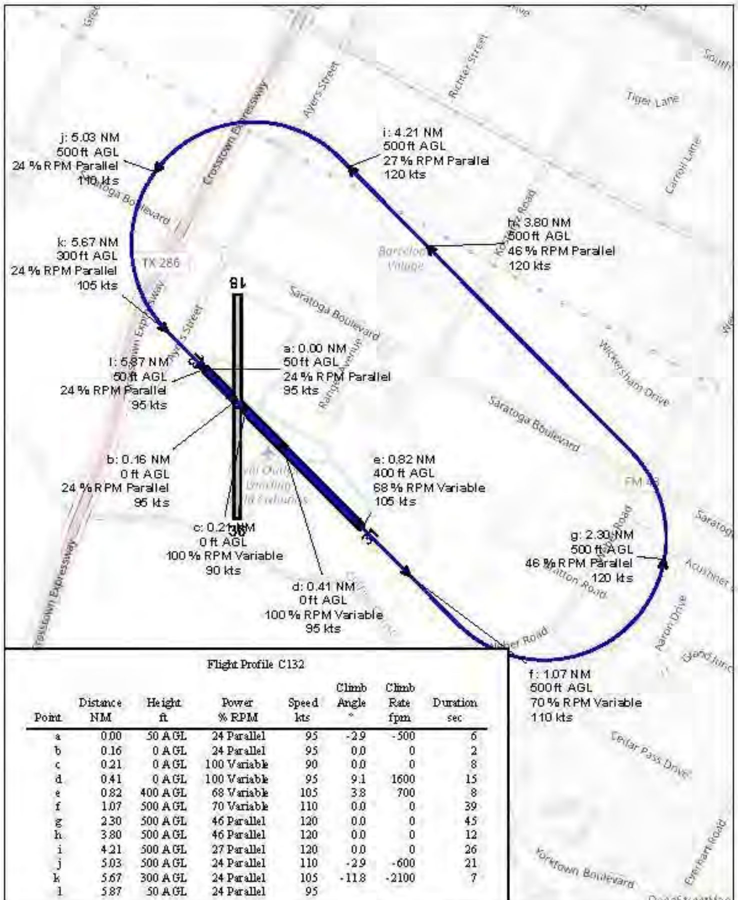
Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6
b	0.16	0 AGL	24 Parallel	95	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	9.1	1600	15
e	0.82	400 AGL	68 Variable	105	3.8	700	17
f	1.32	600 AGL	70 Variable	110	1.9	400	31
g	2.30	800 AGL	46 Parallel	120	0.0	0	45
h	3.80	800 AGL	46 Parallel	120	0.0	0	12
i	4.21	800 AGL	27 Parallel	120	-3.4	-700	26
j	5.03	500 AGL	24 Parallel	110	-2.9	-600	21
k	5.67	300 AGL	24 Parallel	105	-11.8	-2100	7
l	5.87	50 AGL	24 Parallel	95			

NOLF Cabaniss T-44C Flight Profile C131

Touch and Go Runway 13 - long 800 ft AGL pattern

0 2,000 4,000 6,000 8,000 10,000 12,000

Scale in Feet 1:37,800 (1 inch = 3,150 feet)

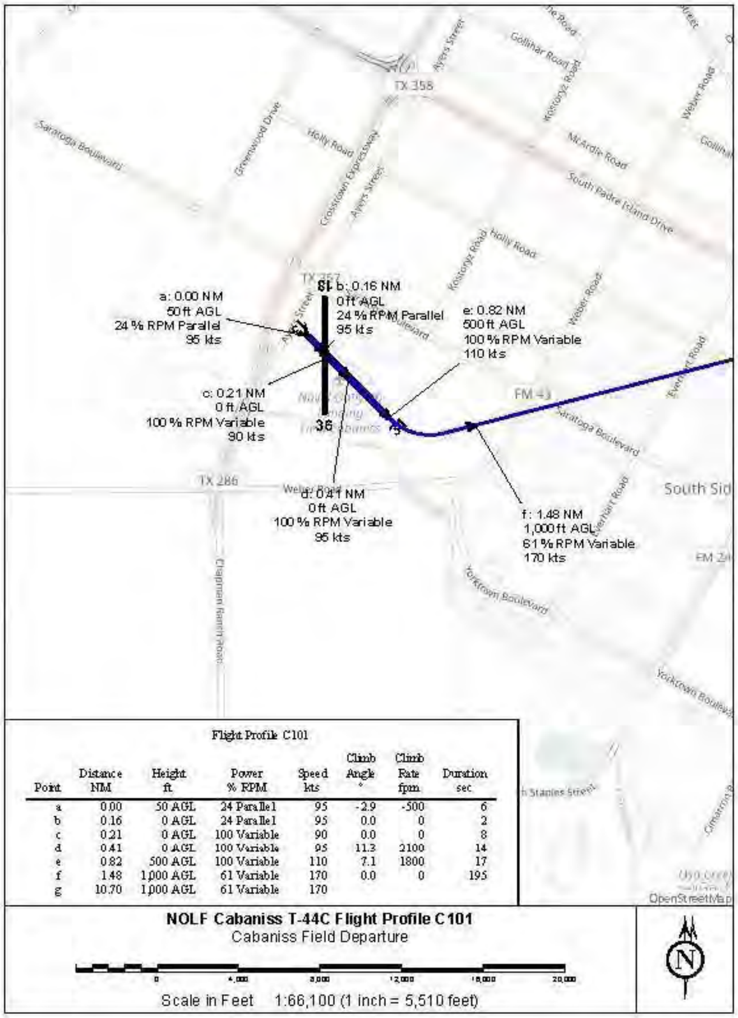


Flight Profile C132

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6
b	0.16	0 AGL	24 Parallel	95	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	9.1	1600	15
e	0.82	400 AGL	68 Variable	105	3.8	700	8
f	1.07	500 AGL	70 Variable	110	0.0	0	39
g	2.30	500 AGL	46 Parallel	120	0.0	0	45
h	3.80	500 AGL	46 Parallel	120	0.0	0	12
i	4.21	500 AGL	27 Parallel	120	0.0	0	26
j	5.03	500 AGL	24 Parallel	110	-2.9	-600	21
k	5.67	300 AGL	24 Parallel	105	-11.8	-2100	7
l	5.87	50 AGL	24 Parallel	95			

NOLF Cabaniss T-44C Flight Profile C132
Touch and Go Runway 13 - long 500 ft AGL pattern

0 2,000 4,000 6,000 8,000 10,000
Scale in Feet 1:34,100 (1 inch = 2,840 feet)



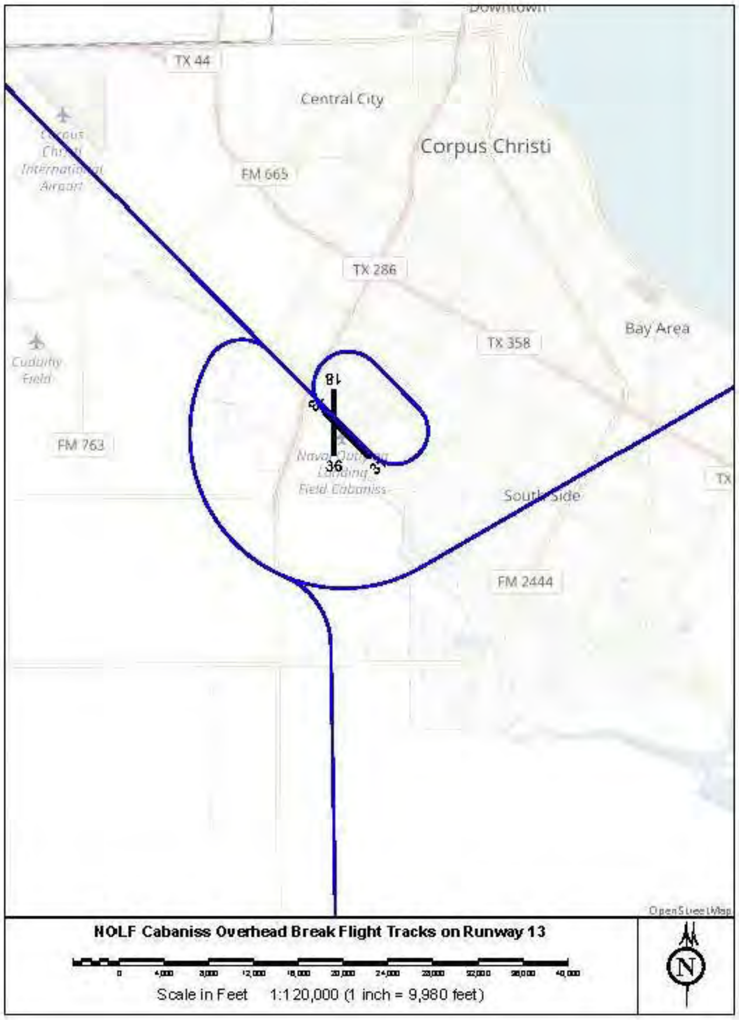
Flight Profile C101

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6
b	0.16	0 AGL	24 Parallel	95	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	11.3	2100	14
e	0.82	500 AGL	100 Variable	110	7.1	1800	17
f	1.48	1,000 AGL	61 Variable	170	0.0	0	195
g	10.70	1,000 AGL	61 Variable	170			

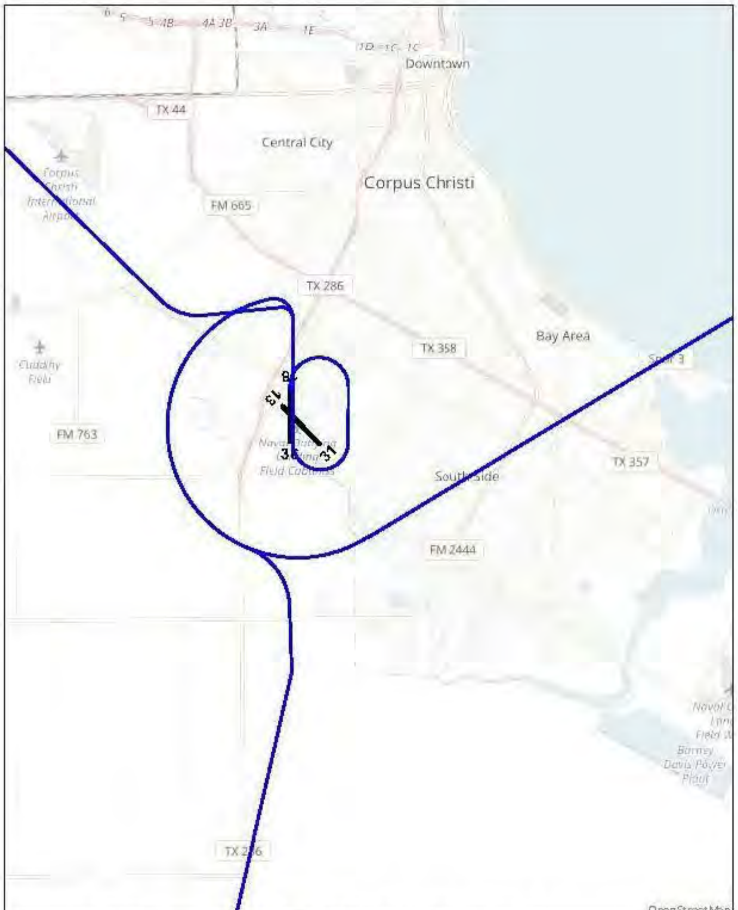
NOLF Cabaniss T-44C Flight Profile C101
Cabaniss Field Departure

Scale in Feet 1:66,100 (1 inch = 5,510 feet)

Summary Map of Arrival Flight Tracks


TX 44
Central City
Corpus Christi
FM 665
TX 286
TX 358
Bay Area
FM 763
18
36
South Side
FM 2444
NOLF Cabaniss Overhead Break Flight Tracks on Runway 13
Scale in Feet 1:120,000 (1 inch = 9,980 feet)
N

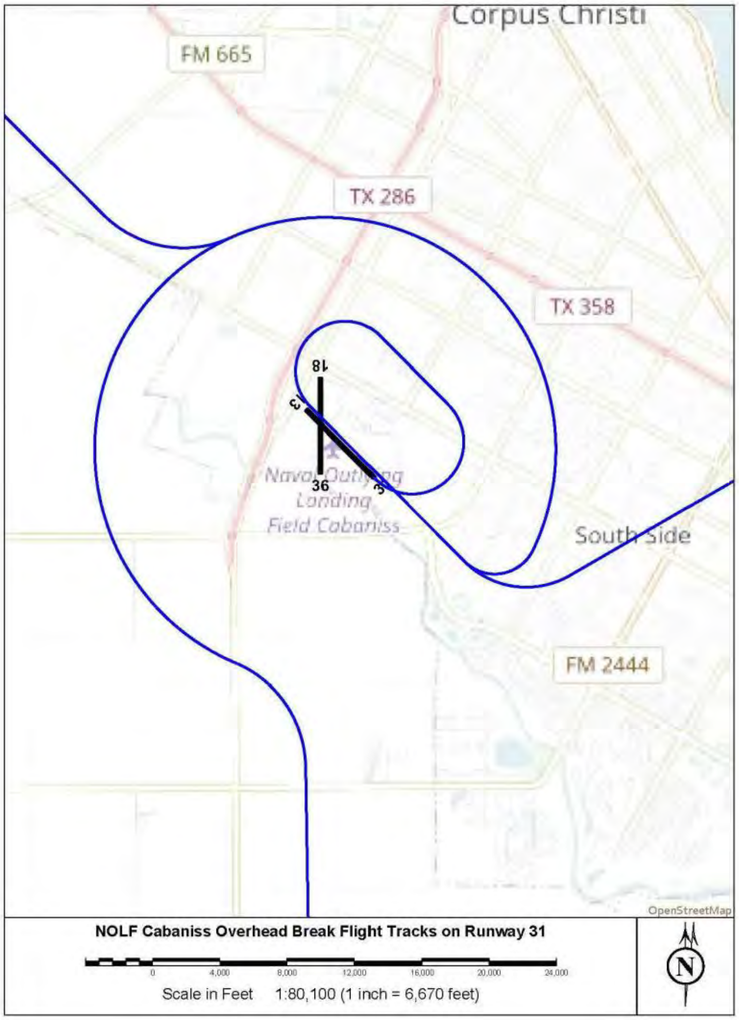
Summary Map of Flight Tracks



NOLF Cabaniss Overhead Break Flight Tracks on Runway 18

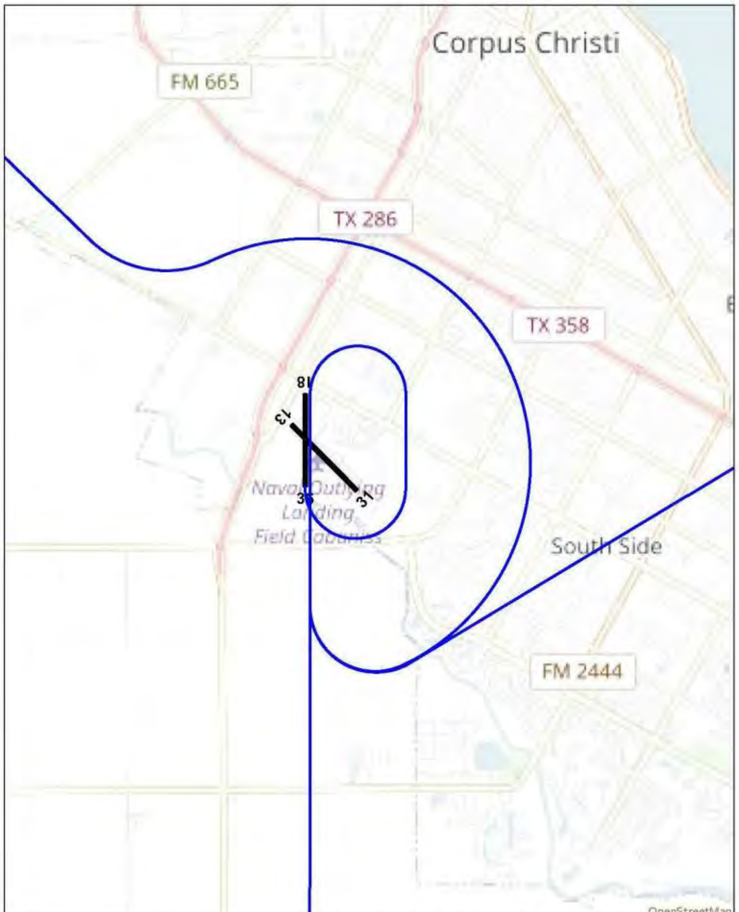
Scale in Feet 1:142,000 (1 inch = 11,800 feet)

Summary Map of Flight Tracks



NOLF Cabaniss Overhead Break Flight Tracks on Runway 31

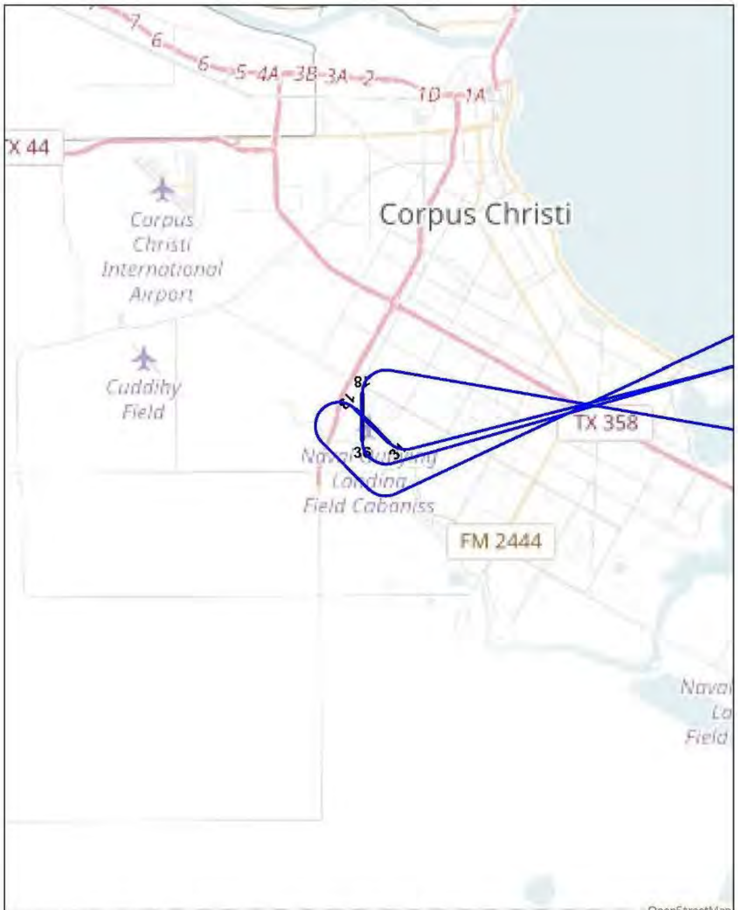
Summary Map of Flight Tracks



NOLF Cabaniss Overhead Break Flight Tracks on Runway 36

Scale in Feet 1:83,000 (1 inch = 6,920 feet)

Summary Map of Departure Flight Tracks



NOLF Cabaniss Interfacility Departure Flight Tracks

Scale in Feet 1:162,000 (1 inch = 13,500 feet)

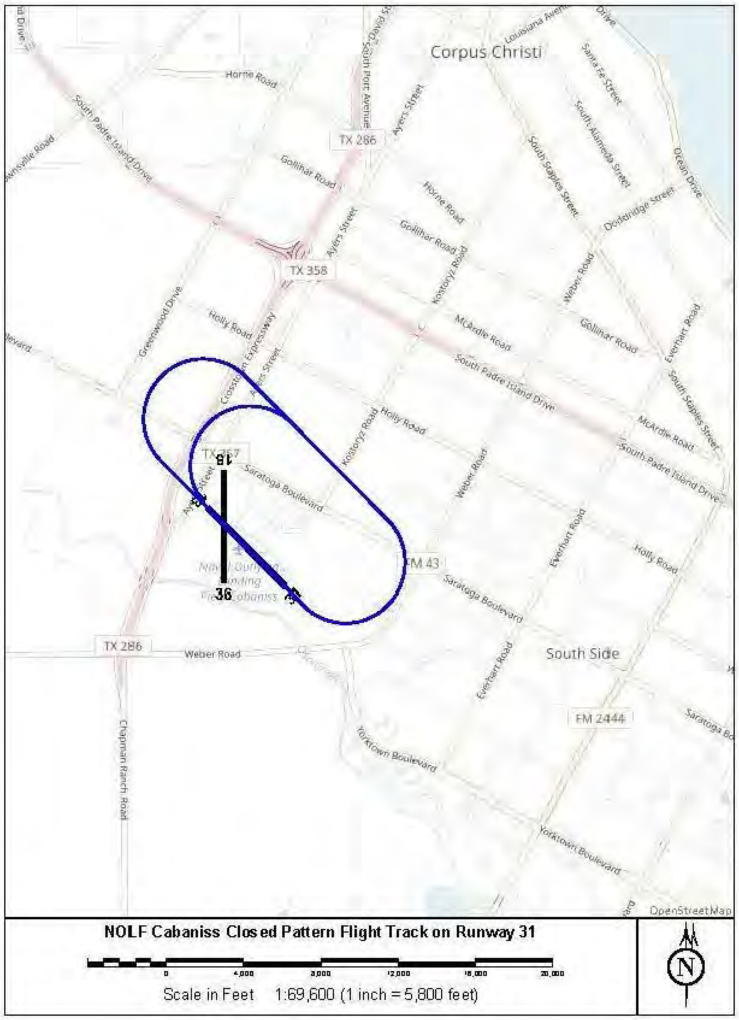
Summary Map of Closed Pattern Flight Tracks


NOLF Cabaniss Closed Pattern Flight Track on Runway 13
Scale in Feet 1:69,600 (1 inch = 5,800 feet)

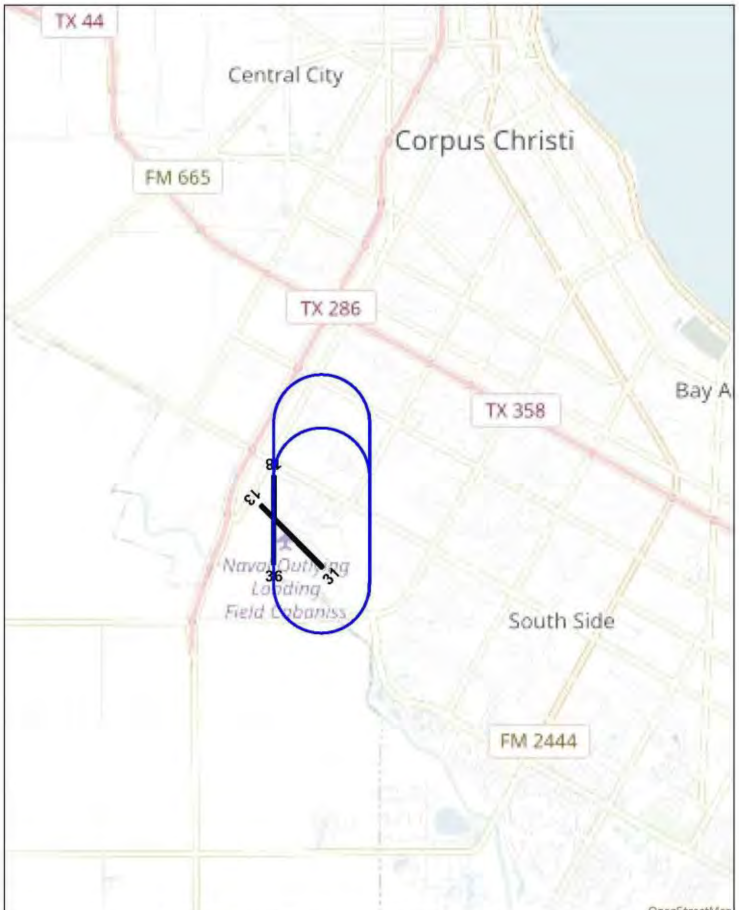
Summary Map of closed tracks on 18

NOLF Cabaniss Closed Pattern Flight Track on Runway 18

Summary Map of Flight Tracks


Corpus Christi
Horne Road
South Padre Island Drive
Gollihar Road
TX 286
TX 358
Ayers Street
South Port Avenue
South Staples Street
South Alameda Street
Santa Fe Street
Ocean Drive
Doddridge Street
Weber Road
Kostoryz Road
McArdle Road
Holly Road
Greenwood Drive
Crosstown Expressway
Everhart Road
Saratoga Boulevard
FM 43
18
36
South Side
FM 2444
Weber Road
Yorktown Boulevard
Chapman Ranch Road
OpenStreetMap
NOLF Cabaniss Closed Pattern Flight Track on Runway 31
Scale in Feet 1:69,600 (1 inch = 5,800 feet)
N

Summary Map of Flight Tracks

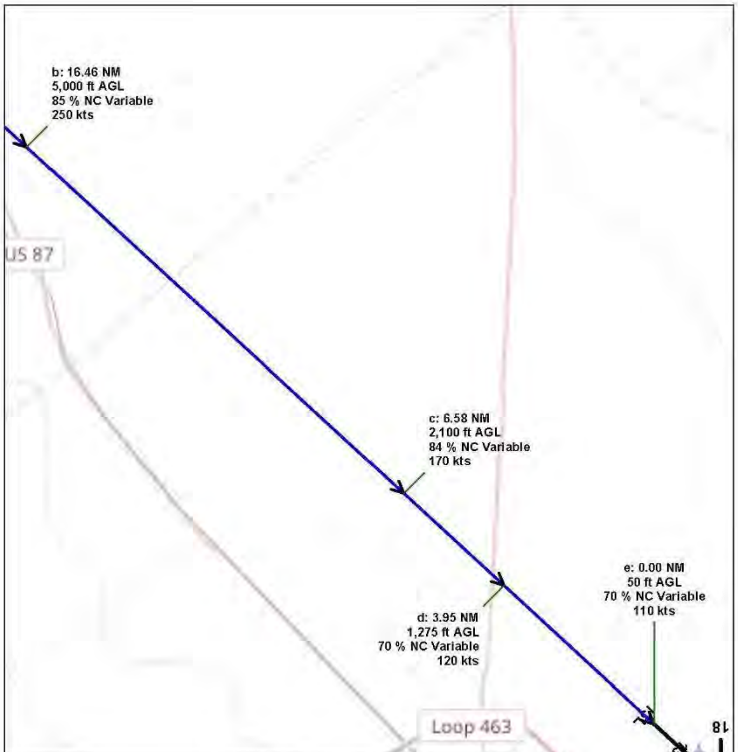


NOLF Cabaniss Closed Pattern Flight Track on Runway 36

Scale in Feet 1:86,900 (1 inch = 7,240 feet)

Appendix C
Nominal Profile and Flight Tracks for T-44C and T-54A Aircraft at International, Regional, and Publicly Owned Municipal Airfields

Appendix C displays nominal flight profile and summary flight tracks for several surrogate aircraft types at international, regional, and publicly owned municipal airfields. The nominal flight tracks used in modeling support a screening-level analysis sufficient to establish whether replacement of T-44C operations with T-54A operations would exceed noise thresholds. T-44C and T-54A flight profiles defined for Naval Air Station Corpus Christi were also used in modeling at non-Navy airfields.



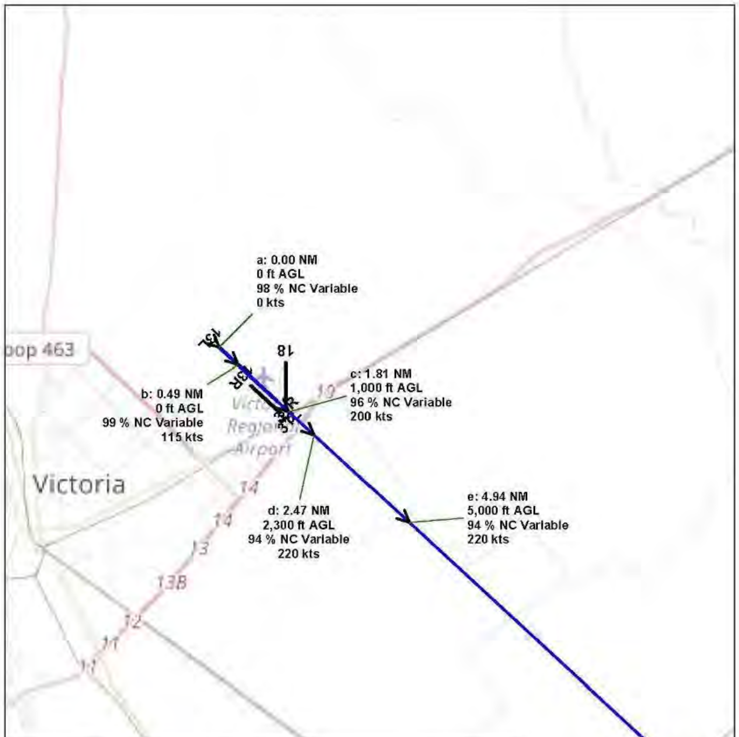
Flight Profile T1_13_A1

Point	Distance NM	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	32.92	10,000 AGL	85 Variable	250	-2.9	-1300	237
b	16.46	5,000 AGL	85 Variable	250	-2.8	-1000	169
c	6.58	2,100 AGL	84 Variable	170	-3.0	-800	65
d	3.95	1,275 AGL	70 Variable	120	-2.9	-600	124
e	0.00	50 AGL	70 Variable	110			

Flight Profile T1_13_A1

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:181,000 (1 inch = 15,100 feet)



Flight Profile T1_13_D1

Point	Distance NM	Height ft	Power % NC	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	0 AGL	98 Variable	0	0.0	0	31
b	0.49	0 AGL	99 Variable	115	7.1	2000	30
c	1.81	1,000 AGL	96 Variable	200	18.0	6900	11
d	2.47	2,300 AGL	94 Variable	220	10.2	4000	40
e	4.94	5,000 AGL	94 Variable	220	4.0	1700	429
f	32.92	17,000 AGL	85 Variable	250			

Flight Profile T1_13_D1

Scale in Feet 1:179,000 (1 inch = 14,900 feet)

Flight Profile T38_13_A1

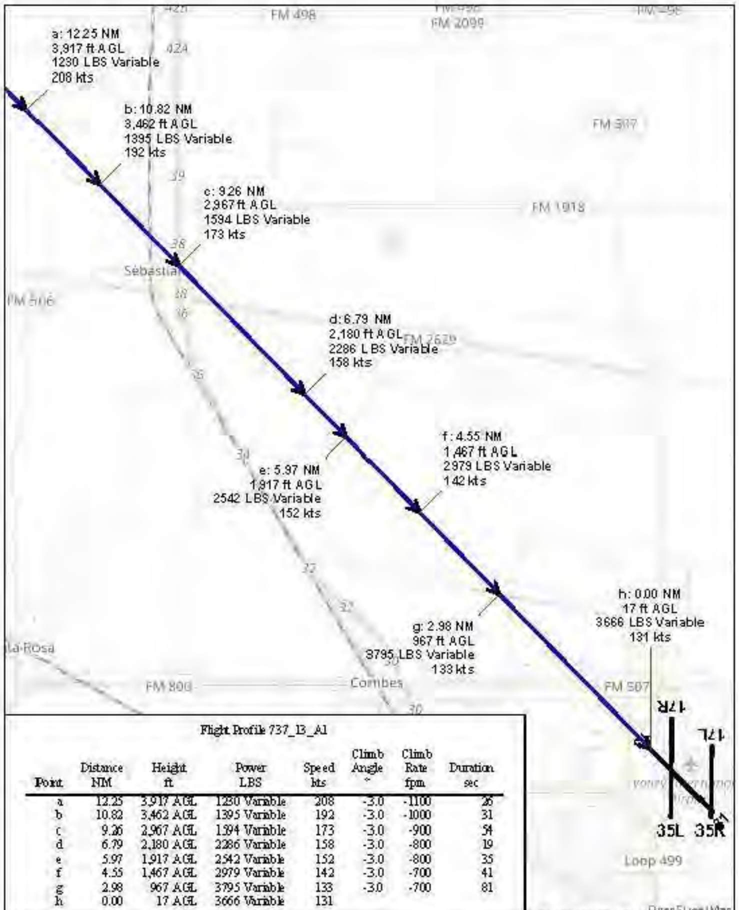
Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle	Climb Rate fpm	Duration sec
a	32.92	8,000 AGL	90 Parallel	230	-2.0	-900	339
b	9.87	3,100 AGL	88 Parallel	240	-2.9	-1000	103
c	4.05	1,300 AGL	92 Parallel	160	-2.9	-800	93
d	0.00	50 AGL	88 Parallel	155			

Flight Profile T38_13_D1

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	0 AGL	100 Max A/B	0	0.0	0	26
b	0.58	0 AGL	100 Afterburner	160	5.7	2100	19
c	1.65	650 AGL	100 Variable	250	8.1	3900	13
d	2.63	1,500 AGL	100 Variable	300	7.1	3800	24
e	4.61	3,000 AGL	100 Variable	300	7.8	4100	58
f	9.43	7,000 AGL	100 Variable	300	7.6	4100	30
g	11.90	9,000 AGL	100 Variable	300	8.2	4400	55
h	16.46	13,000 AGL	100 Variable	300	4.0	2100	197
i	32.92	20,000 AGL	96 Variable	300			

Flight Profile T38_13_D1

Scale in Feet 1:279,000 (1 inch = 23,200 feet)

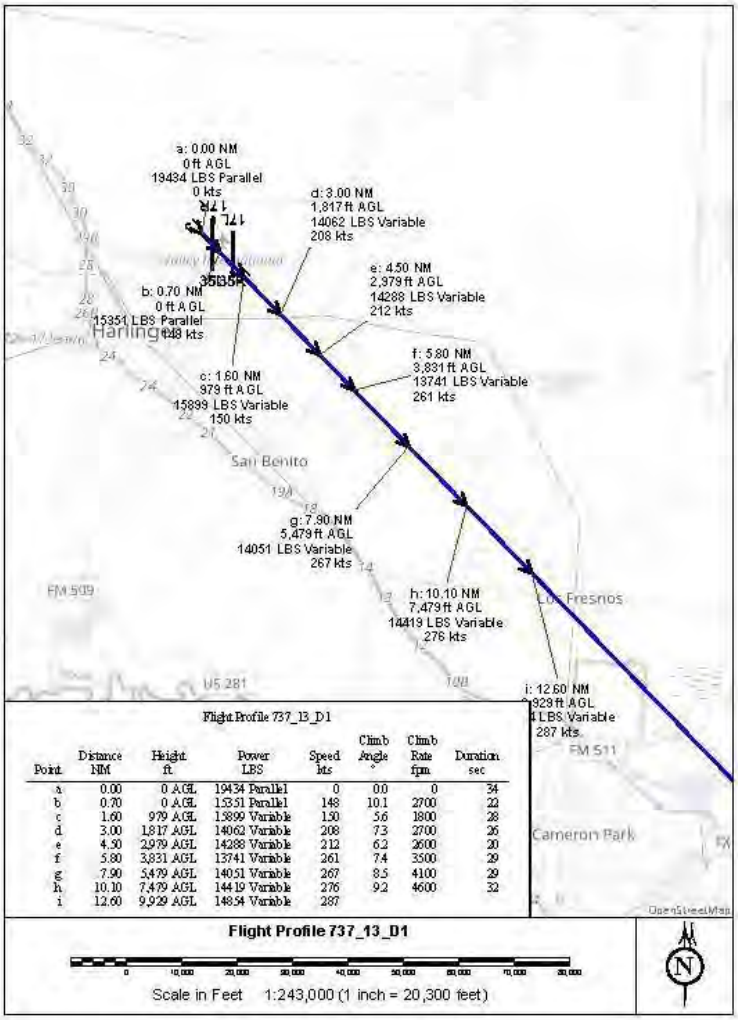


Flight Profile 737_13_A1

Point	Distance NM	Height ft	Power LBS	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	12.25	3,917 AGL	1230 Variable	208	-3.0	-1100	26
b	10.82	3,462 AGL	1395 Variable	192	-3.0	-1000	31
c	9.26	2,967 AGL	1594 Variable	173	-3.0	-900	54
d	6.79	2,180 AGL	2286 Variable	158	-3.0	-800	19
e	5.97	1,917 AGL	2542 Variable	152	-3.0	-800	35
f	4.55	1,467 AGL	2979 Variable	142	-3.0	-700	41
g	2.98	967 AGL	3795 Variable	133	-3.0	-700	81
h	0.00	17 AGL	3666 Variable	131			

Flight Profile 737_13_A1

Scale in Feet 1:125,000 (1 inch = 10,400 feet)



Flight Profile 737_13_D1

Point	Distance NM	Height ft	Power LBS	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	0 AGL	19434 Parallel	0	0.0	0	34
b	0.70	0 AGL	15351 Parallel	148	10.1	2700	22
c	1.60	979 AGL	15899 Variable	150	5.6	1800	28
d	3.00	1,817 AGL	14062 Variable	208	7.3	2700	26
e	4.50	2,979 AGL	14288 Variable	212	6.2	2600	20
f	5.80	3,831 AGL	13741 Variable	261	7.4	3500	29
g	7.90	5,479 AGL	14051 Variable	267	8.5	4100	29
h	10.10	7,479 AGL	14419 Variable	276	9.2	4600	32
i	12.60	9,929 AGL	14854 Variable	287			

Flight Profile 737_13_D1

Scale in Feet 1:243,000 (1 inch = 20,300 feet)

Flight Profile 767_13_A1

Point	Distance NM	Height ft	Power LBS	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	12.20	3,917 AGL	2482 Variable	207	-3.1	-1100	25
b	10.80	3,458 AGL	3059 Variable	190	-3.1	-1000	30
c	9.30	2,967 AGL	3745 Variable	170	-3.0	-900	55
d	6.80	2,180 AGL	7121 Variable	155	-3.1	-800	19
e	6.00	1,917 AGL	8366 Variable	149	-3.0	-800	35
f	4.60	1,467 AGL	10497 Variable	139	-2.9	-700	42
g	3.00	967 AGL	12075 Variable	134	-3.0	-700	81
h	0.00	17 AGL	11667 Variable	132			

Flight Profile 767_13_A1

0 4,000 8,000 12,000 16,000 20,000 24,000 28,000 32,000 36,000 40,000

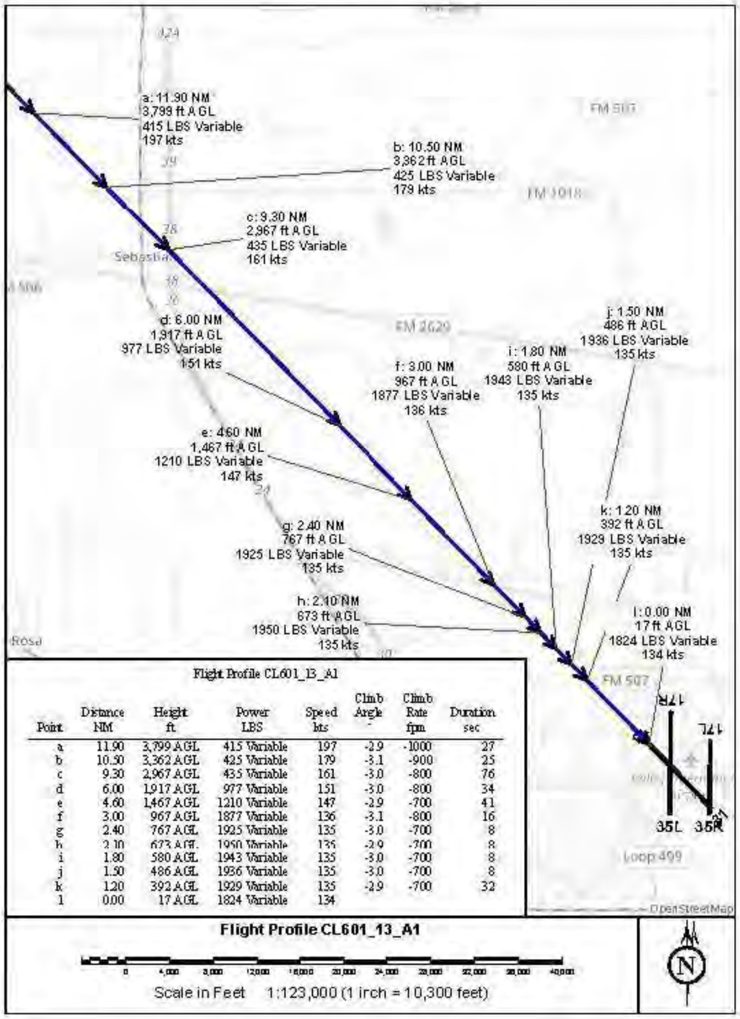
Scale in Feet 1:125,000 (1 inch = 10,400 feet)

Flight Profile 767_13_D1

Point	Distance NM	Height ft	Power LBS	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	0 AGL	56350 Parallel	0	0.0	0	30
b	0.60	0 AGL	48580 Parallel	142	11.6	3000	13
c	1.10	621 AGL	48727 Variable	144	11.2	3200	14
d	1.70	1,345 AGL	47577 Variable	171	2.8	1000	18
e	2.70	1,645 AGL	36939 Variable	226	2.4	1000	17
f	3.80	1,929 AGL	36679 Variable	238	29.9	14000	5
g	4.10	2,979 AGL	37266 Variable	241	6.6	3000	59
h	8.30	5,929 AGL	38286 Variable	269	14.2	7100	34
i	10.90	9,929 AGL	40522 Variable	287			

Flight Profile 767_13_D1

Scale in Feet 1:172,000 (1 inch = 14,400 feet)



Flight Profile CL601_13_A1

Point	Distance NM	Height ft	Power LBS	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	11.90	3,799 AGL	415 Variable	197	-2.9	-1000	27
b	10.50	3,362 AGL	425 Variable	179	-3.1	-900	25
c	9.30	2,967 AGL	435 Variable	161	-3.0	-800	76
d	6.00	1,917 AGL	977 Variable	151	-3.0	-800	34
e	4.60	1,467 AGL	1210 Variable	147	-2.9	-700	41
f	3.00	967 AGL	1877 Variable	136	-3.1	-800	16
g	2.40	767 AGL	1925 Variable	135	-3.0	-700	8
h	2.10	673 AGL	1950 Variable	135	-2.9	-700	8
i	1.80	580 AGL	1943 Variable	135	-3.0	-700	8
j	1.50	486 AGL	1936 Variable	135	-3.0	-700	8
k	1.20	392 AGL	1929 Variable	135	-2.9	-700	32
l	0.00	17 AGL	1824 Variable	134			

Flight Profile CL601_13_A1

Flight Profile CL601_13_C2

Point	Distance NM	Height ft	Power LBS	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	1824 Parallel	134	-2.9	-700	4
b	0.16	0 AGL	7233 Parallel	124	0.0	0	19
c	0.90	0 AGL	6036 Parallel	157	6.7	2000	30
d	2.30	1,000 AGL	1950 Variable	180	0.0	0	20
e	3.30	1,000 AGL	1824 Parallel	180	-6.2	-1700	29
f	4.57	160 AGL	1824 Parallel	134	-3.6	-800	8
g	4.86	50 AGL	1824 Parallel	134			

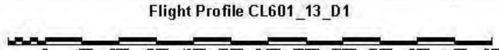
Flight Profile CL601_13_C2

Scale in Feet 1:60,600 (1 inch = 5,050 feet)

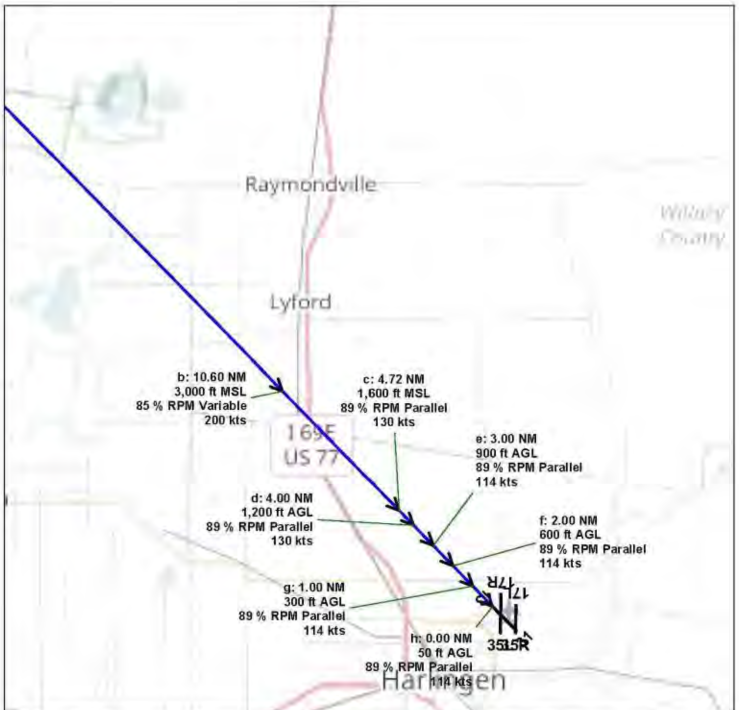
Flight Profile CL601_13_D1

Point	Distance NM	Height ft	Power LBS	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	0 AGL	7233 Parallel	0	0.0	0	41
b	0.90	0 AGL	6036 Parallel	157	6.6	2500	96
c	6.50	3,939 AGL	5249 Variable	262	6.0	2900	71
d	11.80	7,335 AGL	5581 Variable	276			

Flight Profile CL601_13_D1



Scale in Feet 1:145,000 (1 inch = 12,000 feet)



Flight Profile T45_13_A1

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	32.92	10,000 MSL	89 Variable	250	-3.0	-1200	357	Angle = -2.9°, RoC/D = -1100 fpm, Duration
b	10.60	3,000 MSL	85 Variable	200	-2.2	-700	128	Angle = -2.9°, RoC/D = -800 fpm, Duration
c	4.72	1,600 MSL	89 Parallel	130	-4.7	-1100	20	Angle = -2.8°, RoC/D = -600 fpm, Duration
d	4.00	1,200 AGL	89 Parallel	130	-2.8	-600	30	Angle = -2.8°, RoC/D = -600 fpm, Duration
e	3.00	900 AGL	89 Parallel	114	-2.8	-600	32	Angle = -2.8°, RoC/D = -600 fpm, Duration
f	2.00	600 AGL	89 Parallel	114	-2.8	-600	32	Angle = -2.8°, RoC/D = -600 fpm, Duration
g	1.00	300 AGL	89 Parallel	114	-2.4	-500	32	Angle = -2.4°, RoC/D = -500 fpm, Duration
h	0.00	50 AGL	89 Parallel	114				Threshold Crossing

Flight Profile T45_13_A1

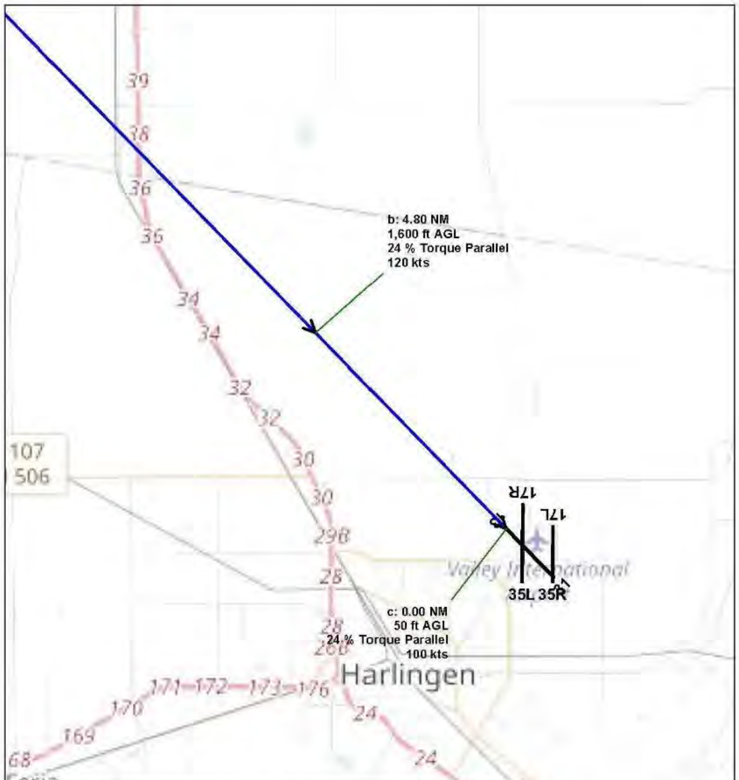
Scale in Feet 1:322,000 (1 inch = 26,900 feet)

Flight Profile T45_13_D1

Point	Distance NM	Height ft	Power %RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	0.00	0 AGL	100 Variable	0	3.0	0	24	Pre-flight runup @ 100% RPM for 7 sec, Mi
b	0.41	0 AGL	100 Variable	125	3.0	2300	13	Angle = 8°, RoD/C = 2300 fpm, Duration =
c	1.00	500 AGL	100 Variable	200	3.5	1600	58	Angle = 3.5°, RoD/C = 1400 fpm, Duration
d	5.00	2,000 AGL	100 Variable	300	5.6	3500	42	Angle = 11.2°, RoD/C = 4900 fpm, Duration
e	8.52	4,500 MSL	100 Variable	300	3.9	5200	41	Angle = 9.3°, RoD/C = 4100 fpm, Duration
f	12.19	8,000 MSL	100 Variable	350	3.9	600	213	
g	32.92	10,000 MSL	89 Variable	350				

Flight Profile T45_13_D1

Scale in Feet 1:247,000 (1 inch = 20,600 feet)

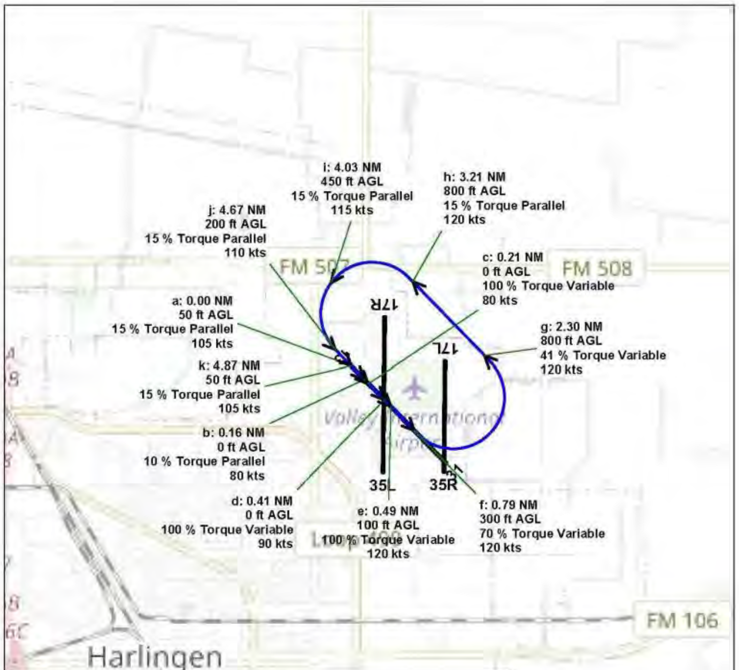


Flight Profile 1ENG_13_A1

Point	Distance NM	Height ft	Power % Torque	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	32.92	1,600 AGL	69 Variable	200	0.0	0	633
b	4.80	1,600 AGL	24 Parallel	120	-3.0	-600	157
c	0.00	50 AGL	24 Parallel	100			

Flight Profile 1ENG_13_A1

Scale in Feet 1:161,000 (1 inch = 13,400 feet)



Flight Profile 1ENG_13_C2

Point	Distance NM	Height ft	Power % Torque	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	15 Parallel	105	-2.9	-500	6
b	0.16	0 AGL	10 Parallel	80	0.0	0	2
c	0.21	0 AGL	100 Variable	80	0.0	0	8
d	0.41	0 AGL	100 Variable	90	11.3	2100	3
e	0.49	100 AGL	100 Variable	120	6.3	1400	9
f	0.79	300 AGL	70 Variable	120	3.1	700	45
g	2.30	800 AGL	41 Variable	120	0.0	0	27
h	3.21	800 AGL	15 Parallel	120	-4.0	-800	25
i	4.03	450 AGL	15 Parallel	115	-3.7	-700	20
j	4.67	200 AGL	15 Parallel	110	-7.1	-1400	7
k	4.87	50 AGL	15 Parallel	105			

OpenStreetMap

Flight Profile 1ENG_13_C2

Scale in Feet 1:80,300 (1 inch = 6,690 feet)

Flight Profile 1ENG_13_D1

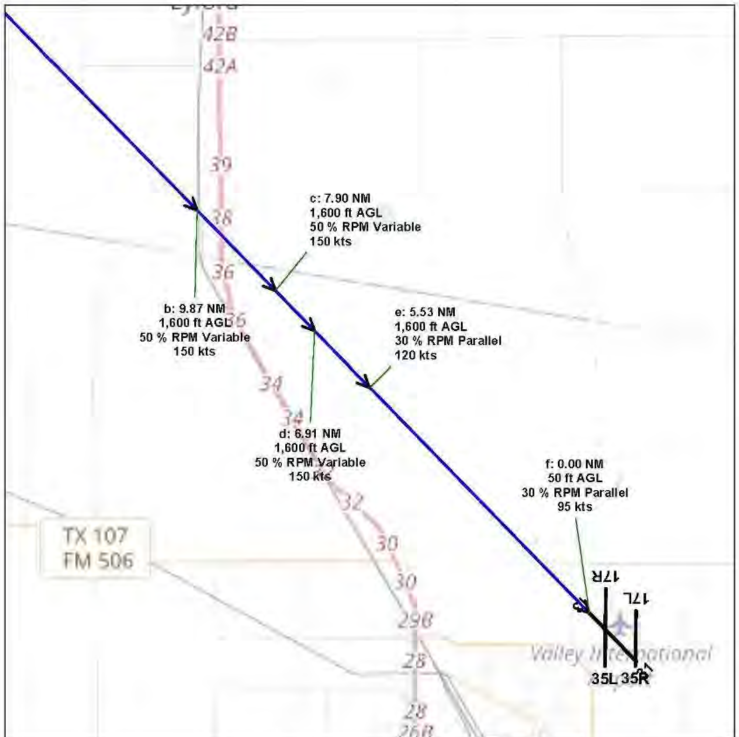
Point	Distance NM	Height ft	Power % Torque	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	0 AGL	100 Variable	0	0.0	0	16
b	0.20	0 AGL	100 Variable	90	2.8	700	26
c	1.23	300 AGL	100 Variable	200	3.4	1200	10
d	1.78	500 AGL	54 Variable	200	0.0	0	51
e	4.61	500 AGL	100 Variable	200	11.3	3800	31
f	6.25	2,500 AGL	100 Variable	180	2.7	800	533
g	32.92	10,000 AGL	54 Variable	180			

Flight Profile 1ENG_13_D1

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:161,000 (1 inch = 13,400 feet)

N



Flight Profile 2ENG_13_A1

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec	Notes
a	32.92	1,600 AGL	50 Variable	170	0.0	0	518	
b	9.87	1,600 AGL	50 Variable	150	0.0	0	47	
c	7.90	1,600 AGL	50 Variable	150	0.0	0	24	
d	6.91	1,600 AGL	50 Variable	150	0.0	0	37	
e	5.53	1,600 AGL	30 Parallel	120	-2.6	-500	185	configure
f	0.00	50 AGL	30 Parallel	95				

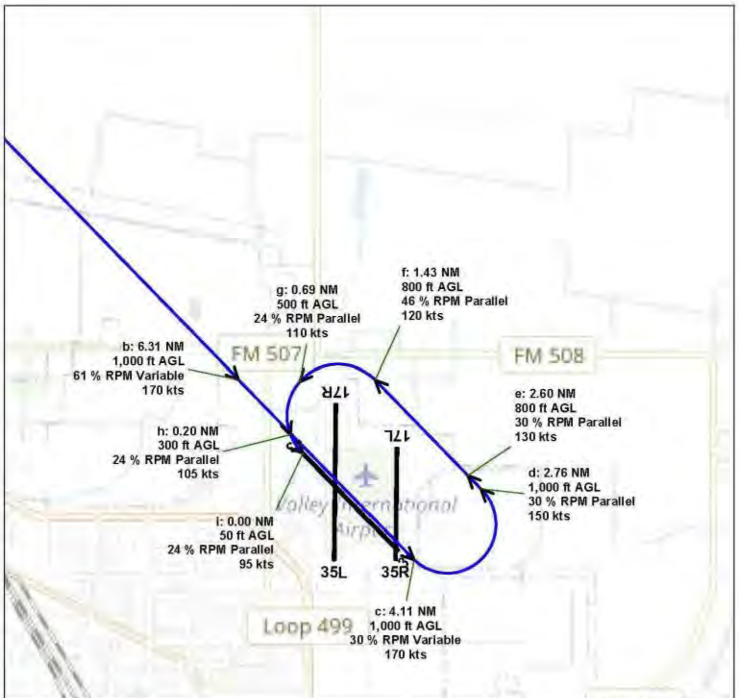
OpenStreetMap

Flight Profile 2ENG_13_A1

0 10,000 20,000 30,000 40,000 50,000

Scale in Feet 1:161,000 (1 inch = 13,400 feet)

N



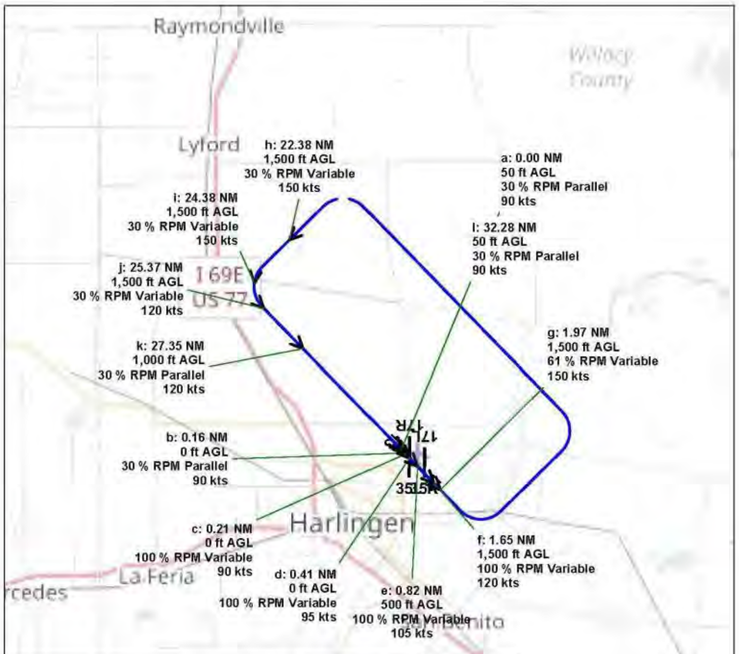
Flight Profile 2ENG_13_A2

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	32.92	1,500 AGL	61 Variable	170	-0.2	-100	563
b	6.31	1,000 AGL	61 Variable	170	0.0	0	47
c	4.11	1,000 AGL	30 Variable	170	0.0	0	30
d	2.76	1,000 AGL	30 Parallel	150	-11.3	-2800	4
e	2.60	800 AGL	30 Parallel	130	0.0	0	34
f	1.43	800 AGL	46 Parallel	120	-3.8	-800	23
g	0.69	500 AGL	24 Parallel	110	-3.8	-700	17
h	0.20	300 AGL	24 Parallel	105	-11.8	-2100	7
i	0.00	50 AGL	24 Parallel	95			

Flight Profile 2ENG_13_A2

0 4,000 8,000 12,000 16,000 20,000 24,000

Scale in Feet 1:80,300 (1 inch = 6,690 feet)



Flight Profile 2ENG_13_C1

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	30 Parallel	90	-2.9	-500	7
b	0.16	0 AGL	30 Parallel	90	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	11.3	2000	15
e	0.82	500 AGL	100 Variable	105	11.3	2300	26
f	1.65	1,500 AGL	100 Variable	120	0.0	0	9
g	1.97	1,500 AGL	61 Variable	150	0.0	0	490
h	22.38	1,500 AGL	30 Variable	150	0.0	0	48
i	24.38	1,500 AGL	30 Variable	150	0.0	0	26
j	25.37	1,500 AGL	30 Variable	120	-2.4	-500	59
k	27.35	1,000 AGL	30 Parallel	120	-1.8	-300	169
l	32.28	50 AGL	30 Parallel	90			

Flight Profile 2ENG_13_C1

Scale in Feet 1:322,000 (1 inch = 26,800 feet)

Flight Profile 2ENG_13_C2

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6
b	0.16	0 AGL	24 Parallel	95	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	9.1	1600	15
e	0.82	400 AGL	68 Variable	105	3.8	700	17
f	1.32	600 AGL	70 Variable	110	1.9	400	31
g	2.30	800 AGL	46 Parallel	120	0.0	0	15
h	2.80	800 AGL	46 Parallel	120	0.0	0	12
i	3.21	800 AGL	27 Parallel	120	-3.4	-700	26
j	4.03	500 AGL	24 Parallel	110	-2.9	-600	21
k	4.67	300 AGL	24 Parallel	105	-11.8	-2100	7
l	4.87	50 AGL	24 Parallel	95			

Flight Profile 2ENG_13_C2

Scale in Feet 1:40,100 (1 inch = 3,340 feet)

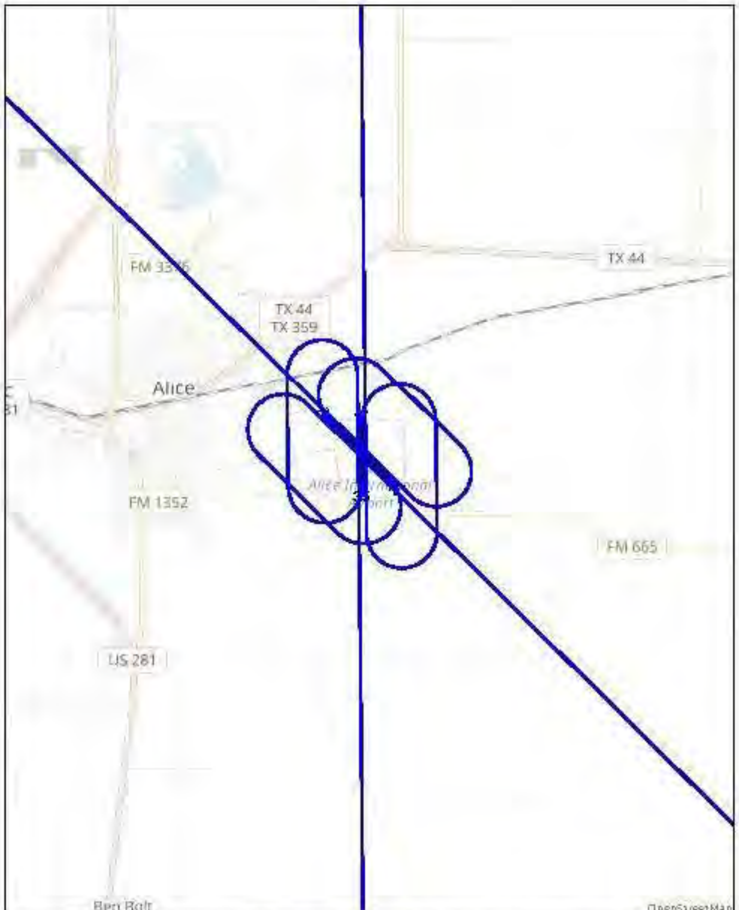
Flight Profile 2ENG_13_D1

Point	Distance NM	Height ft	Power % RPM	Speed kts	Climb Angle °	Climb Rate fpm	Duration sec
a	0.00	50 AGL	24 Parallel	95	-2.9	-500	6
b	0.16	0 AGL	24 Parallel	95	0.0	0	2
c	0.21	0 AGL	100 Variable	90	0.0	0	8
d	0.41	0 AGL	100 Variable	95	11.3	2100	14
e	0.82	500 AGL	100 Variable	110	7.1	1800	17
f	1.48	1,000 AGL	61 Variable	170	0.0	0	195
g	10.70	1,000 AGL	61 Variable	170			

Flight Profile 2ENG_13_D1

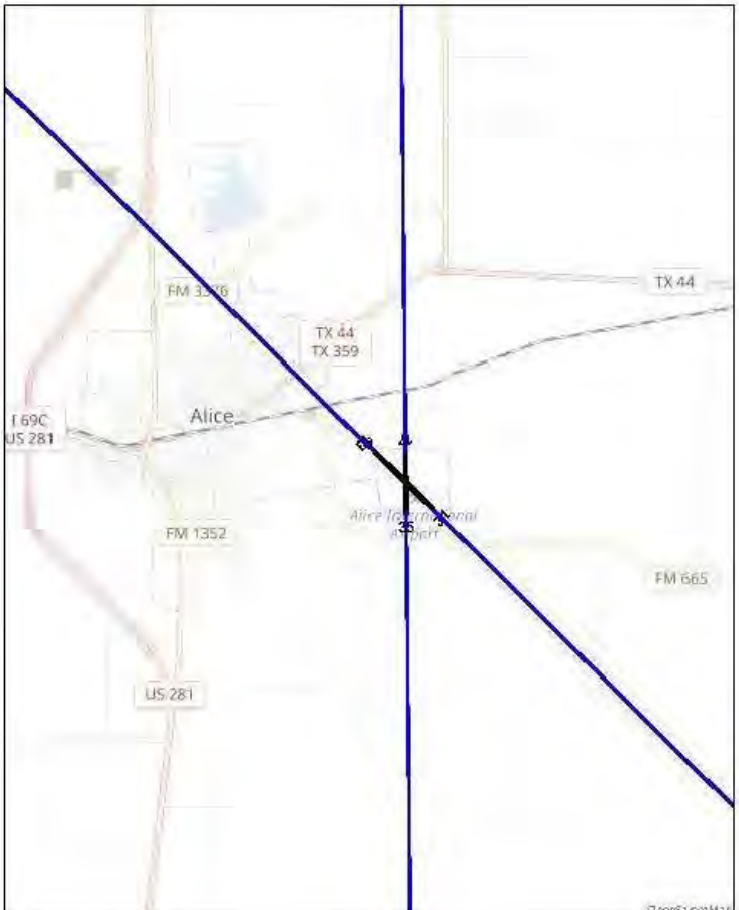
0 20,000 40,000 60,000 80,000 100,000

Scale in Feet 1:322,000 (1 inch = 26,800 feet)



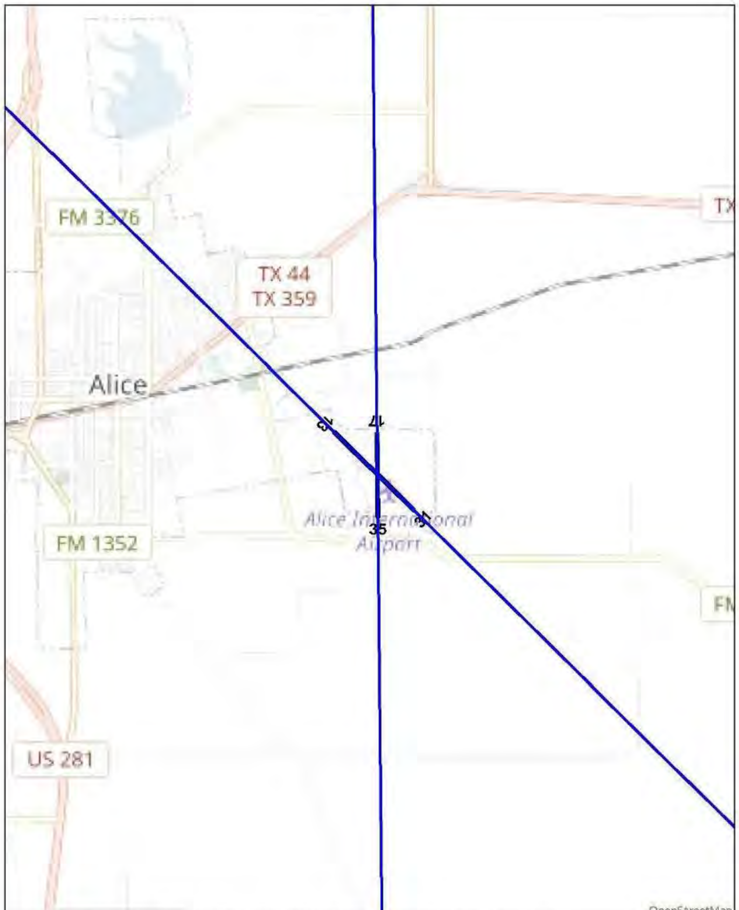
Alice International nominal overhead arrival tracks

Scale in Feet 1:112,000 (1 inch = 9,350 feet)



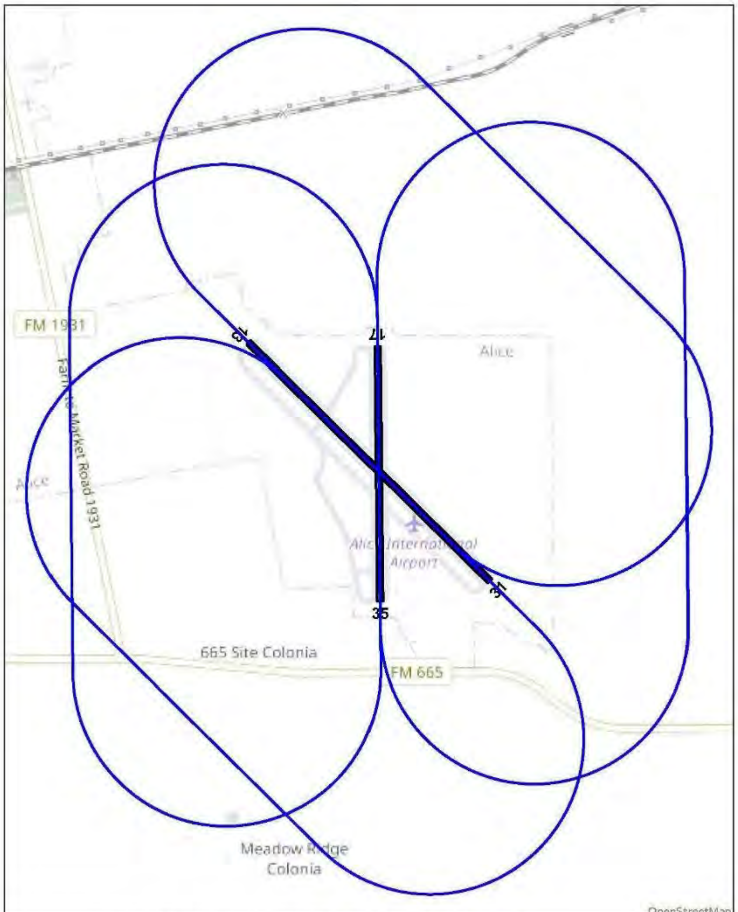
Alice International nominal straight in flight tracks

Scale in Feet 1:110,000 (1 inch = 9,130 feet)



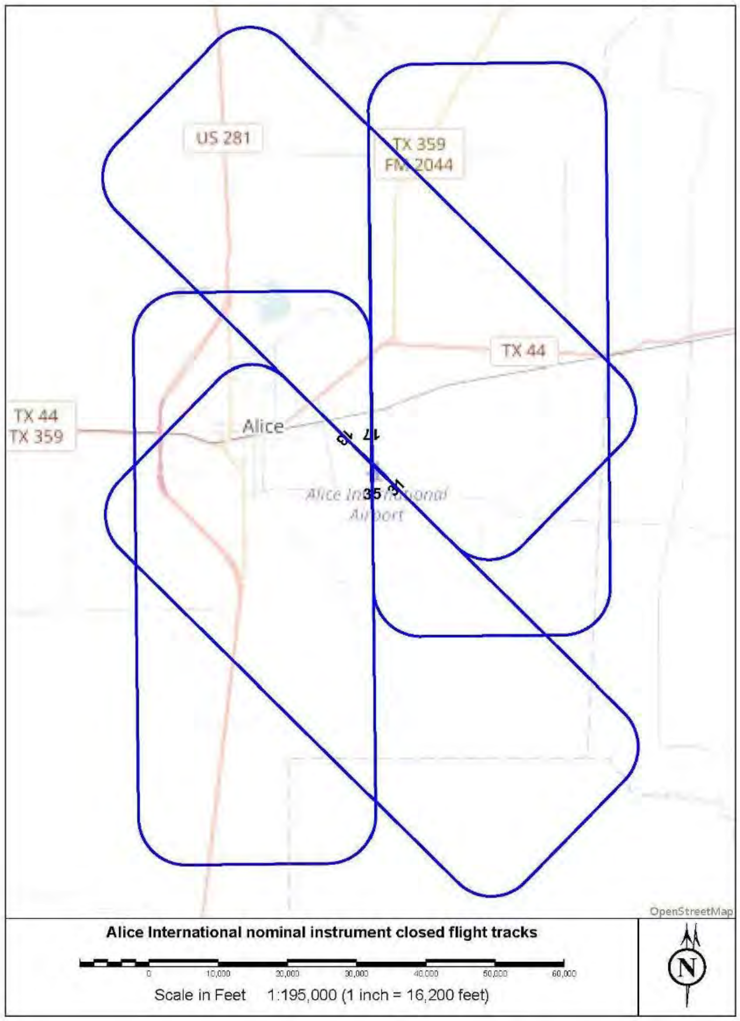
Alice International nominal interfacility/departure flight tracks

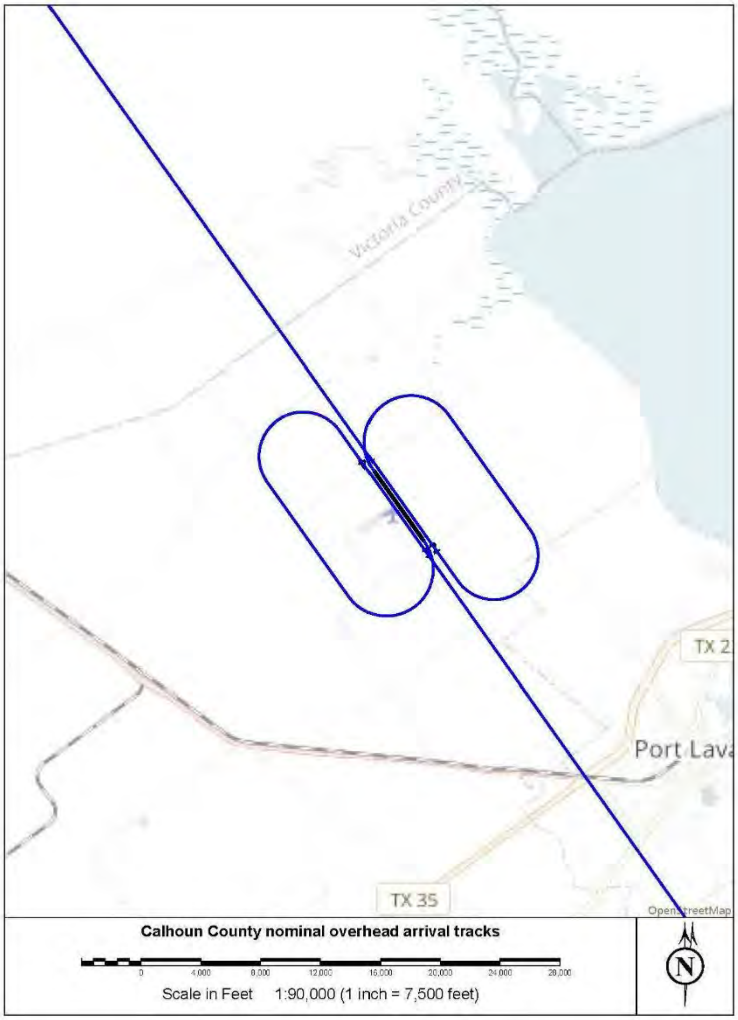
Scale in Feet 1:81,600 (1 inch = 6,800 feet)



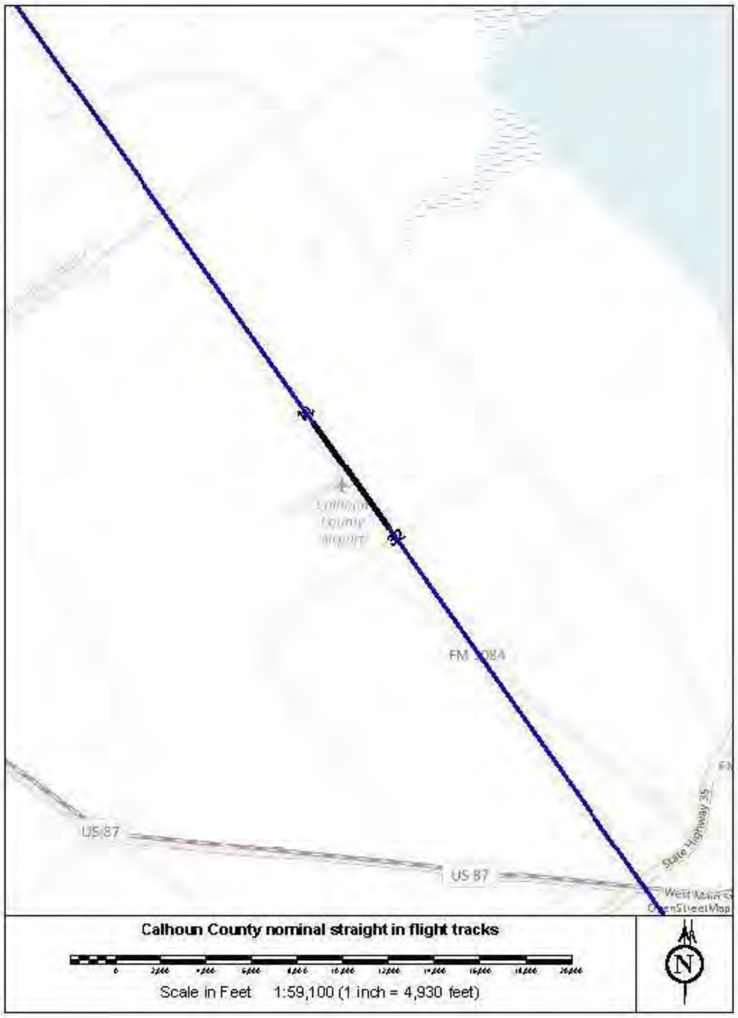
Alice International nominal visual closed flight tracks

Scale in Feet 1:27,000 (1 inch = 2,250 feet)


US 281
TX 359
FM 2044
TX 44
TX 44
TX 359
Alice
Alice International Airport
17
35
OpenStreetMap
Alice International nominal instrument closed flight tracks
Scale in Feet 1:195,000 (1 inch = 16,200 feet)
N



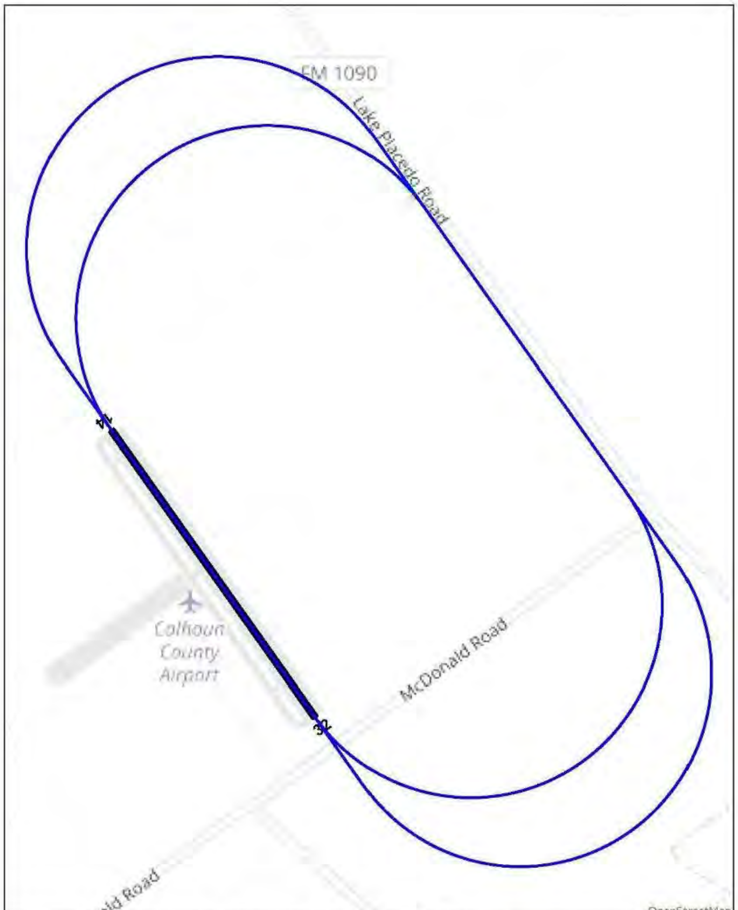
Calhoun County nominal overhead arrival tracks



Calhoun County nominal straight in flight tracks

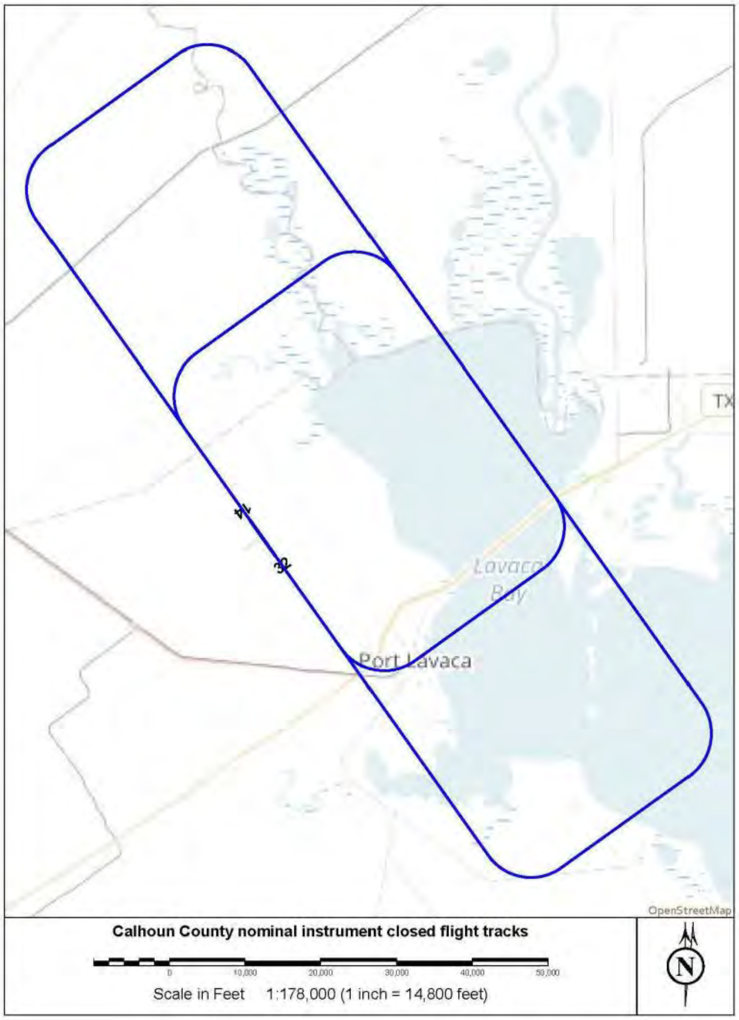
Calhoun County nominal interfacility/departure flight tracks

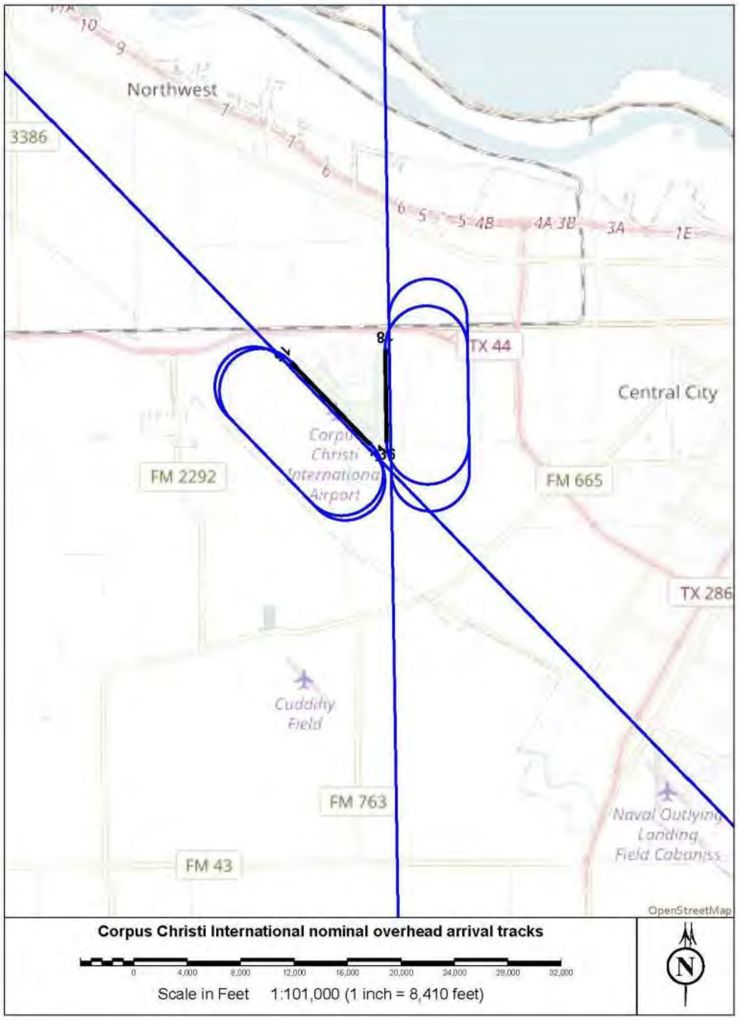
Scale in Feet 1:120,000 (1 inch = 9,990 feet)



Calhoun County nominal visual closed flight tracks

Scale in Feet 1:21,900 (1 inch = 1,820 feet)

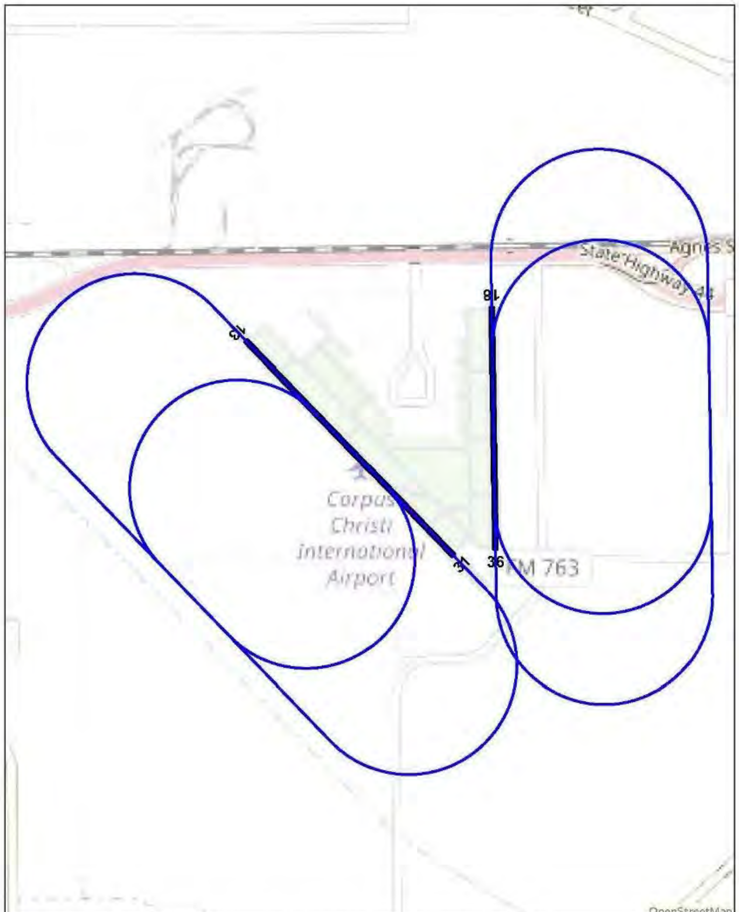

Lavaca Bay
Port Lavaca
TX
OpenStreetMap
Calhoun County nominal instrument closed flight tracks
Scale in Feet 1:178,000 (1 inch = 14,800 feet)
N


Northwest
3386
TX 44
Central City
FM 2292
FM 665
Corpus Christi International Airport
TX 286
Cuddihy Field
FM 763
Naval Outlying Landing Field Cabaniss
FM 43
OpenStreetMap
Corpus Christi International nominal overhead arrival tracks
Scale in Feet 1:101,000 (1 inch = 8,410 feet)
N

Corpus Christi International nominal straight in flight tracks

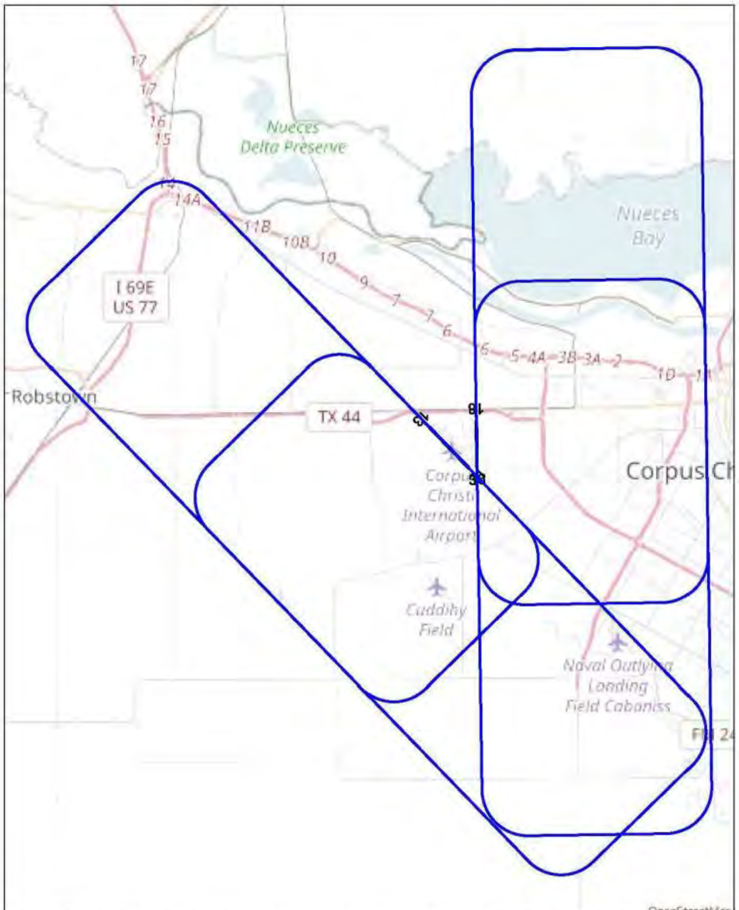
Corpus Christi International nominal interfacility/departure flight tracks

Scale in Feet 1:66,900 (1 inch = 5,580 feet)



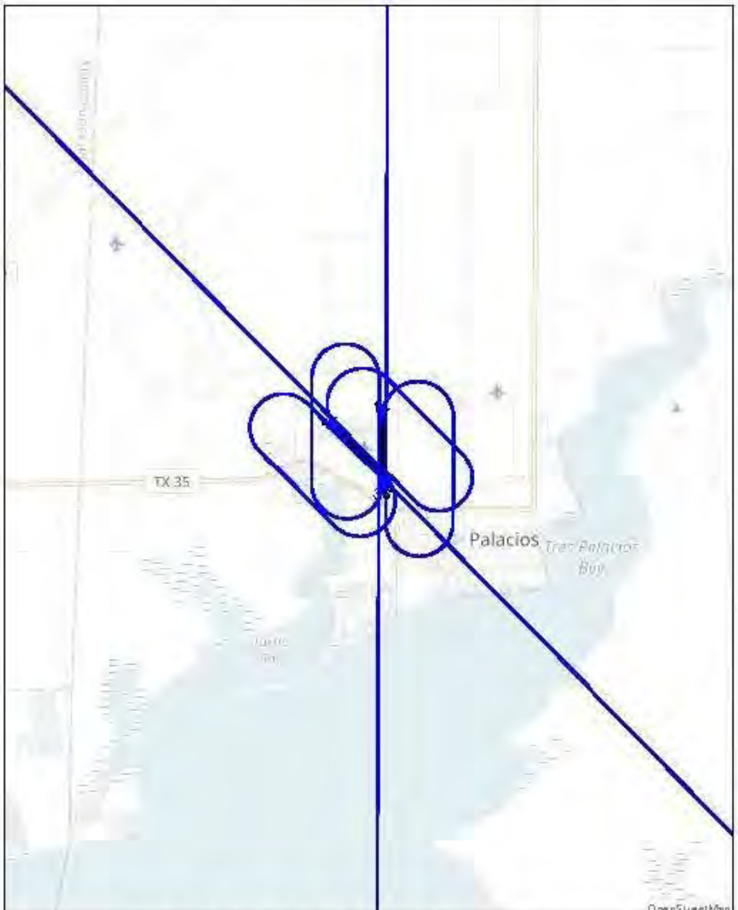
Corpus Christi International nominal visual closed flight tracks

Scale in Feet 1:38,500 (1 inch = 3,200 feet)



Corpus Christi International nominal instrument closed flight tracks

Scale in Feet 1:201,000 (1 inch = 16,800 feet)

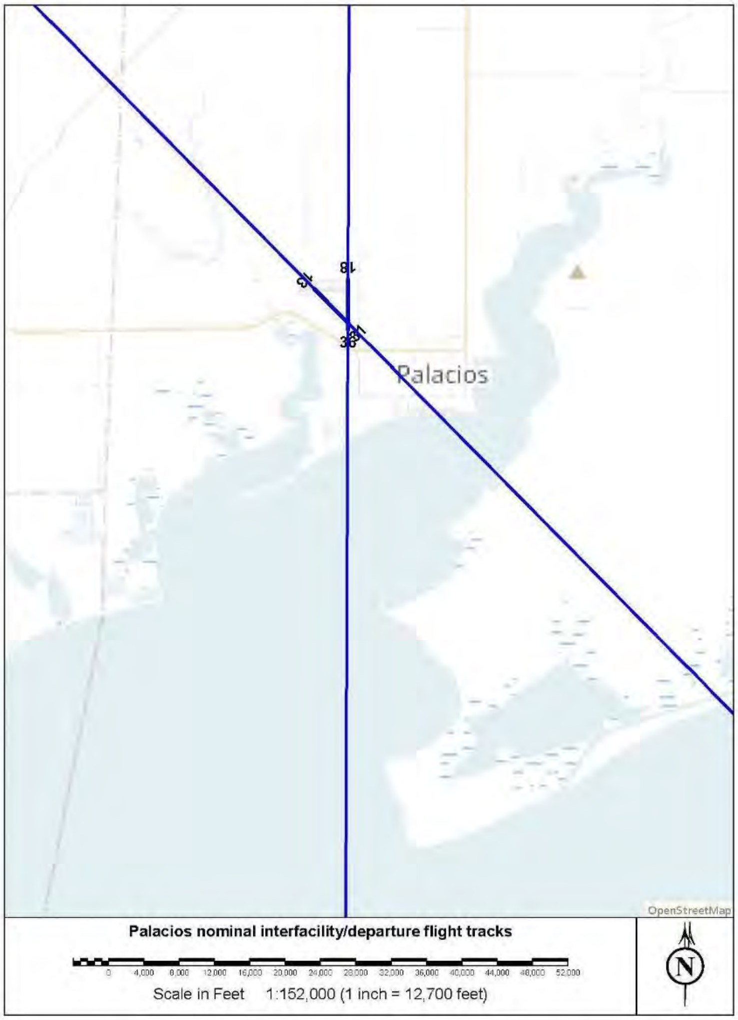


Palacios nominal overhead arrival tracks

Scale in Feet 1:119,000 (1 inch = 9,900 feet)

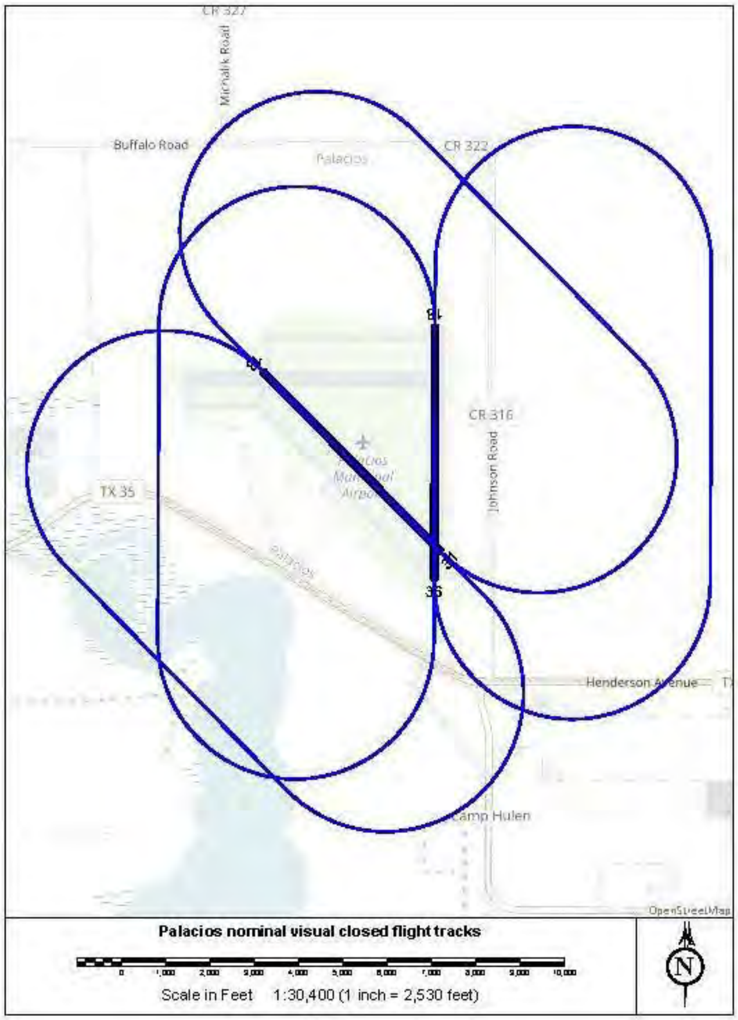
Palacios nominal straight in flight tracks

Scale in Feet 1:115,000 (1 inch = 9,580 feet)



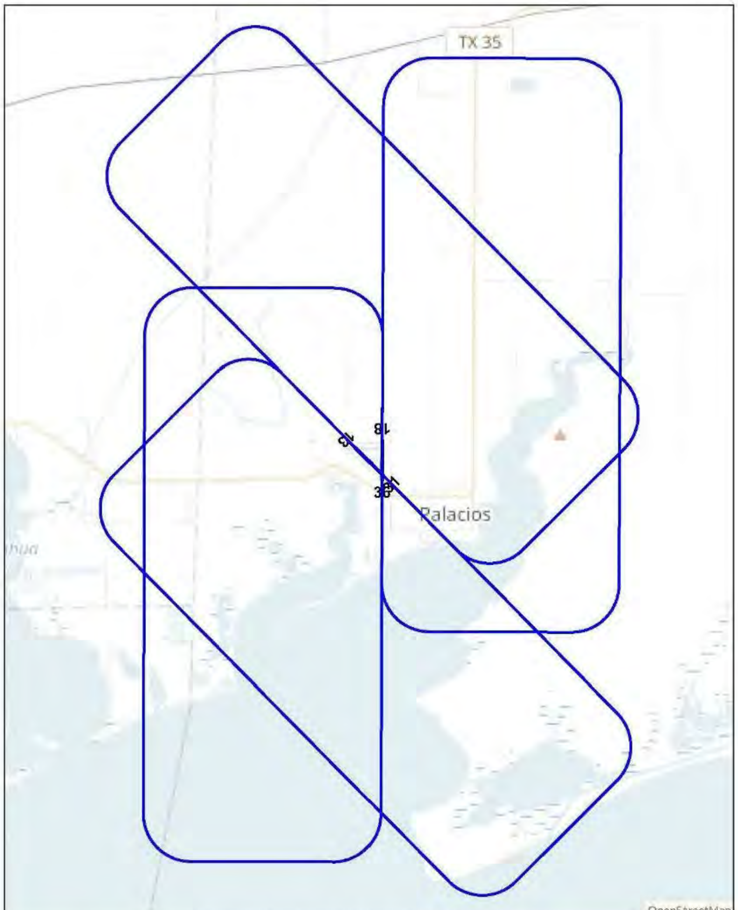
Palacios nominal interfacility/departure flight tracks

Scale in Feet 1:152,000 (1 inch = 12,700 feet)



Palacios nominal visual closed flight tracks

Scale in Feet 1:30,400 (1 inch = 2,530 feet)

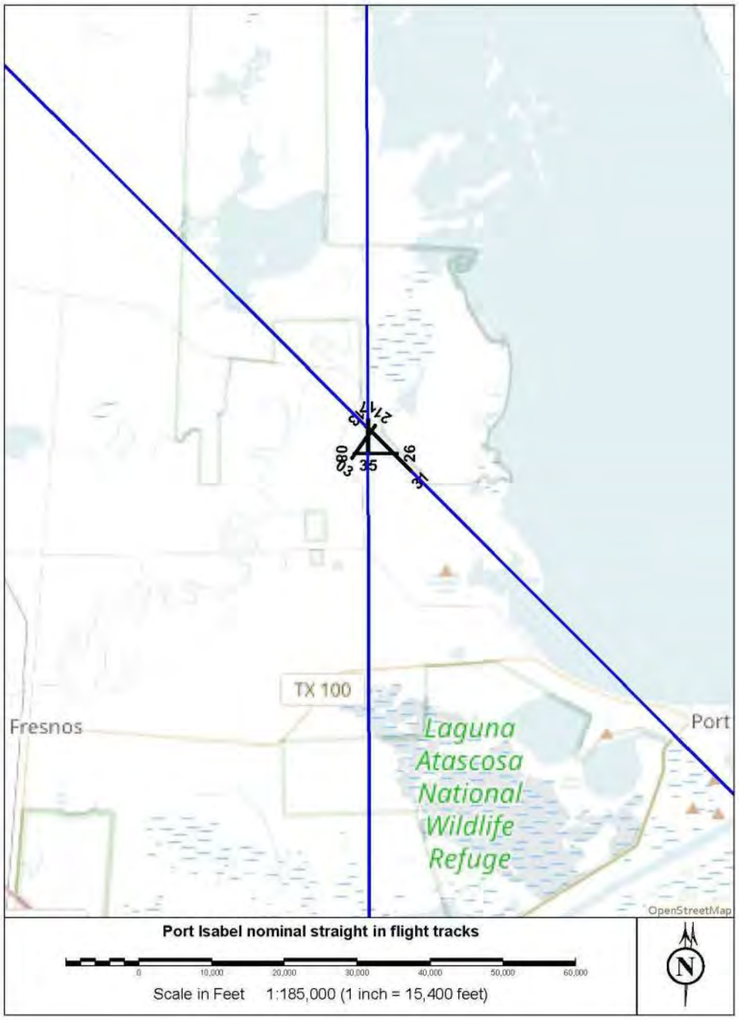


Palacios nominal instrument closed flight tracks

Scale in Feet 1:196,000 (1 inch = 16,300 feet)

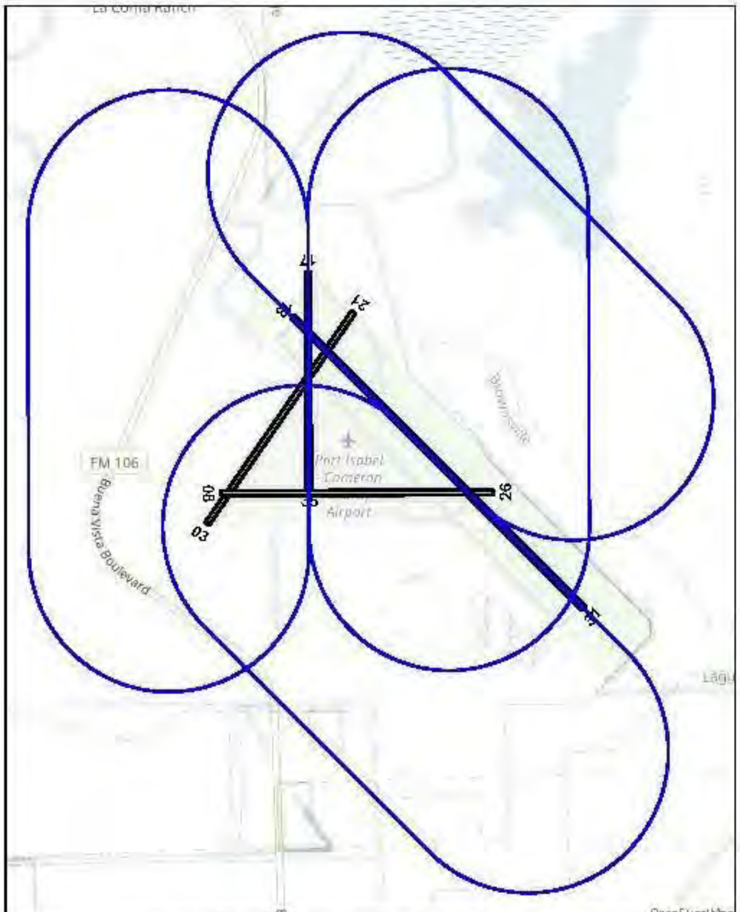
Port Isabel nominal overhead arrival tracks

Scale in Feet 1:141,000 (1 inch = 11,800 feet)



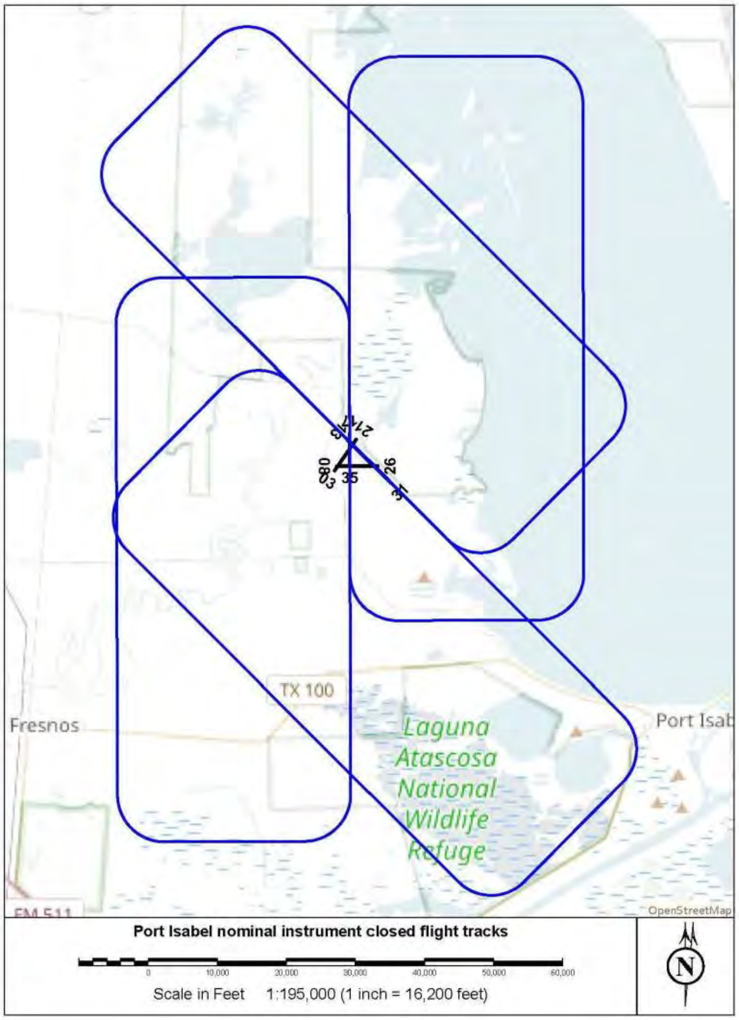
Port Isabel nominal straight in flight tracks


Arroyo City
Bayview
FM 106
FM 510
Buena Vista Boulevard
Buena Vista Drive
Port Isabel Cameron County Airport
Loma la Lauja 6 m
OpenStreetMap
17
21
08
03
35
26
Port Isabel nominal interfacility/departure flight tracks
0 4,000 8,000 12,000 16,000 20,000
Scale in Feet 1:72,700 (1 inch = 6,060 feet)
N

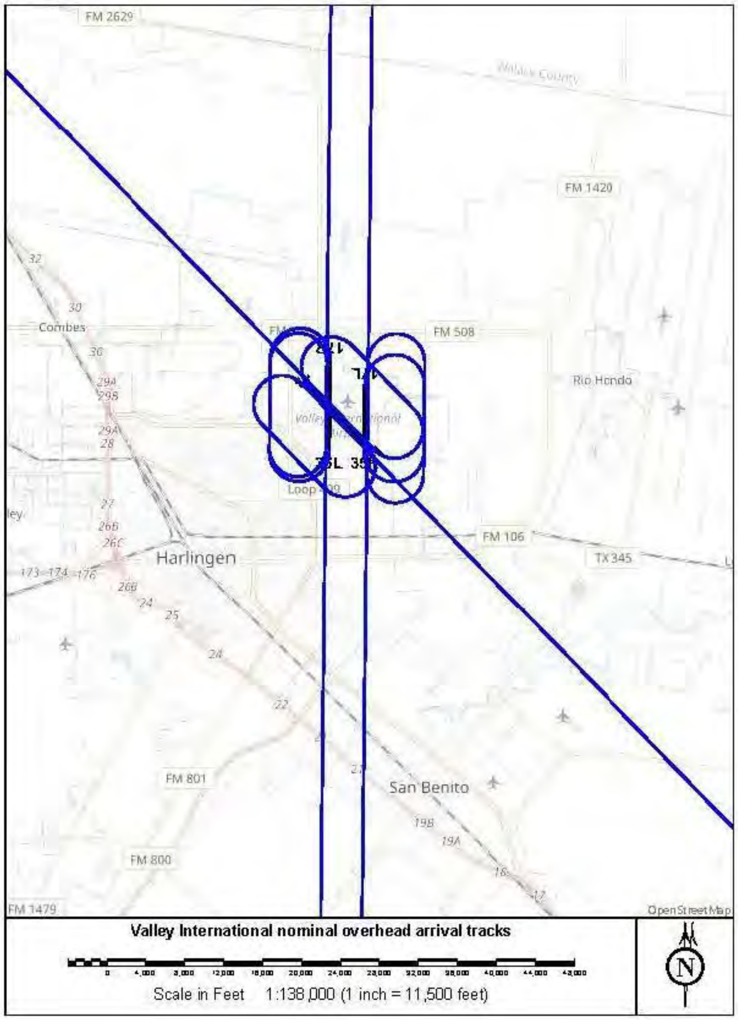


Port Isabel nominal visual closed flight tracks

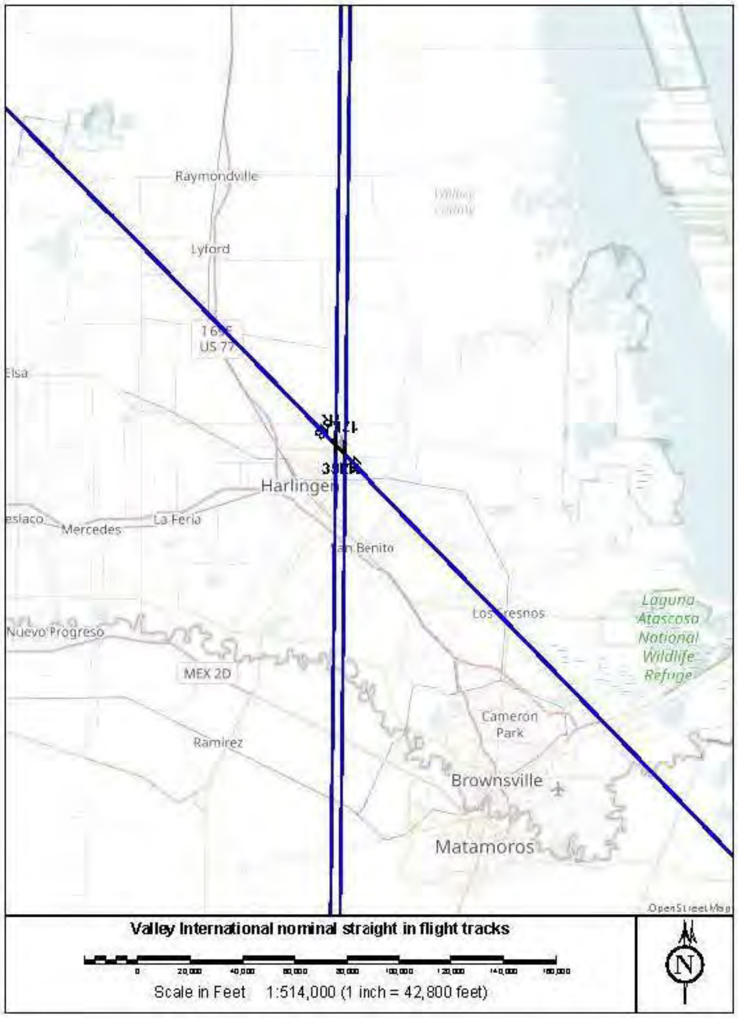
Scale in Feet 1:29,300 (1 inch = 2,440 feet)



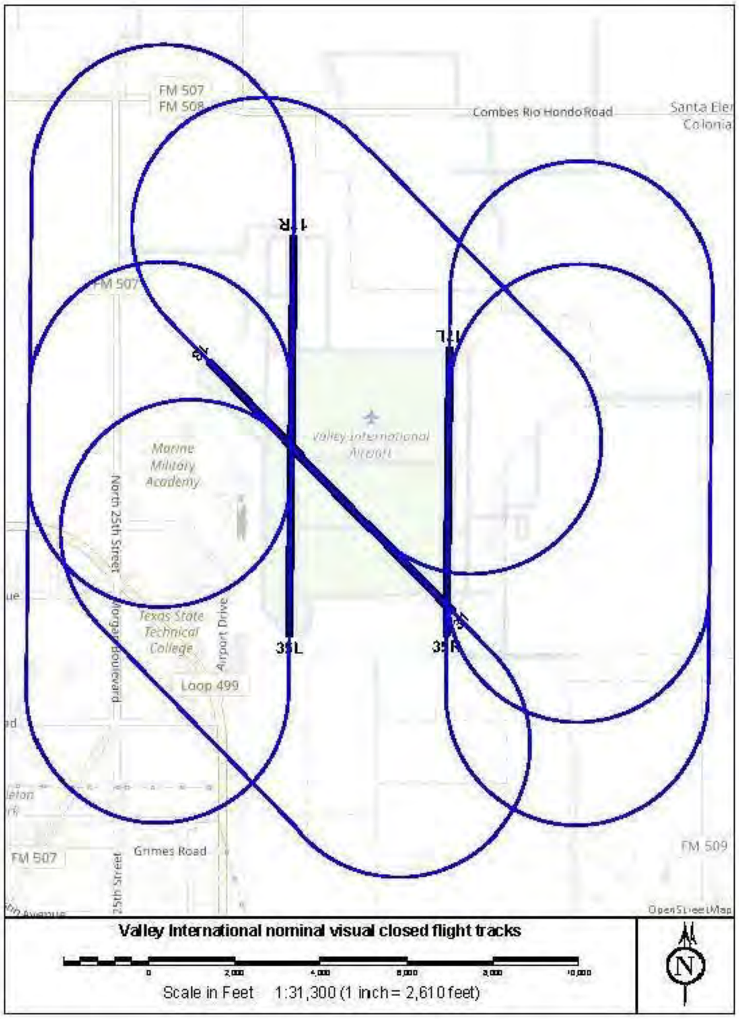
Port Isabel nominal instrument closed flight tracks



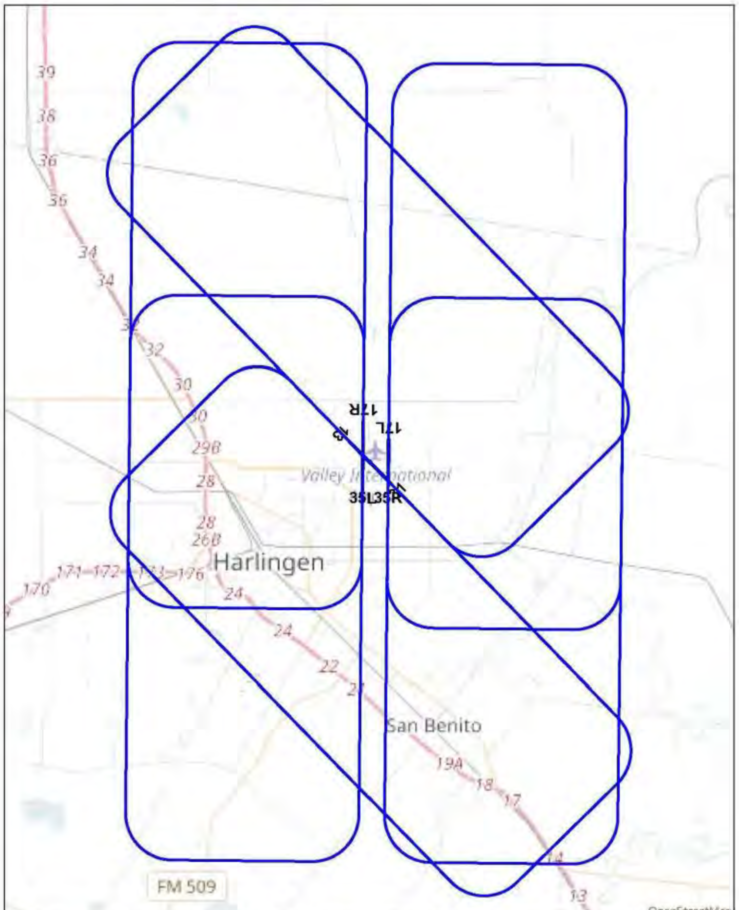
Valley International nominal overhead arrival tracks


Raymondville
Lyford
Elsa
Harlingen
Mercedes
La Feria
San Benito
Los Fresnos
Laguna Atascosa National Wildlife Refuge
Nuevo Progreso
MEX 2D
Cameron Park
Ramirez
Brownsville
Matamoros
Valley International nominal straight in flight tracks
Scale in Feet 1:514,000 (1 inch = 42,800 feet)
N

Valley International nominal interfacility/departure flight tracks

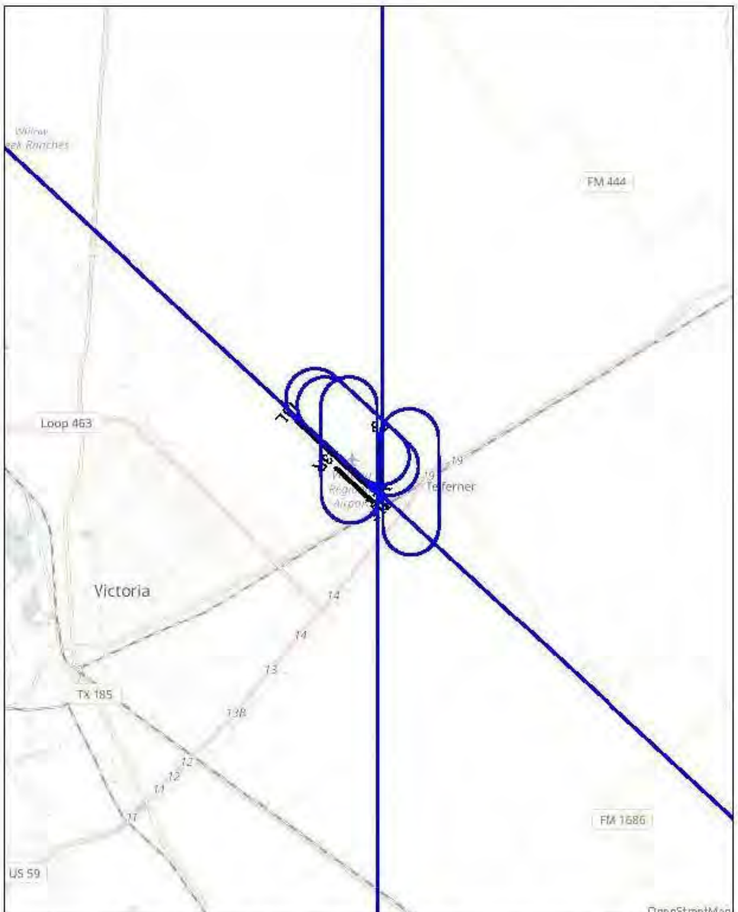


Valley International nominal visual closed flight tracks



Valley International nominal instrument closed flight tracks

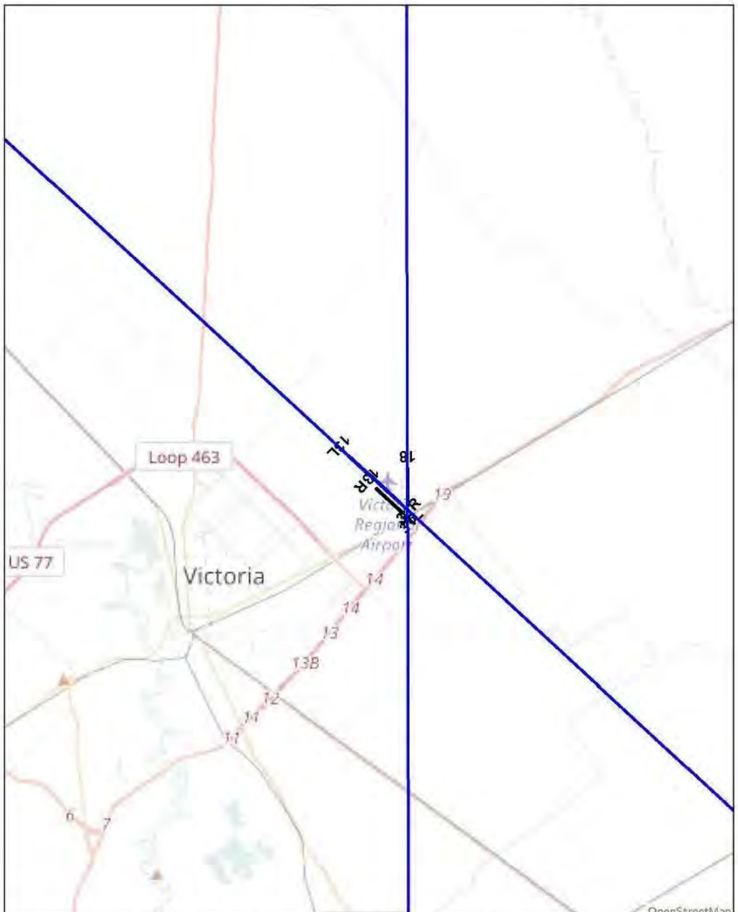
Scale in Feet 1:195,000 (1 inch = 16,200 feet)



Victoria Regional Airport nominal overhead arrival tracks

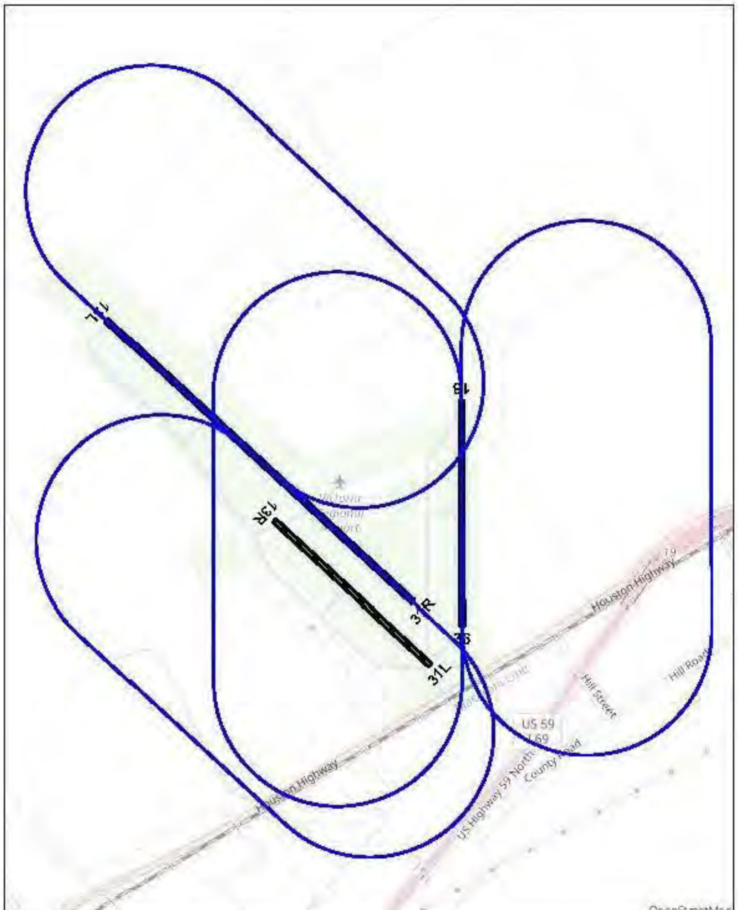
Scale in Feet 1:144,000 (1 inch = 12,000 feet)

Victoria Regional Airport nominal straight in flight tracks

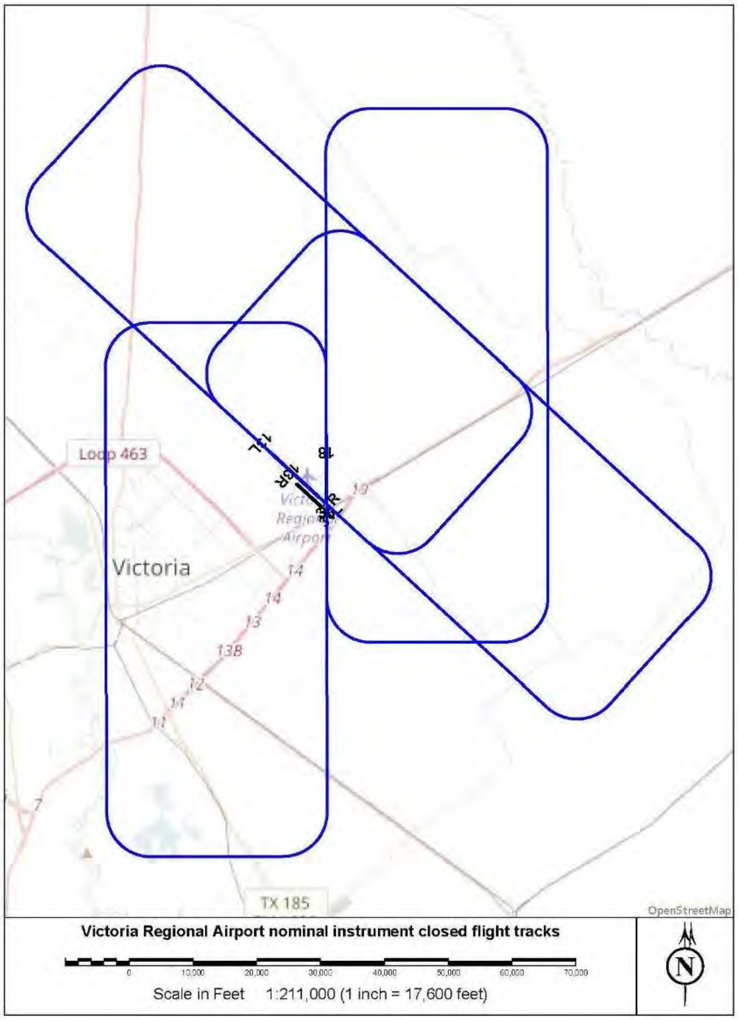


Victoria Regional Airport nominal interfacility/departure flight tracks

Scale in Feet 1:202,000 (1 inch = 16,800 feet)



Victoria Regional Airport nominal visual closed flight tracks



Victoria Regional Airport nominal instrument closed flight tracks

Scale in Feet 1:211,000 (1 inch = 17,600 feet)

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Appendix D
Operations Frequency Calculations at NAS Corpus Christi, NOLF Cabaniss, and International, Regional, and Publicly Owned Municipal Airfields

Appendix D displays modeling parameters used to calculate frequency of each operation type at NAS Corpus Christi, Naval Outlying Landing Field (NOLF) Cabaniss, and international, regional, and publicly owned municipal airfields. Parameters were reviewed by operational subject matter experts and/or sourced from recorded data.

NAS Corpus Christi Operations Calculations - Current Operations at NAS Corpus Christi

Current NAS Corpus Christi Airfield Operations												
Group	*2020 Annual Sorties*	*Unit / Description*	*# of Flying Days*	*Basis of Sorties (# of days)*	*Patterns per Sortie*	*VFR Patterns Rate*	*IFR Patterns Rate*	*Annual Departures*	*Annual Arrivals*	*Annual VFR Pattern Operations*	*Annual IFR Pattern Operations*	*Total Annual Operations*
Based												
T-6B	25,000	VT-27 and VT-28	365	365	1.5	75.0%	25.0%	25,000	25,000	56,250	18,750	125,000
T-44C	10,920	VT-31 and VT-35	365	365	0.5000	7.0%	93.0%	10,920	10,920	764	10,156	32,760
P-3C	364	U.S.CBP	365	365	1.0	100.0%	0.0%	364	364	728	0	1,456
HH/UH-60 (modeled as SH-60)	486	CCAD	365	365	0	0.0%	100.0%	486	486	0	0	972
AH-64 (modeled as SH-60)	54	CCAD	365	365	0	0.0%	100.0%	54	54	0	0	108
			365	365			100.0%	0	0	0	0	0
										TOTAL:		160,296
Transient Aircraft												
H-60 (modeled as SH-60)	38	Transients	365	365	0	0%	100.0%	38	38	0	0	76
AH-64 (modeled as SH-60)	22	Transients	365	365	0	0%	100.0%	22	22	0	0	44
CH-47 (modeled as CH-46)	4	Transients	365	365	0	0%	100.0%	4	4	0	0	8
Learjet (small jets) C-21	9	Transients	365	365	0	0%	100.0%	9	9	0	0	18
F-18C/D (and other fighter jet	60	Transients	365	365	3	0%	100.0%	60	60	0	360	480
T-38 (and other trainer jets)	90	Transients	365	365	4	0%	100.0%	90	90	0	720	900
C-130 (and other cargo)	24	Transients	365	365	0	0%	100.0%	24	24	0	0	48
C-12 (and other props)	28	Transients	365	365	0	0%	100.0%	28	28	0	0	56
										TOTAL:		1,630
										GRAND TOTAL:		161,926

Current Distribution of Runway Use at NAS Corpus Christi

Based Fixed Wing Aircraft		13L	13R	31R	31L	04	22	18	36
VT-27/VT-28 T-6B	Arrival	53%	19%	9%	6%	3%	0%	5%	5%
	Departure	53%	19%	9%	6%	3%	0%	5%	5%
	Closed Pattern	53%	19%	9%	6%	3%	0%	5%	5%
VT-31/VT-35 T-44C	Arrival	53%	19%	5%	6%	3%	0%	7%	7%
	Departure	53%	19%	5%	6%	3%	0%	7%	7%
	Closed Pattern	53%	19%	5%	6%	3%	0%	7%	7%
USCBP P-3C	Arrival	0%	90%	0%	10%	0%	0%	0%	0%
	Departure	0%	90%	0%	10%	0%	0%	0%	0%
	Closed Pattern	0%	90%	0%	10%	0%	0%	0%	0%
Transient Fixed Wing Aircraft		**13L**	**13R**	**31R**	**31L**	**04**	**22**	**18**	**36**
Transient Fixed Wing Aircraft	Arrival	53%	19%	5%	6%	3%	0%	7%	7%
	Departure	53%	19%	5%	6%	3%	0%	7%	7%
	Closed Pattern	53%	19%	5%	6%	3%	0%	7%	7%

Note: For helicopter operations, CCAD helos depart from the CCAD pad

Current NAS Corpus Christi Directional Flow Patterns of Based Aircraft

Fixed Wing Aircraft Departures	Track ID	VT-27/VT-28 T-6B	VT-31 / VT-35 T-44C	Customs P-3C	Transients
Mustang/Seagull	D1	22.2%	39%	90%	100%
Point Sunrise	D2	0%	0.5%		
Nueces Transition	D3	0.6%	0.5%		
Portland	D4	34.2%			
Oso Bridge	D5	3%			
IFR Departure	D6	40%	60%	10%	
Fixed Wing Aircraft Arrivals	**Track ID**	**VT-27/VT-28 T-6B**	**VT-31 / VT-35 T-44C**	**Customs P-3C**	**Transients**
Overhead/Short Break from Point Shamrock	A, B	50%	4%		
Overhead/Short Break from Point Lima	C, D				
Overhead/Short Break from Point Sunrise	E, F	0.4%	32.5%		
Overhead/Short Break from Oso Bridge	G, H	2%			
Overhead/Short Break from Nueces Transit	I, J	2%			
Overhead/Short Break from Point Lex	K, L	1%	2.5%		
IFR Straight-in	A1	40%	60%	10%	100%
Straight-in from Point Shamrock		4%	1%	84%	
Straight-in from Point Lima				6%	
Straight-in from Nueces Transit		0.30%			
Straight-in from Point Lex		0.30%	0.0%		
Fixed Wing Aircraft Closed Patterns	**Track ID**	**VT-27/VT-28 T-6B**	**VT-31 / VT-35 T-44C**	**Customs P-3C**	**Transients**
normal downwind	A tracks	80%	80%	90%	100%
longer downwind	C tracks	15%	20%	5%	
longest downwind	D tracks	5%		5%	

Helicopter Departures	Track ID	CCAD Helos
Seawall Departure to East	D1	80%
Seawall Departure to West	D2	20%
Seawall Departure to North	D3	
Oso Bridge	D4	
MOP Operations to Rwy04	D5	
MOP Operations to Rwy04 then CC1	D6	
MOP Operations to Rwy04 then CC2	D7	
Helicopter Arrivals	**Track ID**	**CCAD Helos**
Seawall Arrival from East	A1	80%
Seawall Arrival from West	A2	19%
Seawall Arrival from North (Shamrock Island)	A3	1%
Oso Bridge	A4	
MOP Operations from Rwy04	A5	
MOP Operations from CC1	A6	
MOP Operations from CC2	A7	

Current Operation Types for Based Aircraft at NAS Corpus Christi

Operation	Type	VT-27 / VT-28 T-6	VT-31 / VT-35 T-44	USCBP P-3C	CCAD Helicopters	Transients
Arrivals	VFR Overhead Break Arrival	50%	33%			
	IFR Straight-in Arrival	40%	65%	10%		100%
	VFR Straight-in Arrival	9%	2%	90%	100%	
	VFR Short Break Arrival	1%	0%			
Departures	Standard Departure	60%	40%	90%	100%	100%
	IFR Departure	40%	60%	10%		
Patterns	VFR (Visual) Pattern	75%	5%	100%		100%
	IFR ILS Pattern	25%	95%			
	IFR TACAN Pattern					
	FCLP					

Current NAS Corpus Christi Percentages of Operations during Acoustic Day and Night

Operation	Type	VT-27 T-6		VT-28 T-6	
		Acoustic Day	Acoustic Night	Acoustic Day	Acoustic Night
		0700 to 2200	2200 to 0700	0700 to 2200	2200 to 0700
Arrivals	Straight-In	90%	10%	90%	10%
	Overhead Break	90%	10%	90%	10%
Departures	Military	100%	0%	100%	0%
Patterns	VFR Pattern	99%	1%	99%	1%
	IFR Pattern	99%	1%	99%	1%

Operation	Type	CCAD Helos		Transients	
		Acoustic Day	Acoustic Night	Acoustic Day	Acoustic Night
		0700 to 2200	2200 to 0700	0700 to 2200	2200 to 0700
Arrivals	Straight-In	100%	0%	100%	0%
	Overhead Break			100%	0%
Departures	Military	100%	0%	100%	0%
Patterns	VFR Pattern			100%	0%
	IFR Pattern			100%	0%

Operation	VT-31 T-44		VT-35 T-44		USCBP P-3C	
	Acoustic Day	Acoustic Night	Acoustic Day	Acoustic Night	Acoustic Day	Acoustic Night
	0700 to 2200	2200 to 0700	0700 to 2200	2200 to 0700	0700 to 2200	2200 to 0700
Arrivals	80%	20%	80%	20%	100%	0%
	80%	20%	80%	20%		
Departures	100%	0%	100%	0%	100%	0%
Patterns	100%	0%	100%	0%	100%	0%
	100%	0%	100%	0%	100%	0%

Current Representative Static Pad Locations at NAS Corpus Christi

Review Notes

The Static Pad Locations are provided for reference. Please review the pad locations and note if any locations are incorrect.


CUS2
Echo
31L
31R


CUS1
13R

Maintenance and Ground Run-up Operations For Based Aircraft at NAS Corpus Christi

Aircraft Type	Run-up Type	Location Name	Annual Run-up Events Total	Annual 0700-2200	Annual 2200-0700	Reported Power Setting	Duration (sec)	Number of Engines	Heading
VT-27/VT-28 T-6	Preflight Run-up	Echo for North Flow	5750	100.00%	0.00%	30% Torque	30	1	West
						Idle	120	1	West
		Sierra for South Flow	19250	100.00%	0.00%	30% Torque	30	1	Southeast
						Idle	120	1	Southeast
	High Power Runs	Maintenance Spot#1	56.5	22.00%	78.00%	1015 ft lbs Q	1800	1	Southeast
		Maintenance Spot#2	56.5	22.00%	78.00%	1015 ft lbs Q	1800	1	Southeast
	Engine Desalinization Runs	Maintenance Spot#1	3390	22.00%	78.00%	900 ft lbs Q	20	1	Southeast
		Maintenance Spot#2	3390	22.00%	78.00%	900 ft lbs Q	20	1	Southeast
VT-31/VT-35 T-44	Preflight Run-up	Echo for all pre-flight runs	10,920	100.00%	0.00%	70% RPM	120	2	West
						Idle	480	2	West
	High Power Runs	Maintenance Spot#1	15	22.00%	78.00%	1315 ft lbs Q	1800	1	Southeast
		Maintenance Spot#2	15	22.00%	78.00%	1315 ft lbs Q	1800	1	Southeast
	Engine Synchronization	Maintenance Spot#1	15	22.00%	78.00%	1000 ft lbs Q	300	2	Southeast
		Maintenance Spot#2	15	22.00%	78.00%	1000 ft lbs Q	300	2	Southeast
	Engine Desalinization Runs	Maintenance Spot#1	1500	22.00%	78.00%	1000 ft lbs Q	20	2	Southeast
		Maintenance Spot#2	1500	22.00%	78.00%	1000 ft lbs Q	20	2	Southeast
VT-31/VT-35 MET	Preflight Run-up	Echo for all pre-flight runs	26	100.00%	0.00%	70% NC	120	2	West
						Idle	480	2	West
	High Power Runs	Maintenance Spot#1	18	22.00%	78.00%	100% NC	1800	1	Southeast
		Maintenance Spot#2	18	22.00%	78.00%	100% NC	1800	1	Southeast
	Engine Synchronization	Maintenance Spot#1	18	22.00%	78.00%	76% NC	300	2	Southeast
		Maintenance Spot#2	18	22.00%	78.00%	76% NC	300	2	Southeast
	Engine Desalinization Runs	Maintenance Spot#1	1800	22.00%	78.00%	76% NC	20	2	Southeast
		Maintenance Spot#2	1800	22.00%	78.00%	76% NC	20	2	Southeast

Aircraft Type	Run-up Type	Location	Annual Run-up Events			Reported Power Setting	Duration (sec)	Number of Engines	Heading
			Total	Annual					
		Name		0700-2200	2200-0700				
P-3C (USCBP)	High Power Runs	High Power Turns Area	24	100.00%	0.00%	4600/1050 SHP/CTIT	300	1 1	Southeast
	Low Power Runs	Custom Hangar	36	100.00%	0.00%	600/550 SHP/CTIT	300	1 1	Southeast
UH-60A (CCAD)	Ground Run-up	CCAD PAD	90	100.00%	0.00%	20% Q	1800	1	North
	Hover Prior to Departure (15Feet)		486	100.00%	0.00%	60% Q	120	1	North
	Maintenance Hover (50Feet)		45	100.00%	0.00%	60% Q	1800	1	North
AH-64 (CCAD)	Ground Run-up	CCAD PAD	10	100.00%	0.00%	20% Q	1800	1	North
	Hover Prior to Departure (15Feet)		54	100.00%	0.00%	60% Q	120	1	North
	Maintenance Hover (50Feet)		10	100.00%	0.00%	60% Q	1800	1	North

NOLF Cabaniss Operations Calculations: This spreadsheet is used to estimate the distribution of operations for the T-44C

Current NOLF Cabaniss Airfield Operations

Aircraft	*Sorties at Full Unit Strength*	*Unit / Description*	*# of Flying Days*	*Basis of Sorties (# of days)*	*Patterns per Sortie*	*VFR Patterns Rate*	*IFR Patterns Rate*	*Annual Departures*	*Annual Arrivals*	*Annual VFR Pattern Operations*	*Annual IFR Pattern Operations*	*Total Annual Operations*
Based												
T-44C	1,474	VT-31	312	312	18.00	100%		1,474	1,474	53,064	-	56,012
										TOTAL:		**56,012**
Transient Aircraft												
	0		365	365	0.00	0%		0	0	0	0	0
			365	365				0	0	0	0	0
			365	365				0	0	0	0	0
			365	365				0	0	0	0	0
			365	365				0	0	0	0	0
			365	365				0	0	0	0	0
			365	365				0	0	0	0	0
										TOTAL:		**0**
										GRAND TOTAL:		**56012**

Current NOLF Cabaniss Percentages of Operations during Acoustic Day and Night

Operation	Type	T-44C	
		Acoustic Day	Acoustic Night
		0700 to 2200	2200 to 0700
Arrivals	Straight-In	100%	0%
	Overhead Break	100%	0%
Departures	Interfacility	93%	7%
Patterns	VFR Pattern	93%	7%

Current NOLF Cabaniss Directional Flow Patterns of Based Aircraft

Departure	Track ID	T-44C
Departure over Sunrise Mall back to NAS Corpus Christi		100%
		good
Arrival	**Track ID**	**T-44C**
Arrival From NAS Corpus Christi	A tracks	78%
Arrival from Corpus Christi International Airport	C tracks	5%
Arrival from the South	E tracks	17%
		good
Closed Pattern	**Track ID**	**T-44C**
Shortest downwind - turn towards expressway with 800 ft AGL Pattern Altitude	A tracks	96%
Longer downwind - turn towards expressway with 800 ft AGL Pattern Altitude	C tracks	4%
Shortest downwind - turn towards expressway with 500 ft AGL Pattern Altitude	A tracks	0%
Longer downwind - turn towards expressway with 500 ft AGL Pattern Altitude	C tracks	0%
		good

Current Distribution of Runway Use at NOLF Cabaniss

Based Aircraft		13	18	31	36
T-44C	Arrival	62%	17%	4%	17%
	Departure	62%	17%	4%	17%
	Closed Pattern	62%	17%	4%	17%

Current Operation Types for Based Aircraft at NOLF Cabaniss

Operation	Type	T-44C
Arrivals	Overhead Break Arrival towards Expressway	100%
	Overhead Break Arrival away from Expressway	0%
	Short Break towards Expressway	0%
		good
Departures	Military Interfacility	100%
		good
Patterns	VFR (Visual) Pattern towards Expressway	100%
	SFO Pattern	
	Re-entry Pattern	

ALI - Alice International

AIR TRAFFIC CONTROL OPS	
TOTAL (baseline)	39,753
TOTAL (proposed)	45,384
T-44 (baseline only)	28,153
METS (Alt 2 only)(T-44 +20%)	33,784
T-6	5,000
T-1	-
T-38	-
T-45	-
C-12	-
Mil Subtotal (baseline)	**33,153**
Mil Subtotal (proposed)	**38,784**
B-737-500	-
CL601	1,780
B-767-300	-
2-eng prop (C-12 surrogate)	2,578
1-eng prop (T-6 surrogate)	2,242
Civilian Subtotal	**6,600**
METS (Alt 1 only)(T-44 +10%)	30969

Cell color meaning:

- NASCC Ops SME Reviewed
- Not Applicable / Rare
- based on PDARS data (provided by FAA), wind rose data, and other non-NASCC sources

Runway Usage		
Runway	**IFR Arrival Sortie**	**VFR Arrival Sortie**
Rwy 13	41%	41%
Rwy 17	28%	28%
Rwy 31	6%	6%
Rwy 35	25%	25%
	good	*good*

Ops per Sortie by Sortie Type	T-44 (baseline only)		METS (proposed only)		T-6		Non-NASCC military ops (representative surrogates)	
	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	T-1	T-38
% of Total Ops	16%	84%	16%	84%	0%	100%	100%	100%
# of Total Ops	4,500	23,653	5,400	28,384	0	5,000	0	0
Arrival % 2200-0700L	0%	0%	0%	0%	0%	0%	4%	4%
Closed % 2200-0700L	7%	7%	7%	7%	0%	0%	4%	4%
Departure % 2200-0700L	7%	7%	7%	7%	0%	0%	4%	4%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1	1
ARR - Overhead Break		1		1				
ARR - PEL						1		
ARR - ST in	1		1		1		1	1
PATT - Touch and Go		16		16		9		
PATT - PEL High Key								
PATT - PEL Low Key								
PATT - Delta (Hold)								
PATT - Instrument	2		2		1			
Ops per Sortie	4	18	4	18	3	11	2	2
Annual Sorties	1,125	1,314	1,350	1,577	0	455	0	0
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------	-------
Departure	1,125	1,314	1,350	1,577	0	455	0	0
Arrival	1,125	1,314	1,350	1,577	0	455	0	0
Touch and Go events	1,125	10,513	1,350	12,615	0	2,045	0	0

Ops per Sortie by Sortie Type

	Non-NASCC military ops (representative surrogates)		Civilian aircraft ops (representative surrogates)				
	T-45	C-12	B-737-500	CL601	B-767-300	2-eng prop (C-12 surrogate)	1-eng prop (T-6 surrogate)
% of Total Ops	100%	100%	100%	100%	100%	100%	100%
# of Total Ops	0	0	0	1,780	0	2,578	2,242
Arrival % 2200-0700L	4%	4%	4%	4%	4%	4%	4%
Closed % 2200-0700L	4%	4%	4%	4%	4%	4%	4%
Departure % 2200-0700L	4%	4%	4%	4%	4%	4%	4%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1
ARR - Overhead Break							
ARR - PEL							
ARR - ST in	1	1	1	1	1	1	1
PATT - Touch and Go				1		1	1
PATT - PEL High Key							
PATT - PEL Low Key							
PATT - Delta (Hold)							
PATT - Instrument							
Ops per Sortie	2	2	2	3	2	3	3
Annual Sorties	0	0	0	593	0	859	747
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------
Departure	0	0	0	593	0	859	747
Arrival	0	0	0	593	0	859	747
Touch and Go events	0	0	0	297	0	430	374

PKV - Calhoun County

AIR TRAFFIC CONTROL OPS	
TOTAL (baseline)	18,257
TOTAL (proposed)	18,968
T-44 (baseline only)	3,557
METS (Alt 2 only)(T-44 +20%)	4,268
T-6	7,500
T-1	-
T-38	-
T-45	-
C-12	-
Mil Subtotal (baseline)	**11,057**
Mil Subtotal (proposed)	**11,768**
B-737-500	-
CL601	979
B-767-300	-
2-eng prop (C-12 surrogate)	1,721
1-eng prop (T-6 surrogate)	4,500
Civilian Subtotal	**7,200**
METS (Alt 1 only)(T-44 +10%)	3912

Cell color meaning:

NASCC Ops SME Reviewed

Not Applicable / Rare

based on PDARS data (provided by FAA), wind rose data, and other non-NASCC sources

Runway Usage		
Runway	**IFR Arrival Sortie**	**VFR Arrival Sortie**
Rwy 14	54%	54%
Rwy 32	46%	46%

Ops per Sortie by Sortie Type	T-44 (baseline only)		METS (proposed only)		T-6		Non-NASCC military ops (representative surrogates)	
	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	T-1	T-38
% of Total Ops	17%	83%	17%	83%	80%	20%	100%	100%
# of Total Ops	600	2,957	720	3,548	6,000	1,500	0	0
Arrival % 2200-0700L*	0%	0%	0%	0%	0%	0%	2%	2%
Closed % 2200-0700L*	0%	0%	0%	0%	0%	0%	2%	2%
Departure % 2200-0700L*	0%	0%	0%	0%	0%	0%	2%	2%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1	1
ARR - Overhead Break		1		1				
ARR - PEL						1		
ARR - ST in	1		1		1		1	1
PATT - Touch and Go		16		16		9		
PATT - PEL High Key								
PATT - PEL Low Key								
PATT - Delta (Hold)								
PATT - Instrument	2		2		1			
Ops per Sortie	4	18	4	18	3	11	2	2
Annual Sorties	150	164	180	197	2,000	136	0	0
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------	-------
Departure	150	164	180	197	2,000	136	0	0
Arrival	150	164	180	197	2,000	136	0	0
Touch and Go	150	1,314	180	1,577	1,000	614	0	0

Ops per Sortie by Sortie Type	Non-NASCC military ops (representative surrogates)		Civilian aircraft ops (representative surrogates)				
	T-45	C-12	B-737-500	CL601	B-767-300	2-eng prop (C-12	1-eng prop (T-6
% of Total Ops	100%	100%	100%	100%	100%	100%	100%
# of Total Ops	0	0	0	979	0	1,721	4,500
Arrival % 2200-0700L*	2%	2%	2%	2%	2%	2%	2%
Closed % 2200-0700L*	2%	2%	2%	2%	2%	2%	2%
Departure % 2200-0700L*	2%	2%	2%	2%	2%	2%	2%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1
ARR - Overhead Break							
ARR - PEL							
ARR - ST in	1	1	1	1	1	1	1
PATT - Touch and Go				6		6	6
PATT - PEL High Key							
PATT - PEL Low Key							
PATT - Delta (Hold)							
PATT - Instrument							
Ops per Sortie	2	2	2	8.0	2	8.0	8.0
Annual Sorties	0	0	0	122	0	215	563
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------
Departure	0	0	0	122	0	215	563
Arrival	0	0	0	122	0	215	563
Touch and Go	0	0	0	367	0	645	1,688

CRP - Corpus Christi International

AIR TRAFFIC CONTROL OPS	
TOTAL (baseline)	91,689
TOTAL (proposed)	95,850
T-44 (baseline only)	20,805
METS (Alt 2 only)(T-44 +20%)	24,966
T-6	12,500
T-1	-
T-38	-
T-45	18,452
C-12	6,476
Mil Subtotal (baseline)	**58,233**
Mil Subtotal (proposed)	**62,394**
B-737-500	6,126
CL601	12,650
B-767-300	-
2-eng prop (C-12 surrogate)	10,039
1-eng prop (T-6 surrogate)	4,641
Civilian Subtotal	**33,456**
METS (Alt 1 only)(T-44 +10%)	22885

Cell color meaning:

NASCC Ops SME Reviewed

Not Applicable / Rare

based on PDARS data (provided by FAA), wind rose data, and other non-NASCC sources

Runway Usage		
Runway	IFR Arrival Sortie	VFR Arrival Sortie
Rwy 13	48%	48%
Rwy 18	21%	21%
Rwy 31	7%	7%
Rwy 36	24%	24%
	good	*good*

Ops per Sortie by Sortie Type								
	T-44 (baseline only)		METS (proposed only)		T-6		Non-NASCC military ops (representative surrogates)	
	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	T-1	T-38
% of Total Ops	36%	64%	36%	64%	0%	100%	100%	100%
# of Total Ops	**7,500**	**13,305**	**9,000**	**15,966**	**0**	**12,500**	**0**	**0**
Arrival % 2200-0700L	0%	0%	0%	0%	0%	0%	**10%**	**10%**
Closed % 2200-0700L	7%	7%	7%	7%	0%	0%	**10%**	**10%**
Departure % 2200-0700L	7%	7%	7%	7%	0%	0%	**10%**	**10%**
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1	1
ARR - Overhead Break		1		1		1		
ARR - PEL								
ARR - ST in	1		1		1		1	1
PATT - Touch and Go		16		16		9		
PATT - PEL High Key								
PATT - PEL Low Key								
PATT - Delta (Hold)								
PATT - Instrument	2		2		1			
Ops per Sortie	**4**	**18**	**4**	**18**	**3**	**11**	**2**	**2**
Annual Sorties	**1,875**	**739**	**2,250**	**887**	**0**	**1,136**	**0**	**0**
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------	-------
Departure	1,875	739	2,250	887	0	1,136	0	0
Arrival	1,875	739	2,250	887	0	1,136	0	0
Touch and Go	1,875	5,913	2,250	7,096	0	5,114	0	0

Ops per Sortie by Sortie Type	Non-NASCC military ops (representative surrogates)		Civilian aircraft ops (representative surrogates)				
	T-45	C-12	B-737-500	CL601	B-767-300	2-eng prop (C-12 surrogate)	1-eng prop (T-6 surrogate)
% of Total Ops	100%	100%	100%	100%	100%	100%	100%
# of Total Ops	18,452	6,476	6,126	12,650	0	10,039	4,641
Arrival % 2200-0700L	10%	10%	10%	10%	10%	10%	10%
Closed % 2200-0700L	10%	10%	10%	10%	10%	10%	10%
Departure % 2200-0700L	10%	10%	10%	10%	10%	10%	10%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1
ARR - Overhead Break							
ARR - PEL							
ARR - ST in	1	1	1	1	1	1	1
PATT - Touch and Go				0.1		0.1	0.1
PATT - PEL High Key							
PATT - PEL Low Key							
PATT - Delta (Hold)							
PATT - Instrument							
Ops per Sortie	2	2	2	2.1	2	2.1	2.1
Annual Sorties	9,226	3,238	3,063	6,024	0	4,780	2,210
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------
Departure	9,226	3,238	3,063	6,024	0	4,780	2,210
Arrival	9,226	3,238	3,063	6,024	0	4,780	2,210
Touch and Go	0	0	0	301	0	239	110

PSX - Palacios Municipal

AIR TRAFFIC CONTROL OPS	
TOTAL (baseline)	13,283
TOTAL (proposed)	14,319
T-44 (baseline only)	5,183
METS (Alt 2 only)(T-44 +20%)	6,219
T-6	2,500
T-1	-
T-38	-
T-45	-
C-12	-
Mil Subtotal (baseline)	**7,683**
Mil Subtotal (proposed)	**8,719**
B-737-500	-
CL601	223
B-767-300	-
2-eng prop (C-12 surrogate)	251
1-eng prop (T-6 surrogate)	5,126
Civilian Subtotal	**5,600**
METS (Alt 1 only)(T-44 +10%)	5701

Cell color meaning:

NASCC Ops SME Reviewed

Not Applicable / Rare

based on PDARS data (provided by FAA), wind rose data, and other non-NASCC sources

Runway Usage			
Runway	**IFR Arrival Sortie**	**VFR Arrival Sortie**	
Rwy 13	100%	49.0%	no published instrument app
Rwy 18	0%	24.2%	
Rwy 31	0%	18.1%	no published instrument app
Rwy 36	0%	8.7%	no published instrument app
	good	*good*	

Ops per Sortie by Sortie Type	T-44 (baseline only)		METS (proposed only)		T-6		Non-NASCC military ops (representative surrogates)	
	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	T-1	T-38
% of Total Ops	12%	88%	12%	88%	80%	20%	100%	100%
# of Total Ops	600	4,583	720	5,499	2,000	500	0	0
Arrival % 2200-0700L*	0%	0%	0%	0%	0%	0%	4%	4%
Closed % 2200-0700L*	0%	0%	0%	0%	0%	0%	4%	4%
Departure % 2200-0700L*	0%	0%	0%	0%	0%	0%	4%	4%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1	1
ARR - Overhead Break		1		1		1		
ARR - PEL								
ARR - ST in	1		1		1		1	1
PATT - Touch and Go		16		16		9		
PATT - PEL High Key								
PATT - PEL Low Key								
PATT - Delta (Hold)								
PATT - Instrument	2		2		1			
Ops per Sortie	**4**	**18**	**4**	**18**	**3**	**11**	**2**	**2**
Annual Sorties	**150**	**255**	**180**	**306**	**667**	**45**	**0**	**0**
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------	-------
Departure	150	255	180	306	667	45	0	0
Arrival	150	255	180	306	667	45	0	0
Touch and Go	150	2,037	180	2,444	333	205	0	0

PSX - Palacios M

AIR TRAFFIC CONTROL OPS
TOTAL (baseline)
TOTAL (proposed)
T-44 (baseline only)
METS (Alt 2 only)(T-44 +20%)
T-6
T-1
T-38
T-45
C-12
Mil Subtotal (baseline)
Mil Subtotal (proposed)
B-737-500
CL601
B-767-300
2-eng prop (C-12 surrogate)
1-eng prop (T-6 surrogate)
Civilian Subtotal
METS (Alt 1 only)(T-44 +10%)

Ops per Sortie by Sortie Type	Non-NASCC military ops (representative surrogates)		Civilian aircraft ops (representative surrogates)				
	T-45	C-12	B-737-500	CL601	B-767-300	2-eng prop (C-12 surrogate)	1-eng prop (T-6 surrogate)
% of Total Ops	100%	100%	100%	100%	100%	100%	100%
# of Total Ops	**0**	**0**	**0**	**223**	**0**	**251**	**5,126**
Arrival % 2200-0700L*	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**
Closed % 2200-0700L*	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**
Departure % 2200-0700L*	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**	**4%**
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1
ARR - Overhead Break							
ARR - PEL							
ARR - ST in	1	1	1	1	1	1	1
PATT - Touch and Go				0.1		0.1	0.1
PATT - PEL High Key							
PATT - PEL Low Key							
PATT - Delta (Hold)							
PATT - Instrument							
Ops per Sortie	**2**	**2**	**2**	**2.1**	**2**	**2.1**	**2.1**
Annual Sorties	**0**	**0**	**0**	**106**	**0**	**119**	**2,441**
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------
Departure	0	0	0	106	0	119	2,441
Arrival	0	0	0	106	0	119	2,441
Touch and Go	0	0	0	5	0	6	122

PIL - Port Isabel

AIR TRAFFIC CONTROL OPS	
TOTAL (baseline)	29,420
TOTAL (proposed)	31,610
T-44 (baseline only)	10,948
METS (Alt 2 only)(T-44 +20%)	13,138
T-6	2,500
T-1	2,552
T-38	-
T-45	-
C-12	-
Mil Subtotal (baseline)	**16,000**
Mil Subtotal (proposed)	**18,190**
B-737-500	-
CL601	2,933
B-767-300	-
2-eng prop (C-12 surrogate)	5,333
1-eng prop (T-6 surrogate)	5,154
Civilian Subtotal	13,420
METS (Alt 1 only)(T-44 +10%)	12043

Cell color meaning:

- NASCC Ops SME Reviewed
- Not Applicable / Rare
- based on PDARS data (provided by FAA), wind rose data, and other non-NASCC sources

Runway Usage			
Runway	**IFR Arrival Sortie**	**VFR Arrival Sortie**	
Rwy 13	100%	31%	
Rwy 17	0%	41%	no published instrument app
Rwy 31	0%	21%	no published instrument app
Rwy 35	0%	7%	no published instrument app
	good	*good*	

Ops per Sortie by Sortie Type

	T-44 (baseline only)		METS (proposed only)		T-6		Non-NASCC military ops (representative surrogates)	
	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	T-1	T-38
% of Total Ops	5%	95%	5%	95%	0%	100%	100%	100%
# of Total Ops	600	10,348	720	12,418	0	2,500	2,552	0
Arrival % 2200-0700L*	0%	0%	0%	0%	0%	0%	2%	2%
Closed % 2200-0700L*	0%	0%	0%	0%	0%	0%	2%	2%
Departure % 2200-0700L*	0%	0%	0%	0%	0%	0%	2%	2%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1	1
ARR - Overhead Break		1		1		1		
ARR - PEL								
ARR - ST in	1		1		1		1	1
PATT - Touch and Go		16		16		9		
PATT - PEL High Key								
PATT - PEL Low Key								
PATT - Delta (Hold)								
PATT - Instrument	2		2		1			
Ops per Sortie	**4**	**18**	**4**	**18**	**3**	**11**	**2**	**2**
Annual Sorties	**150**	**575**	**180**	**690**	**0**	**227**	**1,276**	**0**
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------	-------
Departure	150	575	180	690	0	227	1,276	0
Arrival	150	575	180	690	0	227	1,276	0
Touch and Go	150	4,599	180	5,519	0	1,023	0	0

Ops per Sortie by Sortie Type							
	Non-NASCC military ops (representative surrogates)		Civilian aircraft ops (representative surrogates)				
	T-45	C-12	B-737-500	CL601	B-767-300	2-eng prop (C-12 surrogate)	1-eng prop (T-6 surrogate)
% of Total Ops	100%	100%	100%	100%	100%	100%	100%
# of Total Ops	0	0	0	2,933	0	5,333	5,154
Arrival % 2200-0700L*	2%	2%	2%	2%	2%	2%	2%
Closed % 2200-0700L*	2%	2%	2%	2%	2%	2%	2%
Departure % 2200-0700L*	2%	2%	2%	2%	2%	2%	2%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1
ARR - Overhead Break							
ARR - PEL							
ARR - ST in	1	1	1	1	1	1	1
PATT - Touch and Go				0.4		0.4	0.4
PATT - PEL High Key							
PATT - PEL Low Key							
PATT - Delta (Hold)							
PATT - Instrument							
Ops per Sortie	2	2	2	2.4	2	2.4	2.4
Annual Sorties	0	0	0	1,222	0	2,222	2,147
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------
Departure	0	0	0	1,222	0	2,222	2,147
Arrival	0	0	0	1,222	0	2,222	2,147
Touch and Go	0	0	0	244	0	444	429

HRL - Valley International

AIR TRAFFIC CONTROL OPS	
TOTAL (baseline)	46,740
TOTAL (proposed)	49,710
T-44 (baseline only)	14,848
METS (Alt 2 only)(T-44 +20%)	17,818
T-6	5,000
T-1	-
T-38	-
T-45	-
C-12	-
Mil Subtotal (baseline)	**19,848**
Mil Subtotal (proposed)	**22,818**
B-737-500	4,736
CL601	4,449
B-767-300	1,752
2-eng prop (C-12 surrogate)	8,175
1-eng prop (T-6 surrogate)	7,780
Civilian Subtotal	**26,892**
METS (Alt 1 only)(T-44 +10%)	16333

Cell color meaning:

- NASCC Ops SME Reviewed
- Not Applicable / Rare
- based on PDARS data (provided by FAA), wind rose data, and other non-NASCC sources

Runway Usage		
Runway	IFR Arrival Sortie	VFR Arrival Sortie
Rwy 13	41%	41%
Rwy 17R	16%	16%
Rwy 17L	16%	16%
Rwy 31	7%	7%
Rwy 35R	10%	10%
Rwy 35L	10%	10%
	good	*good*

Ops per Sortie by Sortie Type	T-44 (baseline only)		METS (proposed only)		T-6		Non-NASCC military ops (representative surrogates)	
	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	T-1	T-38
% of Total Ops	30%	70%	30%	70%	0%	100%	100%	100%
# of Total Ops	4,500	10,348	5,400	12,418	0	5,000	0	0
Arrival % 2200-0700L*	0%	0%	0%	0%	0%	0%	16%	16%
Closed % 2200-0700L*	0%	0%	0%	0%	0%	0%	16%	16%
Departure % 2200-0700L*	0%	0%	0%	0%	0%	0%	16%	16%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1	1
ARR - Overhead Break		1		1		0		
ARR - PEL						1		
ARR - ST in	1		1		1		1	1
PATT - Touch and Go		16		16		9		
PATT - PEL High Key								
PATT - PEL Low Key								
PATT - Delta (Hold)								
PATT - Instrument	2		2		1			
Ops per Sortie	4	18	4	18	3	11	2	2
Annual Sorties	1,125	575	1,350	690	0	455	0	0
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------	-------
Departure	1,125	575	1,350	690	0	455	0	0
Arrival	1,125	575	1,350	690	0	455	0	0
Touch and Go	1,125	4,599	1,350	5,519	0	2,045	0	0

Ops per Sortie by Sortie Type							
	Non-NASCC military ops (representative surrogates)		Civilian aircraft ops (representative surrogates)				
	T-45	C-12	B-737-500	CL601	B-767-300	2-eng prop (C-12 surrogate)	1-eng prop (T-6 surrogate)
% of Total Ops	100%	100%	100%	100%	100%	100%	100%
# of Total Ops	0	0	4,736	4,449	1,752	8,175	7,780
Arrival % 2200-0700L*	16%	16%	16%	16%	16%	16%	16%
Closed % 2200-0700L*	16%	16%	16%	16%	16%	16%	16%
Departure % 2200-0700L*	16%	16%	16%	16%	16%	16%	16%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1
ARR - Overhead Break							
ARR - PEL							
ARR - ST in	1	1	1	1	1	1	1
PATT - Touch and Go				0.2		0.1	0.1
PATT - PEL High Key							
PATT - PEL Low Key							
PATT - Delta (Hold)							
PATT - Instrument							
Ops per Sortie	2	2	2	2.2	2	2.1	2.1
Annual Sorties	0	0	2,368	2,022	876	3,893	3,705
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------
Departure	0	0	2,368	2,022	876	3,893	3,705
Arrival	0	0	2,368	2,022	876	3,893	3,705
Touch and Go	0	0	0	202	0	195	185

VCT- Victoria Regional

AIR TRAFFIC CONTROL OPS	
TOTAL (baseline)	55,919
TOTAL (proposed)	56,898
T-44 (baseline only)	4,896
METS (Alt 2 only)(T-44 +20%)	5,875
T-6	12,500
T-1	21,443
T-38	5,601
T-45	-
C-12	-
Mil Subtotal (baseline)	**44,440**
Mil Subtotal (proposed)	**45,419**
B-737-500	-
CL601	1,087
B-767-300	-
2-eng prop (C-12 surrogate)	4,487
1-eng prop (T-6 surrogate)	5,905
Civilian Subtotal	**11,479**
METS (Alt 1 only)(T-44 +10%)	5385

Cell color meaning:

NASCC Ops SME Reviewed

Not Applicable / Rare

based on PDARS data (provided by FAA), wind rose data, and other non-NASCC sources

Runway Usage		
Runway	**IFR Arrival Sortie**	**VFR Arrival Sortie**
Rwy 13L	34%	34%
Rwy 13R	0%	0%
Rwy 18	29%	29%
Rwy 31L	0%	0%
Rwy 31R	8%	8%
Rwy 36	30%	30%
	good	*good*

Note: a much smaller number of ops is assumed to use Rwy 13R and 31L, which are less than 5,000 feet long

Ops per Sortie by Sortie Type

	T-44 (baseline only)		METS (proposed only)		T-6		Non-NASCC military ops (representative surrogates)	
	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	IFR Arrival	VFR Arrival	T-1	T-38
% of Total Ops	25%	75%	25%	75%	0%	100%	100%	100%
# of Total Ops	1,200	3,696	1,440	4,435	0	12,500	21,443	5,601
Arrival % 2200-0700L*	0%	0%	0%	0%	0%	0%	4%	4%
Closed % 2200-0700L*	0%	0%	0%	0%	0%	0%	4%	4%
Departure % 2200-0700L*	0%	0%	0%	0%	0%	0%	4%	4%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1	1
ARR - Overhead Break		1		1				
ARR - PEL						1		
ARR - ST in	1		1		1		1	1
PATT - Touch and Go		16		16		9		
PATT - PEL High Key								
PATT - PEL Low Key								
PATT - Delta (Hold)								
PATT - Instrument	2		2		1			
Ops per Sortie	4	18	4	18	3	11	2	2
Annual Sorties	300	205	360	246	0	1,136	10,722	2,801
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------	-------
Departure	300	205	360	246	0	1,136	10,722	2,801
Arrival	300	205	360	246	0	1,136	10,722	2,801
Touch and Go	300	1,643	360	1,971	0	5,114	0	0

Ops per Sortie by Sortie Type

	Non-NASCC military ops (representative surrogates)		Civilian aircraft ops (representative surrogates)				
	T-45	C-12	B-737-500	CL601	B-767-300	2-eng prop (C-12 surrogate)	1-eng prop (T-6 surrogate)
% of Total Ops	100%	100%	100%	100%	100%	100%	100%
# of Total Ops	0	0	0	1,087	0	4,487	5,905
Arrival % 2200-0700L*	4%	4%	4%	4%	4%	4%	4%
Closed % 2200-0700L*	4%	4%	4%	4%	4%	4%	4%
Departure % 2200-0700L*	4%	4%	4%	4%	4%	4%	4%
OPS / SORTIE	-------	-------	-------	-------	-------	-------	-------
DEPARTURES	1	1	1	1	1	1	1
ARR - Overhead Break							
ARR - PEL							
ARR - ST in	1	1	1	1	1	1	1
PATT - Touch and Go				0.4		0.4	0.4
PATT - PEL High Key							
PATT - PEL Low Key							
PATT - Delta (Hold)							
PATT - Instrument							
Ops per Sortie	2	2	2	2.4	2	2.4	2.4
Annual Sorties	0	0	0	453	0	1,870	2,460
ANNUAL EVENTS	-------	-------	-------	-------	-------	-------	-------
Departure	0	0	0	453	0	1,870	2,460
Arrival	0	0	0	453	0	1,870	2,460
Touch and Go	0	0	0	91	0	374	492

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Appendix B
Special Status Species Documentation

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Texas Coastal Ecological Services Field Office
4444 Corona Drive, Suite 215
Corpus Christi, Texas 78411
PHONE: 361/994-9004
FAX: 361/994-8262

In Reply Refer To:
2022-0050570

August 2, 2023

Mr. Biji Pandisseril
Environmental Program Director
Department of the Navy
Naval Air Station Corpus Christi
11001 D. Street, Suite 101
Corpus Christi, Texas 78419-5021

Dear Mr. Pandisseril:

This responds to your June 23, 2023, letter received by the U.S. Fish and Wildlife Service (Service) requesting concurrence on your determination of effects of the Naval Air Station (NAS) Corpus Christi's Multi-Engine Training System, on federally listed threatened and endangered species and critical habitat. The proposed project is to replace 54 T-44C Pegasus aircraft with 58 new T-54A aircraft including short- and long-term construction projects of Navy support facilities at NAS Corpus Christi, Nueces County, Texas. This proposed project has been reviewed pursuant to the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. § 1536).

The Navy determined that the project may affect but is not likely to adversely affect the following species as they have the potential to occur in the project area, due to the presence of suitable habitat within or near the project area.

Eastern black rail	(*Laterallus jamaicensis ssp. Jamaicensis*)
Northern aplomado falcon	(*Falco femoralis septentrionalis*)
Piping plover	(*Charadrius melodus*)
Red knot	(*Calidris canutus rufa*)
Whooping crane	(*Grus americana*)

Based on our review and discussions with the Navy the following measures were agreed upon to prevent or minimize potential adverse effects to the northern aplomado falcon and whooping crane species to the extent practicable.

Mr. Biji Pandisseril 2

Northern aplomado falcon

- Low-level aircraft routes (less than 500 feet above ground level) should avoid northern aplomado falcon nesting platforms and territories on Mustang and Matagorda Islands by at least one mile to reduce potential noise and human disturbance effects. Maintaining a distance of 1,500 feet above ground level is preferable.

Whooping crane

- Whooping cranes are not expected in the project area. Report sightings of whooping cranes to the Texas Coastal Ecological Services Field Office in Corpus Christi at 361-533-6765.

Based on the information provided and the implementation of the conservation, avoidance and minimization measures noted above, the Service agrees the likelihood of an impact occurring to eastern black rail, northern aplomado falcon, piping plover, red knot and whooping crane is insignificant and discountable. The Service, therefore, concurs with the Navy's determination that the project may affect, but is not likely to adversely affect these five species.

The Navy has made a "no effect" determination for the following species due to lack of habitat:

West Indian manatee	(*Trichechus manatus*)
Green sea turtle	(*Chelonia mydas*)
Hawksbill sea turtle	(*Eretmochelys imbricata*)
Kemp's ridley sea turtle	(*Lepidochelys kempii*)
Leatherback sea turtle	(*Dermochelys coriacea*)
Loggerhead sea turtle	(*Caretta caretta*)
Black lace cactus	(*Echinocereus reichenbachii var. albertii*)
Slender rush-pea	(*Hoffmannseggia tenella*)
South Texas ambrosia	(*Ambrosia cheiranthifolia*)
Texas avenia	(*Ayenia limitaris*)
False spike	(*Fusconaia mitchelli*)
Guadalupe orb	(*Cyclonaias necki*)
Attwater's prairie chicken	(*Tympanuchus cupido attwateri*)
West Indian manatee	(*Trichechus manatus*)
Ocelot	(*Felis pardalis*)
Jaguarundi	(*Pumayagouaroundi cacomitli*)
Monarch butterfly	(*Danaus plexippus*)

The Service does not provide concurrence for "no effect" determinations, but by making a determination pursuant to Section 7 of the Act, we believe Section 7(a)(2) of the Endangered Species Act of 1973, as amended was complied with.

Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination can be reconsidered. If you have any questions or

Mr. Biji Pandisseril 3

need further assistance, please contact Dayma Wasmund at 361-225-7318 or by email at dayma_wasmund@fws.gov.

Sincerely,

CHARLES ARDIZZONE Digitally signed by CHARLES ARDIZZONE Date: 2023.08.02 11:15:04 -05'00'

Charles Ardizzone
Field Supervisor

NAVY LETTERHEAD

U.S. Fish and Wildlife Service
Texas Coastal Ecological Services Field Office
4444 Corona Drive, Suite 215
Corpus Christi, TX 78411
(281) 286-8282

SUBJECT: ENDANGERED SPECIES ACT SECTION 7 CONSULTATION FOR THE NAVAL AIR STATION (NAS) CORPUS CHRISTI MULTI-ENGINE TRAINING SYSTEM, Project Code: **2022-0050570**

U.S. Fleet Forces Command on behalf of Chief of Naval Air Training, a Command of the U.S. Navy (hereinafter, jointly referred to as the Navy), proposes to replace aircraft used for multi-engine maritime flight training. This training program is operated by Commander, Training Air Wing Four, located at NAS Corpus Christi. The Proposed Action includes replacement of 54 T-44C Pegasus aircraft with 58 new T-54A aircraft. The aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. The Proposed Action also includes short- and long-term construction projects for Navy support facilities at NAS Corpus Christi.

A 10 percent increase in flight operations is also proposed. In accordance with section 7(a)(2) of the Endangered Species Act (16 United States Code Sections 1531–1544, as amended) and the Sikes Act (16 United States Code 670a–670o, 74 Stat. 1052), the Navy is requesting coordination and informal consultation with the U.S. Fish and Wildlife Service concerning the potential effects to threatened and endangered species and critical habitats within the project area. The Navy is also preparing a National Environmental Policy Act Environmental Assessment to assess the potential environmental consequences of this action.

Enclosed is the Navy's Biological Evaluation for the Proposed Action. The Navy has determined that the Proposed Action may affect, but is not likely to adversely affect, the northern aplomado falcon, piping plover, red knot, eastern black rail, whooping crane, and tricolored bat, as these species are at risk, although negligible, of potential aircraft strike during flight. The Proposed Action would have no effect on any other listed species or any critical habitats.

The Navy requests that the U.S. Fish and Wildlife Service provide written concurrence with this determination in satisfaction of section 7 of the Endangered Species Act.

If you need further information or have any questions regarding this matter, please contact XXX at XXX.

Thank you very much for your assistance in this matter.

Sincerely,

XX

Enclosure 1: Biological Evaluation.

Enclosure 2: USFWS Official Species List, Project Code 2022-0050570

ENCLOSURE 1: BIOLOGICAL EVALUATION

BIOLOGICAL EVALUATION

For

MULTI-ENGINE TRAINING SYSTEM

AT

NAVAL AIR STATION CORPUS CHRISTI

CORPUS CHRISTI, TEXAS

May 2023

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Draft

Biological Evaluation

Multi-Engine Training System

Naval Air Station Corpus Christi

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ESA Section 7 Consultation between the Navy and the USFWS regarding the NAS Corpus Christi METS, Enclosure 1 Biological Evaluation

Acronyms and Abbreviations

Acronym	*Definition*
BASH	Bird/animal aircraft strike hazard
CFR	Code of Federal Regulations
FAA	Federal Aviation Administration
MBTA	Migratory Bird Treaty Act
NAS	Naval Air Station
NOLF	Naval Outlying Landing Field
USFWS	U.S. Fish and Wildlife Service

1 Introduction and Description of the Proposed Action

Fifty-four T-44C Pegasus aircraft would be replaced by 58 new T-54A aircraft at Naval Air Station (NAS) Corpus Christi. The new aircraft would be delivered between 2024 to 2026, and proposed construction would begin in 2024 and continue through 2027. The T-44C Pegasus and the T-54A are both twin engine, pressurized, fixed-wing monoplane aircraft derived from the Beechcraft King Air/Super King Air line of commercial aircraft (Figure 1-1). Aircraft specifications are presented in Table 1-1.

Figure 1-1 T-44C Pegasus (left) and T-54A [King Air 260] (right)

Table 1-1 Aircraft Specifications

Aircraft Specifications	*T-44C*	*T-54A*
Length	35.5 feet	43.8 feet
Height	14.25 feet	14.83 feet
Wingspan	50.25 feet	57.91 feet
Weight (empty)	6,246 pounds	8,830 pounds
Weight (maximum takeoff)	9,650 pounds	12,500 pounds
Ceiling	31,300 feet	35,000 feet
Range	1,300 nautical miles	1,720 nautical miles
Maximum airspeed	245 knots	310 knots
Crew	3	3

Sources: (Navy, 2021; Navy, ND)

The new aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with a 10 percent increase in the number of annual operations. Approximately 7 percent of the operations would occur at night; the same percentage of operations as occurs with the T-44C. Figure 1-2 shows the location of the airfields that the T-54A would utilize. Table 1-2 and Table 1-3 detail these changes.

Airfield operations include takeoffs, landings, touch-and-goes, low approaches, and simulated emergency landings. An approach and departure from an airfield are considered two airfield operations that occur with one landing. A practice approach can end in a full-stop landing, touch-and-go, or low approach (no landing). Landing requirements include the following:

- Full-stop landing is a typical landing ending with the aircraft stopping and exiting the runway.
- Touch-and-go operations are when the student pilot lands (touches down) and then takes off again without coming to a stop; the "touch-and-go" is considered two operations but a single landing. As many as five or six aircraft may enter the landing pattern at an airfield, sequentially performing touch-and-go operations.
- Low approach is a practice approach without landing followed by a go-around maneuver.

- Simulated emergency landings are performed while in the landing pattern at surrounding airfields. During a simulated landing, the student pilot practices landing the aircraft under a simulated emergency condition, under the instruction and direct supervision of a qualified instructor pilot.

The Proposed Action also includes short- and long-term construction projects for Navy support facilities at NAS Corpus Christi. The locations of these activities are depicted in Figure 1-3.

Table 1-4 shows the proposed change in number of aircraft associated with the Proposed Action. There would be no increase in the number of personnel associated with the Proposed Action.

Table 1-2 Current and Projected Use of Navy Airfields

Name	*FAA Identifier*	*Baseline T-44C Aircraft Operations*	*Proposed Action Projected T-54A Operations*[1]
Truax Field	NGP	32,760	36,000
NOLF Cabaniss	NGW	56,012	61,600
TOTAL		88,772	97,600

Key: FAA = Federal Aviation Administration; NOLF = Naval Outlying Landing Field.
Note:
1. Proposed Action includes a 10 percent increase in operations.

Table 1-3 Current and Projected Use of Non-Navy Airfields

Name	*FAA Identifier*	*Baseline T-44C Aircraft Operations*[1]	*Proposed Action Projected T-54A Operations*[1, 2]
Alice International Airport	ALI	28,200	31,000
Calhoun County Airport	PKV	3,600	3,900
Corpus Christi International Airport	CRP	20,800	22,900
Palacios Municipal Airport	PSX	5,200	5,700
Port Isabel-Cameron County Airport	PIL	11,000	12,000
Valley International Airport	HRL	14,800	16,300
Victoria Regional Airport	VCT	4,900	5,400
Other		7,400	8,200
TOTAL		95,900	105,400

Key: FAA = Federal Aviation Administration.
Notes:
1. Numbers are rounded to nearest hundred.
2. Proposed Action includes a 10 percent increase in operations.

Table 1-4 Comparison of Navy T-44C and T-54A Aircraft and Personnel

Aircraft and Personnel Numbers	*Baseline (T-44C)*	*Proposed Action (T-54A)*
Aircraft		
Number of aircraft	54	58
Personnel		
Students	110	110
Instructors	55	55
Maintenance	175 (Contractor)	175 (Contractor)
Total Personnel	340	340

Figure 1-2 International, Regional, and Municipal Airfields Locations Map

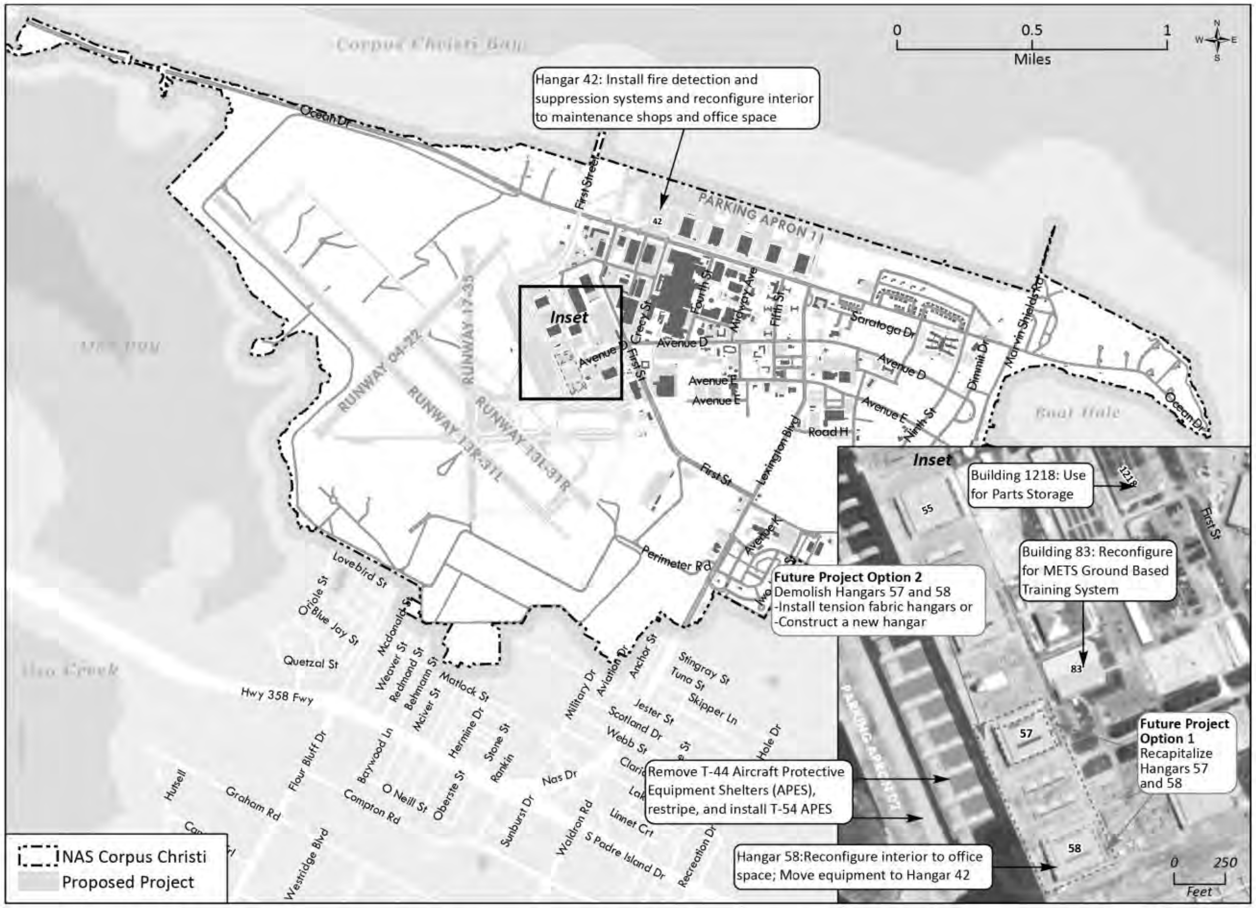

Figure 1-3 Locations of Construction and Renovation Projects at NAS Corpus Christi

1.1 Action Area Definition

The Action Area is defined by regulation as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 Code of Federal Regulations [CFR] Section 402.02). For the purposes of this Biological Evaluation analysis, the Action Area includes the Proposed Action airfields for aircraft noise, aircraft strike, and construction impacts and the airspace traveled between airfields for aircraft strike only. No habitats or natural vegetation would be disturbed by the Proposed Action. All ground disturbance and construction would occur on previously developed land.

2 Species and Critical Habitat in the Action Area

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation web application and the Texas Parks and Wildlife Department Annotated County List of Rare Species was used to identify federally threatened, endangered, proposed, and candidate species that could potentially occur within the Action Area (USFWS, 2022a; TWPD, 2022a). These species are presented in Table 2-1.

Table 2-1 Species and Critical Habitats in the Action Area

Common Name	*Scientific Name*	*Federal Listing Status*[1]	*Critical Habitat Within the Action Area?*[2]	*Potential Occurrence (by Airport Code)*
Plants				
Black lace cactus	*Echinocereus reichenbachii var. albertii*	Endangered	-	ALI, NGW, NGP, CRP
Slender rushpea	*Hoffmannseggia tenella*	Endangered	-	NGW, NGP, CRP
South Texas ambrosia	*Ambrosia cheiranthifolia*	Endangered	-	ALI, NGW, NGP, CRP, PIL, HRL
Texas ayenia	*Ayenia limitaris*	Endangered	-	PIL, HRL
Insects				
Monarch butterfly	*Danaus plexippus*	Candidate	-	ALI, NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
Mollusks				
False spike clam	*Fusconaia mitchelli*	Proposed endangered	-	PKV
Guadalupe orb clam	*Cyclonaias necki*	Proposed endangered	-	VCT, PKV
Birds				
Attwater's greater prairie chicken	*Tympanuchus cupido attwateri*	Endangered	-	VCT
Eastern black rail	*Laterallus jamaicensis* ssp. *jamaicensis*	Threatened	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
Northern aplomado falcon	*Falco femoralis septentrionalis*	Endangered	-	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Piping plover	*Charadrius melodus*	Threatened	Yes	ALI, NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
Red knot	*Calidris canutus rufa*	Threatened	Yes (Proposed)	ALI, NGP, NGW, PKV, CRP, PSX, PIL, HRL, VCT
Whooping crane	*Grus americana*	Endangered	Yes	ALI, NGP, NGW, PKV, CRP, PSX, VCT
Mammals				
Gulf Coast jaguarundi	*Herpailurus yagouaroundi cacomitli*	Endangered	-	PIL, HRL
Ocelot	*Leopardus pardalis*	Endangered	-	ALI, CRP, NGP, NGW, PIL, HRL

Table 2-1 Species and Critical Habitats in the Action Area

Common Name	*Scientific Name*	*Federal Listing Status*[1]	*Critical Habitat Within the Action Area?*[2]	*Potential Occurrence (by Airport Code)*
Tricolored bat	*Perimyotis subflavus*	Proposed endangered	-	ALI, PKV, PIL, PSX, CRP, NGP, NGW, VCT
West Indian manatee	*Trichechus manatus*	Endangered	None	CRP, NGP, NGW, PKV, PSX, PIL
Reptiles				
Green sea turtle	*Chelonia mydas*	Threatened	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Hawksbill sea turtle	*Eretmochelys imbricata*	Endangered	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Leatherback sea turtle	*Dermochelys coriacea*	Endangered	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL
Loggerhead sea turtle	*Caretta caretta*	Threatened	None	NGP, NGW, PKV, CRP, PSX, PIL, HRL

Sources: (TWPD, 2022; USFWS, 2022a)

Key: ALI = Alice International Airport; CRP = Corpus Christi International Airport; HRL = Valley International Airport; NGP = NAS Corpus Christi; NGW = Naval Outlying Landing Field Cabaniss; PIL = Port Isabel-Cameron County Airport; PKV = Calhoun County Airport; PSX = Palacios Municipal Airport; ROI = region of influence; VCT = Victoria Regional Airport.

Notes:

1. Federally listed species are those designated as threatened, endangered, or candidate species by the Endangered Species Act. These species and locations were determined based on the U.S. Fish and Wildlife Service Information for Planning and Conservation tool (USFWS, 2022a).
2. If blank (-), then critical habitat has not been designated for the species. If "None," then critical habitat has been designated but it is not located within the ROI.

2.1 Species Not Carried Forward in this Biological Evaluation

Twenty-two federally listed species have the potential to occur in the Action Area. This Biological Evaluation analyzes potential impacts to six species. The 16 species that are not carried forward in this Biological Evaluation include 4 plants, 2 clams, 1 insect, 5 sea turtles, 1 bird, 1 marine mammal, and 2 land mammals.

The plants identified in Table 2-1 do not occur within any of the Proposed Action airfields and would not be affected by overflights of the T-54A. Therefore, the Proposed Action would have no effect on the black lace cactus, the slender rushpea, the south Texas ambrosia, and the Texas avenia.

Similarly, the two clam species do not occur within any of the Proposed Action airfields and would not be affected by overflights of the T-54A (Table 2-1). Therefore, the Proposed Action would have no effect on the false spike clam and the Guadalupe orb clam.

Habitat for the Monarch butterfly, which requires a diverse assemblage of nectar resources as well as milkweed for laying eggs and larval sustenance, does not occur on the Proposed Action airfields and this species is not expected to be affected by T-54A flights. Therefore, the Proposed Action would have no effect on the Monarch butterfly.

Nesting habitat for the five sea turtle species does not exist at any of the Proposed Action airfields. In addition, the most intense underwater noise from subsonic aircraft is less than the behavioral response threshold for sea turtles (166 dB RMS re 1 μPa)[1] (Laney & Cavanagh, 2000). Note that the modeled subsonic aircraft from Laney & Cavanagh (2000) was an F-18 flying subsonic, which is much louder than a T-54A at any speed. Additionally, the sound frequencies associated with these pressures would possibly be below the in-air and in-water hearing sensitivity ranges for sea turtles (Bartol & Ketten, 2006; Piniak et al., 2016), reducing the likelihood of a behavioral reaction. Finally, the sound profiles of the new aircraft (T-54A) versus the legacy aircraft (T-44C) are virtually the same; there would only be a 10 percent increase over current operations. Therefore, the Proposed Action would have no effect on the green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles.

The Attwater's prairie chicken is found in three locations in Texas: the Attwater's Prairie Chicken National Wildlife Refuge (Colorado County, Texas), the Texas City Prairie Preserve (Galveston County, Texas), and a private ranch in Goliad County, Texas (USFWS, 2021a). All of these locations are far removed from the Proposed Action airfields. Therefore, the Proposed Action would have no effect on the Attwater's prairie chicken.

West Indian manatees are infrequent visitors to the Action Area and are considered extralimital. Individuals occurring in the Action Area are likely vagrants from the Mexico or Florida populations (Schmidly & Bradley, 2023). Overflights of the T-54A would not be expected to disturb West Indian manatees as flights would be conducted at altitudes higher than those shown to elicit responses in this species (over 600 feet above ground level) (Rathbun, 1988). Therefore, the Proposed Action would have no effect on the West Indian manatee.

The ocelot is believed to have fewer than 100 individuals in two separate populations in southern Texas—one in Laguna Atascosa National Wildlife Refuge in Cameron County and the other on private ranchland in Willacy County. In south Texas, ocelots occupy dense thornscrub communities (USFWS, 2016). Primary threats facing ocelots include habitat loss, conversion, fragmentation, and commercial exploitation and hunting (USFWS, 2016). Automobile collisions make up 40 percent of ocelot mortalities within the Laguna Atascosa National Wildlife Refuge population (Blackburn et al., 2021).

The Port Isabel-Cameron County Airport directly abuts the Laguna Atascosa National Wildlife Refuge, one of two locations where populations of the ocelot exist in Texas. Records of aircraft ocelot strikes have not been recorded in the literature, and the slight increase in modeled noise in the vicinity of the airfield would not be expected to affect ocelots at the refuge. Aircraft noise has not been named as a stressor or threat for this species. As noted earlier, the greatest threat to ocelots at the Laguna Atascosa National Wildlife Refuge is collisions with automobiles. Therefore; the Proposed Action would have no effect on the ocelot.

The final species not carried forward, the jaguarundi, is extinct in Texas (Schmidly & Bradley, 2023). The last verified sighting of a jaguarundi in Texas occurred in 1986. A survey for jaguarundis from 2003 to 2021 across southern Texas and northern Tamaulipas, Mexico, did not record any jaguarundis in Texas and concluded that jaguarundis were likely extirpated from Texas (Lombardi et al., 2022). Therefore, the Proposed Action would have no effect on the jaguarundi.

[1] Underwater sound threshold is measured in decibels using root-mean-square (RMS) pressure as referenced to a pressure of 1 microPascal (μPa) (University of Rhode Island and Inner Space Center, 2021).

2.2 Species Carried Forward in this Biological Evaluation

This section presents brief summaries of the federally listed species carried forward for analysis. Complete species accounts are provided in various resources including the USFWS Environmental Conservation Online System (ecos.fws.gov). Critical habitats within the Action Area are presented in Figure 2-1 and described in the following summaries.

2.2.1 Eastern Black Rail

The eastern black rail (*Laterallus jamaicensis jamaicensis*) is a subspecies of black rail (*Laterallus jamaicensis*), a small, cryptic marsh bird that occurs in salt, brackish, and freshwater wetlands in the eastern United States (east of the Rocky Mountains), Mexico, Central America, and the Caribbean (USFWS, 2019). The USFWS listed the eastern black rail as a threatened species on November 9, 2020 (85 FR 63764).

Habitat for black rails in Texas consists of tidal salt marshes along the barrier islands and the mainland fringe, as well as drier coastal prairie. A recent Texas study found that black rails used the salt and brackish high tidal marsh, salty prairie, and baccharis (*Baccharis* spp.) shrubland habitat types, and avoided salt and brackish low tidal marsh habitat types (Haverland et al., 2022). Critical habitat has not been designated for this species.

Watts (2016) estimates, with high uncertainty, the Texas population at 100 to 500 pairs. The USFWS estimates that prior to Hurricane Harvey there were an estimated 1,299 individuals on the upper Texas coast within specific protected areas (USFWS, 2019).

The USFWS has concluded that the eastern black rail is at risk of extinction within the foreseeable future due to continued wetland habitat loss, sea level changes, increasing storm frequency and intensity and increased flood events (which are both associated with high tides and storms), wetland subsidence, and land management practices (e.g., incompatible prescribed fire, grazing, and mechanical treatment activities) (85 FR 63797).

2.2.2 Northern Aplomado Falcon

The northern aplomado falcon (*Falco femoralis septentrionalis*) is one of three subspecies of the aplomado falcon (*Falco femoralis*). This species was listed as endangered on February 25, 1986 (51 FR 6686–6690). This small falcon's current range includes the reintroduced Texas population (Brownsville, Rockport, Chihuahuan Desert) and reports of solitary and breeding falcons in New Mexico and Arizona. There is also a nonessential experimental population in southern New Mexico (USFWS, 2014).

Northern aplomado falcon habitat varies and can consist of palm and oak savannahs, numerous coastal grassland and desert associations, and open pine woodlands. Key elements of these habitats seem to include an abundance of prey (small- to medium-sized birds and insects) scattered trees, and comparatively sparse ground cover (USFWS, 2014). Critical habitat has not been designated for this species.

During a survey conducted from 2010 to 2014, the known number of breeding pairs of northern aplomado falcons in the United States ranged from 28 to 36 pairs, virtually all of which were recorded using artificial nesting towers in southern coastal Texas. Additional surveys in 2013 and 2014 found 29 pairs in south Coastal Texas (USFWS, 2014).

Threats to the northern aplomado falcon include Chihuahuan Desert habitat changes (e.g., agricultural development), drought/water depletion, climate change, prey declines, peripheral ranges (species is at the northern terminus of its range), and wind towers (USFWS, 2014).

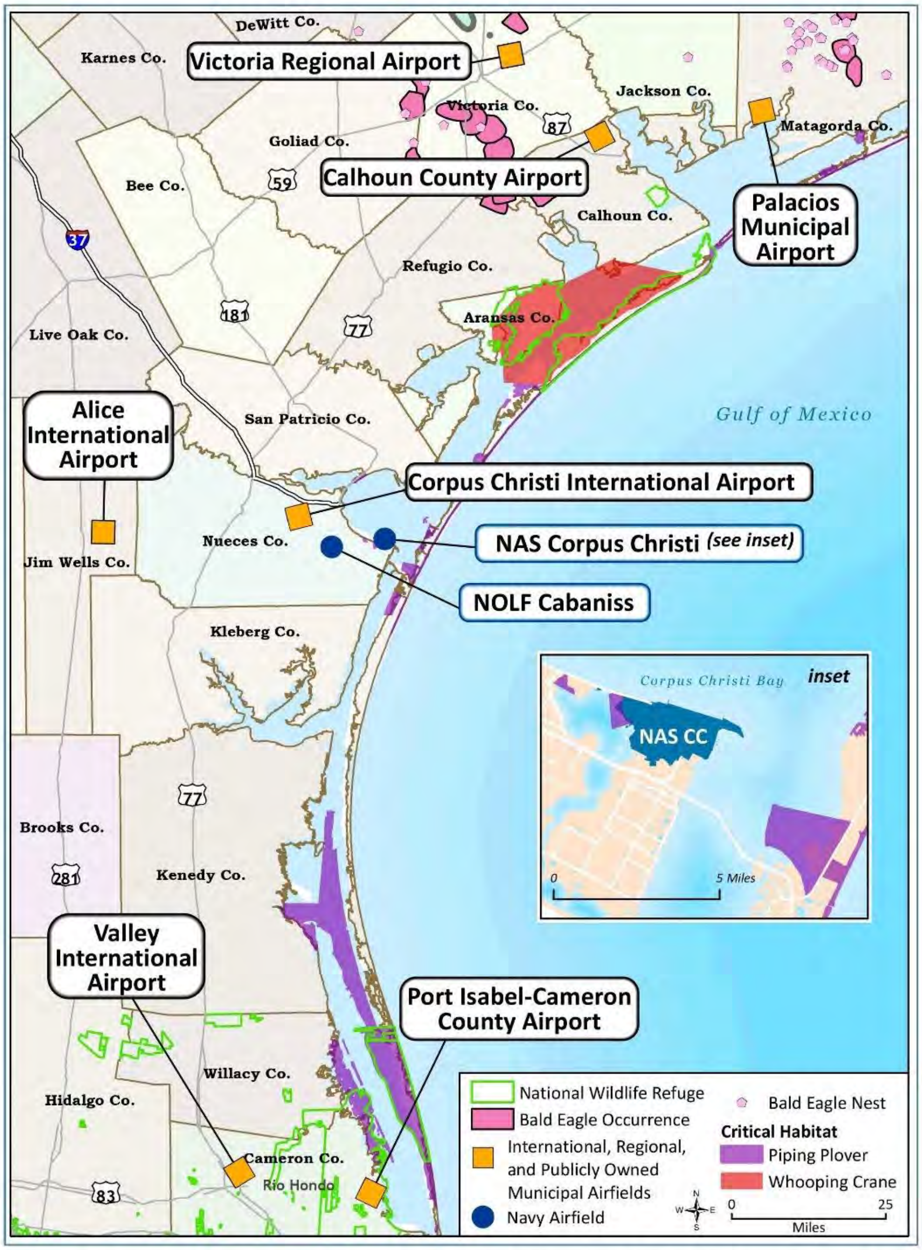

Figure 2-1 Locations of Navy, International, Regional, and Publicly Owned Municipal Airfields and Bird Critical Habitats in the Region of Influence

2.2.3 Piping Plover

The piping plover (*Charadrius melodus*) was historically common in certain habitats along the Atlantic and Gulf Coasts, along river systems and lakes of the northern Great Plains, the Great Lakes, and in the Bahamas and West Indies (65 FR 41782). The Atlantic Coast and Northern Great Plains populations of this species were listed as threatened on December 11, 1985 (50 FR 50726–50734). Today, only remnant populations occur throughout the historic range. Piping plovers spend 60 to 70 percent of the year wintering primarily along the Gulf Coast and Atlantic Coast from North Carolina to Florida.

The preferred wintering habitats of piping plover include beaches, sandflats, mudflats, algal mats, washover passes, and spoil islands along the Gulf Intracoastal Waterway.

The destruction, modification, and loss of habitat along with recreation disturbance continue to be the primary threats to the piping plover coastal migration and wintering range. Oil spills, predation, storms, wind farms, and severe cold weather are also of concern. Accelerating sea level rise and increases in storm frequency are thought to compound ongoing habitat losses. Military operations pose minimal threat to nonbreeding piping plovers (USFWS, 2020a).

The USFWS designated 142 areas along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas as critical habitat for wintering populations of the piping plover on July 10, 2001 (66 FR 36038). Piping plover critical habitat in the Action Area is shown in Figure 2-1. While critical habitat has been designated within NAS Corpus Christi, piping plovers have not been recorded within the boundaries of the station; however, a small number of these birds have been observed regularly along the western side of Oso Bay, adjacent to the eastern boundary of NAS Corpus Christi (Navy, 2016).

2.2.4 Red Knot

The red knot (*Calidris canutus rufa*) is one of six subspecies of red knot (*Calidris canutus*), each with its own migration route and yearly cycle. This subspecies was listed as threatened on January 12, 2015 (79 FR 73705–73748) This medium-sized shore bird migrates between breeding grounds in the central Canadian Arctic and four wintering regions: the Southeast United States and through the Caribbean; the Western Gulf of Mexico from Mississippi through Central America; northern Brazil and extending west along the northern coast of South America; and Tierra del Fuego at the southern tip of South America (mainly in Chile) and extending north along the Patagonian coast of Argentina. During the spring and fall migrations, the birds utilize staging and stopover sites to rest and feed (USFWS, 2020b). There are an estimated 63,600 rufa red knots distributed across these four geographically large wintering regions (USFWS, 2021b).

Coastal habitats used by red knots in migration and wintering areas are similar in character, generally coastal marine and estuarine habitats with large areas of exposed intertidal sediments. Migration and wintering habitats include both high-energy ocean or bayfront areas, as well as tidal flats in more sheltered bays and lagoons. Preferred wintering and migration habitats are muddy or sandy coastal areas, specifically, bays and estuaries, tidal flats, and unimproved tidal inlets (USFWS, 2020b).

Loss of breeding and nonbreeding habitat is attributed to sea level rise, coastal engineering, coastal development, and arctic ecosystem change. Secondary factors include hunting in nonbreeding areas; predation in nonbreeding areas; harmful algal blooms; human disturbance; oil spills; wind energy development, especially near the coasts; beach cleaning; agriculture; research activities; and disease (USFWS, 2021b).

Critical habitat has been proposed for this species in the Action Area (86 FR 37410–37668) and will largely overlap with piping plover critical habitat (Figure 2-1), however, it has not been finalized.

2.2.5 Whooping Crane

Whooping cranes (*Grus americana*) migrate from Wood Buffalo National Park in Canada to winter at Aransas National Wildlife Refuge in Texas. This species was listed as endangered on March 11, 1967 (32 FR 4001). An estimated 543 whooping cranes overwintered at the Aransas National Wildlife Refuge during the winter of 2021–22 (USFWS and CWS, 2023). Habitats used during breeding, migration, wintering, and foraging include coastal and inland marshes, estuaries, lakes, ponds, shallow bays, sand and tidal flats, wet meadows, rivers, pastures, and agricultural fields (USFWS, 2012).

Threats to the whooping crane include limited genetics of the population, loss and degradation of migration stopover habitat, construction of additional power lines, degradation of coastal ecosystems, and threat of chemical spills in Texas. Climate change, sea level rise, wind turbines, and collisions with other objects are also threats. Aircraft strikes are a rare event, due to the small number of whooping cranes, but are a rising concern (USFWS, 2012).

Critical habitat in the Action Area has been designated for the whooping crane (43 FR 20938–20942). It is primarily located in the Aransas National Wildlife Refuge and vicinity (Figure 2-1). (USFWS, 2016; Blackburn et al., 2021)

2.2.6 Tricolored Bat

The tricolored bat (*Perimyotis subflavis*) is one of the smallest bats native to North America. This species was proposed as endangered on September 14, 2022 (87 FR 56381–56393). The once-common species is wide ranging, occurring across the eastern and central United States and portions of southern Canada, Mexico, and Central America. During the winter, tricolored bats are found in caves and mines, although in the southern United States including Texas, where caves are sparse, tricolored bats are often found roosting in road-associated culverts. During the spring, summer, and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves (USFWS, 2022b).

Abundance of this species has declined by 24 percent in the Southern representation unit, which includes Texas (USFWS, 2021c). Threats to this species (in order of severity) include white-nose syndrome, wind energy related mortality, climate change, and habitat loss (USFWS, 2021c).

Critical habitat has not been designated for this species.

3 Analysis of Effects and Description of the Manner in Which the Action May Affect Any Listed (and/or Proposed) Species or Critical Habitat

3.1 Effects on Critical Habitat

The nearest proposed construction project would be approximately 1,700 meters from piping plover and red knot critical habitat. No other species' critical habitats are in the vicinity of Proposed Action construction. Proposed Action construction would have no effect on critical habitats.

The surrogate aircraft used to model the T-54A for noise modeling, the C-12 (a variant of Beechcraft King Air that uses the same engines as the T-54A), has the same noise properties as the aircraft it is replacing, the T-44C. Results of noise modeling indicate that noise impacts would be minimal as the only factor that would change would be operations tempo. Noise from Proposed Action operations would have no effect on critical habitats.

3.2 Effects on Federally Listed Species

3.2.1 Eastern Black Rail, Northern Aplomado Falcon, Piping Plover, Red Knot, and Whooping Crane

Under the Proposed Action air operations would increase by 10 percent. Threatened and endangered bird species in the Action Area consisting of NAS Corpus Christi, Naval Outlying Landing Field (NOLF) Cabaniss, and international, regional, and publicly owned municipal airfields proposed for increased operations are already exposed to and would be potentially habituated to aircraft operations. As the noise properties of the T-54A would be expected to be the same as the T-44C, there would be no significant change in noise associated with the proposed increase in airfield operations as compared with baseline conditions.

However, there could be a minor increase in aircraft strike potential for threatened and endangered birds. The potential for interactions between aircraft and birds that migrate or transit through the Action Area would be increased proportionally to the 10 percent increase in aircraft operations.

Strikes involving threatened or endangered species have not been recorded while operating the T-44C aircraft; therefore, strikes involving T-54A aircraft would not be expected because the aircraft would operate in a similar manner (e.g., same training operations at the same locations and within the same airspace) and are virtually the same size (see Table 1-1).

Continued implementation of the Bird/Animal Aircraft Strike Hazard (BASH) Reduction Plan (Navy, 2011) at NAS Corpus Christi and NOLF Cabaniss would reduce BASH risk. Non-Navy training airfields also implement measures to mitigate BASH risk and adhere to Federal Aviation Administration (FAA) regulations, including conducting the required airport Wildlife Hazard Assessments and Wildlife Hazard Management Plans. In addition to these plans, the Visual Flight Rule Course Rules for Training Air Wing Four require that aircraft maintain altitudes above 3,000 feet above ground level when overflying Aransas National Wildlife Refuge, to include Matagorda Island and Padre Island National Seashore. This requirement exceeds the FAA altitude guidelines for flights over National Wildlife Refuges. These guidelines were recommended by the USFWS during informal consultation to reduce BASH risk for prior flight training operations at NAS Corpus Christi (USFWS, 2017).

The Navy has determined that the Proposed Action may affect, but is not likely to adversely affect, the eastern black rail, northern aplomado falcon, piping plover, red knot, and whooping crane, as individuals of these species are at risk, although negligible, of potential aircraft strike during flight.

3.2.2 Tricolored Bat

Habitat for this species of bat does not occur at any of the Proposed Action airfields. This bat has not been recorded at any of the Proposed Action airfields, however, this species may still be present in the Action Area, e.g., transiting the airfields or foraging in the area. Bat strikes make up an extremely small minority of the recorded BASH incidents (Block, 2022; FAA, 2022). T-54A night operations are planned to comprise only 7 percent of total operations. Therefore, strikes involving this species are unlikely. The Navy has determined that the Proposed Action may affect, but is not likely to adversely affect, the tricolored bat.

3.3 Cumulative Effects

Cumulative effects are defined in 50 CFR Section 402.02 (Interagency Cooperation on the Endangered Species Act of 1973, as amended): "...those effects of future State or private activities not involving Federal activities that are reasonably certain to occur within the Action Area of the Federal action subject to consultation." Reasonably foreseeable future federal actions and potential future federal actions that are unrelated to the Proposed Action are not considered in the analysis of cumulative effects because they would require separate consultation pursuant to section 7 of the Endangered Species Act. Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area.

A review of proposed and upcoming projects for southeast Texas did not locate any projects that would result in cumulative effects when combined the Proposed Action.

4 Conclusion

Table 4-1 summarizes the Navy's Endangered Species Act determinations of effects of the Proposed Action for each of the species analyzed in this Biological Evaluation.

Table 4-1 Endangered Species Act Determinations

Species	*Endangered Species Act Determination*
Eastern black rail (*Laterallus jamaicensis jamaicensis*)	May affect, not likely to adversely affect
Northern aplomado falcon (*Falco femoralis septentrionalis*)	May affect, not likely to adversely affect
Piping plover (*Charadrius melodus*)	May affect, not likely to adversely affect
Red knot (*Calidris canutus rufa*)	May affect, not likely to adversely affect
Whooping crane (*Grus americana*)	May affect, not likely to adversely affect
Tricolored bat (*Perimyotis subflavis*)	May affect, not likely to adversely affect

5 Birds Covered by the Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

The Proposed Action would, in the long term, recapitalize or demolish buildings that may contain active bird nests within the buildings or on the rooftop. Building demolition work and tree removal (if any) would, to the extent feasible, take place outside of the breeding season. If work must be conducted during the bird breeding season, a qualified biologist will confirm that no active nests would be impacted by these actions. The qualified biologist will survey the area within 72 hours of commencing work to determine if active nests are present. If an active nest is found in the project area at any time during project work, work would be halted immediately, and the NAS Corpus Christi Wildlife Biologist would be contacted. Any removal action must be overseen by the NAS Corpus Christi Wildlife Biologist. The NAS Corpus Christi Wildlife Biologist, in coordination with the qualified biologist, will confirm that there would be no impacts to active nests before construction work could resume. With implementation of these measures, construction activities associated with the Proposed Action would not result in takes of migratory birds or their active nests.

Under the Proposed Action, there would be a minor increase in aircraft strike potential for birds corresponding to the increase in operations.

Bird/aircraft collisions are not an acknowledged population level stressor for any bird species and are not mentioned in the literature regarding sources of direct anthropogenic mortality. Collisions between aircraft and birds are estimated to account for a small percentage of all bird deaths per year (USFWS, 2022c). Kelly and Allen (2006) concluded that it is likely that mortalities from bird aircraft collisions are not additive (i.e., in excess of what would occur naturally) and, therefore, are not of conservation concern. Population-level anthropogenic sources of mortality commonly cited for birds include cats, buildings, automobiles, powerlines, wind turbines, pesticides, gill nets, oil and gas activities, and marine longlines/trawls (Loss et al., 2015; Kelly & Allan, 2006).

From August 2020 through July 2022, the Proposed Action airfields that recorded BASH data (NAS Corpus Christi, NOLF Cabaniss, Corpus Christi International Airport, Palacios Municipal Airport, Valley International Airport, and Victoria Regional Airport), reported between 214 and 327 bird/wildlife strikes per year total for all aircraft operations (not just T-44C). A wide range of bird species were struck, though the identity of numerous impacted birds was not determined.

Due to the low number of strikes when compared to the overall operations numbers and the information presented above, additional strikes resulting from the 10 percent increase in flight operations under the Proposed Action would not pose population-level risks for any bird species.

Continued implementation of the BASH Plan at NAS Corpus Christi and NOLF Cabaniss would reduce BASH risk. International, regional, and publicly owned municipal airfields also implement measures to mitigate BASH risk by adhering to FAA regulations, including conducting required Wildlife Hazard Assessments and implementing Wildlife Hazard Management Plans.

For compliance with the Migratory Bird Treaty Act (MBTA), the Navy has determined that the Proposed Action may result in the incidental "take" of native birds protected by the MBTA by operation of the T-54A aircraft. The definition of "take," as defined by the MBTA is "pursue, hunt, shoot, wound, kill, trap, capture, or collect." Under the MBTA's regulations that are applicable to military readiness activities (50 CFR part 21), the USFWS has promulgated a rule that authorizes the incidental take of MBTA-listed birds, provided it does not result in significant adverse effects on their population. The

Proposed Action is not expected to result in adverse impacts on any migratory bird species populations with current standard operating procedures (e.g., BASH Plan and Wildlife Hazard Management Plans).

The term "take," as defined by the USFWS for Bald and Golden Eagle Protection Act purposes, means to "pursue, shoot, shoot at, poison, wound, kill, trap, capture, trap, collect, molest or disturb." Although there is no exemption for military readiness activities from the Bald and Golden Eagle Protection Act, a prohibited "take" is unlikely due to:

- Lack of previous takes of eagles by historical operation of T-44C aircraft
- Implementation of the BASH Plan at NAS Corpus Christi and NOLF Cabaniss
- Implementation of Wildlife Hazard Management Plans for the international, regional, and publicly owned municipal airfields
- The absence of eagle nests in the vicinity of Proposed Action airfields (There are no bald eagle nests or occurrences in proximity to any of the Proposed Action airfields [see Figure 2-1].)

The Proposed Action does not require an eagle take permit.

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ENCLOSURE 2: USFWS OFFICIAL SPECIES LIST, PROJECT CODE 2022-0050570

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Texas Coastal Ecological Services Field Office
4444 Corona Drive, Suite 215
Corpus Christi, TX 78411
Phone: (281) 286-8282 Fax: (281) 488-5882

In Reply Refer To: June 06, 2022
Project Code: 2022-0050570
Project Name: NAS Corpus Christi Multi-Engine Trainer System

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The U.S. Fish and Wildlife Service (Service) field offices in Clear Lake, Tx, and Corpus Christi, Tx, have combined administratively to form the Texas Coastal Ecological Services Field Office. A map of the Texas Coastal Ecological Services Field Office area of responsibility can be found at: http://www.fws.gov/southwest/es/TexasCoastal/Map.html. All project related correspondence should be sent to the field office responsible for the area in which your project occurs. For projects located in southeast Texas please write to: Field Supervisor; U.S. Fish and Wildlife Service; 17629 El Camino Real Ste. 211; Houston, Texas 77058. For projects located in southern Texas please write to: Field Supervisor; U.S. Fish and Wildlife Service; P.O. Box 81468; Corpus Christi, Texas 78468-1468. For projects located in six counties in southern Texas (Cameron, Hidalgo, Starr, Webb, Willacy, and Zapata) please write: Santa Ana NWR, ATTN: Ecological Services Sub Office, 3325 Green Jay Road, Alamo, Texas 78516.

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:
http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- Migratory Birds
- Marine Mammals
- Coastal Barriers
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Texas Coastal Ecological Services Field Office
4444 Corona Drive, Suite 215
Corpus Christi, TX 78411
(281) 286-8282

Project Summary

Project Code: 2022-0050570
Event Code: None
Project Name: NAS Corpus Christi Multi-Engine Trainer System
Project Type: Airport - Maintenance/Modification
Project Description: Replace T-44C multi-engine trainer with new aircraft at NAS Corpus Christi. Utilize area airfields for training (proposed airfields encompassed in polygon). Modification of NAS Corpus Christi infrastructure to support new aircraft (new and renovated hangars). Project is undergoing NEPA analysis.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@27.3381203,-97.50017537080508,14z

Counties: Texas

Endangered Species Act Species

There is a total of 21 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Gulf Coast Jaguarundi *Puma yagouaroundi cacomitli* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3945	Endangered
Ocelot *Leopardus (=Felis) pardalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4474	Endangered
West Indian Manatee *Trichechus manatus* There is **final** critical habitat for this species. The location of the critical habitat is not available. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/4469	Threatened

Birds

NAME	STATUS
Attwater's Greater Prairie-chicken *Tympanuchus cupido attwateri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7259	Endangered
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Northern Aplomado Falcon *Falco femoralis septentrionalis* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1923	Endangered
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Whooping Crane *Grus americana* Population: Wherever found, except where listed as an experimental population There is **final** critical habitat for this species. Your location overlaps the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/758	Endangered

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: North Atlantic DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Hawksbill Sea Turtle *Eretmochelys imbricata* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3656	Endangered
Kemp's Ridley Sea Turtle *Lepidochelys kempii* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5523	Endangered
Leatherback Sea Turtle *Dermochelys coriacea* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1493	Endangered
Loggerhead Sea Turtle *Caretta caretta* Population: Northwest Atlantic Ocean DPS There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1110	Threatened

Clams

NAME	STATUS
False Spike *Fusconaia mitchelli* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3963	Proposed Endangered
Guadalupe Orb *Cyclonaias necki* Population: There is **proposed** critical habitat for this species. The location of the critical habitat is not available.	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Black Lace Cactus *Echinocereus reichenbachii var. albertii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5560	Endangered
Slender Rush-pea *Hoffmannseggia tenella* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5298	Endangered
South Texas Ambrosia *Ambrosia cheiranthifolia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3331	Endangered
Texas Ayenia *Ayenia limitaris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4942	Endangered

Critical habitats

There are 2 critical habitats wholly or partially within your project area under this office's jurisdiction.

NAME	STATUS
Piping Plover *Charadrius melodus* https://ecos.fws.gov/ecp/species/6039#crithab	Final
Whooping Crane *Grus americana* https://ecos.fws.gov/ecp/species/758#crithab	Final

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American Golden-plover *Pluvialis dominica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
American Oystercatcher *Haematopus palliatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8935	Breeds Apr 15 to Aug 31
Audubon's Shearwater *Puffinus lherminieri* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Aug 5

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Black Scoter *Melanitta nigra* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Black Skimmer *Rynchops niger* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5234	Breeds May 20 to Sep 15
Black-legged Kittiwake *Rissa tridactyla* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Brown Pelican *Pelecanus occidentalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/6034	Breeds Jan 15 to Sep 30
Chestnut-collared Longspur *Calcarius ornatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Common Loon *gavia immer* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/4464	Breeds Apr 15 to Oct 31
Cory's Shearwater *Calonectris diomedea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Double-crested Cormorant *phalacrocorax auritus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/3478	Breeds Apr 20 to Aug 31

NAME	BREEDING SEASON
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Great Shearwater *Puffinus gravis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Gull-billed Tern *Gelochelidon nilotica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9501	Breeds May 1 to Jul 31
Hudsonian Godwit *Limosa haemastica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
King Rail *Rallus elegans* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Long-billed Curlew *Numenius americanus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere
Long-tailed Duck *Clangula hyemalis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/7238	Breeds elsewhere
Magnificent Frigatebird *Fregata magnificens* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Marbled Godwit *Limosa fedoa* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere

NAME	BREEDING SEASON
Mountain Plover *Charadrius montanus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3638	Breeds elsewhere
Orchard Oriole *Icterus spurius* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Jun 10 to Aug 15
Pomarine Jaeger *Stercorarius pomarinus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red Phalarope *Phalaropus fulicarius* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Red-breasted Merganser *Mergus serrator* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Red-necked Phalarope *Phalaropus lobatus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Red-throated Loon *Gavia stellata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Reddish Egret *Egretta rufescens* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/7617	Breeds Mar 1 to Sep 15
Ring-billed Gull *Larus delawarensis* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere

NAME	BREEDING SEASON
Royal Tern *Thalasseus maximus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Apr 15 to Aug 31
Ruddy Turnstone *Arenaria interpres morinella* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Short-billed Dowitcher *Limnodromus griseus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Sooty Tern *Onychoprion fuscatus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Mar 10 to Jul 31
Sprague's Pipit *Anthus spragueii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8964	Breeds elsewhere
Surf Scoter *Melanitta perspicillata* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Swallow-tailed Kite *Elanoides forficatus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30
White-winged Scoter *Melanitta fusca* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds elsewhere
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5
Wilson's Plover *Charadrius wilsonia* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Aug 20
Yellow Rail *Coturnicops noveboracensis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9476	Breeds elsewhere

Probability Of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

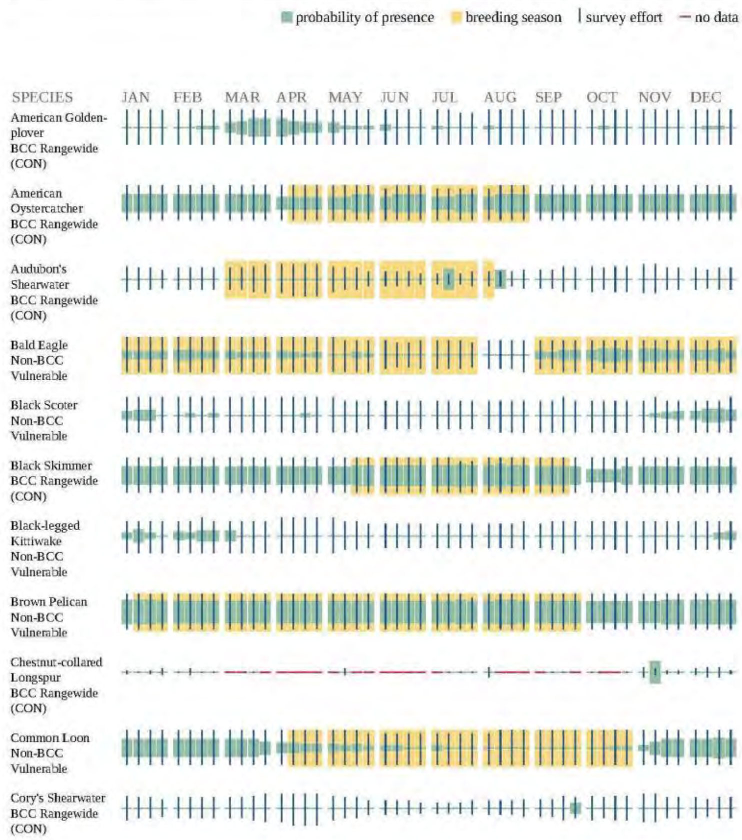
Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

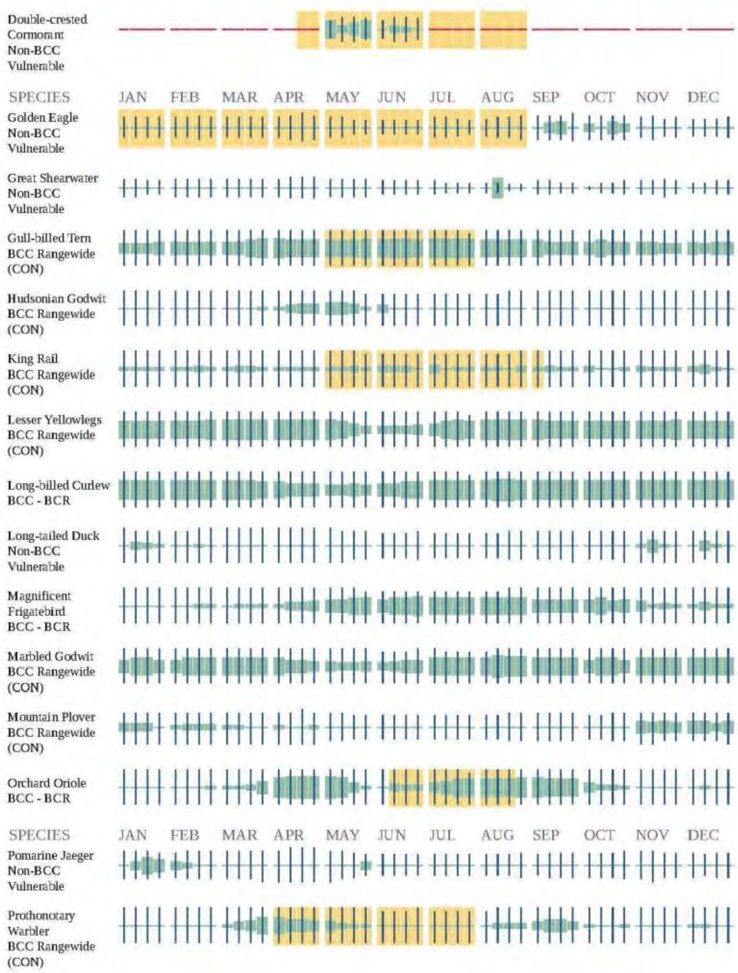
Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Double-crested Cormorant
Non-BCC Vulnerable
SPECIES
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Golden Eagle
Non-BCC Vulnerable
Great Shearwater
Non-BCC Vulnerable
Gull-billed Tern
BCC Rangewide (CON)
Hudsonian Godwit
BCC Rangewide (CON)
King Rail
BCC Rangewide (CON)
Lesser Yellowlegs
BCC Rangewide (CON)
Long-billed Curlew
BCC - BCR
Long-tailed Duck
Non-BCC Vulnerable
Magnificent Frigatebird
BCC - BCR
Marbled Godwit
BCC Rangewide (CON)
Mountain Plover
BCC Rangewide (CON)
Orchard Oriole
BCC - BCR
SPECIES
JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
Pomarine Jaeger
Non-BCC Vulnerable
Prothonotary Warbler
BCC Rangewide (CON)

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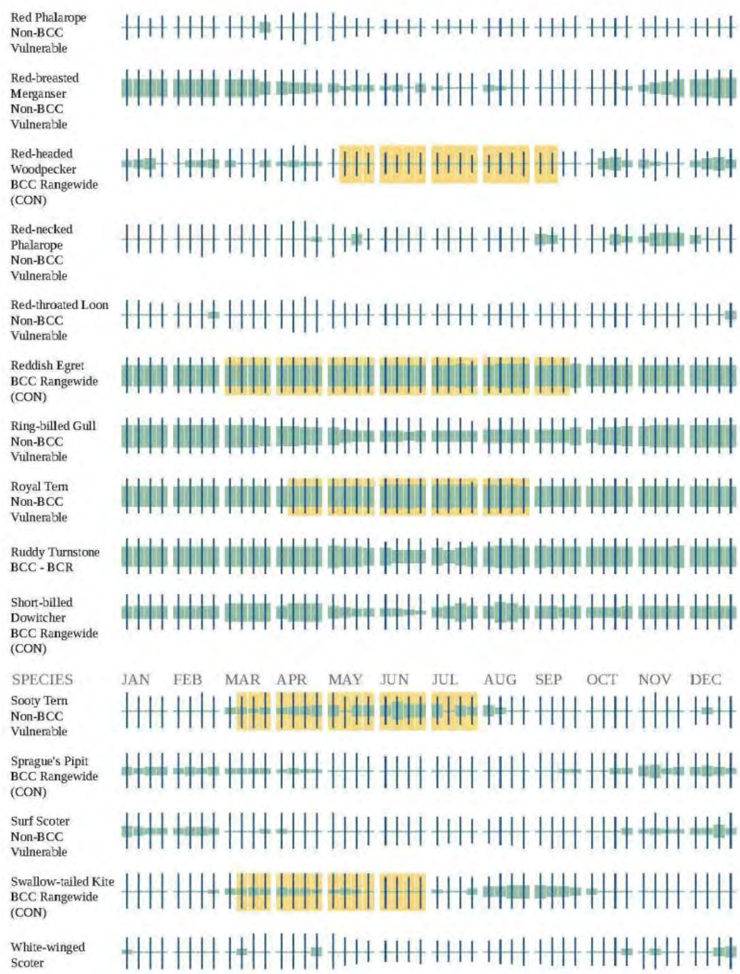
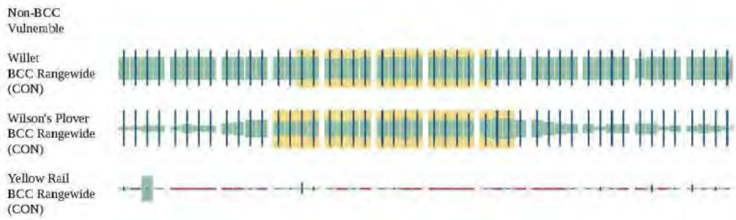

Red Phalarope
Non-BCC
Vulnerable
Red-breasted
Merganser
Non-BCC
Vulnerable
Red-headed
Woodpecker
BCC Rangewide
(CON)
Red-necked
Phalarope
Non-BCC
Vulnerable
Red-throated Loon
Non-BCC
Vulnerable
Reddish Egret
BCC Rangewide
(CON)
Ring-billed Gull
Non-BCC
Vulnerable
Royal Tern
Non-BCC
Vulnerable
Ruddy Turnstone
BCC - BCR
Short-billed
Dowitcher
BCC Rangewide
(CON)
SPECIES
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP
OCT
NOV
DEC
Sooty Tern
Non-BCC
Vulnerable
Sprague's Pipit
BCC Rangewide
(CON)
Surf Scoter
Non-BCC
Vulnerable
Swallow-tailed Kite
BCC Rangewide
(CON)
White-winged
Scoter



Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

Migratory Birds FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?
Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides

birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Coastal Barriers

Projects within the John H. Chafee Coastal Barrier Resources System (CBRS) may be subject to the restrictions on federal expenditures and financial assistance and the consultation requirements of the Coastal Barrier Resources Act (CBRA) (16 U.S.C. 3501 et seq.). For more information, please contact the local Ecological Services Field Office or visit the CBRA Consultations website. The CBRA website provides tools such as a flow chart to help determine whether consultation is required and a template to facilitate the consultation process.

UNIT	NAME	TYPE	ESTABLISHMENT DATE	FLOOD INSURANCE DATE
T07	Matagorda Peninsula	System Unit	10/18/1982	10/1/1983
T07	Matagorda Peninsula	System Unit	11/16/1990	11/16/1990
T08	San Jose Island	System Unit	10/18/1982	10/1/1983
T10	North Padre Island	System Unit	10/18/1982	10/1/1983
T11	South Padre Island	System Unit	10/18/1982	10/1/1983
T12	Boca Chica	System Unit	11/16/1990	11/16/1990
T12	Boca Chica	System Unit	11/15/1993	11/16/1991
TX-17	Shamrock Island	System Unit	11/16/1990	11/16/1990
TX-19	Starvation Point	System Unit	11/16/1990	11/16/1990
TX-21	Kleberg Point	System Unit	11/16/1990	11/16/1990
T07P	Matagorda Peninsula	Otherwise Protected Area	N/A	11/16/1991
T08P	San Jose Island	Otherwise Protected Area	N/A	11/16/1991
T10P	North Padre Island	Otherwise Protected Area	N/A	11/16/1991
T11P	South Padre Island	Otherwise Protected Area	N/A	11/16/1991
TX-06P	Matagorda Island	Otherwise Protected Area	N/A	10/1/1983
TX-06P	Matagorda Island	Otherwise Protected Area	N/A	11/16/1991

UNIT	NAME	TYPE	ESTABLISHMENT DATE	FLOOD INSURANCE DATE
TX-15P	Mustang Island	Otherwise Protected Area	N/A	11/16/1991
TX-17P	Shamrock Island	Otherwise Protected Area	N/A	11/16/1991

Marine Mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

NAME

West Indian Manatee *Trichechus manatus*
Species profile: https://ecos.fws.gov/ecp/species/4469

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

Due to your project's size, the list below may be incomplete, or the acreages reported may be inaccurate. For a full list, please contact the local U.S. Fish and Wildlife office or visit https://www.fws.gov/wetlands/data/mapper.HTML

FRESHWATER EMERGENT WETLAND

- Palustrine

RIVERINE

- Riverine

ESTUARINE AND MARINE DEEPWATER

- Estuarine

IPaC User Contact Information

Agency: Department of Defense
Name: Vincent Passaro
Address: 724B Thimble Shoals Blvd.
City: Newport News
State: VA
Zip: 23606
Email passarov@leidos.com
Phone: 7572692034

Appendix C
National Historic Preservation Act Section 106 Documentation

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From: Goodwin, Sara R CIV USN NAVFAC LANT NOR VA (USA)
To: Farrell, Peggy [US-US]
Cc: Thompson, Gregory S CIV USN (USA)
Subject: EXTERNAL: FW: [Non-DoD Source] HANGARS 57 AND 58, NASCC
Date: Wednesday, July 5, 2023 11:31:02 AM
Attachments: ~WRD031.jpg
Final_METS MOA.docx
Final_METS MOA.pdf

Peggy,
Final MOA signed.

Vr,
Sara

From: Calabrese, John A CIV USN NAVFAC SE JAX FL (USA) <john.a.calabrese4.civ@us.navy.mil>
Sent: Wednesday, July 5, 2023 10:28 AM
To: Goodwin, Sara R CIV USN NAVFAC LANT NOR VA (USA) <sara.r.goodwin.civ@us.navy.mil>
Subject: FW: [Non-DoD Source] HANGARS 57 AND 58, NASCC

Sara:

Trailing is the THC's assent to the MOA. I just returned from two weeks leave, so my apologies for the delay. I have attached the MOA, now marked as Final, with the changes to Stipulation 1.8 as we had vetted by the lawyers.

Who sends this on to Capt. Jurica for signature? Me, or Mary?

V/r,

John

From: noreply@thc.state.tx.us <noreply@thc.state.tx.us>
Sent: Friday, June 23, 2023 12:59 PM
To: Calabrese, John A CIV USN NAVFAC SE JAX FL (USA) <john.a.calabrese4.civ@us.navy.mil>; reviews@thc.state.tx.us
Subject: [Non-DoD Source] HANGARS 57 AND 58, NASCC

Re: Project Review under Section 106 of the National Historic Preservation Act

THC Tracking #202308548
Date: 06/23/2023
HANGARS 57 AND 58, NASCC
Naval Air Station Corpus Christi

Description: Revised MOA Submission

Dear Dr. John Calabrese:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Jeff Durst and Alexander Shane, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- THC/SHPO concurs with information provided.

We have the following comments: The Division of Architecture Review Staff, led by Alexander Shane, wants to thank the Navy for the 2nd submission of the METS draft MOA. In the next submission please submit a clean copy for our review and finalization. We look forward to further consultation.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Jeff.Durst@thc.texas.gov, Alexander.Shane@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

DocuSign Envelope ID: 20790264-6506-45B8-B4AA-89BD3F31727E

MEMORANDUM OF AGREEMENT BETWEEN THE UNITED STATES NAVY AND THE TEXAS STATE HISTORIC PRESERVATION OFFICER REGARDING THE DEMOLITION OF HANGARS 57 AND 58 AND SUPPORT BUILDINGS 57A, 57B, and 58A AT NAVAL AIR STATION CORPUS CHRISTI NUECES COUNTY, TEXAS

WHEREAS, the United States Navy (Navy) is planning to implement the critical Multi-Engine Training System (METS) at NAS Corpus Christi (NASCC) which entails the introduction of new training aircraft along the flight line; and,

WHEREAS, Hangars 51, 55, 56, 57, and 58, and support buildings 56A, 56B, 57A, 57B, and 58A along the flight line are contributing resources of the Landplane Hangars Historic District found eligible under Criterion A for its association with World War II (WWII) history; and,

WHEREAS, the Navy has concluded that the WWII hangars have exceeded their "life expectancy" and do not afford sufficient interior space to support METS; and,

WHEREAS, the Navy has concluded that Hangars 57 and 58 are optimally sited on the flight line to support METS; and,

WHEREAS, the Navy is currently evaluating alternative construction options that include the demolition or recapitalization of Hangars 57 and 58 to support METS; and,

WHEREAS, the demolition option would entail razing Hangars 57 and 58 and constructing in their footprint a single large replacement hangar or multiple fabric-tension structures to house training aircraft; and,

WHEREAS, the recapitalization option would entail deconstructing Hangars 57 and 58 to their structural frames and rebuilding the facilities to accommodate METS space requirements in compliance with current building and safety codes; and,

WHEREAS, the demolition or recapitalization of Hangars 57 and 58 both entail "physical destruction of or damage to all or part" of Hangars 57 and 58 and constitute an adverse effect pursuant to 36 CFR 800.5(a)(2)(i); and,

WHEREAS, the demolition or recapitalization of Hangars 57 and 58 will prompt the demolition of non-functional WWII storage buildings 57A, 57B, and 58A due to their loss of historical association; and,

WHEREAS, storage buildings 57A, 57B, and 58A are contributing resources of the Landplane Hangars Historic District and their demolition constitutes an adverse effect pursuant to 36 CFR 800.5(a)(2)(i); and,

WHEREAS, in accordance with 36 CFR Section 800.6(a)(1)(iii), the ACHP has declined to participate in consultation regarding METS; and,

NOW, THEREFORE, the Navy (and consulting parties) agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

I. STIPULATIONS

The Navy agrees to undertake the following actions, following SHPO concurrence, to mitigate the demolition or recapitalization of Hangars 57 and 58 and the demolition of support facilities 57A, 57B, and 58A (Subject Properties):

1. The Navy will contact the SHPO when program funding is received and represent a final decision on demolishing or recapitalizing the Subject Properties in support of METS.

2. Prior to demolition or recapitalization, the Navy will coordinate the salvage and removal of select structural elements, as appropriate, from the Subject Properties for potential use in extant World War II hangars at NASCC or other installations in the Southeastern Area of Operations (AOR). Such elements including windows, doors, and hardware fixtures will be inventoried and curated at the installation in secure and environmentally-regulated conditions. The Navy will provide a roster of all recovered items and circulate the list to the SHPO within 270 calendar days following the final execution of this instrument.

3. Prior to demolition or recapitalization, the Navy will ensure that original "as-built" drawings of the Subject Properties are located and adequately curated, as they are available. The Navy does not anticipate that Historic American Building Survey documentation of the Subject Properties is required. The Navy will convey digital copies of all available "as-built" drawings to the SHPO within 270 calendar days following the final execution of this instrument.

4. Prior to demolition or recapitalization, the Navy will endeavor to locate all historic photographs of the Subject Properties. The Navy will convey digital copies of available historic photographs to the SHPO within 270 calendar days following the final execution of this instrument.

5. Prior to demolition or recapitalization, the Navy will undertake digital photographic documentation of the Subject Properties. The photography shall conform to the requirements of NPS National Register Photo Policy Factsheet found at: https://www.nps.gov/subjects/nationalregister/publications.htm. The format, number, and type of photographs shall be determined in consultation with the SHPO. The Navy will convey all photographic documentation to the SHPO within 270 calendar days following the final execution of this instrument.

6. Following salvage recovery and drawing/photographic documentation, the consulting parties will review the records. Once those records are approved and deemed sufficient by all consulting parties, the Navy will demolish or recapitalize the Subject Properties at its earliest convenience.

7. The Navy will represent the history of the Subject Resources in text and photographs on the NASCC public website. All such content and the manner in which it is presented will be coordinated with the consulting parties. The Navy will create the public website within 270 calendar days following the final execution of this instrument.

8. Following the completion of all ground construction actions associated with METS, NASCC will erect a commemorative sign or signs in the Landplane Hangars Historic District that depicts the Subject Properties and their role in the WWII mission. The Navy will coordinate the contents, medium, and placement of the sign with all the consulting parties. The Navy will erect signage at a safe location within 270 calendar days following the final execution of this instrument. The sign shall conform to the NASCC Installation Appearance Plan and be designed and fabricated in a manner consistent with the Department of the Interior's Wayside Exhibits: A Guide to Developing Outdoor Interpretive Exhibits (Wayside Guide) (nps.gov). THC will review the sign at the 30% design stage, at which time fabrication of the sign may proceed.

II. ADMINISTRATIVE STIPULATIONS

A. Resolving Objections

1. Should any signatory or concurring party to this MOA object to any action carried out or proposed by the Navy with respect to the implementation of this agreement, the Navy shall consult with the objecting party to attempt resolution of the objection. If after initiating such consultation, the Navy determines that the objection cannot be resolved through consultation, the Navy will forward all documentation relevant to the disagreement to the ACHP, including the Navy's proposed response to the objection. The ACHP shall provide the Navy with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Navy shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the

ACHP, signatories and concurring parties, and provide them with a copy of this written response. The Navy will then proceed according to its final decision.

2. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, the Navy may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Navy shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

3. The Navy's responsibility to carry out all actions under this MOA that are not subject to the dispute shall remain unchanged.

4. At any time during implementation of the measures stipulated in this MOA, should an objection pertaining to this MOA be raised by a member of the public, the Navy shall notify the parties to this MOA and take the objection into account, consulting with the objector and, should the objector so request, with any of the parties to this MOA in an attempt to resolve the objection.

B. Amendments and Termination

1. This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

2. If the Navy determines that it cannot implement the terms of this MOA, or if any party determines that the MOA is not properly implemented, the Navy and/or its consulting parties may propose to the other parties that the MOA be terminated.

3. The party proposing to terminate this MOA shall so notify all parties to this MOA, explaining the reasons for termination and affording them at least thirty (30) calendar days to consult and seek alternatives to termination, including amendment per Stipulation II.B.1.

4. Should such consultation fail and the MOA be terminated, the Navy shall ensure that each action that would otherwise be covered by this MOA is reviewed in accordance with 36 CFR §800.4 through 800.6.

C. MOA Duration

This MOA shall be null and void if its terms are not carried out within ten (10)) years from the date of its execution unless the signatories agree in writing to an extension for carrying out its terms. The Navy shall notify the signatories when it has determined that all of the stipulations have been implemented.

III. ANTI-DEFICIENCY ACT

A. All requirements set forth in this MOA requiring the expenditure of Government funds are expressly subject to the availability of appropriations and the requirements of the Anti-Deficiency Act, 31 U.S.C. Part 1341. No obligation of this MOA shall require or be construed to require a commitment by the Navy to expend funds not appropriated for a legally sufficient purpose.

B. The obligations of this MOA as to the Navy are severable. If the Navy cannot perform any obligation set forth in this MOA because of the unavailability of funds, the parties intend that the remainder of the MOA be executed to the greatest extent practicable. The parties agree to consult in accordance with Stipulation II.B on any obligation of the MOA that cannot be performed because of the unavailability of funds.

IV. EXECUTION

Execution of this MOA by the Navy and its consulting parties, and implementation of its terms, confirms that the Navy has afforded the ACHP an opportunity to comment on the Project and its effects on historic properties, and that the Navy has taken into account the effects of the Project on historic properties.

PRINCIPAL SIGNATORIES

Captain Ty Jurica
Commanding Officer, NAS Corpus Christi

By: Ty J

Date: 8/23/2023

Texas State Historic Preservation Officer
Mr. Mark Wolfe

By: DocuSigned by: Mark Wolfe A2A0711769D2462... Date: 8/21/2023

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CONCURRING SIGNATORIES

Nueces County Historical Commission
Kathy Wemer, President

By:____________________________ Date:________

8

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND SOUTHEAST
JACKSONVILLE, FL 32212-0030

5090
Ser EV/00302
April 18, 2023

Mr. Mark Wolfe
Executive Director
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, TX 78711-2276

SUBJECT: A PROPOSAL TO DEMOLISH HANGARS 57 AND 58 AND THREE ANCILLARY FACILITIES IN SUPPORT OF THE MULTI-ENGINE TRAINING SYSTEM AT NAVAL AIR STATION CORPUS CHRISTI

This letter serves to invite your office to consult in the matter of the Navy proposal to demolish Hangars 57 and 58 and small ancillary facilities 57A, 57B, and 58A in support of the Multi-Engine Training System (METS) at Naval Air Station Corpus Christi (NASCC), Nueces County, Texas.

These hangars and ancillary facilities are contributing resources to the Landplane Hangars Historic District at NASCC and their demolition constitutes an adverse effect under 36 CFR 800.5(a)(2)(i). This undertaking and its effects are being considered under Section 106 of the *National Historic Preservation Act of 1966*, as amended, and its implementing regulations found at 36 CFR 800.

MISSION REQUIREMENTS

Pilot training is the primary operational role of NASCC and METS represents the latest critical evolution in aviation training. NASCC serves as the primary training facility for multi-engine aircraft and the failure to accommodate the METS program jeopardizes Navy, Marine Corps, and Coast Guard pilot instruction as well as Navy readiness throughout the globe.

The METS program will replace the T-44C Pegasus aircraft currently operated by Training Air Wing Four at NASCC with the Beechcraft King 260, a new multi-engine turboprop aircraft (Enclosure 1). The transition to the new training platform will occur in late 2024.

Airfield space at NASCC is limited and predominated by World War II (WWII) hangars 51, 55, 56, 57, and 58 and small support buildings 51A, 56A, 56B, 57A, 57B, and 58A. These 11 facilities comprise the Landplane Hangars Historic District (Enclosure 2). Exceeding their 80th year of service, these facilities have exceeded their "life expectancy" and cannot accommodate modern aviation platforms and training requirements. Given the optimal airfield location of Hangars 57 and 58, the Navy proposes to demolish or recapitalize these facilities in service to the METS program.

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PROPOSED ACTION

The Navy is currently evaluating two viable construction options to support the METS program.

The first option entails the complete demolition and removal of Hangars 57 and 58 to make way for the construction of a large "super hangar" or a series of smaller tension-fabric tent structures designed to secure and house aircraft.

The second option entails the recapitalization of Hangars 57 and 58, a construction process whereby the facilities are stripped down to their structural steel skeletons, inspected, repaired, and then fully rebuilt using modern materials that satisfy current building and safety codes. The Navy acknowledges that both construction actions incur an adverse effect under 36 CFR 800.5(a)(2)(i) in that they involve the "physical destruction of or damage to all or part" of the facilities.

With the hangars removed or rebuilt, the Navy will demolish ancillary facilities 57A, 57B, and 58A due to the loss of their functional and historical association. These small buildings once stored ammunition or maintenance supplies at a safe distance from the main hangars, a practice that is no longer exercised in modern hangar construction.

Once the program is fully underway, METS equipment will be stored in Building 1218, a hangar constructed in 1954 that was determined ineligible for listing in the National Register of Historic Places (NRHP). Ground-based METS training will occur in Building 83, an aviation instructional facility constructed in 2010 that does not exhibit Criteria Consideration G characteristics. Neither proposed action has the potential to affect other historic properties.

In addition, Hangar 42, a 1941 construction that contributes to the Seaplane Hangars Historic District, will be used as "swing space" during the course of the METS project. In compliance with safety codes, the hangar interior will be refitted with fire detection and suppression systems. All work will be conducted within the non-contributing interior of the hangar and will not diminish the qualifying characteristics of this historic property.

The METS program will be funded in 2027. At that time, the Navy will select the best construction option to promote mission success and consult your office on the steps that will be taken to avoid, minimize, or mitigate effects on historic properties.

MITIGATING ADVERSE EFFECTS

For the purposes of Section 106 consultation and the resolution of adverse effects, the Navy submits that neither proposed construction action is complex or complicated by greater unknowns that might warrant the implementation of a Programmatic Agreement (PA). In contrast, the Navy concludes that the proposed METS project is better managed through a concise Memorandum of Agreement (MOA) and details its reasoning below.

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As opposed to a miles-long corridor project where the right-of-way may need to be adjusted in course, both METS construction actions entail demolition to "all or part" of the facilities that are sited in a confined Area of Potential Effects (APE).

As opposed to myriad constructions that could affect viewsheds over a large expanse, the proposed action to recapitalize Hangars 57 and 58 or install tension-fabric tent structures will occur in a small footprint that is decidedly industrial in appearance.

The Navy maintains that the recapitalization and creation of new facilities which closely resemble the WWII hangars or the introduction of tent structures do not have the potential to affect significant cultural resources. The Navy submits that the retention of Hangars 51, 55, and 56 and ancillary support buildings 51A, 56A, 56B will continue to convey the Criterion A association of the Landplane Hangars Historic District and its mission during WWII.

Demolition and deconstruction can incur potential effects on archaeological resources that may be located underfoot. Documentary evidence confirms that the NASCC airfield was significantly remodeled through grading and filling during its original construction in 1941. Numerous archaeological investigations conducted at the installation over many years have revealed that no archaeological sites are present at NASCC.

A large-scale Section 110 survey of the remaining undeveloped parcels (204 acres) was conducted in late 2021, also failing to identify archaeological resources. The Navy consulted your office on April 5, 2022, represented the negative findings, and concluded that the installation "in its entirety has been sufficiently surveyed...and that no further Phase I archaeological surveys will be need to be undertaken at NASCC. (Enclosure 3)." Your office concurred with these findings and the summary pronouncement regarding future surveys on April 22, 2022 (Enclosure 4). Notwithstanding this agreement, the Navy will immediately consult your office during the METS project in the remote event of inadvertent archaeological discovery pursuant to 36 CFR 800.13 and resolve the manner in which cultural resources are treated.

In keeping with consultation requirements associated with METS, the Navy has consulted Native American tribes with interest and affinity to prehistoric resources that may be sited on lands occupied by NASCC. As of this writing, no tribe has contested the proposed METS action. Although no archaeological sites, sacred sites, or Traditional Cultural Properties have been identified at the installation, the Navy will consult the tribes in the remote event that prehistoric resources or cultural items subject to the Native American Graves Protection and Repatriation Act (NAGPRA) are inadvertently discovered in the course of construction.

The NAVFAC SE Historic Preservation Officer telephoned Ms. Kathy Wemer, President of the Nueces County Historical Commission (NCHC), on April 4, 2023. He described the METS action and its effects on historic properties located along the flight line. A longtime consulting party in matters regarding historic preservation at NASCC, President Wemer expressed her support of METS in the knowledge that the Navy has always upheld its historic preservation responsibilities while pursuing its critical air mission.

5090
Ser EV/00302
April 18, 2023

Pursuant to 36 CFR 800.6(b)(iv), we have enclosed a draft Memorandum of Agreement (MOA) that proposes mitigations designed to compensate the loss of the subject properties (Enclosure 5).

In keeping with previous Navy undertakings, this instrument is provided to facilitate your review of the action and the manner in which the Navy proposes to offset adverse effects. It does not foreclose our obligation to continue consultation with your office, the Advisory Council on Historic Preservation, the Nueces County Historical Commission, and the general public with the intent to resolve disagreement and mitigate project effects.

We are confident that the MOA is a sufficient legal instrument that effectively mitigates impacts to historic properties while accommodating the critical and time-sensitive METS project.

SUMMARY

NASCC looks forward to continued consultation with your office regarding the METS project and the manner in which adverse effects will be mitigated. We will keep you apprised of funding issues which will dictate how Hangars 57 and 58 are affected and notify you if any substantive changes to the project are proposed.

Please contact NAVFAC SE Historic Preservation Officer Len Winter at leonard.e.winter2.civ@us.navy.mil or Staff Archaeologist Dr. John Calabrese at john.a.calabrese4.civ@us.navy.mil if you develop questions or require clarification on any aspect of this proposal.

Thank you for supporting the Navy mission in Texas.

Sincerely,

M. B. OXENDINE, PE
Environmental Business Line Leader
By direction
of the Commanding Officer

Enclosures:
1. Beechcraft King 260 airplane
2. Landplane Hangar Historic District plan view and description
3. Navy letter to SHPO re Section 110 survey
4. SHPO email to Navy re Section 110 survey
5. Draft Memorandum of Agreement

4

Enclosure 1

Enclosure 1. Beechcraft King 260 airplane.

Enclosure 2

Table 4-4. Contributing Properties of the Seaplane Hangars/Ramps Historic District.

Facility	Name	Built Date	Status
46	CCAD Hangar 46	1941	Contributing
46B	Flammable Storage/CCAD	1942	Contributing
47	CCAD Hangar 47	1941	Contributing
47A	Storage Locker	1941	Contributing
47B	Ready Magazine/CCAD	1942	Contributing
A5	Fuse and Magazine	1941	Contributing
A6	High Explosives Magazine	1941	Contributing
A7	High Explosives Magazine	1941	Contributing
A11	Small Arms/Pyrotechnics Magazine	1942	Contributing
A14	Small Arms Magazine	1944	Contributing
B1	Small Craft Berth	1941	Contributing
B16	Catapult Pier	1942	Contributing
B18	Seaplane Ramp	1942	Contributing
B22	Boat Launch Area	1942	Contributing
B25	Crane Platform	1942	Contributing
B26	Seaplane Ramp	1942	Contributing
B27	Marina Boat Pier	1942	Contributing
B28	Seaplane Ramp	1942	Contributing
B29	Fishing Dock	1942	Contributing
201047	B32b, B-33 (Quay Wall), B33a, B34 and pier	1942	Contributing

Landplane Hangars Historic District

The Landplane Hangars Historic District is located between the Warehouse/Industrial district and the airfield, and consists of aircraft hangars and support facilities. Contributing properties include five hangars and six support facilities (**Figures 4-17 and 4-18**). The Landplane Hangars Historic District is directly related to the station's primary mission as a flight training activity and is eligible for inclusion in the NRHP under Criterion A for its contribution to naval aviation training efforts from World War II to 1947. **Table 4-5** includes an inventory of all contributing properties within the Landplane Hangars Historic District and is based upon information presented in the Thomason and Associates (1994a) report and the 2000 NAS Corpus Christi ICRMP (Moore et al.). SEARCH (2013) made no recommendations for changing the Seaplane Hangars/Ramps Historic District.

Figure 4-17. Landplane Hangars Historic District. Photo taken December 2012, facing north.

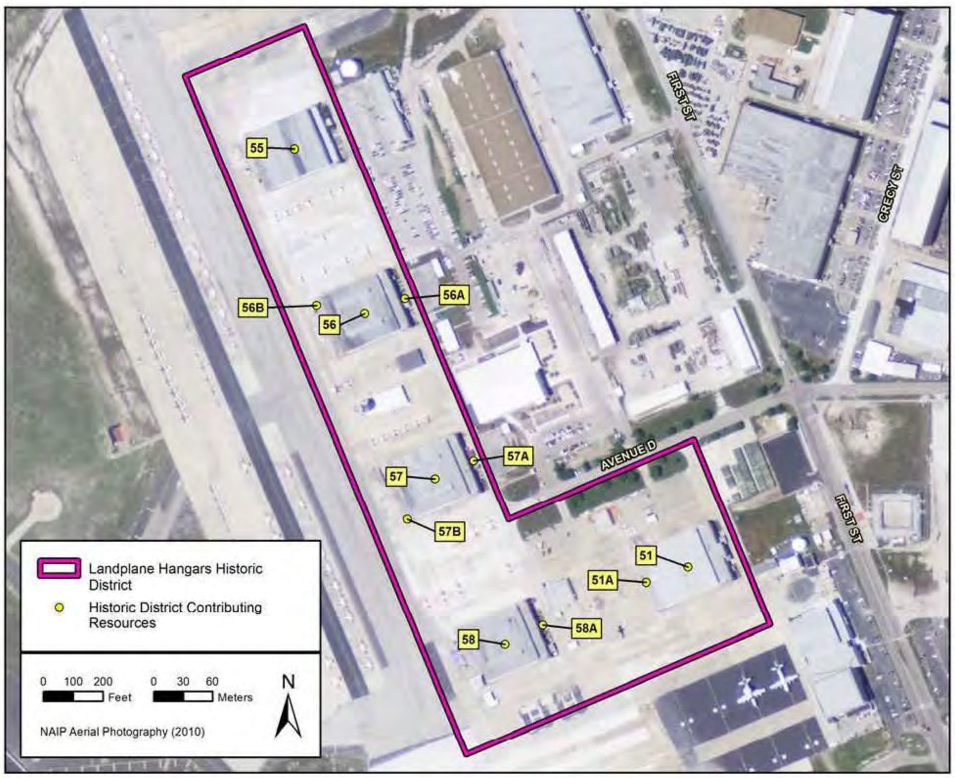

Figure 4-18. Landplane Hangars Historic District.

Table 4-5. Contributing Properties of the Landplane Hangars Historic District.

Facility	Name	Built Date	Status
51	Hangar 51 Maint Hangar/AIMD	1942	Contributing
51A	Flammable Storage	1941	Contributing
55	Hangar 55 VT-35	1941	Contributing
56	Hangar 56 VT27/VT28	1941	Contributing
56A	Storage Locker/ VT28	1941	Contributing
56B	Ready Magazine/VT28	1942	Contributing
57	Hangar 57 VT31	1941	Contributing
57A	OPS/Hazardous/Flammable Storage VT28	1942	Contributing
57B	Ready Magazine VT28	1942	Contributing
58	Hangar 58 Air Operations Hangar	1941	Contributing
58A	Flammable Storage	1941	Contributing

Warehouse/Industrial Historic District

The Warehouse/Industrial Historic District is a concentration of aircraft support facilities located between the landplane and the seaplane hangars (**Figure 4-19 and 4-20**). The district contains infrastructure and repair facilities directly related to the station's prime mission as a naval aviation training center. The Warehouse/Industrial Historic District includes warehouses, storehouses, and repair shops dedicated to aircraft repair, as well as public works facilities necessary for the station's day-to-day operation. According to the 2000 ICRMP (Moore et al.), the district is significant for its association with the station's World War II training mission and is eligible for inclusion in the NHRP under Criterion A. **Table 4-6** includes an inventory of all contributing properties within the Warehouse/Industrial Historic District and is based upon information presented in the Thomason and Associates (1994a) report and the 2000 NAS Corpus Christi ICRMP (Moore et al.). SEARCH (2013) recommended the 1994 boundaries of the Warehouse/Industrial Historic District be reduced so that noncontributing buildings were not included, and **Figure 4-20** depicts the reduced boundary.

Figure 4-19. Facility 22. Photo taken September 2013, facing northeast.

Enclosure 3

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING SYSTEMS COMMAND SOUTHEAST
JACKSONVILLE, FL 32212-0030

5090
Ser EV23/00261
April 5, 2022

Mr. Mark Wolfe, ED, SHPO
Texas Historical Commission
PO Box 12276
Austin, TX 78711-2276

SUBJECT: ARCHAEOLOGICAL SURVEY 204 ACRES

The Department of the Navy (DON) has completed an archaeological survey of approximately 204 acres at Naval Air Station Corpus Christi (NASCC), located in Nueces County, Texas. A copy of the Technical Report (THC #202110102) is attached for your review in accordance with the terms of Section 110 of the National Historic Preservation Act of 1966.

As described in our previous letter with respect to this project, dated 3 June 2021, the DON completed a Geographic Information Systems (GIS) study of the land base at NASCC. The results of this study, which identified the location of buried utilities, hazardous waste, hardened surfaces, "made-land" and previous archaeological survey areas, indicated that 204 acres of NASCC had the potential to contain archaeological resources that are accessible by Phase I survey methodology.

Between 16 January and 4 February 2022, Environmental Research Group, LLC completed a Phase I archaeological investigation at NASCC of the 204 acres that had the potential to contain archeological resources. This acreage was divided into eight survey blocks (A-H). The investigation included an intensive survey of subsurface shovel testing supplemented by pedestrian survey. Systematic shovel testing resulted in the excavation of 458 shovel test pits (STPs), none of which were positive for *in situ* cultural material.

Cultural material encountered during the survey primarily represents construction demolition and debris (CDD) in the form of unidentified metal, sheet metal roofing fragments, nails, bricks, concrete and asphalt. Other materials encountered, such as plastic, soda cans and glass shards are likely the result of the casual discard of refuse which then became mixed into the CDD fill and buried during subsequent development activities. A total of nine (9) prehistoric artifacts were recovered from seven (7) STPS in Survey Block C; these consisted of non-diagnostic chert flakes (n=7) and shell tools (n-=2). All of these prehistoric artifacts were recovered from secondary depositional contexts and therefore do not represent intact archaeological deposits; they were therefore not assigned site designations. Accordingly, they were assigned Isolated Find designations 1 through 9.

Based on the results of this and previous survey efforts, combined with the GIS studies undertaken, the DON submits that the installation in its entirety has been sufficiently surveyed for archaeological resources. As stipulated in our letter of 4 June 2021, we have concluded that no further Phase I archaeological surveys will need to be undertaken at NASCC given the negative findings of this expansive investigation. The DON will continue to apprise your office of projects that have the potential to incur effects on historic architectural properties. However,

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Ser EV23/00261
April 5, 2022

all undertakings at NASCC will be represented as actions which warrant a finding of No Historic Properties Affected with respect to archeological resources.

As with all Navy projects, every construction contract and DON project aboard NASCC will carry safeguarding provisions which confirm that inadvertently discovered archaeological resources will be treated pursuant to 36 CFR 800.13. In similar regard, please note that this effort does not include the outlying fields managed by NASCC. These installations and other special-use areas managed by NASCC will continue to be subject to Section 106 consideration and consultation with your office, as warranted.

If you require additional information regarding this project, please contact Dr. John Calabrese, Naval Facilities Engineering Command Southeast Staff Archaeologist, at (904) 542-6985 or john.a.calabrese4.civ@us.navy.mil.

Sincerely,

M. B. OXENDINE, PE
Environmental Business Line Leader
By direction
of the Commanding Officer

Enclosure

Copy to:
Mr. Biji Pandisseril, IEPD, NAS Corpus Christi

2

Enclosure 4

From: Winter, Leonard E CIV USN NAVFAC SE JAX FL (USA)
To: Winter, Leonard E CIV USN NAVFAC SE JAX FL (USA)
Subject: Section 106 Submission
Date: Monday, April 10, 2023 6:49:51 AM
Attachments: ~WRD000.jpg

From: noreply@thc.state.tx.us <noreply@thc.state.tx.us>
Sent: Friday, April 22, 2022 11:38 AM
To: Calabrese, John A CIV USN NAVFAC SE JAX FL (USA) <john.a.calabrese4.civ@us.navy.mil>; reviews@thc.state.tx.us
Subject: [Non-DoD Source] Section 106 Submission

Re: Project Review under Section 106 of the National Historic Preservation Act
THC Tracking #202208721
Date: 04/22/2022
NAS Corpus Christi Section 110, 204 Acres
NAS Corpus Christi

Description: Submission of Section 110 Report for concurrence pursuant to Section 110(a)(2)(D) of the NHPA.

Dear Dr. John Calabrese:
Thank you for your submittal regarding the above-referenced project. This response represents the comments of the State Historic Preservation Officer, the Executive Director of the Texas Historical Commission (THC), pursuant to review under Section 106 of the National Historic Preservation Act.

The review staff, led by Jeff Durst, Caitlin Brashear and Alexander Shane, has completed its review and has made the following determinations based on the information submitted for review:

Archeology Comments

- No historic properties affected. However, if cultural materials are encountered during construction or disturbance activities, work should cease in the immediate area; work can continue where no cultural materials are present. Please contact the THC's Archeology Division at 512-463-6096 to consult on further actions that may be necessary to protect the cultural remains.
- THC/SHPO concurs with information provided.

We look forward to further consultation with your office and hope to maintain a partnership that will foster effective historic preservation. Thank you for your cooperation in this review process, and for your efforts to preserve the irreplaceable heritage of Texas. If the project changes, or if new historic properties are found, please contact the review staff. If you have any questions concerning our review or if we can be of further assistance, please email the following reviewers: Jeff.Durst@thc.texas.gov, caitlin.brashear@thc.texas.gov, Alexander.Shane@thc.texas.gov.

This response has been sent through the electronic THC review and compliance system (eTRAC). Submitting your project via eTRAC eliminates mailing delays and allows you to check the status of the review, receive an electronic response, and generate reports on your submissions. For more information, visit http://thc.texas.gov/etrac-system.

Sincerely,

for Mark Wolfe, State Historic Preservation Officer
Executive Director, Texas Historical Commission

Please do not respond to this email.

Enclosure 5

MEMORANDUM OF AGREEMENT
BETWEEN
THE UNITED STATES NAVY
AND
THE TEXAS STATE HISTORIC PRESERVATION OFFICER
REGARDING
THE DEMOLITION OF HANGARS 57 AND 58
AND SUPPORT BUILDINGS 57A, 57B, and 58A
AT
NAVAL AIR STATION CORPUS CHRISTI
NUECES COUNTY, TEXAS

WHEREAS, the United States Navy (Navy) is planning to implement the critical Multi-Engine Training System (METS) at NAS Corpus Christi (NASCC) which entails the introduction of new training aircraft along the flight line; and,

WHEREAS, Hangars 51, 55, 56, 57, and 58, and support buildings 56A, 56B, 57A, 57B, and 58A along the flight line are contributing resources of the Landplane Hangars Historic District found eligible under Criterion A for its association with World War II (WWII) history; and,

WHEREAS, the Navy has concluded that the WWII hangars have exceeded their "life expectancy" and do not afford sufficient interior space to support METS; and,

WHEREAS, the Navy has concluded that Hangars 57 and 58 are optimally sited on the flight line to support METS; and,

WHEREAS, the Navy is currently evaluating alternative construction options that include the demolition or recapitalization of Hangars 57 and 58 to support METS; and,

WHEREAS, the demolition option would entail razing Hangars 57 and 58 and constructing in their footprint a single large replacement hangar or multiple fabric-tension structures to house training aircraft; and,

WHEREAS, the recapitalization option would entail deconstructing Hangars 57 and 58 to their structural frames and rebuilding the facilities to accommodate METS space requirements in compliance with current building and safety codes; and,

WHEREAS, the demolition or recapitalization of Hangars 57 and 58 both entail "physical destruction of or damage to all or part" of Hangars 57 and 58 and constitute an adverse effect pursuant to 36 CFR 800.5(a)(2)(i); and,

WHEREAS, the demolition or recapitalization of Hangars 57 and 58 will prompt the demolition of non-functional WWII storage buildings 57A, 57B, and 58A due to their loss of historical association; and,

WHEREAS, storage buildings 57A, 57B, and 58A are contributing resources of the Landplane Hangars Historic District and their demolition constitutes an adverse effect pursuant to 36 CFR 800.5(a)(2)(i); and,

WHEREAS, in accordance with 36 CFR Section 800.6(a)(1)(iii), the ACHP has **elected/declined** to participate in consultation regarding METS; and,

NOW, THEREFORE, the Navy (**and consulting parties**) agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on historic properties.

I. STIPULATIONS

The Navy agrees to undertake the following actions to mitigate the demolition or recapitalization of Hangars 57 and 58 and the demolition of support facilities 57A, 57B, and 58A (Subject Properties):

1. The Navy will contact the SHPO when program funding is received and represent a final decision on demolishing or recapitalizing the Subject Properties in support of METS.

2. Prior to demolition or recapitalization, the Navy will coordinate the salvage and removal of select structural elements from the Subject Properties for potential use in extant World War II hangars at NASCC or other installations in the Southeastern Area of Operations (AOR). Such elements including windows, doors, and hardware fixtures will be inventoried and curated at the installation in secure and environmentally-regulated conditions. The Navy will provide a roster of all recovered items and circulate the list to the SHPO within 270 calendar days following the final execution of this instrument.

3. Prior to demolition or recapitalization, the Navy will ensure that original "as-built" drawings of the Subject Properties are located and adequately curated. The Navy does not anticipate that Historic American Building Survey documentation of the Subject Properties is required. The Navy will convey all "as-built" drawings to the SHPO within 270 calendar days following the final execution of this instrument.

4. Prior to demolition or recapitalization, the Navy will endeavor to locate all historic photographs of the Subject Properties. The Navy will convey digital copies of available historic photographs to the SHPO within 270 calendar days following the final execution of this instrument.

5. Prior to demolition or recapitalization, the Navy will undertake digital photographic documentation of the Subject Properties. The photography shall conform to the requirements of NPS National Register Photo Policy Factsheet found at: http://www.nps.gov/nr/publications/bulletins/photopolicy/index.htm. The format, number, and type of photographs shall be determined in consultation with the SHPO. The Navy will convey all photographic documentation to the SHPO within 270 calendar days following the final execution of this instrument.

6. Following salvage recovery and drawing/photographic documentation, the consulting parties will review the records. Once those records are approved and deemed sufficient by all consulting parties, the Navy will demolish or recapitalize the Subject Properties at its earliest convenience.

7. The Navy will represent the history of the Subject Resources in text and photographs on the NASCC public website. All such content and the manner in which it is presented will be coordinated with the consulting parties. The Navy will create the public website within 270 calendar days following the final execution of this instrument

8. Following the completion of all ground construction actions associated with METS, NASCC will erect a commemorative sign in the Landplane Hangars Historic District that depicts the Subject Properties and their role in the WWII mission. The Navy will coordinate the contents of the sign with all the consulting parties. The Navy will erect signage at a safe location within 270 calendar days following the final execution of this instrument

II. ADMINISTRATIVE STIPULATIONS

A. Resolving Objections

1. Should any signatory or concurring party to this MOA object to any action carried out or proposed by the Navy with respect to the implementation of this agreement, the Navy shall consult with the objecting party to attempt resolution of the objection. If after initiating such consultation, the Navy determines that the objection cannot be resolved through consultation, the Navy will forward all documentation relevant to the disagreement to the ACHP, including the Navy's proposed response to the objection. The ACHP shall provide the Navy with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, the Navy shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. The Navy will then proceed according to its final decision.

2. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, the Navy may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, the Navy shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

3. The Navy's responsibility to carry out all actions under this MOA that are not subject to the dispute shall remain unchanged.

4. At any time during implementation of the measures stipulated in this MOA, should an objection pertaining to this MOA be raised by a member of the public, the Navy shall notify the parties to this MOA and take the objection into account, consulting with the objector and, should the objector so request, with any of the parties to this MOA in an attempt to resolve the objection.

B. Amendments and Termination

1. This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

2. If the Navy determines that it cannot implement the terms of this MOA, or if any party determines that the MOA is not properly implemented, the Navy and/or its consulting parties may propose to the other parties that the MOA be terminated.

3. The party proposing to terminate this MOA shall so notify all parties to this MOA, explaining the reasons for termination and affording them at least thirty (30) calendar days to consult and seek alternatives to termination, including amendment per Stipulation II.B.1.

4. Should such consultation fail and the MOA be terminated, the Navy shall ensure that each action that would otherwise be covered by this MOA is reviewed in accordance with 36 CFR §800.4 through 800.6.

C. MOA Duration

This MOA shall be null and void if its terms are not carried out within ten (10)) years from the date of its execution unless the signatories agree in writing to an extension for carrying out its terms. The Navy shall notify the signatories when it has determined that all of the stipulations have been implemented.

III. ANTI-DEFICIENCY ACT

A. All requirements set forth in this MOA requiring the expenditure of Government funds are expressly subject to the availability of appropriations and the requirements of the Anti-Deficiency Act, 31 U.S.C. Part 1341. No obligation of this MOA shall require or be construed to require a commitment by the Navy to expend funds not appropriated for a legally sufficient purpose.

B. The obligations of this MOA as to the Navy are severable. If the Navy cannot perform any obligation set forth in this MOA because of the unavailability of funds, the parties intend that the remainder of the MOA be executed to the greatest extent practicable. The parties agree to consult in accordance with Stipulation II.B on any obligation of the MOA that cannot be performed because of the unavailability of funds.

IV. EXECUTION

Execution of this MOA by the Navy and its consulting parties, and implementation of its terms, confirms that the Navy has afforded the ACHP an opportunity to comment on the Project and its effects on historic properties, and that the Navy has taken into account the effects of the Project on historic properties.

PRINCIPAL SIGNATORIES

Captain Ty Jurica
Commanding Officer, NAS Corpus Christi

By: Date:

Texas State Historic Preservation Officer
Mr. Mark Wolfe

By: Date:

The Advisory Council on Historic Preservation
Reid Nelson, Director

By: Date:

CONCURRING SIGNATORIES

Nueces County Historical Commission
Kathy Wemer, President

By:______________________________ Date:_________

6

Appendix D
Tribal Government-to-Government Documentation

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From: Goodwin, Sara R CIV USN NAVFAC LANT NOR VA (USA)
To: Farrell, Peggy [US-US]
Subject: EXTERNAL: FW: [URL Verdict: Neutral][Non-DoD Source] RE: OFFICIAL SECTION 106 CORRESPONDENCE: NAS Corpus Christi/Multi-Engine Training System
Date: Wednesday, April 19, 2023 11:22:01 AM
Attachments: image003.png
image004.png

FYSA.

From: Winter, Leonard E CIV USN NAVFAC SE JAX FL (USA) <leonard.e.winter2.civ@us.navy.mil>
Sent: Wednesday, April 19, 2023 10:01 AM
To: Goodwin, Sara R CIV USN NAVFAC LANT NOR VA (USA) <sara.r.goodwin.civ@us.navy.mil>
Cc: Calabrese, John A CIV USN NAVFAC SE JAX FL (USA) <john.a.calabrese4.civ@us.navy.mil>
Subject: FW: [URL Verdict: Neutral][Non-DoD Source] RE: OFFICIAL SECTION 106 CORRESPONDENCE: NAS Corpus Christi/Multi-Engine Training System

FYI

From: Winter, Leonard E CIV USN NAVFAC SE JAX FL (USA)
Sent: Wednesday, April 19, 2023 10:00 AM
To: Carissa Speck <cspeck@delawarenation-nsn.gov>
Subject: RE: [URL Verdict: Neutral][Non-DoD Source] RE: OFFICIAL SECTION 106 CORRESPONDENCE: NAS Corpus Christi/Multi-Engine Training System

Ms. Speck,

Thank you for the speed-of-light response.

Len

From: Carissa Speck <cspeck@delawarenation-nsn.gov>
Sent: Wednesday, April 19, 2023 9:45 AM
To: Winter, Leonard E CIV USN NAVFAC SE JAX FL (USA) <leonard.e.winter2.civ@us.navy.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: OFFICIAL SECTION 106 CORRESPONDENCE: NAS Corpus Christi/Multi-Engine Training System

The Delaware Nation does not have any contrary information. Nueces County is outside of our area of interest. Thank you.

Wanishi,

Carissa Speck
Delaware Nation
Historic Preservation Director
405-247-2448 Ext. 1403

cspeck@delawarenation-nsn.gov

From: Winter, Leonard E CIV USN NAVFAC SE JAX FL (USA) <leonard.e.winter2.civ@us.navy.mil>
Sent: Wednesday, April 19, 2023 8:13 AM
To: Carissa Speck <cspeck@delawarenation-nsn.gov>
Subject: OFFICIAL SECTION 106 CORRESPONDENCE: NAS Corpus Christi/Multi-Engine Training System

THIS LETTER CONSTITUTES OFFICIAL SECTION 106 CORRESPONDENCE

Dear Director Speck:

The Navy invites the Delaware Nation to consult in the matter of the Navy proposal to demolish Hangars 57 and 58 and small ancillary facilities 57A, 57B, and 58A in support of the Multi-Engine Training System (METS) at Naval Air Station Corpus Christi (NASCC), Nueces County, Texas. These hangars and ancillary facilities are contributing resources to the Landplane Hangars Historic District at NASCC and their demolition constitutes an adverse effect under 36 CFR 800.5(a)(2)(i). This undertaking and its effects are being considered under Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations found at 36 CFR 800.

We are inviting you to comment on potential effects to cultural resources that may be esteemed by your tribe.

MISSION REQUIREMENTS

Pilot training is the primary operational role of NASCC and METS represents the latest critical evolution in aviation training. NASCC serves as the primary training facility for multi-engine aircraft and the failure to accommodate the METS program jeopardizes Navy, Marine Corps, and Coast Guard pilot instruction as well as Navy readiness throughout the globe. The METS program will replace the T-44C Pegasus aircraft currently operated by Training Air Wing Four at NASCC with the Beechcraft King 260, a new multi-engine turboprop aircraft. The transition to the new training platform will occur in late 2024.

Airfield space at NASCC is limited and predominated by World War II (WWII) hangars 51, 55, 56, 57, and 58 and small support buildings 51A, 56A, 56B, 57A, 57B, and 58A. Given the optimal airfield location of Hangars 57 and 58, the Navy proposes to demolish or recapitalize these facilities in service to the METS program.

PROPOSED ACTION AND POTENTIAL EFFECTS

The Navy is currently evaluating whether to demolish or recapitalize Hangars 57 and 58. Both construction actions incur an adverse effect under 36 CFR 800.5(a)(2)(i) in that they involve the "physical destruction of or damage to all or part" of the facilities.

Demolition as well as new construction can incur potential effects on prehistoric and historic archaeological resources that may be located underfoot. Documentary evidence confirms that the NASCC airfield was significantly remodeled through grading and major filling during its original construction in 1941. Numerous archaeological investigations conducted at NASCC over many years have identified no archaeological sites. A large-scale Section 110 survey of the remaining undeveloped parcels at NASCC was conducted in late 2021. This survey also failed to identify archaeological resources. The Navy received concurrence from the Texas SHPO that the installation "in its entirety has been sufficiently surveyed...and that no further Phase I archaeological surveys will need to be undertaken at NASCC."

Given known disturbances on the airfield, the Navy has concluded that the METS action is unlikely to encounter archaeological resources in the course of construction. In the remote event that prehistoric archaeological resources are identified, the Navy will contact your tribe and implement inadvertent discovery provisions under 36 CFR 800.13 as stipulated in the NASCC Integrated Cultural Resources Management Plan. In similar regard, the Navy will follow the provisions of the Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.) and contact your tribe in the remote event that cultural items are inadvertently discovered in the course of construction.

As of this writing, the tribes with cultural affinity to the region have identified no sacred sites or Traditional Cultural Properties at NASCC. Please let us know if the Delaware Nation is in possession of contrary information so that we can improve the management of cultural resources at NASCC.

SUMMARY

We have concluded that the proposed METS project will not incur effects on Native American cultural resources at NASCC. Please contact me or Staff Archaeologist Dr. John Calabrese at john.a.calabrese4.civ@us.navy.mil if you develop questions or require clarification on any aspect of this proposal.

We would appreciate your email response to this proposed action no later than 19 May 2023.

Thank you for supporting the Navy mission in Texas.

Sincerely,

Len Winter
Historic Preservation Officer
Cultural Resources Section Head
NAVY REGION SOUTHEAST/NAVFAC SOUTHEAST
BOX 30/BLDG 135N
NAS Jacksonville
Jacksonville, FL 32212
CELL: (904) 814-3199
Email: leonard.e.winter2.civ@us.navy.mil

CONFIDENTIALITY NOTE:

This e-mail (including attachments) may be privileged and is confidential information covered by the Electronic Communications Privacy Act 18 U.S.C. 2510-2521 and any other applicable law, and is intended only for the use of the individual or entity named herein. If the reader of this message is not the intended recipient, or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any retention, dissemination, distribution or copying of this communication is strictly prohibited. Although this e-mail and any attachments are believed to be free of any virus or other defect that might affect any computer system in to which it is received and opened, it is the responsibility of the recipient to ensure that it is virus free and no responsibility is accepted by Delaware Nation or the author hereof in any way from its use. If you have received this communication in error, please immediately notify us by return e-mail. Thank you.

Appendix E
Coastal Consistency Determination

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TEXAS GENERAL LAND OFFICE
COMMISSIONER DAWN BUCKINGHAM, M.D.

July 28, 2023

NASCC PW EV
8851 Ocean Dr. Bldg. 19
Corpus Christi, TX 78419
ATTN: Biji Pandisseril

Re: Replace aircraft used for the multi-engine maritime flight training program, includes short- and long-term construction projects for Navy support facilities at Naval Air Station Corpus Christi (NASCC)
NASCC, Naval Outlying Landing Field Cabaniss; international, regional, and publicly owned municipal airfields; and Federal Aviation Administration's National Airspace System throughout South Texas
Texas CMP#: 23-1251-F2

Dear Mr. Pandisseril:

Based on information provided to the Texas Coastal Management Program (TCMP) on the above referenced project, it has been determined that the project will likely not have adverse impacts on coastal natural resource areas (CNRAs) in the coastal zone and is consistent with the goals and policies of the TCMP. However, siting and construction should avoid and minimize impacts to CNRAs.

Please note that this letter does not authorize the use of Coastal Public Land. No work may be conducted, or structures placed on State-owned land until all necessary authorizations have been obtained, including any that are required by the Texas General Land Office and the U.S. Army Corps of Engineers. If a U. S. Army Corps of Engineers permit is required, it will be subject to consistency review under the Texas Coastal Management Program.

Please forward this letter to applicable parties. If you have any questions or concerns, please contact me at (512) 463-7497 or at federal.consistency@glo.texas.gov.

Sincerely,

Leslie Koza

Leslie Koza
Federal Consistency Coordinator
Texas General Land Office

1700 North Congress Avenue, Austin, Texas 78701-1495
P.O. Box 12873, Austin, Texas 78711-2873
512-463-5001 glo.texas.gov

Consistency with the Texas Coastal Management Program

The Applicant Should Sign This Statement And Return With Application Packet To:

TEXAS GENERAL LAND OFFICE
COASTAL RESOURCES-FEDERAL CONSISTENCY
1700 NORTH CONGRESS AVENUE, ROOM 330
AUSTIN, TEXAS 78701-1495
federal.consistency@glo.texas.gov

For USACE Use Only:

Permit #: ____________________

Project Mgr: ____________________

Applicant's Name And Address (Please Print):

Title Mr. First Biji Last Pandisseril Suffix

Mailing Address NAS Corpus Christi, 8851 Ocean Dr., Bldg 19

Home

Work 361-961-5353

City Corpus Christi State TX Zip Code 78419 Mobile

Country US Email biji.a.pandisseril.civ@us.navy.mil Fax

The Texas Coastal Management Program (CMP) coordinates state, local, and federal programs for the management of Texas coastal resources. Activities within the CMP boundary must comply with the enforceable policies of the Texas Coastal Management Program and be conducted in a manner consistent with those policies. The boundary definition is contained in the CMP rules (31 TAC §27.1).

- To determine whether your proposed activity lies within the CMP boundary, please contact GLO Federal Consistency Staff at federal.consistency@glo.texas.gov

Project Description:

Is the proposed activity at a waterfront site or within coastal, tidal, or navigable waters? ☐ Yes ☑ No

If Yes, name affected coastal, tidal, or navigable waters:

Is the proposed activity water dependent? ☐ Yes ☑ No (31 TAC §26.3(a)(14))
https://tinyurl.com/TXCMPdefinitions

Please briefly describe the project and all possible effects on coastal resources:

The Navy proposes to replace the over 40-year-old T-44C Pegasus aircraft used for the multi-engine maritime flight training program. This training program is operated by Commander, Training Air Wing Four (TRAWING 4), located at Naval Air Station (NAS) Corpus Christi. The 54 T-44C aircraft would be replaced by 58 new T-54A aircraft. The new aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. The Proposed Action would take place at NAS Corpus Christi in Texas and its associated training locations at Naval Outlying Landing Field (NOLF) Cabaniss; at international, regional, and municipal airfields; and in the Federal Aviation Administration's (FAA's) National Airspace System throughout South Texas. The Proposed Action also includes short- and long-term construction projects for Navy support facilities at NAS Corpus Christi. Attachment 1 provides more detail of the project description, and Figures 1 through 3 show the locations. The proposed activity complies with Texas' approved coastal management program and will be conduced in a manner consistent with such program.

Indicate area of impact: See Figures 1, 2, and 3 ☐ acres or ☐ square feet

Additional Permits/ Authorizations Required:

- ☐ Coastal Easement - Date application submitted:
- ☐ Coastal Lease - Date application submitted:
- ☑ Stormwater Permit- Date application submitted: TBD
- ☐ Water Quality Certification - Date application submitted:
- ☐ Other state/federal/local permits/authorizations required:

The proposed activity must not adversely affect coastal natural resource areas (CNRAs).

PLEASE CHECK ALL COASTAL NATURAL RESOURCE AREAS THAT MAY BE AFFECTED:

- ☐ Coastal Barriers
- ☐ Coastal Historic Areas
- ☐ Coastal Preserves
- ☐ Coastal Shore Areas
- ☐ Coastal Wetlands
- ☐ Critical Dune Areas
- ☐ Critical Erosion Areas
- ☐ Gulf Beaches
- ☐ Hard Substrate Reefs
- ☐ Oyster Reefs
- ☐ Special Hazard Areas
- ☐ Submerged Lands
- ☐ Submerged Aquatic Vegetation
- ☐ Tidal Sand or Mud Flats
- ☑ Waters of Gulf of Mexico
- ☑ Waters Under Tidal Influence

The applicant affirms that the proposed activity, its associated facilities, and their probable effects comply with the relevant enforceable policies of the CMP, and that the proposed activity will be conducted in a manner consistent with such policies.

PLEASE CHECK ALL APPLICABLE ENFORCEABLE POLICIES:

https://tinyurl.com/TXCMPpolicies

☐	§26.15 Policy for Major Actions
☐	§26.16 Policies for Construction of Electric Generating and Transmission Facilities
☐	§26.17 Policies for Construction, Operation, and Maintenance of Oil and Gas Exploration and Production Facilities
☐	§26.18 Policies for Discharges of Wastewater and Disposal of Waste from Oil and Gas Exploration and Production Activities
☐	§26.19 Policies for Construction and Operation of Solid Waste Treatment, Storage, and Disposal Facilities
☐	§26.20 Policies for Prevention, Response and Remediation of Oil Spills
☑	§26.21 Policies for Discharge of Municipal and Industrial Wastewater to Coastal Waters
☐	§26.22 Policies for Nonpoint Source (NPS) Water Pollution
☐	§26.23 Policies for Development in Critical Areas
☐	§26.24 Policies for Construction of Waterfront Facilities and Other Structures on Submerged Lands
☐	§26.25 Policies for Dredging and Dredged Material Disposal and Placement
☐	§26.26 Policies for Construction in the Beach/Dune System
☐	§26.27 Policies for Development in Coastal Hazard Areas
☐	§26.28 Policies for Development Within Coastal Barrier Resource System Units and Otherwise Protected Areas on Coastal Barriers
☐	§26.29 Policies for Development in State Parks, Wildlife Management Areas or Preserves
☐	§26.30 Policies for Alteration of Coastal Historic Areas
☐	§26.31 Policies for Transportation Projects
☑	§26.32 Policies for Emission of Air Pollutants
☐	§26.33 Policies for Appropriations of Water
☐	§26.34 Policies for Levee and Flood Control Projects

Please explain how the proposed project is consistent with the applicable enforceable policies identified above. Please use additional sheets if necessary. *For example: If you are constructing a pier with a covered boathouse, then the applicable enforceable policy is: §26.24 Policies for Construction of Waterfront Facilities and Other Structures on Submerged Lands. The project is consistent because it will not interfere with navigation, natural coastal processes, and avoids/minimizes shading.*

Section 26.21 Policies for Discharge of Municipal and Industrial Wastewater to Coastal Waters

The Proposed Action (Future Project Options 1 and 2) would include land disturbance associated with demolition and construction exceeding one acre in area. The land disturbance would potentially result in discharges of stormwater runoff from the construction site to area waters. Prior to beginning land-disturbing actions, the Navy would obtain Texas Pollutant Discharge Elimination System Construction General Permit TXR150000 and abide by the permit conditions. By obtaining and abiding by the permit, the Proposed Action would not impair or degrade coastal waters and would comply with water-quality-based effluent.

Section 26.32 Policies for Emission of Air Pollutants

The Proposed Action has the potential to increase emissions of criteria pollutants associated with construction and flight operations. Counties in the region of influence within the Texas Coastal Zone include Matagorda, Calhoun, Nueces, and Cameron Counties. These counties are currently in attainment for all criteria pollutants. Construction emissions would result from proposed demolition, renovation, and new construction on NAS Corpus Christi. Emissions would be localized and temporary. With the direction of the prevailing winds, the ground-level emissions would be quickly entrained downwind to the north and west of the flightline. However, as the ambient criteria pollutant concentrations in the region are well below the National Ambient Air Quality Standards (NAAQS), anticipated air quality changes from construction would not interfere with the attainment of NAAQS. Emissions from flight operations would increase due to the 10 percent proposed increase in operations. The region of influence is in attainment for all NAAQS, and the increase would not be considered significant. Therefore, the Proposed Action is consistent with this enforceable policy.

BY SIGNING THIS STATEMENT, THE APPLICANT IS STATING THAT THE PROPOSED ACTIVITY COMPLIES WITH THE TEXAS COASTAL MANAGEMENT PROGRAM AND WILL BE CONDUCTED IN A MANNER CONSISTENT WITH SUCH PROGRAM

Signature of Applicant/Agent Date

Any questions regarding the Texas Coastal Management Program should be referred to:

Texas General Land Office
Coastal Resources Division
1700 North Congress Avenue, Room 330
Austin, Texas 78701-1495
Phone: (512) 463-7497
Toll Free: 1-800-998-4GLO
federal.consistency@glo.texas.gov

Print Form

Information collected by electronic mail and by web form is subject to the Public Information Act, Chapter 552, Government Code.

Coastal Consistency Determination

Multi-Engine Training System at Naval Air Station Corpus Christi, Texas

INTRODUCTION

This document provides the state of Texas with the United States (U.S.) Department of the Navy's (Navy) Consistency Determination under section 307(c)(1) of the Coastal Zone Management Act (CZMA) of 1972, as amended, and 15 Code of Federal Regulations (CFR) part 930, subpart C, for the proposed activities at Naval Air Station (NAS) Corpus Christi.

This Consistency Determination addresses the Proposed Action (Preferred Alternative, Alternative 1) of the Environmental Assessment for the Multi-Engine Training System at NAS Corpus Christi, Texas. The Proposed Action would replace the over 40-year-old T-44C Pegasus aircraft used for the maritime flight training program. The training program is operated by Commander, Training Air Wing Four located at NAS Corpus Christi. The Proposed Action includes replacement of 54 T-44C aircraft with 58 T-54A aircraft. The new aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. To accommodate the new aircraft, construction and renovation of Navy support facilities at NAS Corpus Christi would be required.

The purpose of the Proposed Action is to replace T-44C aircraft that are over 40 years old and require upgrades to address existing training capability gaps. The T-44C fleet is nearing the end of its service life and has outdated avionics, limited availability of parts, and increased maintenance costs. The replacement of aircraft would provide advanced instrumentation for communication, navigation, and tracking aircraft health to facilitate maintenance planning and efficiency. The need for the Proposed Action is to enable continued aviator training in furtherance of the Navy's mandate to train and equip Naval forces for the peacetime promotion of the national security interests and prosperity of the United States and prompt and sustained combat incident to operations at sea.

REGULATORY BACKGROUND INFORMATION

The CZMA of 1972, codified in 16 U.S. Code section 1451 et seq., established a comprehensive regulatory scheme for effective management, beneficial use, protection, and development of the coastal zone and its natural resources. The CZMA encourages coastal states and provides a mechanism for them to develop, obtain federal approval for, and implement a broad-based coastal management program.

CZMA section 307 provides that federal agency activities shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs. Section 307 applies to federal agency activity in a state's coastal zone and also to federal agency activity outside the coastal zone if the activity affects a land or water use in or natural resources of the coastal zone. Federal agency activity includes activity performed by a federal agency, approved by a federal agency, or for which a federal agency provides financial assistance. Such activity, whether direct, indirect, or cumulative, must be demonstrated to be consistent with the enforceable policies of the Texas Coastal Management Program, unless full consistency is otherwise prohibited by federal law (per 15 CFR part 930.32, "consistent to the maximum extent practicable"). The Navy's Proposed Action constitutes a direct federal action.

DESCRIPTION OF THE PROPOSED FEDERAL AGENCY ACTION

The Navy proposes to replace the over 40-year-old T-44C Pegasus aircraft used for the multi-engine maritime flight training program. This training program is operated by Commander, Training Air Wing Four located at NAS Corpus Christi. Fifty-four T-44C Pegasus aircraft would be replaced by 58 new T-54A aircraft. T-54A aircraft would be delivered from 2024 to 2026, and proposed construction would begin in 2024 and continue through 2027. The T-44C Pegasus and the T-54A are both twin-engine, pressurized, fixed-wing monoplane aircraft derived from the Beechcraft King Air/Super King Air line of commercial aircraft (Figure 1). Aircraft specifications are presented in Table 1.

Figure 1 T-44C Pegasus (left) and T-54A [King Air 260] (right)

Table 1 Aircraft Specifications

Aircraft Specifications	*T-44C*	*T-54A*
Length	35.5 feet	43.8 feet
Height	14.25 feet	14.83 feet
Wingspan	50.25 feet	57.91 feet
Weight (empty)	6,246 pounds	8,830 pounds
Weight (maximum takeoff)	9,650 pounds	12,500 pounds
Ceiling	31,300 feet	35,000 feet
Range	1,300 nautical miles	1,720 nautical miles
Maximum airspeed	245 knots	310 knots
Crew	3	3

Sources: (Navy, 2021; Navy, ND)

The new aircraft would conduct training operations at the same locations and within the same airspace as T-44C aircraft but with a 10 percent increase in the number of annual operations. Approximately 7 percent of the operations would occur at night, the same percentage of operations as occurs with the T-44C. Figure 2 shows the locations of the airfields that the T-54A would utilize. Table 2 and Table 3 detail these changes.

Airfield operations include takeoffs, landings, touch-and-goes, low approaches, and simulated emergency landings. An approach and departure from an airfield are considered two airfield operations that occur with one landing. A practice approach can end in a full-stop landing, touch-and-go, or low approach (no landing). Landing requirements include the following:

- Full-stop landing is a typical landing ending with the aircraft stopping and exiting the runway.
- Touch-and-go operations are when the student pilot lands (touches down) and then takes off again without coming to a stop; the "touch-and-go" is considered two operations but a single landing. As many as five or six aircraft may enter the landing pattern at an airfield, sequentially performing touch-and-go operations.

- Low approach is a practice approach without landing followed by a go-around maneuver.
- Simulated emergency landings are performed while in the landing pattern at surrounding airfields. During a simulated landing, the student pilot practices landing the aircraft under a simulated emergency condition, under the instruction and direct supervision of a qualified instructor pilot.

The Proposed Action also includes short- and long-term construction projects for Navy support facilities but no changes in personnel at NAS Corpus Christi. The locations of these activities are depicted in Figure 3. Proposed construction would begin in 2024 and continue through 2027.

Table 4 shows the proposed change in number of aircraft associated with the Proposed Action. There would be no increase in the number of personnel associated with the Proposed Action.

Table 2 Current and Projected Use of Navy Airfields

Name	*FAA Identifier*	*Baseline T-44C Aircraft Operations*	*Proposed Action Projected T-54A Operations*
Truax Field	NGP	32,760	36,000
NOLF Cabaniss	NGW	56,012	61,600
TOTAL		88,772	97,600

Key: FAA = Federal Aviation Administration; NOLF = Naval Outlying Landing Field.
Note: Proposed Action includes a 10 percent increase in operations.

Table 3 Current and Projected Use of Non-Navy Airfields

Name	*FAA Identifier*	*Baseline T-44C Aircraft Operations*[1]	*Proposed Action Projected T-54A Operations*[1,2]
Alice International Airport	ALI	28,200	31,000
Calhoun County Airport	PKV	3,600	3,900
Corpus Christi International Airport	CRP	20,800	22,900
Palacios Municipal Airport	PSX	5,200	5,700
Port Isabel-Cameron County Airport	PIL	11,000	12,000
Valley International Airport	HRL	14,800	16,300
Victoria Regional Airport	VCT	4,900	5,400
Other		7,400	8,200
TOTAL		95,900	105,400

Key: FAA = Federal Aviation Administration.
Notes:
1. Numbers are rounded to nearest hundred.
2. Proposed Action includes a 10 percent increase in operations.

Table 4 Comparison of Navy T-44C and T-54A Aircraft and Personnel

Aircraft and Personnel Numbers	*Baseline (T-44C)*	*Proposed Action (T-54A)*
Aircraft		
Number of Aircraft	54	58
Personnel		
Students	110	110
Instructors	55	55
Maintenance	175 (Contractor)	175 (Contractor)
Total Personnel	340	340

Figure 2 International, Regional, and Municipal Airfields Locations Map

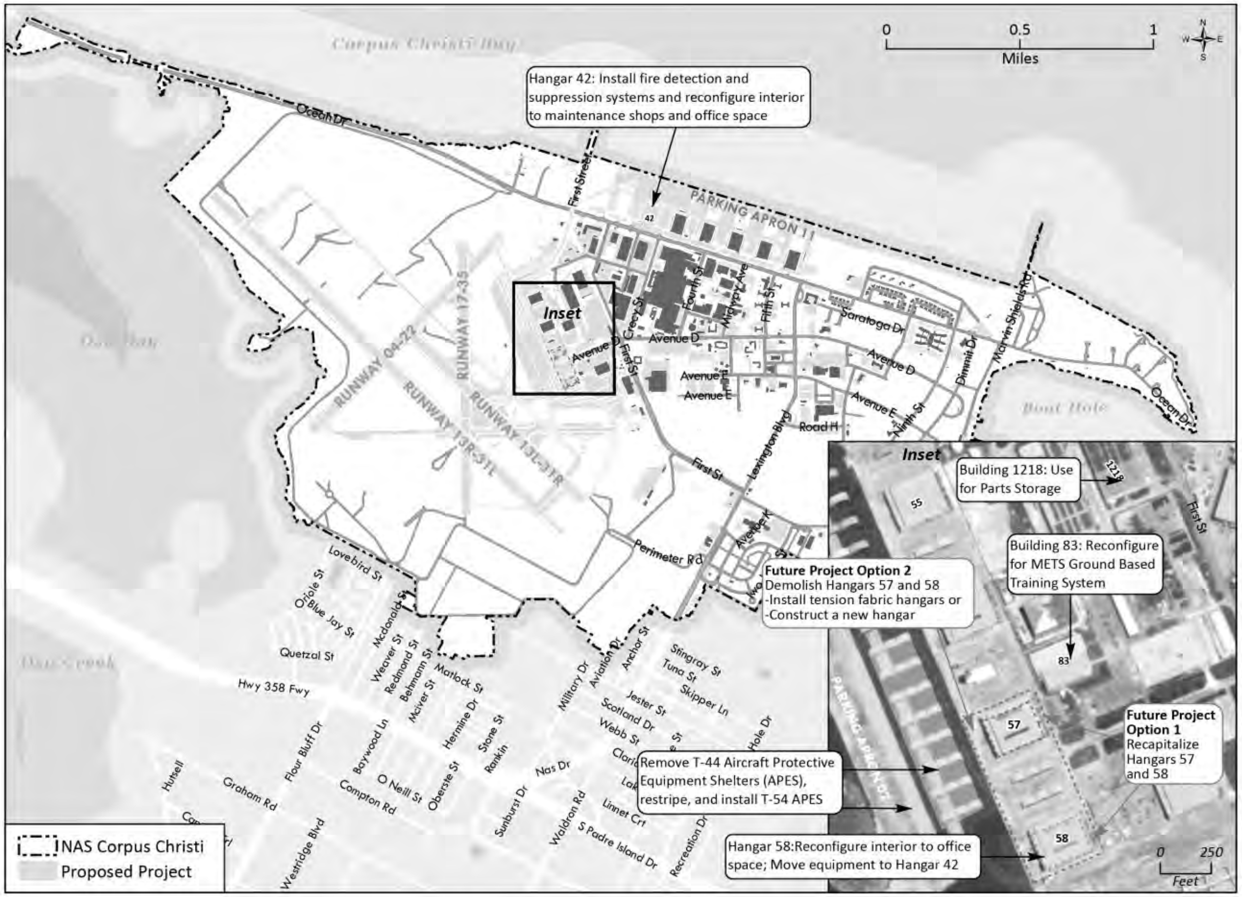

Figure 3 Locations of Construction and Renovation Projects at NAS Corpus Christi

DETERMINATION OF POTENTIAL EFFECTS

In accordance with 15 CFR part 930 subpart C, the Navy reviewed its Proposed Action and has determined that certain activities that would be conducted as part of the Proposed Action may have an effect on a coastal use or resource of the State of Texas.

The Proposed Action would generate air emissions through the combustion of fuels from aircraft operations and construction equipment as well as from ground disturbance during construction, resulting in minor effects to coastal air quality. The Proposed Action would also generate point source water discharge from construction and demolition of Navy support facilities resulting in minor effects to coastal water quality.

ANALYSIS OF ENFORCEABLE POLICIES

Table 5 lists each of the enforceable program policies and management principles for the Texas Coastal Zone Management Program. The table describes how the activities in the Proposed Action will be consistent with each applicable policy.

CONCLUSION

The Navy has reviewed Texas' Coastal Zone Management Program and determined that two of the enforceable policies (or portions thereof) are applicable to the Proposed Action, as analyzed above.

The Navy will be consistent to the maximum extent practicable with the policies of the Texas Coastal Zone Management Program.

REFERENCES

Navy. (2021). Multi-engine Training System (METS) Concept of Operations. Corpus Christi: Chief of Naval Air Training.

Navy. (ND). T-44C Pegasus Aircraft Profile. Corpus Christi: Training Air Wing Four. Retrieved July 7, 2021, from https://www.cnatra.navy.mil/tw4/vt31/aircraft-T44C.asp.

Table 5 Texas Coastal Zone Management Program Consistency Review

Policy or State Plan Section #	*Policy/Requirement*	*Navy Response to Policy*
Section 26.15 Policy for Major Actions		
26.15	Major Actions	The policy pertains to proposed actions requiring an environmental impact statement. The Proposed Action does not require an environmental impact statement and is being analyzed in an environmental assessment. This policy is not applicable to the Proposed Action.
Section 26.16 Policies for Construction of Electric Generating and Transmission Facilities		
26.16	Construction of Electric Generating and Transmission Facilities	The Proposed Action does not include construction of electric generating or transmission facilities. This policy is not applicable to the Proposed Action.
Section 26.17 Policies for Construction, Operation, and Maintenance of Oil and Gas Exploration and Production Facilities		
26.17	Construction, Operation, and Maintenance of Oil and Gas Exploration and Production Facilities	The Proposed Action does not include construction, operation, or maintenance of oil and gas exploration and production facilities. This policy is not applicable to the Proposed Action.
Section 26.18 Policies for Discharges of Wastewater and Disposal of Waste from Oil and Gas Exploration and Production Activities		
26.18	Discharges of Wastewater and Disposal of Waste from Oil and Gas Exploration and Production Activities	The Proposed Action does not include oil and gas exploration or production facilities. This policy is not applicable to the Proposed Action.
Section 26.19 Policies for Construction and Operation of Solid Waste Treatment, Storage, and Disposal Facilities		
26.19	Construction and Operation of Solid Waste Treatment, Storage, and Disposal Facilities	The Proposed Action does not include construction or operation of solid waste treatment, storage, and disposal facilities.
Section 26.20 Policies for Prevention, Response and Remediation of Oil Spills		
26.20	Prevention, Response and Remediation of Oil Spills	The Proposed Action does not impact the prevention, response, and remediation oil spills. Naval Air Station (NAS) Corpus Christi maintains and implements a Spill Prevention and Countermeasure Plan and a Facility Response Plan to prevent and respond to oil spills. The Proposed Action is not expected to result in any changes to the management of petroleum, oil, and lubricants at NAS Corpus Christi. This policy is not applicable to the Proposed Action.

Table 5 Texas Coastal Zone Management Program Consistency Review

Policy or State Plan Section #	*Policy/Requirement*	*Navy Response to Policy*
Section 26.21 Policies for Discharge of Municipal and Industrial Wastewater to Coastal Waters		
26.21	Discharge of Municipal and Industrial Wastewater to Coastal Waters	The Proposed Action (Future Project Options 1 and 2) would include land disturbance associated with demolition and construction exceeding one acre in area. The land disturbance would potentially result in discharges of stormwater runoff from the construction site to area waters. Prior to beginning land disturbing actions, the Navy would obtain Texas Pollutant Discharge Elimination System Construction General Permit TXR150000 and abide by the permit conditions. By obtaining and abiding by the permit, the Proposed Action would not impair or degrade coastal waters and would comply with water-quality-based effluent limits. Therefore, the Proposed Action is consistent with this enforceable policy.
Section 26.22 Policies for Nonpoint Source (NPS) Water Pollution		
26.22	Nonpoint Source Water Pollution	This policy is specific to agricultural and silviculture nonpoint source pollution, onsite sewage disposal systems, and underground storage tanks, which are not part of the Proposed Action. This policy is not applicable to the Proposed Action.
Section 26.23 Policies for Development in Critical Areas		
26.23	Development in Critical Areas	The Proposed Action does not include development in Critical Areas, which include coastal wetlands, oyster reefs, hard substrate reefs, submerged aquatic vegetation, or tidal sands and mud flats. This policy is not applicable to the Proposed Action.
Section 26.24 Policies for Construction of Waterfront Facilities and Other Structures on Submerged Lands		
26.24	Construction of Waterfront Facilities and Other Structures on Submerged Lands	The Proposed Action does not include construction on submerged lands or elsewhere. This policy is not applicable to the Proposed Action.
Section 26.25 Policies for Dredging and Dredged Material and Placement		
26.25	Dredging and Dredged Material and Placement	The Proposed Action does not include dredging or dredged material placement. This policy is not applicable to the Proposed Action.
Section 26.26 Policies for Construction in the Beach/Dune System		
26.26	Construction in the Beach/Dune System	The Proposed Action does not include construction in the beach/dune system or elsewhere. This policy is not applicable to the Proposed Action.
Section 26.27 Policies for Development in Coastal Hazard Areas		
26.27	Development in Coastal Hazard Areas	The Proposed Action does not include development in coastal hazard areas or elsewhere. This policy is not applicable to the Proposed Action.

Table 5 Texas Coastal Zone Management Program Consistency Review

Policy or State Plan Section #	*Policy/Requirement*	*Navy Response to Policy*
Section 26.28 Policies for Development within Coastal Barrier Resource System Units and Otherwise Protected Areas on Coastal Barriers		
26.28	Development within Coastal Barrier Resource System Units and Otherwise Protected Areas on Coastal Barriers	The Proposed Action does not include development in coastal barrier resource system units or otherwise protected areas on coastal barriers. This policy is not applicable to the Proposed Action.
Section 26.29 Policies for Development in State Parks, Wildlife Management Areas or Preserves		
26.29	Development in State Parks, Wildlife Management Areas or Preserves	The Proposed Action does not include development in state parks, wildlife management areas, preserves, or elsewhere. This policy is not applicable to the Proposed Action.
Section 26.30 Policies for Alteration of Coastal Historic Areas		
26.30	Alteration of Coastal Historic Areas	The Proposed Action does not include coastal development affecting coastal historic areas. Coastal historic areas are sites that are coastal in character and on the National Register of Historic Places (NRHP) or state archaeological landmarks. The affected buildings are not coastal in character and are not listed on the NRHP or designated state archaeological landmarks. The two hangars and ancillary facilities that are proposed for recapitalization or demolition are contributing resources to the NRHP-eligible Landplane Hangars Historic District. The Navy is undergoing National Historic Preservation Act Section 106 consultation to resolve the adverse effect. This policy is not applicable to the Proposed Action.
Section 26.31 Policies for Transportation Projects		
26.31	Transportation Projects	This policy is specific to transportation construction and maintenance projects, which are not part of the proposed activities. This policy is not applicable to the Proposed Action.
Section 26.32 Policies for Emission of Air Pollutants		
26.32	Emission of Air Pollutants	The Proposed Action has the potential to increase emissions of criteria pollutants associated with construction and flight operations. Counties in the Region of Influence within the Texas Coastal Zone include Matagorda, Calhoun, Nueces, and Cameron County. These counties are currently in attainment for all criteria pollutants. Construction emissions would result from proposed demolition, renovation, and new construction on NAS Corpus Christi. Emissions would be localized and temporary. With the direction of the prevailing winds, the ground-level emissions would be quickly entrained downwind to the north and west of the flightline. However, as the ambient criteria pollutant concentrations in the region are well below the National Ambient Air Quality Standards (NAAQS), anticipated air quality changes from construction would not interfere with the

Table 5 Texas Coastal Zone Management Program Consistency Review

Policy or State Plan Section #	*Policy/Requirement*	*Navy Response to Policy*
		attainment of NAAQS. Emissions from flight operations would increase due to the 10 percent proposed increase in operations. The region of influence is in attainment for all NAAQS and the increase would not be considered significant. Therefore, the Proposed Action is consistent with this enforceable policy.
Section 26.33 Policies for Appropriations of Water		
26.33	Appropriations of Water	The Proposed Action does not include appropriations of waters. This policy is not applicable to the Proposed Action.
Section 26.34 Policies for Levee and Flood Control Projects		
26.34	Levee and Flood Control Projects	The Proposed Action does not include levee or flood control projects. This policy is not applicable to the Proposed Action.

Key: # = number.

Appendix F
Air Quality Methodology and Calculations

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TAB A. Construction & Additional Worker Emissions

Assumptions:

453.59 grams per pound
2,000 lbs per ton
43,560 SF per acre
0.1639 daily vendor trips/1,000 SF — *Trip rates from defaults in CalEEMod documentation, Appendix A, Section 4.5 Trips and VMT
0.42 daily construction worker trip rate (office/industrial)
1.25 workers/# const equip (non-bldg const activities) — *Construction worker assumptions based on defaults from CalEEMod documentation, Appendix A, Section 4.5 Trips and VMT
0.5 assume 1/2 level of effort required for renovation (based on building construction defaults)

12 CY dump truck capacity
9 CY concrete truck capacity
11.79 lbs/sf - non-residential renovation waste
158 lbs/sf - non-residential demolition waste
900 lbs/cy - mixed C&D debris

98,800 SF: Hangar 42 approx size (from aerial map) - 260' x 380'
49,025 SF: Hangar 57/58 approx size ea (from aerial map) - 185' x 265' ea
38,000 SF: Building 83 approx size (from aerial map) - 190' x 200'
2,800 SF: Approx size of Aircraft Protective Equipment Shelter (APES) - 40' x 70'
24 # of APES shelters to remove

5 work days per week
260 working days per year
Conservatively assume all emissions would occur in one year (even though short term projects would occur in 2024 and long-term projects in 2027, per EA Table 2-5)

40 mi r/t - materials/supply and hauling distance — ~20 mi to L&W supply: https://lwsupply.com/locations/lw-supply-corpus-christi-tx/ ~20 mi to Corpus Christi Landfill (Type I): https://tceq.maps.arcgis.com/apps/webappviewer/index.html?id=33ad0b935f434cee927a1fd4807b14

SHORT TERM CONSTRUCTION

Renovation

Hangar 42, 58, Bldg 83 — 185,825 sf — 4.3 ac
2,190,877 lbs waste est from reno
2,434 CY of waste
203 Truck loads of reno debris
15 vendor trips per day
115 days

• Installing fire detection and suppression systems and reconfiguring the interior to maintenance shops and office space in Hangar 42
• Reconfiguring the interior of Hangar 58 to office space and moving the maintenance equipment to Hangar 42

Assume 1/2 amount of trips required for reno, based on building construction vendor trip rate (see cells B5 & B9)
*Assumption based on project footprint (ac) and defaults from CalEEMod, Appendix D, Table 3.1 Phase Length, but 50% of the time of building const (230 days) assumed for

Replace Aircraft Protective Equipment Shelter (APES)

assume — 60 days total to remove/install new
450,300 SF: approx a — 10.3 ac
0.06 % total pavement area for restriping
27,018 SF — 0.6 ac

• Removing the T-44 Aircraft Protective Equipment Shelters (APES), restriping, and installing T-54 APES (existing shelters ~40' L x 70' W ea * 3 per row * 8 rows. Assume replacement would be similar)
*% cover default assumption from CalEEMod documentation, Appendix A, Section 4.7 Architectural Coatings

85.8 g/l VOC content — Per TxDOT DMS-8200 — http://onlinemanuals.txdot.gov/txdotmanuals/pmh/pavement_marking_material_descriptions.htm#i1021095
typ use DOW DT-400 — https://coatingresins.arkema.com/files/live/sites/coatingresins/files/downloads/literature/landing-pages/waterborne-polymer-construction-pdfs/encordt400_en.pdf

0.0040 lb/SF: VOC Emission Factor - Striping — Emissions Factor (lb/SF) = [VOC content (g/L)] / [453.59 (g/lb)] x [3.785(L/Gal)]/180(SF)

Demolition

Total from EA Table 2-6 — 9,390 SF — 0.2 ac
Demolition debris — 1,483,620 lbs
1,648 CY
137 Truck loads demolition debris

LONG TERM CONSTRUCTION

Demo: Hangar 57/58 — 98,050 SF — 2.3 ac — 20 days
Demolition debris — 15,491,900 lbs
17,213 CY
1,434 Truck loads demolition debris

Construct New Hangar — 94,000 SF — 2.2 ac — 220 days
15 vendor trips
39 construction workers

*Option 2 constructing new hangars is used as the bounding case (would take more time/equip than other options)

RENOVATION

185,825 SF — 115 days — Emission Rates in grams/horsepower-hour (g/hp-hr)

Off-road Equipment	# Pieces of Equip	Hrs per Day	Total Ops Hrs	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Diesel Generator	1	8	920	40	0.43	0.2425	0.8967	3.3412	0.0018	0.1643	0.1594	589.6637
Scissor Lift	2	8	1,840	83	0.59	0.5862	3.1895	3.3436	0.0022	0.4322	0.4193	694.3080
Skid-Steer Loader	1	8	920	67	0.59	0.7613	3.9327	4.4858	0.0022	0.5473	0.5309	693.8046
All Terrain Forklift	2	8	1,840	84	0.59	0.0631	0.6841	1.5199	0.0017	0.1040	0.1009	595.9753

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Diesel Generator	8.46	31.28	116.56	0.06	5.73	5.56	20,571
Scissors Lift	116.45	633.59	664.20	0.43	85.86	83.28	137922.98
Skid steer loader	61.04	315.31	359.66	0.18	43.88	42.56	55627.35
all terrain forklift	12.69	137.53	305.55	0.33	20.90	20.28	119815.75
Subtotal (lbs)	***198.63***	***1117.71***	***1445.98***	***1.01***	***156.38***	***151.69***	***333,937***

Onsite Material Movement

Assume 2 onsite trucks operating 2 hours per day (idle) and traveling 2 miles per day around construction site during renovation activities

2 hrs/day — Emission Rates in grams/hour (g/hr)

Equipment	Activity	# Trucks	Total Hours	VOC g/hr	CO g/hr	NOx g/hr	SO2 g/hr	PM10 g/hr	PM2.5 g/hr	CO2 g/hr
Onsite trucks - Idle	Idle	2	460	0.8469	4.4775	7.0727	0.0058	0.9878	0.4552	1701.0500

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Onsite trucks - Idle Subtotal (lbs)	***0.86***	***4.54***	***7.17***	***0.01***	***1.00***	***0.46***	***1725.09***

2 mi/day — Emission Rates in grams/vehicle miles traveled (g/VMT)

Equipment	Activity	# Trucks	Total Miles	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO2 g/VMT
Onsite trucks - 10 MPH	10 MPH	2	460	0.2425	0.8967	3.3412	0.0018	0.1643	0.1564	589.6637

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Onsite trucks - 10 MPH Subtotal (lbs)	***0.25***	***0.91***	***3.39***	***0.00***	***0.17***	***0.16***	***598.00***

Material Deliveries\Hauling

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	Total # trips	avg RT distance (mi)	Total Miles	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO_2 g/VMT
Delivery Truck	1,954	40	78,165	0.2425	0.8967	3.3412	0.0018	0.1643	0.1564	589.6637

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Delivery Truck Subtotal (lbs)	***41.79***	***154.52***	***575.78***	***0.31***	***28.31***	***27.47***	***101613.68***

Construction Workers

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	Daily trips*	Total # trips	avg RT distance (mi)	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO_2 g/VMT
Passenger car	39	4,488	40	0.2425	0.8967	3.3412	0.0018	0.1643	0.1564	589.6637

*see cell B7/B9 for daily trips assumption

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Passenger Car Subtotal (lbs)	***95.98***	***354.86***	***1322.29***	***0.71***	***65.02***	***65.07***	***233357.72***

TOTAL EMISSIONS (TONS) - RENOVATION

	VOC tons	CO tons	NOx tons	SO2 tons	PM10 tons	PM2.5 tons	CO_2 tons
TOTAL (TONS)	**0.17**	**0.82**	**1.68**	**0.00**	**0.13**	**0.12**	**336**

REPLACE APES

67,200 SF — 60 days — Emission Rates in grams/horsepower hour (g/hp-hr)

Off-road Equipment	# Pieces of Equip	Hrs per Day	Total Ops Hrs	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Crane	1	8	480	330	0.58	0.0518	0.2326	0.9853	0.0015	0.0353	0.0342	530.8941
Telehandler	1	8	480	99	0.59	0.0552	0.2625	0.8616	0.0015	0.0583	0.0565	536.6732
Diesel Generator	1	8	480	40	0.43	0.2425	0.8967	3.3412	0.0018	0.1643	0.1564	589.6637
Scissor Lift	2	8	960	82	0.59	0.5863	3.1895	3.3436	0.0022	0.4322	0.4193	694.3080
Skid-Steer Loader	1	8	480	67	0.59	0.7613	3.9327	4.4858	0.0022	0.5473	0.5309	693.8046
All Terrain Forklift	2	8	960	84	0.59	0.0631	0.6841	1.5199	0.0017	0.1040	0.1009	595.9753

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Crane	10.49	47.11	199.56	0.31	7.14	6.93	107,529
Telehandler	3.42	16.29	53.26	0.09	3.60	3.49	33,172
Diesel Generator	4.41	16.32	60.82	0.03	2.99	2.90	10,733
Scissors Lift	60.75	330.57	346.54	0.22	44.80	43.45	71959.82
Skid steer loader	31.85	164.51	187.65	0.09	22.89	22.21	29022.96
all terrain forklift	6.62	71.75	159.42	0.17	10.91	10.58	62512.56
Subtotal (lbs)	***117.54***	***646.55***	***1007.24***	***0.92***	***92.33***	***89.56***	***314929.81***

Onsite Material Movement

Assume 2 onsite trucks operating 2 hours per day (idle) and traveling 2 miles per day around construction site during renovation activities

2 hrs/day — Emission Rates in grams/hour (g/hr)

Equipment	Activity	# Trucks	Total Hours	VOC g/hr	CO g/hr	NOx g/hr	SO2 g/hr	PM10 g/hr	PM2.5 g/hr	CO2 g/hr
Onsite trucks - Idle	Idle	2	240	0.8469	4.4775	7.0727	0.0058	0.9878	0.4552	1701.0500

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Onsite trucks - Idle Subtotal (lbs)	***0.45***	***2.37***	***3.74***	***0.00***	***0.52***	***0.24***	***900.05***

2 mi/day — Emission Rates in grams/vehicle miles traveled (g/VMT)

Equipment	Activity	# Trucks	Total Miles	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO2 g/VMT
Onsite trucks - 10 MPH	10 MPH	2	240	5.2283	21.9853	32.9317	0.0195	2.5396	2.3364	5727.8200

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Onsite trucks - 10 MPH Subtotal (lbs)	***2.77***	***11.63***	***17.42***	***0.01***	***1.34***	***1.24***	***3030.66***

Material Deliveries\Hauling

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	Total # trips*	distance (mi)	Total Miles	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO_2 g/VMT
Delivery Truck	48	40	1,920	0.3066	1.7382	3.0738	0.0033	1.3723	0.3327	972.7910

*Assume one truck trip ea to deliver new and remove old APES

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Delivery Truck Subtotal (lbs)	1.30	7.36	13.01	0.01	5.81	1.41	4117.72

Pavement Re-striping

27,030 SF* 5 days Emission Rates in grams/horsepower-hour (g/hp-hr)

Off-road Equipment	# Pieces of Equip	Hrs per Day	Total Ops Hrs	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Air compressor	1	8	40	49	0.59	0.11	0.34	2.61	0.00	0.08	0.08	590.05

*See cells B44, B45

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Air Compressor Subtotal (lbs)	0.27	0.86	6.66	0.00	0.08	0.08	1,504

VOC Off-Gassing

Activity	SF covered	VOC lb/SF
Pavement re-striping	27,030	0.0040

Annual Emissions

	VOC lb
Pavement Re-striping Subtotal (lbs)	107.51

Construction Workers

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	Daily trips*	Total # trips	avg RT distance (mi)	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO_2 g/VMT
Passenger car	10	650	40	0.0254	3.4229	0.0645	0.0019	3.4459	0.5175	285.4633

*see cell B7/B9 for daily trips assumption

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Passenger Car Subtotal (lbs)	1.46	196.20	3.70	0.11	197.52	29.66	16362.89

TOTAL EMISSIONS (TONS) - REPLACE APES

	VOC tons	CO tons	NOx tons	SO2 tons	PM10 tons	PM2.5 tons	CO_2 tons
TOTAL (TONS)	0.12	0.43	0.53	0.00	0.15	0.06	170.42

DEMOLITION

9,390 SF 10 days Emission Rates in grams/horsepower-hour (g/hp-hr)

Off-road Equipment	# Pieces of Equip	Hrs per Day	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM_{10} g/hp-hr	$PM_{2.5}$ g/hp-hr	CO_2 g/hp-hr
Excavator	1	8	80	243	0.59	0.0169	0.0671	0.2346	0.0014	0.0128	0.0124	536.7817
Loader	2	8	160	87	0.23	0.0455	0.5642	1.4334	0.0016	0.0894	0.0867	596.0272
Air Compressor	1	8	80	49	0.59	0.1061	0.3390	2.6121	0.0016	0.0329	0.0319	590.0527
Rubber-Tired Dozer	1	8	80	145	0.59	0.0208	0.1381	0.4811	0.0014	0.0323	0.0313	536.7723
All Terrain Forklift	1	8	80	84	0.59	0.0631	0.6641	1.5199	0.0017	0.1040	0.1009	595.9753

Annual Emissions

	VOC lb	CO lb	NOx lb	SO_2 lb	PM_{10} lb	$PM_{2.5}$ lb	CO_2 lb
Hydraulic excavator	0.42	1.70	5.93	0.04	0.32	0.31	13,573.21
Loader/Backhoe	0.32	3.98	10.12	0.01	0.63	0.61	4,206.97
Air compressor	0.54	1.73	13.32	0.01	0.17	0.16	3,008.61
Dozer (Rubber Tired)	0.31	2.08	7.26	0.02	0.49	0.47	8,099.10
All Terrain Forklift	0.55	5.98	13.28	0.01	0.91	0.88	5,209.38
Subtotal (lbs):	2.14	15.47	49.91	0.09	2.52	2.44	34097.26

On-road Equipment	# trips	avg RT distance (mi)	Total Miles	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM g/VMT	PM2.5 g/VMT	CO_2 g/VMT
Dump Truck	137	40	5,495	0.3066	1.7382	3.0738	0.0033	1.3723	0.3327	972.7910

Annual Emissions

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Dump Truck Subtotal (lbs)	3.71	21.06	37.24	0.04	16.62	4.08	11784.60

Construction Workers

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	Daily trips*	Total # trips	avg RT distance (mi)	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO_2 g/VMT
Passenger car	8	75	40	0.0254	3.4229	0.0645	0.0019	3.4459	0.5175	285.4633

*see cell B7/B9 for daily trips assumption

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Passenger Car Subtotal (lbs)	0.17	22.64	0.43	0.01	22.79	3.42	1888.03

TOTAL EMISSIONS (TONS) - DEMOLITION

	VOC tons	CO tons	NOx tons	SO2 tons	PM10 tons	PM2.5 tons	CO_2 tons
TOTAL (TONS)	0.003	0.03	0.04	0.000	0.02	0.005	23.88

Fugitive Dust Emissions:

PM_{10} tons/acre-mo	ac dist per day	Months of disturbance	PM_{10} tons/yr	$PM_{2.5}/PM_{10}$ Ratio	$PM_{2.5}$ tons/yr
0.42	0.04	12.0	0.20	0.1	0.02

Notes: Acres and days of disturbance based on total area for construction/demo over 1 year
Calculation for PM10 Total (tons) = 0.42 tons/acre-mo x 0.3 acres x 1 month x (days of disturbance/26 working days per month)

TOTAL EMISSIONS (TONS) - SHORT TERM PROJECTS

	VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
	tons	tons	tons	tons	tons	tons	tons
TOTAL (TONS)	**0.29**	**1.28**	**2.25**	**0.00**	**0.50**	**0.21**	**529.92**

LONG TERM: HANGARS 57 & 58

Demolition of Hangars 57/58 98,050 SF 20 days Emission Rates in grams/horsepower-hour (g/hp-hr)

Off-road Equipment	# Pieces of Equip	Hrs per Day	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM_{10} g/hp-hr	$PM_{2.5}$ g/hp-hr	CO_2 g/hp-hr
Excavator	1	8	160	243	0.59	0.0165	0.0671	0.2346	0.0014	0.0128	0.0124	536.7817
Loader	2	8	320	87	0.23	0.0455	0.5642	1.4334	0.0016	0.0894	0.0867	596.0272
Air Compressor	1	8	160	49	0.59	0.1061	0.3390	2.6121	0.0016	0.0329	0.0319	590.0527
Rubber-Tired Dozer	1	8	160	145	0.59	0.0208	0.1381	0.4811	0.0014	0.0323	0.0313	536.7723
All Terrain Forklift	1	8	160	84	0.59	0.0631	0.6541	1.3199	0.0017	0.1040	0.1009	595.9753

Annual Emissions	VOC lb	CO lb	NOx lb	SO_2 lb	PM_{10} lb	$PM_{2.5}$ lb	CO_2 lb
Excavator	0.88	3.29	11.87	0.07	0.65	0.63	27,146.41
Loader	0.64	7.96	20.23	0.02	1.26	1.22	8,413.95
Air Compressor	1.08	3.46	26.64	0.02	0.34	0.33	6,017.21
Rubber-Tired Dozer	0.63	4.17	14.52	0.04	0.97	0.94	16,196.20
All Terrain Forklift	1.10	11.96	26.57	0.03	1.82	1.76	10,435.76
Subtotal (lbs)	***4.29***	***30.94***	***99.83***	***0.18***	***5.08***	***4.88***	***68194.53***

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	# trips	avg RT distance (mi)	Total Miles	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM g/VMT	PM2.5 g/VMT	CO_2 g/VMT
Dump Truck	1,434	40	57,377	0.3066	1.7382	3.0738	0.0033	1.3723	0.3327	972.7910

Annual Emissions	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Dump Truck Subtotal (lbs)	***38.78***	***219.88***	***388.82***	***0.42***	***173.59***	***42.08***	***123054.36***

Hangar Construction 94,000 SF 220 days Emission Rates in grams/horsepower-hour (g/hp-hr)

Off-road Equipment	# Pieces of Equip	Hrs per Day	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Crane	1	8	1,760	330	0.58	0.0518	0.2376	0.9853	0.0015	0.0353	0.0342	530.3041
Diesel Generator	1	8	1,760	40	0.43	0.2425	0.8967	3.2412	0.0018	0.1643	0.1594	589.0637
Telehandler	1	8	1,760	99	0.59	0.0552	0.2635	0.8616	0.0015	0.0583	0.0565	536.6732
Scissor Lift	1	8	1,760	83	0.59	0.5862	3.1895	3.3436	0.0022	0.4322	0.4193	694.3080
Skid-Steer Loader	1	8	1,760	67	0.59	0.7613	3.9327	4.4858	0.0022	0.5473	0.5309	693.8046
All Terrain Forklift	1	8	1,760	84	0.59	0.0631	0.6841	1.3199	0.0017	0.1040	0.1009	595.9753
Loader	2	8	3,520	87	0.23	0.0455	0.5642	1.4334	0.0016	0.0894	0.0867	596.0272

Annual Emissions	VOC lb	CO lb	NOx lb	SO_2 lb	PM_{10} lb	$PM_{2.5}$ lb	CO_2 lb
Crane	38.45	172.73	731.71	1.12	26.18	25.40	394,274.77
Diesel Generator	16.19	59.84	222.99	0.12	10.97	10.64	39,353.38
Telehandler	12.52	59.72	195.27	0.34	13.21	12.81	121,631.57
Scissor Lift	111.38	606.04	635.32	0.41	82.13	79.66	131,926.33
Skid-Steer Loader	116.77	603.21	688.05	0.34	83.95	81.43	106,417.54
All Terrain Forklift	12.13	131.55	292.27	0.32	20.00	19.40	114,606.37
Loader	7.06	87.61	222.58	0.26	13.88	13.46	92,553.40
Subtotal (lbs)	***314.51***	***1,720.71***	***2,988.20***	***2.91***	***250.30***	***242.79***	***##########***

Onsite Material Movement

Assume 2 onsite trucks operating 2 hours per day (idle) and traveling 2 miles per day around construction site during renovation activities

2 hrs/day Emission Rates in grams/hour (g/hr)

Equipment	Activity	# Trucks	Total Hours	VOC g/hr	CO g/hr	NOx g/hr	SO2 g/hr	PM10 g/hr	PM2.5 g/hr	CO2 g/hr
Onsite trucks - Idle	Idle	2	880	0.8469	4.4775	7.0727	0.0056	0.9878	0.4552	1701.0500

Annual Emissions	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Onsite trucks - Idle Subtotal (lbs)	***1.64***	***8.69***	***13.72***	***0.01***	***1.92***	***0.88***	***3300.17***

2 mi/day Emission Rates in grams/vehicle miles traveled (g/VMT)

Equipment	Activity	# Trucks	Total Miles	VOC g/VMT	CO g/VMT	NOx g/VMT	SO2 g/VMT	PM10 g/VMT	PM2.5 g/VMT	CO2 g/VMT
Onsite trucks - 10 MPH	10 MPH	2	880	5.2283	21.9853	32.9317	0.0195	2.5296	2.3364	5727.8200

Annual Emissions	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Onsite trucks - 10 MPH Subtotal (lbs)	***10.14***	***42.65***	***63.89***	***0.04***	***4.93***	***4.53***	***11112.42***

Material Deliveries\Hauling

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	Total # trips	avg RT distance (mi)	Total Miles	VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
				g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT
Delivery Truck	3,389	40	125,578	0.3066	1.7382	3.0738	0.0033	1.3723	0.3327	972.7910
				VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
				lb	lb	lb	lb	lb	lb	lb
			Delivery Truck Subtotal (lbs)	***91.64***	***519.56***	***918.75***	***0.99***	***410.17***	***99.44***	***290767.29***

Construction Workers

Emission Rates in grams/vehicle miles traveled (g/VMT)

On-road Equipment	Daily trips*	Total # trips	avg RT distance (mi)	VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
				g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT
Passenger car	38	9,475	40	0.0254	3.4229	0.0645	0.0019	3.4459	0.5175	285.4633
				VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
				lb	lb	lb	lb	lb	lb	lb
			Passenger Car Subtotal (lbs)	***21.22***	***2860.06***	***53.88***	***1.58***	***2879.28***	***432.42***	***238525.66***

Fugitive Dust Emissions:

PM_{10} tons/acre-mo	ac dist per day	Months of disturbance	PM_{10} tons/yr	$PM_{2.5}/PM_{10}$ Ratio	$PM_{2.5}$ tons/yr
0.42	0.02	12.0	0.09	0.1	0.01

Notes: Acres and days of disturbance based on total area for construction/demo over 1 year

Calculation for PM10 Total (tons) = 0.42 tons/acre-mo x 0.3 acres x 1 month x (days of disturbance/26 working days per month)

TOTAL EMISSIONS (TONS) - LONG TERM PROJECTS

	VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
	tons	tons	tons	tons	tons	tons	tons
TOTAL (TONS)	0.24	2.70	2.26	0.00	1.95	0.42	867.86

Additional Worker POV emissions - Alt 2 only

On-road Equipment	# vehicles	# days	mi/day	VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
				g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT	g/VMT
Passenger car	33	260	40	0.0254	3.4229	0.0645	0.0019	3.4459	0.5175	285.4633
*Assumes 20 mi one way trip, 2x per day				VOC	CO	NOx	SO2	PM10	PM2.5	CO_2
				lb	lb	lb	lb	lb	lb	lb
			Subtotal (lbs)	***19***	***2590***	***49***	***1***	***2607***	***392***	***215990***
			Additional Worker Grand Total in Tons	0.01	1.29	0.02	0.00	1.30	0.20	108.00

[illegible]

NOLF Cabaniss Flight Profiles
DEPARTURES [illegible]
NOLF Cabaniss T-44C Flight Profile C1D - Cabaniss Field Departure [illegible] % of total ops OpsType_Current Tab from DVP

Point	Distance (NM)	Height (ft)	Power (% RPM)	Speed (kts)	Climb Angle (deg)	Climb Rate (fpm)	Duration (sec)	Notes	
a	0.00	0 AGL	24 Parallel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible] engine runup	
b	0.24	0 AGL	24 Parallel	[illegible]	0.0	0	2	6.1	a-b
c	0.22	0 AGL	100 Variable	50	0.0	0	8	3.1	b-c
d	0.43	0 AGL	100 Variable	95	11.3	2100	14	7.6	c-d
e	0.82	500 AGL	100 Variable	110	7.2	2500	[illegible]	12.5	d-e
f	1.46	1,000 AGL	51 Variable	170	0.0	0	115	14.0	e-f
g	10.70	1,000 AGL	51 Variable	170	-			[illegible]	f-g
							[illegible]		
					(use time to Taxi out [illegible])		[illegible]		

Flight Mode	Duration (Sec)
[illegible]	[illegible]
Takeoff	[illegible]
Takeoff	[illegible]
Takeoff	[illegible]
Takeoff	[illegible]
Climbout	[illegible]
Climbout	[illegible]
Idle	[illegible]
	[illegible]

Time by Mode	Duration (Sec)	Min
Idle	[illegible]	[illegible]
Engine Runup	[illegible]	[illegible]
Takeoff	[illegible]	[illegible]
Climbout	[illegible]	[illegible]
	[illegible]	

ARRIVALS
T-44 Flight Profile [illegible] - [illegible] Arrival [illegible] [illegible] % of total ops OpsType_Current Tab from DVP

Point	Distance (NM)	Height (ft)	Power (% RPM)	Speed (kts)	Climb Angle (deg)	Climb Rate (fpm)	Duration (sec)	Notes	
a	[illegible]	2,500 AGL	61 Variable	170	[illegible]	[illegible]	[illegible]		
b	5.51	1,000 AGL	61 Variable	170	0.0	0	40	[illegible]	a-b
c	[illegible]	1,000 AGL	[illegible] Variable	170	0.0	0	[illegible]	[illegible]	b-c
d	2.58	1,000 AGL	[illegible] Parallel	120	[illegible]	[illegible]	[illegible]	[illegible]	c-d
e	[illegible]	500 AGL	[illegible] Parallel	120	0.0	0	[illegible]	[illegible]	d-e
f	[illegible]	800 AGL	46 Parallel	120	[illegible]	[illegible]	[illegible]	[illegible]	e-f
g	[illegible]	500 AGL	24 Parallel	120	[illegible]	[illegible]	[illegible]	[illegible]	f-g
h	[illegible]	200 AGL	24 Parallel	100	[illegible]	-2100	7	[illegible]	g-h
i	[illegible]	0 AGL	24 Parallel	[illegible]	-	-		[illegible]	h-i
							[illegible]		
					(use time to Taxi in [illegible])		[illegible]		

Flight Mode	Duration (Sec)
Approach	[illegible]
Approach	40
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
Approach	7
Idle	[illegible]
	[illegible]

Time by Mode	Duration (Sec)	Duration (Min)
Approach	[illegible]	[illegible]
Idle	[illegible]	[illegible]
	[illegible]	

PATTERNS
NOLF Cabaniss T-44C Flight Profile C[illegible] - Touch and Go Runway [illegible] - [illegible] 800 ft AGL pattern [illegible] % of total ops OpsType_Current Tab from DVP Type: [illegible]

Point	Distance (NM)	Height (ft)	Power (% RPM)	Speed (kts)	Climb Angle (deg)	Climb Rate (fpm)	Duration (sec)	Notes	
a	[illegible]	50 AGL	24 Parallel	[illegible]	[illegible]	[illegible]	[illegible]		
b	[illegible]	0 AGL	24 Parallel	[illegible]	0.0	0	[illegible]	[illegible]	a-b
c	[illegible]	0 AGL	100 Variable	[illegible]	0.0	0	[illegible]	[illegible]	b-c
d	[illegible]	0 AGL	100 Variable	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	c-d
e	[illegible]	400 AGL	[illegible] Variable	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	d-e
f	[illegible]	800 AGL	70 Variable	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	e-f
g	[illegible]	800 AGL	46 Parallel	[illegible]	[illegible]	0	[illegible]	[illegible]	f-g
h	[illegible]	800 AGL	46 Parallel	120	[illegible]	0	[illegible]	[illegible]	g-h
i	[illegible]	800 AGL	27 Parallel	120	[illegible]	[illegible]	[illegible]	[illegible]	h-i
j	[illegible]	500 AGL	24 Parallel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	i-j
k	[illegible]	[illegible] AGL	24 Parallel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	j-k
l	[illegible]	50 AGL	24 Parallel	[illegible]	-	-		[illegible]	k-l
							[illegible]		

Flight Mode	Duration (Sec)
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
Climbout	[illegible]
Climbout	[illegible]
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
Approach	[illegible]
	[illegible]

Time by Mode	Duration (Sec)	Duration (Min)
Approach	[illegible]	[illegible]
Climbout	[illegible]	[illegible]
	[illegible]	

T-44C Baseline Flight Operations Emissions Calculations

NASCC Baseline

T-44 Flight Operations

Note: T-44C baseline operations use the [illegible] as a surrogate with (2) PT6A-42A engines

Flight distance from NASCC to:

NASCC Cabaniss	8.0 NM	ALI	38.1 NM	[illegible]	63.6 NM	[illegible]	40.4 NM
CRP	12.3 NM	RKV	65.7 NM	PIL	53.1 NM	VCT	72.1 NM

Type of Operation[1]	Total number of Operations[2]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	6,552																		
Taxi Out		2	12.3	8.0	1,289,434	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	214,600	54,388	3,843	1,380	116	103	4,148,600
Engine Runup		2	0.09	9.5	10,600	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	7.63	71	71	11	3	3	34,075
Takeoff		2	0.69	20.6	95,250	5.40E-01	5.36	7.08	1.07	0.26	0.20	3,214.59	50.8	511	675	102	25	20	306,614
Climbout		2	4.51	9.5	562,??	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	405.35	3,781	3,765	602	163	146	1,808,929
												Subtotal	**215,064**	**58,752**	**8,351**	**2,095**	**307**	**274**	**6,294,532**
VFR Departure	4,368																		
Taxi Out		2	11.70	8.0	898,630	209	72.44	2.09	1.07	0.50	0.45	3,214.59	1,797	70,867	1,797	935	430	387	3,763,539
Engine Runup		2	0.09	9.5	7,067	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	5.09E+00	47	47	8	2	2	22,717
Takeoff		2	1.91	20.6	165,570	5.30E-01	5.36	7.08	1.07	0.26	0.20	3,214.59	8.47E-01	889	3,179	178	43	33	532,480
Climbout		2	16.36	9.5	854,238	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	6.44E-01	6,013	5,983	957	259	225	2,774,892
Total Departures	10,920											**Subtotal**	**2,534**	**77,817**	**9,006**	**2,067**	**735**	**660**	**6,596,432**
IFR Arrival	7,098																		
Approach		2	13.40	5.7	1,085,620	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	3,576.39	22,542	4,980	1,164	800	724	3,473,760
Taxi In		2	6.1	8.0	692,785	186.43	42.18	2.98	1.07	0.08	0.08	3,214.59	115,297	29,221	2,064	741	62	55	2,226,358
												Subtotal	**118,874**	**51,763**	**7,025**	**1,891**	**862**	**779**	**5,700,291**
Overhead Break Arrival	3,084																		
Approach		2	12.05	5.7	402,137	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	15,28?.96	10,266	2,259	527	364	330	1,582,001
Taxi In		2	6.1	8.0	351,711	186.43	42.18	2.98	1.07	0.08	0.08	3,214.59	58,535	14,838	1,049	376	32	28	1,130,605
												Subtotal	**60,160**	**25,101**	**3,307**	**903**	**396**	**358**	**2,712,609**
VFR Arrival	738																		
Approach		2	13.52	5.7	33,486	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	110.74	698	154	36	25	22	107,549
Taxi In		2	6.1	8.0	22,???	186.43	42.18	2.98	1.07	0.08	0.08	3,214.59	3,548	899	64	23	2	2	69,522
Total Arrivals	10,920											**Subtotal**	**3,658**	**1,597**	**237**	**58**	**27**	**24**	**176,870**
												Total LTO Emissions in tons	**208.15**	**107.52**	**13.95**	**3.51**	**1.16**	**1.05**	**10,540**
IFR Pattern	5,078																		
Approach		2	12.63	5.7	727,097	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	2406.56	15,166	3,337	778	538	487	2,337,109
Climb out		2	0.83	9.5	80,543	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	57.99	541	539	86	23	21	258,912
												Subtotal	**2464.55**	**15,708**	**3,876**	**864**	**561**	**508**	**2,596,101**
VFR Pattern	382																		
Approach		2	1.48	5.7	6,430	3.31E+00	20.86	4.58	1.07	0.24	0.67	3,214.59	21.26	134	29	7	5	4.30E+00	20,644
Climb out		2	1.18	9.5	8,604	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	6.19	58	58	9	2	2	27,657
Total Patterns	5,460											**Subtotal**	**27.35**	**192**	**87**	**16**	**7**	**7**	**48,301**
												Total Pattern Emissions in Tons	**1.25**	**7.95**	**1.98**	**0.44**	**0.28**	**0.26**	**1,322**
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	**201.38**	**115.46**	**15.94**	**3.95**	**1.45**	**1.30**	**11,862**

T-44 Engine Maintenance Operations

Aircraft Type	Run-up Type	Total Events	Power Setting (selected mode)	Number of Engines	Duration (sec)	Annual Duration (min/yr)	Fuel Flow lb/min	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2
VT-31/VT-35 T-44	Preflight Run-up	10,920	70% FPM	2	120	43,680	9.5	415,688	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	299.30	2793.42	2780.95	444.29	120.55	108.08	1,336,286
			Idle (5%)	2	480	174,720	8.0	1,397,760	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	232,629.20	58957.52	4165.32	1495.60	125.80	111.82	[illegible]
	High Power Runs	30	57%	2	1,800	1800	9.5	8,565	0.72	5.72	6.69	1.07	0.29	0.26	3,214.59	6.17	57.56	57.30	9.18	2.48	2.22	27,533
	Engine Synchronization	30	53%	2	300	300	5.7	1,290	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	5.63	35.46	7.80	1.82	1.26	1.14	5,465
	Engine Desalinization Rinse	2,000	53%	2	30	2000	5.7	22,800	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	37.51	236.41	52.02	12.13	8.43	7.59	36,432
															Annual Total Engine Maintenance Emissions in Tons for All T-44 Aircraft	**116.49**	**31.04**	**3.51**	**0.98**	**0.13**	**0.12**	**2,949**

Ground Support Equipment (GSE) or Aerospace Ground Equipment (AGE)

Formula: GSE emissions in lbs = # of GSE * Op Hrs per LTO * Emissions in lbs/hr Annual LTOs = 10,920

GSE	# GSE	Op Hours for Each LTO	Emissions in lbs/hr: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
A/M32A-86D	1	0.75	0.29	0.46	6.10	0.05	0.09	0.09	146.08	2,400	3,742	49,975	385	745	729	1,196,395
									Total in pounds	**2,400**	**3,742**	**49,975**	**385**	**745**	**729**	**1,196,395**
									Total in tons	**1.20**	**1.87**	**24.99**	**0.19**	**0.37**	**0.36**	**598.20**

NASCC Aircraft Emissions Annual Total Tons (flight + maintenance ops + GSE)						
VOC	CO	NOx	SO2	PM10	PM2.5	CO2
319.04	**148.38**	**44.45**	**5.12**	**1.95**	**1.78**	**15,410**

[illegible]

Type of Operation[1]	Total Number of Operations[2]	No. of Engines in Use	Time in Mode/Engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
B-E Departure	1,474																		
Taxi Out		2	12.9	9.0	290,003	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	48,275	12,238	864	310	26	23	932,423
Engine Runup		2	0.10	9.5	3,129	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	2	16	16	3	1	1	7,535
Takeoff		2	0.60	10.6	18,751	5.30E-01	5.36	7.08	1.07	0.26	0.22	3,214.59	8	83	110	17	4	4	49,989
Climbout		2	3.53	9.5	99,109	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	71	666	663	106	29	26	318,659
Interfacility cruise		2	4.00	5.7	66,776	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	221	1,293	307	71	49	45	214,658
												Subtotal	**48,583**	**14,290**	**1,960**	**507**	**109**	**98**	**1,521,317**
Overhead Break Arrival	1,474																		
Interfacility cruise		2	4.00	5.7	66,776	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	221	1,293	307	71	49	45	214,658
Approach		2	12.02	5.7	200,742	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	664	4,187	922	215	149	134	645,305
Taxi In		2	6.20	9.0	143,862	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	23,943	6,068	429	154	13	12	462,458
												Subtotal	**24,829**	**11,548**	**1,657**	**440**	**211**	**191**	**1,322,421**
												Total LTO Emissions in Tons	**36.70**	**12.92**	**1.81**	**0.47**	**0.16**	**0.14**	**1,424**
T&G Pattern	26,532																		
Approach		2	1.01	5.7	304,215	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	1,007	6,346	1,396	326	225	204	977,926
Climb Out		2	1.65	9.5	832,870	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	599	5,595	5,570	891	241	216	2,676,466
												Subtotal	**1,606**	**11,941**	**6,966**	**1,216**	**467**	**420**	**3,654,392**
												Total Pattern Emissions in Tons	**0.80**	**5.97**	**3.48**	**0.61**	**0.23**	**0.21**	**1827.20**
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	**37.51**	**18.89**	**5.29**	**1.08**	**0.39**	**0.35**	**3,250**

[illegible]

Type of Operation[1]	Total Number of Operations[2]	No. of Engines in Use	Time in Mode/Engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
B-E Departure	2,439																		
Taxi Out		2	12.3	9.0	478,905	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	79,586	20,246	1,430	514	43	38	1,542,960
Engine Runup		2	0.08	9.5	3,889	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	3	26	26	4	1	1	12,436
Takeoff		2	0.60	10.6	26,150	5.30E-01	5.36	7.08	1.07	0.26	0.22	3,214.59	14	138	182	28	7	6	82,758
Climbout		2	3.53	9.5	164,015	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	119	1,103	1,097	176	48	43	527,235
Interfacility cruise		2	19.95	5.7	540,459	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	1,789	11,274	2,481	578	400	362	1,737,342
												Subtotal	**81,889**	**32,796**	**5,216**	**1,299**	**499**	**450**	**3,902,756**
Overhead Break Arrival	2,439																		
Interfacility cruise		2	19.95	5.7	540,459	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	1,789	11,274	2,481	578	400	362	1,737,342
Approach		2	12.02	5.7	332,197	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	1,099	6,929	1,525	355	246	223	1,067,770
Taxi In		2	6.20	9.0	238,046	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	39,618	10,041	709	255	21	19	765,222
												Subtotal	**42,506**	**28,244**	**4,715**	**1,188**	**667**	**604**	**3,570,332**
												Total LTO Emissions in Tons	**62.16**	**30.52**	**4.97**	**1.24**	**0.58**	**0.53**	**3,737**
T&G Pattern	11,630																		
Approach		2	1.01	5.7	133,441	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	442	2,784	612	143	99	89	428,957
Climb Out		2	1.65	9.5	365,212	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	262	2,454	2,443	391	106	95	1,174,006
												Subtotal	**705**	**5,238**	**3,056**	**534**	**205**	**184**	**1,602,963**
												Total Pattern Emissions in Tons	**0.35**	**2.62**	**1.53**	**0.27**	**0.10**	**0.09**	**801.48**
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	**62.51**	**33.13**	**6.49**	**1.51**	**0.68**	**0.62**	**4,538**

[illegible]

Type of Operation[1]	Total Number of Operations[2]	No. of Engines in Use	Time in Mode/Engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
B-E Departure	2,634																		
Taxi Out		2	12.9	9.0	514,435	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	85,617	21,699	1,533	550	46	41	1,653,658
Engine Runup		2	0.08	9.5	4,146	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	3	28	28	4	1	1	13,328
Takeoff		2	0.60	10.6	27,578	5.30E-01	5.36	7.08	1.07	0.26	0.22	3,214.59	15	148	195	30	7	6	88,651
Climbout		2	3.53	9.5	175,794	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	129	1,181	1,176	188	51	46	565,107
Interfacility cruise		2	5.00	5.7	180,206	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	596	3,759	827	193	133	121	579,288
												Subtotal	**86,358**	**26,816**	**3,759**	**965**	**239**	**215**	**2,900,032**
Overhead Break Arrival	2,634																		
Interfacility cruise		2	5.00	5.7	180,206	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	596	3,759	827	193	133	121	579,288
Approach		2	12.02	5.7	355,938	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	1,178	7,425	1,634	381	263	238	1,144,207
Taxi In		2	6.20	9.0	259,126	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	43,461	10,761	760	273	23	21	833,127
												Subtotal	**44,236**	**21,946**	**3,221**	**847**	**420**	**380**	**2,541,002**
												Total LTO Emissions in Tons	**65.30**	**22.56**	**3.49**	**0.91**	**0.33**	**0.30**	**2,722**
T&G Pattern	7,740																		
Approach		2	1.01	5.7	89,307	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	295	1,862	410	96	66	60	287,083
Climb Out		2	1.65	9.5	244,286	7.30E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	178	1,642	1,635	262	71	64	785,629
												Subtotal	**472**	**3,505**	**2,045**	**357**	**137**	**123**	**1,072,682**
												Total Pattern Emissions in Tons	**0.24**	**1.75**	**1.02**	**0.18**	**0.07**	**0.06**	**536.34**
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	**65.53**	**24.25**	**4.51**	**1.09**	**0.40**	**0.36**	**3,258**

[illegible] Baseline

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/Engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
B-B Departure	1,700																		
Taxi Out		2	12.3	8.0	334,890	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	55,841	14,113	997	359	30	27	1,075,473
Engine Runup		2	0.08	9.5	2,686	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	2	18	19	3	1	1	8,648
Takeoff		2	0.60	10.6	17,935	5.30E-01	5.26	7.08	1.07	0.26	0.23	3,214.59	10	96	127	19	5	4	57,854
Climbout		2	3.53	8.5	114,377	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	82	769	766	122	33	30	367,514
Interfacility cruise		2	45.29	5.7	870,598	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	2,882	18,161	3,996	932	644	583	2,798,636
												Subtotal	58,8[illegible]	33,159	5,908	1,436	713	645	4,307,975
Overhead Break Arrival	1,700																		
Interfacility cruise		2	45.28	5.7	870,598	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	2,882	18,161	3,996	932	644	583	2,798,636
Approach		2	12.02	5.7	231,572	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	766	4,830	1,063	248	171	155	744,245
Taxi In		2	6.20	8.0	166,820	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	27,614	6,998	494	179	15	13	535,365
												Subtotal	31,262	29,989	5,553	1,357	831	752	4,076,226
												Total LTO Emissions in Tons	44.96	31.57	5.73	1.40	0.77	0.70	4,192
VFR Pattern	5,724																		
Approach		2	1.01	5.7	65,9[illegible]	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	217	1,369	303	70	49	44	210,975
Climb out		2	1.65	9.5	179,625	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	129	1,207	1,202	192	52	47	577,459
												Subtotal	347	2,576	1,503	262	101	91	788,397
												Total Pattern Emissions in Tons	0.17	1.29	0.75	0.13	0.05	0.05	394.20
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	45.13	32.86	6.48	1.53	0.82	0.74	4,586

[illegible] Baseline

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/Engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
B-B Departure	725																		
Taxi Out		2	12.3	8.0	142,680	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	23,746	6,018	425	153	13	11	458,656
Engine Runup		2	0.08	9.5	1,150	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	1	8	8	1	0	0	3,697
Takeoff		2	0.60	10.6	7,649	5.30E-01	5.26	7.08	1.07	0.26	0.23	3,214.59	4	41	54	8	2	2	24,590
Climbout		2	3.53	9.5	48,757	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	35	328	326	52	14	13	156,734
Interfacility cruise		2	46.08	5.7	378,425	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	1,253	7,894	1,737	405	280	254	1,216,480
												Subtotal	25,039	14,289	2,550	619	309	280	1,860,156
Overhead Break Arrival	725																		
Interfacility cruise		2	46.08	5.7	378,425	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	1,253	7,894	1,737	405	280	254	1,216,480
Approach		2	12.02	5.7	98,737	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	327	2,060	453	106	73	66	317,446
Taxi In		2	6.20	8.0	70,760	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	11,777	2,985	211	76	6	6	227,464
												Subtotal	13,356	12,938	2,401	586	359	325	1,761,391
												Total LTO Emissions in Tons	19.20	13.61	2.49	0.60	0.33	0.30	1,811
VFR Pattern	4,749																		
Approach		2	1.01	5.7	54,682	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	180	1,136	250	58	40	36	175,040
Climb out		2	1.65	9.5	149,028	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	107	1,001	997	159	43	39	479,064
												Subtotal	288	2,137	1,247	218	84	75	654,105
												Total Pattern Emissions in Tons	0.14	1.07	0.62	0.11	0.04	0.04	327.05
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	19.34	14.68	3.10	0.71	0.38	0.34	2,138

[illegible] Baseline

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/Engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
B-B Departure	404																		
Taxi Out		2	12.3	8.0	79,507	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	13,232	3,354	237	85	7	6	255,583
Engine Runup		2	0.08	9.5	641	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	0	4	4	1	0	0	2,060
Takeoff		2	0.60	10.6	4,262	5.30E-01	5.26	7.08	1.07	0.26	0.23	3,214.59	2	22	30	5	1	1	13,701
Climbout		2	3.53	9.5	27,169	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	20	183	182	29	8	7	87,336
Interfacility cruise		2	41.28	5.7	188,993	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	625	3,943	867	202	140	127	607,525
												Subtotal	13,880	7,506	1,321	322	156	141	966,738
Overhead Break Arrival	404																		
Interfacility cruise		2	41.28	5.7	188,993	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	625	3,943	867	202	140	127	607,525
Approach		2	12.02	5.7	55,030	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	182	1,148	253	59	41	37	176,900
Taxi In		2	6.20	8.0	39,430	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	6,562	1,663	118	42	4	3	126,753
												Subtotal	7,370	6,753	1,238	303	184	167	911,178
												Total LTO Emissions in Tons	10.63	7.13	1.28	0.31	0.17	0.15	939
VFR Pattern	2,187																		
Approach		2	1.01	5.7	25,206	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	83	526	116	27	19	17	80,809
Climb out		2	1.65	9.5	68,630	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	49	461	459	73	20	18	220,618
												Subtotal	132	986	574	100	38	35	301,727
												Total Pattern Emissions in Tons	0.07	0.49	0.29	0.05	0.02	0.02	150.43
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	10.69	7.62	1.57	0.36	0.19	0.17	1,089

VCT Baseline

Type of Operation[2]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	585																		
Taxi Out		2	12.8	6.0	99,884	166.48	42.18	2.98	1.07	0.09	0.08	3,214.59	16,540	4,192	296	106	9	8	819,479
Engine Runup		2	0.08	9.5	801	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	1	5	5	1	0	0	2,575
Takeoff		2	0.50	10.6	5,328	5.30E-01	5.36	7.08	1.07	0.36	0.28	3,214.59	3	29	38	6	1	2	17,127
Climbout		2	3.58	9.5	33,957	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	24	228	227	36	10	9	109,173
Interfacility cruise		2	36.06	5.7	206,398	3.31E+00	20.88	4.59	1.07	0.74	0.67	3,214.59	683	4,305	947	221	153	138	663,484
												Subtotal	17,252	8,760	1,514	370	173	157	1,111,838
Overhead Break Arrival	585																		
Interfacility cruise		2	36.06	5.7	206,398	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	683	4,305	947	221	153	138	663,484
Approach		2	12.02	5.7	68,775	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	228	1,435	316	74	51	46	221,085
Taxi In		2	6.10	7.0	49,288	166.48	42.18	2.98	1.07	0.09	0.08	3,214.59	8,203	2,079	147	53	4	4	158,441
												Subtotal	9,114	7,819	1,410	347	208	188	1,043,009
												Total LTO Emissions in Tons	13.18	8.29	1.46	0.36	0.19	0.17	1,077
VFR Pattern	1,943																		
Approach		2	1.01	5.7	22,279	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	74	465	102	24	16	15	71,618
Climb out		2	1.65	9.5	60,973	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	44	410	408	65	18	16	196,004
												Subtotal	118	874	510	89	34	31	267,620
												Total Pattern Emissions in Tons	0.06	0.44	0.26	0.04	0.02	0.02	133.81
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	13.24	8.73	1.72	0.40	0.21	0.19	1,211

PKV Baseline

Type of Operation[2]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	334																		
Taxi Out		2	12.8	6.0	61,795	166.48	42.18	2.98	1.07	0.09	0.08	3,214.59	10,285	2,607	184	66	6	5	198,646
Engine Runup		2	0.08	9.5	498	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	0	3	3	1	0	0	1,601
Takeoff		2	0.50	10.6	3,323	5.30E-01	5.36	7.08	1.07	0.26	0.22	3,214.59	2	18	23	4	1	1	10,648
Climbout		2	3.53	9.5	21,127	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	15	142	141	22	6	5	67,882
Interfacility cruise		2	32.85	5.7	116,893	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	387	2,438	537	125	87	78	375,762
												Subtotal	10,689	5,208	889	218	99	90	654,540
Overhead Break Arrival	334																		
Interfacility cruise		2	32.85	5.7	116,893	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	387	2,438	537	125	87	78	375,762
Approach		2	12.02	5.7	42,763	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	142	892	196	46	32	29	137,467
Taxi In		2	6.10	0.0	30,646	166.48	42.18	2.98	1.07	0.09	0.08	3,214.59	5,100	1,293	91	33	3	2	98,516
												Subtotal	5,629	4,623	824	204	121	109	611,744
												Total LTO Emissions in Tons	8.16	4.92	0.86	0.21	0.11	0.10	633
VFR Pattern	1,464																		
Approach		2	1.01	5.7	16,786	3.31E+00	20.86	4.59	1.07	0.74	0.67	3,214.59	56	350	77	18	12	11	53,961
Climb out		2	1.65	9.5	45,942	7.20E-01	6.72	6.69	1.07	0.29	0.26	3,214.59	33	309	307	49	13	12	147,684
												Subtotal	89	659	384	67	26	23	201,644
												Total Pattern Emissions in Tons	0.04	0.33	0.19	0.03	0.01	0.01	100.82
												Total Annual Baseline T-44 Aircraft Flight Emissions in Tons	8.20	5.24	1.05	0.24	0.12	0.11	734

SUMMARY - T-44C BASELINE ANNUAL OPERATIONAL EMISSIONS (TONS/YR)

Location	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NASCC[1]	319.09	146.38	44.42	8.12	1.96	1.78	15,410
NOLF Cabaniss	37.51	18.99	5.29	1.08	0.39	0.35	3,250
ALI - Alice International	62.51	33.18	6.49	1.51	0.69	0.62	4,538
CRP - Corpus Christi International	65.50	24.25	4.51	1.09	0.40	0.36	3,258
HRL - Valley International	45.13	32.86	6.48	1.53	0.82	0.74	4,556
PIL - Port Isabel	19.34	14.68	3.10	0.71	0.38	0.34	2,138
PSX - Palacios Municipal	10.69	7.62	1.57	0.36	0.19	0.17	1,089
VCT - Victoria Regional	13.24	8.73	1.72	0.40	0.21	0.19	1,211
PKV - Calhoun County	8.20	5.24	1.05	0.24	0.12	0.11	734
Total	**573.04**	**288.65**	**73.61**	**11.80**	**5.02**	**4.56**	**35,491**

Notes: [1] Includes maintenance operations that occur at NASCC.

TAB D. Alternative 1 Flight Operations Emissions Calculations

NASCC METS ACT 1
Alternative 1 T-54A Replacement Aircraft Flight Operations
Note: T-54A operations use the C-12 as a surrogate, with (2) PT6A-60A engines

Flight distances from NASCC to:

NOLF Cabaniss	8.0 NM	ALI	39.1 NM	BSX	82.6 NM	HRL	90.4 NM
CRP	12.2 NM	PKV	65.7 NM	PIL	92.1 NM	VCT	72.1 NM

10% increase in operations over baseline

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	**7,207**																		
Taxi Out		2	12.3	8.0	1,418,371	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	236,060	59,827	4,227	1,518	128	113	4,559,500
Engine Runup		2	0.09	9.5	11,660	0.72	6.72	6.66	1.07	0.29	0.26	3.21459	8	78	78	12	3	3	37,482
Takeoff		2	0.69	10.6	104,886	0.53	5.36	7.08	1.07	0.26	0.23	3.21459	56	562	743	112	27	24	337,164
Climbout		2	4.51	9.5	618,995	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	445	4,160	4,141	662	180	161	1,989,816
												Subtotal	**236,570**	**64,627**	**9,189**	**2,305**	**338**	**302**	**6,923,963**
VFR Departure	**4,805**																		
Taxi Out		2	12.90	8.0	1,418,371	2.09	82.44	2.06	1.07	0.50	0.45	3.21459	2,964	116,930	2,964	1,518	709	638	4,559,500
Engine Runup		2	0.09	9.5	11,660	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	8	78	78	12	3	3	37,482
Takeoff		2	1.81	10.6	274,854	0.53	5.36	7.08	1.07	0.26	0.23	3.21459	146	1,473	1,946	294	71	63	883,542
Climbout		2	10.76	9.5	1,475,633	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	1,062	9,916	9,872	1,579	428	384	4,743,555
Total Departures	12,012											**Subtotal**	**4,181**	**128,399**	**14,860**	**3,403**	**1,212**	**1,088**	**10,224,079**
IFR Arrival	**7,808**																		
Approach		2	13.43	5.7	1,188,694	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	3,935	24,796	5,456	1,272	880	796	3,821,164
Taxi In		2	6.1	8.0	762,041	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	126,827	32,143	2,271	815	69	61	2,449,650
												Subtotal	**130,763**	**56,939**	**7,727**	**2,087**	**948**	**857**	**6,270,815**
Overhead Break Arrival	**3,964**																		
Approach		2	12.05	5.7	541,345	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	1,792	11,292	2,485	579	401	363	1,740,202
Taxi In		2	6.1	8.0	386,882	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	64,389	16,319	1,153	414	35	31	1,243,669
												Subtotal	**66,183**	**27,611**	**3,638**	**993**	**435**	**394**	**2,983,870**
VFR Arrival	**240**																		
Approach		2	13.52	5.7	36,802	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	122	768	169	39	27	25	118,304
Taxi In		2	6.1	8.0	23,440	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	3,901	989	70	25	2	2	75,374
Total Arrivals	12,012											**Subtotal**	**4,024**	**1,757**	**239**	**64**	**29**	**27**	**193,678**
												Total LTO Emissions in Tons	**220.86**	**339.67**	**37.83**	**4.43**	**1.48**	**1.33**	**13,298**
IFR Pattern	**5,586**																		
Approach		2	12.63	5.7	770,762	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	2,547	16,683	3,671	856	597	536	2,570,908
Climb out		2	0.83	9.5	88,591	0.72	6.72	6.66	1.07	0.29	0.26	3.21459	64	595	593	95	26	23	284,803
												Subtotal	**2,711**	**17,278**	**4,264**	**951**	**638**	**559**	**2,855,711**
VFR Pattern	**420**																		
Approach		2	1.48	5.7	7,064	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	22	147	32	8	5	5	22,708
Climb out		2	1.18	9.5	9,464	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	7	64	63	10	3	2	30,423
Total Patterns	6,006											**Subtotal**	**30**	**211**	**96**	**18**	**8**	**7**	**53,131**
												Total Pattern Emissions in Tons	**1.37**	**8.74**	**2.18**	**0.48**	**0.33**	**0.28**	**1,454**
												Total Annual METS Aircraft Flight Emissions in Tons	**222.23**	**348.41**	**40.01**	**4.91**	**1.79**	**1.62**	**14,753**

METS Engine Maintenance Operations 60 sec/min

Aircraft Type	Run-up Type	Total Events	Power Setting (selected mode)	Number of Engines	Duration (sec)	Annual Duration (min/yr)	Fuel Flow lb/min	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2
VT-31/VT-35 METS Engine Maintenance Operations	Preflight Run-up	12,012	(70% RPM)	2	120	48,048	9.5	457,257	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	329.22	3072.77	3059.05	489.25	132.60	118.89	1,469,891
			Idle (7%)	2	480	192,192	8.0	1,537,536	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	255892.12	64853.27	4581.86	1645.16	138.38	123.00	4,942,548
	High Power Run	33	67%	1	1,800	990	9.5	9,422	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	0.78	65.21	63.03	10.08	2.73	2.45	30,288
	Engine Synchronization	33	51%	2	300	330	5.7	1,870	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	6.19	39.01	8.58	2.00	1.38	1.25	6,011
	Engine Desalinization Runs	3,300	51%	2	20	2,200	5.7	12,467	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	41.26	260.05	57.22	13.34	9.23	8.35	40,075
															Annual Total Engine Maintenance Emissions - Tons for All METS Alt 1 Aircraft	**128.14**	**34.34**	**3.88**	**1.08**	**0.14**	**0.13**	**3,244**

Ground Support Equipment (GSE) or Aerospace Ground Equipment (AGE) *Assume same GSE types as baseline
Formula: GSE emissions in lbs = # of GSE * Op hrs per LTO * Emissions in lbs/h
Annual LTOs = 12,012

AGE	# AGE	Op Hours for Each LTO	Emissions in lbs/hr: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
A/M32A-86D	1	0.75	0.29	0.46	6.10	0.05	0.09	0.09	146.18	2,649	4,117	54,973	422	820	802	1,316,035
									Total in pounds	**2,649**	**4,117**	**54,973**	**423**	**820**	**802**	**1,316,035**
									Annual Total GSE Emissions in Tons for All METS Alt 1 Aircraft	**1.32**	**2.06**	**27.49**	**0.21**	**0.41**	**0.40**	**658**

NASCC METS Alt 1 Emissions: Annual Total Tons (flight + maintenance ops + GSE)						
VOC	CO	NOx	SO2	PM10	PM2.5	CO2
351.69	384.61	51.38	6.20	2.35	2.14	18,655

NOLF Cabaniss METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	1,621																		
Taxi Out		2	12.30	8.0	319,092	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	53,106	13,459	951	341	29	26	1,025,748
Engine Runup		2	0.08	9.5	2,572	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	2	17	17	3	1	1	8,267
Takeoff		2	0.50	10.6	17,142	0.53	5.36	7.08	1.07	0.26	0.23	3.21459	9	92	121	18	4	4	55,104
Climbout		2	3.53	9.5	109,041	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	79	733	729	117	32	28	350,522
Interfacility cruise		2	4.00	5.7	73,454	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	243	1,532	337	79	54	49	236,123
												Subtotal	**53,439**	**15,833**	**2,156**	**558**	**120**	**108**	**1,675,765**
Overhead Break Arrival	1,621																		
Interfacility cruise		2	4.00	5.7	73,454	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	243.130617	1532.243063	337.1523027	78.5954169	54.3557089	49.2139526	236120.4032
Approach		2	12.02	5.7	220,817	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	730.9031593	4606.23662	1013.54849	236.273831	163.4043317	147.9471652	709835.0414
Taxi In		2	6.10	8.0	158,249	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	26337.32116	6674.927636	471.5809472	169.3260448	14.2423776	12.6598912	508704.4957
												Subtotal	**27,311**	**12,813**	**1,822**	**484**	**232**	**210**	**1,454,663**
												Total LTO Emissions in Tons	**40.38**	**14.32**	**1.99**	**0.52**	**0.18**	**0.16**	**1,565**
VFR Pattern	29,185																		
Approach		2	1.01	5.7	334,636	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	1,108	6,981	1,536	358	248	224	1,075,718
Climb out		2	1.65	9.5	915,859	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	659	6,155	6,127	980	266	238	2,944,113
												Subtotal	**1,767**	**13,135**	**7,663**	**1,338**	**513**	**462**	**4,019,831**
												Total Pattern Emissions in Tons	**0.88**	**6.57**	**3.83**	**0.67**	**0.26**	**0.23**	**2009.92**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**41.26**	**20.89**	**5.82**	**1.19**	**0.43**	**0.39**	**3,575**

ALI METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	2,683																		
Taxi Out		2	12.3	8.0	527,995	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	87,874	22,271	1,573	565	48	42	1,697,287
Engine Runup		2	0.1	9.5	4,255	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	3	29	28	5	1	1	13,679
Takeoff		2	0.5	10.6	28,364	0.53	5.36	7.08	1.07	0.26	0.23	3.21459	15	152	201	30	7	7	91,179
Climbout		2	3.5	9.5	180,428	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	130	1,212	1,207	193	52	47	580,002
Interfacility cruise		2	19.6	5.7	594,501	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	1,968	12,401	2,729	636	440	398	1,911,076
												Subtotal	**89,990**	**36,065**	**5,739**	**1,429**	**548**	**495**	**4,293,223**
Overhead Break Arrival	2,683																		
Interfacility cruise		2	19.6	5.7	594,501	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	1,968	12,401	2,729	636	440	398	1,911,076
Approach		2	12.0	5.7	365,381	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	1,209	7,622	1,677	391	270	245	1,174,551
Taxi In		2	6.1	8.0	261,851	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	43,580	11,045	780	280	24	21	841,744
												Subtotal	**46,757**	**31,068**	**5,186**	**1,307**	**734**	**664**	**3,927,371**
												Total LTO Emissions in Tons	**68.37**	**33.57**	**5.46**	**1.37**	**0.64**	**0.58**	**4,110**
VFR Pattern	12,802																		
Approach		2	1.0	5.67	146,785	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	486	3,062	674	157	109	98	471,853
Climb out		2	1.6	9.52	401,735	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	289	2,700	2,688	430	117	104	1,291,406
												Subtotal	**775**	**5,762**	**3,361**	**587**	**225**	**203**	**1,763,259**
												Total Pattern Emissions in Tons	**0.39**	**2.88**	**1.68**	**0.29**	**0.11**	**0.10**	**881.63**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**68.76**	**36.45**	**7.14**	**1.66**	**0.75**	**0.68**	**4,992**

CRP METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	2,875																		
Taxi Out		2	12.3	8.0	565,879	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	94,179	23,869	1,686	605	51	45	1,819,068
Engine Runup		2	0.1	9.5	4,561	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	3	31	31	5	1	1	14,661
Takeoff		2	0.5	10.6	30,399	0.53	5.36	7.08	1.07	0.26	0.23	3.21459	16	163	215	33	8	7	97,721
Climbout		2	3.5	9.5	193,374	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	139	1,299	1,294	207	56	50	621,618
Interfacility cruise		2	6.1	5.7	198,227	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	656	4,135	910	212	147	133	637,217
												Subtotal	**94,994**	**25,362**	**4,136**	**1,062**	**263**	**237**	**3,190,285**
Overhead Break Arrival	2,875																		
Interfacility cruise		2	6.1	5.7	198,227	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	656	4,135	910	212	147	133	637,217
Approach		2	12.0	5.7	391,598	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	1,296	8,169	1,797	419	290	262	1,258,826
Taxi In		2	6.1	8.0	280,639	166.43	42.18	2.98	1.07	0.09	0.08	3.21459	46,707	11,837	836	300	25	22	902,139
												Subtotal	**48,659**	**24,141**	**3,544**	**931**	**462**	**418**	**2,798,182**
												Total LTO Emissions in Tons	**71.83**	**24.75**	**3.84**	**1.00**	**0.36**	**0.33**	**2,994**
VFR Pattern	8,567																		
Approach		2	1.0	5.67	98,227	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	325	2,049	451	105	73	66	315,758
Climb out		2	1.6	9.52	268,834	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	194	1,807	1,799	288	78	70	864,192
												Subtotal	**519**	**3,856**	**2,249**	**393**	**151**	**136**	**1,179,950**
												Total Pattern Emissions in Tons	**0.26**	**1.93**	**1.12**	**0.20**	**0.08**	**0.07**	**589.98**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**72.09**	**26.68**	**4.96**	**1.19**	**0.44**	**0.39**	**3,584**

HRL METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	1,870																		
Taxi Out		2	12.30	8.0	368,016	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	61,249	15,523	1,097	394	33	29	1,183,021
Engine Runup		2	0.08	9.5	2,966	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	2	20	20	3	1	1	9,535
Takeoff		2	0.50	10.6	19,770	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	10	106	140	21	5	5	63,553
Climbout		2	3.53	9.5	125,760	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	91	845	841	135	36	33	404,265
Interfacility cruise		2	45.19	5.7	957,658	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	3,170	19,977	4,396	1,025	709	642	3,078,478
												Subtotal	**64,522**	**36,471**	**6,493**	**1,577**	**784**	**709**	**4,738,851**
Overhead Break Arrival	1,870																		
Interfacility cruise		2	45.19	5.7	957,658	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	3,170	19,977	4,396	1,025	709	642	3,078,478
Approach		2	12.02	5.7	254,675	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	843	5,312	1,169	273	188	171	818,670
Taxi In		2	6.10	8.0	182,512	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	30,375	7,698	544	195	16	15	586,701
												Subtotal	**34,388**	**32,988**	**6,108**	**1,492**	**934**	**827**	**4,483,849**
												Total LTO Emissions in Tons	**49.46**	**34.73**	**6.30**	**1.53**	**0.85**	**0.77**	**4,611**
VFR Pattern	6,296																		
Approach		2	1.01	5.67	72,194	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	239	1,506	331	77	53	48	232,075
Climb out		2	1.65	9.52	197,580	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	142	1,328	1,322	211	57	51	635,161
												Subtotal	**381**	**2,834**	**1,653**	**289**	**111**	**100**	**867,236**
												Total Pattern Emissions in Tons	**0.19**	**1.42**	**0.83**	**0.14**	**0.06**	**0.05**	**433.62**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**49.65**	**36.15**	**7.13**	**1.68**	**0.90**	**0.82**	**5,045**

PIL METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	798																		
Taxi Out		2	12.30	8.0	156,948	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	26,121	6,620	468	168	14	13	504,523
Engine Runup		2	0.08	9.5	1,265	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	1	9	8	1	0	0	4,066
Takeoff		2	0.50	10.6	8,431	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	4	45	60	9	2	2	27,103
Climbout		2	3.53	9.5	53,635	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	39	360	359	57	16	14	172,407
Interfacility cruise		2	46.06	5.7	416,267	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,378	8,683	1,911	445	308	279	1,338,128
												Subtotal	**27,543**	**15,718**	**2,805**	**681**	**340**	**308**	**2,046,228**
Overhead Break Arrival	798																		
Interfacility cruise		2	46.06	5.7	416,267	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,378	8,683	1,911	445	308	279	1,338,128
Approach		2	12.02	5.7	108,611	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	360	2,266	499	116	80	73	349,138
Taxi In		2	6.10	8.0	77,836	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	12,954	3,283	232	83	7	6	250,211
												Subtotal	**14,692**	**14,232**	**2,641**	**645**	**395**	**358**	**1,937,477**
												Total LTO Emissions in Tons	**21.12**	**14.97**	**2.72**	**0.66**	**0.37**	**0.33**	**1,992**
VFR Pattern	5,224																		
Approach		2	1.01	5.67	59,897	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	198	1,249	275	64	44	40	192,544
Climb out		2	1.65	9.52	163,931	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	118	1,102	1,097	175	48	43	526,971
												Subtotal	**316**	**2,351**	**1,372**	**239**	**92**	**83**	**719,515**
												Total Pattern Emissions in Tons	**0.16**	**1.18**	**0.69**	**0.12**	**0.05**	**0.04**	**359.76**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**21.28**	**16.15**	**3.41**	**0.78**	**0.41**	**0.37**	**2,352**

PSX METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	444																		
Taxi Out		2	12.30	8.0	87,458	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	14,556	3,689	261	94	8	7	281,141
Engine Runup		2	0.08	9.5	705	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	1	5	5	1	0	0	2,266
Takeoff		2	0.50	10.6	4,698	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	2	25	33	5	1	1	15,103
Climbout		2	3.53	9.5	29,886	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	22	201	200	32	9	8	96,073
Interfacility cruise		2	41.28	5.7	207,890	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	688	4,337	954	222	154	139	668,280
												Subtotal	**15,268**	**8,256**	**1,453**	**354**	**172**	**155**	**1,062,863**
Overhead Break Arrival	444																		
Interfacility cruise		2	41.28	5.7	207,890	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	688	4,337	954	222	154	139	668,280
Approach		2	12.02	5.7	60,522	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	200	1,262	278	65	45	41	194,555
Taxi In		2	6.10	8.0	43,375	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	7,219	1,829	129	46	4	3	139,428
												Subtotal	**8,107**	**7,429**	**1,361**	**334**	**203**	**183**	**1,002,263**
												Total LTO Emissions in Tons	**11.69**	**7.84**	**1.41**	**0.34**	**0.19**	**0.17**	**1,033**
VFR Pattern	2,406																		
Approach		2	1.01	5.67	27,584	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	91	575	127	30	20	18	88,670
Climb out		2	1.65	9.52	75,493	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	54	507	505	81	22	20	242,680
												Subtotal	**146**	**1,083**	**632**	**110**	**42**	**38**	**331,350**
												Total Pattern Emissions in Tons	**0.07**	**0.54**	**0.32**	**0.06**	**0.02**	**0.02**	**165.67**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**11.76**	**8.38**	**1.72**	**0.40**	**0.21**	**0.19**	**1,199**

VCT METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	556																		
Taxi Out		2	13.90	8.0	109,322	166.43	42.18	2.56	1.07	0.09	0.08	3.21459	18,195	4,611	306	117	10	9	351,427
Engine Runup		2	0.08	9.5	881	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	1	5	6	1	0	0	2,832
Takeoff		2	0.50	10.6	5,873	0.53	5.36	7.08	1.07	0.25	0.23	3.21459	3	31	42	6	2	1	18,879
Climbout		2	3.53	9.5	37,358	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	27	251	250	40	11	10	120,091
Interfacility cruise		2	36.06	5.7	227,038	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	751	4,736	1,042	243	168	152	729,832
												Subtotal	**18,977**	**9,636**	**1,665**	**407**	**190**	**172**	**1,221,061**
Overhead Break Arrival	556																		
Interfacility cruise		2	36.00	5.7	227,038	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	751	4,736	1,042	243	168	152	729,832
Approach		2	12.02	5.7	75,655	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	250	1,578	347	81	56	51	243,193
Taxi In		2	6.10	8.0	54,211	166.43	42.18	2.56	1.07	0.09	0.08	3.21459	9,023	2,287	162	58	5	4	174,265
												Subtotal	**10,025**	**8,601**	**1,551**	**382**	**229**	**207**	**1,147,310**
												Total LTO Emissions in Tons	**14.50**	**9.12**	**1.61**	**0.39**	**0.21**	**0.19**	**1,185**
VFR Pattern	2,137																		
Approach		2	1.01	5.67	24,506	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	81	511	112	26	18	16	78,777
Climb out		2	1.65	9.52	67,071	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	48	451	449	72	19	17	215,604
												Subtotal	**129**	**962**	**561**	**99**	**38**	**34**	**294,382**
												Total Pattern Emissions in Tons	**0.06**	**0.48**	**0.28**	**0.05**	**0.02**	**0.02**	**147.19**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**14.57**	**9.60**	**1.89**	**0.44**	**0.23**	**0.21**	**1,332**

PKV METS Alt 1

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	345																		
Taxi Out		2	12.30	8.0	67,975	166.43	42.18	2.56	1.07	0.09	0.08	3.21459	11,313	2,867	203	73	6	5	218,512
Engine Runup		2	0.08	9.5	548	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	0	4	4	1	0	0	1,761
Takeoff		2	0.50	10.6	3,652	0.53	5.36	7.08	1.07	0.25	0.23	3.21459	2	20	26	4	1	1	11,739
Climbout		2	3.53	9.5	23,229	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	17	156	155	25	7	6	74,670
Interfacility cruise		2	22.85	5.7	128,582	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	426	2,682	590	138	95	86	413,338
												Subtotal	**11,758**	**5,729**	**978**	**290**	**109**	**99**	**720,019**
Overhead Break Arrival	345																		
Interfacility cruise		2	22.85	5.7	128,582	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	426	2,682	590	138	95	86	413,338
Approach		2	12.02	5.7	47,040	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	156	981	216	50	35	32	151,213
Taxi In		2	6.10	8.0	33,711	166.43	42.18	2.56	1.07	0.09	0.08	3.21459	5,611	1,422	100	36	3	3	108,367
												Subtotal	**6,192**	**5,085**	**907**	**224**	**133**	**120**	**672,918**
												Total LTO Emissions in Tons	**8.97**	**5.41**	**0.94**	**0.23**	**0.12**	**0.11**	**696**
VFR Pattern	1,610																		
Approach		2	1.01	5.67	18,465	3.31	20.86	4.59	1.07	0.74	0.67	3.21459	61	385	85	20	14	12	59,357
Climb out		2	1.65	9.52	50,536	0.72	6.72	6.69	1.07	0.29	0.26	3.21459	36	340	338	54	15	13	162,452
												Subtotal	**98**	**725**	**423**	**74**	**28**	**26**	**221,809**
												Total Pattern Emissions in Tons	**0.05**	**0.36**	**0.21**	**0.04**	**0.01**	**0.01**	**111**
												Total Annual METS Alt 1 Aircraft Flight Emissions in Tons	**9.02**	**5.77**	**1.15**	**0.27**	**0.14**	**0.12**	**807**

SUMMARY - METS ALT 1 ANNUAL OPERATIONAL EMISSIONS (TONS/YR)

Location	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NASCC[1]	351.60	184.61	51.88	6.20	1.85	2.14	18,555
NOLF Cabaniss	41.26	20.89	5.83	1.19	0.45	0.39	3,575
ALI - Alice International	68.76	36.45	7.14	1.66	0.75	0.68	4,992
CRP - Corpus Christi International	72.09	35.68	4.96	1.19	0.44	0.39	3,584
HRL - Valley International	49.65	36.15	7.13	1.68	0.90	0.82	5,046
PIL - Port Isabel	21.28	18.15	2.41	0.78	0.41	0.37	2,052
PSX - Palacios Municipal	11.76	8.38	1.72	0.40	0.21	0.19	1,298
VCT - Victoria Regional	14.57	9.60	1.89	0.44	0.23	0.21	1,332
PKV - Calhoun County	9.02	5.77	1.15	0.27	0.14	0.12	807
Total	**631.04**	**338.91**	**83.45**	**13.55**	**5.72**	**5.29**	**40,734**

Notes: [1]Includes maintenance operations that occur at NASCC

TAB E Alternative 2 Flight Operations Emissions Calculations

NASCC METS ALT 2
Alternative 2 T-54A Replacement Aircraft Flight Operations
Note: T-54A operations use the C-12 as a surrogate, with (2) PT6A-60A engines

Flight distances from NASCC to:

NOLF Cabaniss	8.0 NM	ALI	39.1 NM	PSX	82.5 NM	HRL	90.4 NM
CRP	12.2 NM	NGW	89.7 NM	PIL	92.1 NM	VCT	72.1 NM

20% increase in operations over baseline

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	7,862																		
Taxi Out		2	12.30	8.0	1,547,320	166.42	42.18	2.98	1.07	0.09	0.08	3,214.59	257,521	65,266	4,611	1,656	139	124	4,974,000
Engine Runup		2	0.09	9.5	12,720	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	9	85	85	14	4	3	40,890
Takeoff		2	0.83	10.6	114,421	0.53	5.36	7.08	1.07	0.25	0.23	3,214.59	61	613	810	122	31	26	367,819
Climbout		2	4.51	9.5	675,268	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	486	4,538	4,518	723	196	176	2,170,709
												Subtotal	**258,077**	**70,503**	**10,024**	**2,514**	**369**	**329**	**7,553,414**
VFR Departure	5,242																		
Taxi Out		2	12.30	8.0	1,547,320	2.09	82.44	2.09	1.07	0.50	0.45	3,214.59	3,234	127,561	3,234	1,656	774	696	4,974,000
Engine Runup		2	0.09	9.5	12,720	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	9	85	85	14	4	3	40,890
Takeoff		2	1.83	10.6	299,840	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	159	1,607	2,123	321	78	69	963,864
Climbout		2	16.76	9.5	1,609,781	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	1,159	10,818	10,769	1,722	467	419	5,174,787
Total Departures	13,104											**Subtotal**	**4,561**	**140,071**	**16,211**	**3,713**	**1,322**	**1,187**	**11,153,541**
IFR Arrival	3,518																		
Approach		2	13.43	5.7	1,295,757	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	4,293	27,050	5,952	1,388	960	869	4,168,543
Taxi In		2	6.10	8.0	831,318	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	138,358	35,065	2,477	890	75	67	2,672,346
												Subtotal	**142,648**	**62,115**	**8,429**	**2,277**	**1,034**	**935**	**6,840,889**
Overhead Break Arrival	4,324																		
Approach		2	12.05	5.7	590,558	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,955	12,319	2,711	632	437	396	1,898,403
Taxi In		2	6.10	8.0	422,064	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	70,243	17,802	1,258	452	38	34	1,356,729
												Subtotal	**72,197**	**30,121**	**3,968**	**1,083**	**475**	**429**	**3,255,133**
VFR Arrival	262																		
Approach		2	13.52	5.7	40,148	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	133	837	184	43	30	27	129,059
Taxi In		2	6.10	8.0	25,575	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	4,257	1,079	76	27	2	2	82,226
Total Arrivals	13,104											**Subtotal**	**4,390**	**1,916**	**261**	**70**	**32**	**29**	**211,285**
												Total LTO Emissions in Tons	**238.94**	**152.16**	**19.45**	**4.03**	**1.62**	**1.45**	**14,587**
IFR Pattern	6,094																		
Approach		2	12.63	5.7	872,408	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	2,888	18,200	4,005	934	646	585	2,804,427
Climb out		2	0.83	9.5	96,185	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	70	646	647	103	28	25	310,894
												Subtotal	**2,957**	**18,849**	**4,651**	**1,037**	**674**	**610**	**3,115,321**
VFR Pattern	458																		
Approach		2	1.48	5.7	7,706	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	26	161	35	8	6	5	24,772
Climb out		2	1.18	9.5	10,324	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	7	69	69	11	3	3	33,189
Total Patterns	6,552											**Subtotal**	**33**	**230**	**104**	**19**	**9**	**8**	**57,961**
												Total Pattern Emissions in Tons	**1.50**	**9.54**	**2.38**	**0.53**	**0.34**	**0.31**	**1,587**
												Total Annual METS Aircraft Flight Emissions in Tons	**242.43**	**161.90**	**21.82**	**5.36**	**3.96**	**1.76**	**16,094**

METS Engine Maintenance Operations

CO mg/min

Aircraft Type	Run-up Type	Total Events	Power Setting (selected mode)	Number of Engines	Duration (sec)	Annual Duration (min/yr)	Fuel Flow lb/min	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2
VT-31/VT-35 METS Engine Maintenance Operations	Preflight Run-up	13,104	(70 % RPM)	2	120	52,416	9.5	498,826	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	359.15	3352.11	3337.14	533.74	144.66	129.69	1,603,530
			Idle (7%)	2	480	209,664	8.0	1,677,312	166.43	47.19	2.98	1.07	0.09	0.08	3,214.59	279155.04	79149.02	4998.39	1,794.72	150.96	134.18	5,391,870
	High Power Runs	36	67%	1	1,800	1,080	9.5	10,278	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	7.40	69.07	68.76	11.00	2.98	2.67	33,040
	Engine Synchronization	36	53%	2	300	360	5.7	2,040	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	6.75	42.55	9.36	2.18	1.51	1.37	6,558
	Engine Desalinization Runs	3,600	53%	2	20	2,400	5.7	13,600	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	45.02	283.70	62.42	14.55	10.06	9.11	43,718
															Total in pounds	279573.36	74496.45	8475.08	2356.20	310.17	277.03	7,078,706
															Annual Total Engine Maintenance Emissions in Tons for all METS AC Subtotal	**139.79**	**37.25**	**4.24**	**1.18**	**0.16**	**0.14**	**3,539**

Ground Support Equipment (GSE) or Aerospace Ground Equipment (AGE) — *Assume same GSE types as baseline

Formula: (GSE emissions in lbs = # of GSE * Op Hrs per LTO * Emissions in lbs/hr) — Annual LTOs = 13,104

AGE	# AGE	Op Hours for Each	Emissions in lbs/hr: VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually: VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
A/M32A-860	1	0.25	0.29	0.46	5.10	0.05	0.09	0.09	146.08	2,889	4,482	59,970	462	894	875	1,435,874
									Total in pounds	**2,889**	**4,481**	**59,970**	**462**	**891**	**875**	**1,435,874**
									Annual Total AGE Emissions in Tons for All METS AC Subtotal	**1.44**	**2.25**	**29.99**	**0.23**	**0.45**	**0.44**	**718**

NASCC METS Alt 2 Emissions Annual Total Tons (flight + maintenance ops + GSE)						
VOC	CO	NOx	SO2	PM10	PM2.5	CO2
383.66	**201.40**	**56.05**	**6.77**	**2.56**	**2.44**	**20,351**

NOLF Cabaniss METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	1,769																		
Taxi Out		2	12.30	8.0	348,100	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	57,934	14,683	1,037	372	31	28	1,118,998
Engine Runup		2	0.08	9.5	2,806	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	2	19	19	3	1	1	9,019
Takeoff		2	0.50	10.6	18,700	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	10	100	132	20	5	4	60,113
Climbout		2	3.53	9.5	118,954	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	86	799	796	127	34	31	382,388
Interfacility cruise		2	4.00	5.7	80,131	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	265	1,672	368	86	59	54	257,589
												Subtotal	**58,297**	**17,273**	**2,352**	**608**	**131**	**117**	**1,828,107**
Overhead Break Arrival	1,769																		
Interfacility cruise		2	4.00	5.7	80,131	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	265.2344912	1671.538214	367.802512	85.7404548 7	59.29713702	53.68794838	257589.1671
Approach		2	12.02	5.7	240,891	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	797.3489011	5024.984313	1105.689262	257.7532701	178.2592709	161.3969075	774365.4997
Taxi In		2	6.10	8.0	172,635	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	28731.62308	7281.739238	514.4519424	184.7193216	15.5371392	13.8107904	554950.3589
												Subtotal	**29,794**	**13,978**	**1,988**	**528**	**253**	**229**	**1,586,905**
												Total LTO Emissions in Tons	**44.05**	**15.63**	**2.17**	**0.57**	**0.19**	**0.17**	**1,708**
VFR Pattern	31,838																		
Approach		2	1.01	5.7	365,058	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,208	7,615	1,676	391	270	245	1,173,511
Climb out		2	1.65	9.5	999,119	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	719	6,714	6,684	1,069	290	260	3,211,759
												Subtotal	**1,928**	**14,329**	**8,360**	**1,460**	**560**	**504**	**4,385,270**
												Total Pattern Emissions in Tons	**0.96**	**7.16**	**4.18**	**0.73**	**0.28**	**0.25**	**2192.64**
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	**45.01**	**22.79**	**6.35**	**1.30**	**0.47**	**0.43**	**3,900**

ALi METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	2,927																		
Taxi Out		2	12.3	8.0	575,994	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	95,863	24,295	1,716	616	52	46	1,851,585
Engine Runup		2	0.1	9.5	4,642	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	3	31	31	5	1	1	14,922
Takeoff		2	0.5	10.6	30,943	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	16	166	219	33	8	7	99,468
Climbout		2	3.5	9.5	196,831	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	142	1,322	1,317	211	57	51	632,730
Interfacility cruise		2	19.6	5.7	648,546	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	2,147	13,529	2,977	694	480	435	2,084,811
												Subtotal	**98,171**	**39,344**	**6,260**	**1,559**	**598**	**540**	**4,683,517**
Overhead Break Arrival	2,927																		
Interfacility cruise		2	19.6	5.7	648,546	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	2,147	13,529	2,977	694	480	435	2,084,811
Approach		2	12.0	5.7	398,598	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,319	8,315	1,830	426	295	267	1,281,328
Taxi In		2	6.1	8.0	285,656	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	47,542	12,049	851	306	26	23	918,266
												Subtotal	**51,008**	**33,892**	**5,658**	**1,426**	**801**	**724**	**4,284,404**
												Total LTO Emissions in Tons	**74.59**	**36.62**	**5.96**	**1.49**	**0.70**	**0.63**	**4,484**
VFR Pattern	13,966																		
Approach		2	1.0	5.67	160,129	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	530	3,340	735	171	118	107	514,749
Climb out		2	1.6	9.52	438,254	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	316	2,945	2,932	469	127	114	1,408,807
												Subtotal	**846**	**6,285**	**3,667**	**640**	**246**	**221**	**1,923,556**
												Total Pattern Emissions in Tons	**0.42**	**3.14**	**1.83**	**0.32**	**0.12**	**0.11**	**961.78**
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	**75.01**	**39.76**	**7.79**	**1.81**	**0.82**	**0.74**	**5,446**

GRP METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	3,137																		
Taxi Out		2	12.3	8.0	617,322	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	102,741	26,039	1,840	661	56	49	1,984,438
Engine Runup		2	0.1	9.5	4,975	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	4	33	33	5	1	1	15,994
Takeoff		2	0.5	10.6	33,163	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	18	178	235	35	9	8	106,605
Climbout		2	3.5	9.5	210,953	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	152	1,418	1,411	226	61	55	678,128
Interfacility cruise		2	6.1	5.7	216,247	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	716	4,511	993	231	160	145	695,146
												Subtotal	**103,630**	**27,667**	**4,512**	**1,158**	**287**	**258**	**3,480,311**
Overhead Break Arrival	3,137																		
Interfacility cruise		2	6.1	5.7	216,247	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	716	4,511	993	231	160	145	695,146
Approach		2	12.0	5.7	427,197	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,414	8,911	1,961	457	316	286	1,373,264
Taxi In		2	6.1	8.0	306,152	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	50,953	12,913	912	328	28	24	984,152
												Subtotal	**53,083**	**26,336**	**3,866**	**1,016**	**504**	**456**	**3,052,562**
												Total LTO Emissions in Tons	**78.36**	**27.00**	**4.19**	**1.09**	**0.40**	**0.36**	**3,266**
VFR Pattern	9,346																		
Approach		2	1.0	5.67	107,156	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	355	2,235	492	115	79	72	344,463
Climb out		2	1.6	9.52	293,274	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	211	1,971	1,962	314	85	76	942,755
												Subtotal	**566**	**4,206**	**2,454**	**428**	**164**	**148**	**1,287,219**
												Total Pattern Emissions in Tons	**0.28**	**2.10**	**1.23**	**0.21**	**0.08**	**0.07**	**643.61**
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	**78.64**	**29.10**	**5.42**	**1.30**	**0.48**	**0.43**	**3,910**

HRL METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	2,040																		
Taxi Out		2	12.30	8.0	401,472	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	66,817	16,934	1,196	430	36	32	1,290,568
Engine Runup		2	0.08	9.5	3,236	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	2	22	22	3	1	1	10,401
Takeoff		2	0.50	10.6	21,567	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	11	116	153	23	6	5	69,330
Climbout		2	3.53	9.5	137,192	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	99	922	918	147	40	36	441,017
Interfacility cruise		2	45.19	5.7	1,044,718	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	3,458	21,793	4,795	1,118	773	700	3,358,339
												Subtotal	**70,388**	**39,786**	**7,084**	**1,721**	**856**	**774**	**5,169,455**
Overhead Break Arrival	2,040																		
Interfacility cruise		2	45.19	5.7	1,044,718	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	3,458	21,793	4,795	1,118	773	700	3,358,339
Approach		2	12.02	5.7	277,825	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	920	5,795	1,275	297	206	186	893,095
Taxi In		2	6.10	8.0	199,104	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	33,137	8,398	593	213	18	16	640,038
												Subtotal	**37,514**	**35,986**	**6,664**	**1,628**	**997**	**902**	**4,891,471**
												Total LTO Emissions in Tons	**53.95**	**37.89**	**6.87**	**1.67**	**0.93**	**0.84**	**5,031**
VFR Pattern	6,869																		
Approach		2	1.01	5.67	78,757	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	261	1,643	361	84	58	53	253,173
Climb out		2	1.65	9.52	215,550	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	155	1,448	1,442	231	63	56	692,903
												Subtotal	**416**	**3,091**	**1,804**	**315**	**121**	**109**	**946,076**
												Total Pattern Emissions in Tons	**0.21**	**1.55**	**0.90**	**0.16**	**0.06**	**0.05**	**473.04**
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	**54.16**	**39.43**	**7.78**	**1.83**	**0.99**	**0.89**	**5,504**

PIL METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	870																		
Taxi Out		2	12.30	8.0	171,216	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	28,495	7,222	510	183	15	14	550,389
Engine Runup		2	0.08	9.5	1,380	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	1	9	9	1	0	0	4,436
Takeoff		2	0.50	10.6	9,198	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	5	49	65	10	2	2	29,567
Climbout		2	3.53	9.5	58,508	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	42	393	391	63	17	15	188,081
Interfacility cruise		2	46.06	5.7	454,109	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,503	9,473	2,084	486	336	304	1,459,776
												Subtotal	**30,047**	**17,346**	**3,060**	**743**	**371**	**336**	**2,232,249**
Overhead Break Arrival	870																		
Interfacility cruise		2	46.06	5.7	454,109	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	1,503	9,473	2,084	486	336	304	1,459,776
Approach		2	12.02	5.7	118,484	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	392	2,472	544	127	88	79	380,879
Taxi In		2	6.10	8.0	84,912	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	14,132	3,582	253	91	8	7	272,957
												Subtotal	**16,027**	**15,526**	**2,881**	**704**	**431**	**390**	**2,113,612**
												Total LTO Emissions in Tons	**23.04**	**16.34**	**2.97**	**0.72**	**0.40**	**0.36**	**2,173**
VFR Pattern	5,499																		
Approach		2	1.01	5.67	65,342	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	216	1,363	300	70	48	44	210,048
Climb out		2	1.65	9.52	178,834	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	129	1,202	1,196	191	52	46	574,877
												Subtotal	**345**	**2,565**	**1,496**	**261**	**100**	**90**	**784,926**
												Total Pattern Emissions in Tons	**0.17**	**1.28**	**0.75**	**0.13**	**0.05**	**0.05**	**392.46**
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	**23.21**	**17.62**	**3.72**	**0.85**	**0.45**	**0.41**	**2,565**

PSX METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel							Total Pounds Annually						
						VOC	CO	NOx	SO2	PM10	PM2.5	CO2	VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	485																		
Taxi Out		2	12.30	8.0	95,409	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	15,879	4,024	284	102	9	8	306,700
Engine Runup		2	0.08	9.5	769	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	1	5	5	1	0	0	2,472
Takeoff		2	0.50	10.6	5,125	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	3	27	36	5	1	1	16,476
Climbout		2	3.53	9.5	32,603	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	23	219	218	35	9	8	104,806
Interfacility cruise		2	41.28	5.7	226,789	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	751	4,731	1,041	243	168	152	729,033
												Subtotal	**16,656**	**9,007**	**1,585**	**386**	**187**	**169**	**1,159,487**
Overhead Break Arrival	485																		
Interfacility cruise		2	41.28	5.7	226,789	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	751	4,731	1,041	243	168	152	729,033
Approach		2	12.02	5.7	66,024	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	219	1,377	303	71	49	44	212,241
Taxi In		2	6.10	8.0	47,316	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	7,875	1,996	141	51	4	4	152,103
												Subtotal	**8,844**	**8,104**	**1,485**	**364**	**221**	**200**	**1,093,377**
												Total LTO Emissions in Tons	**12.75**	**8.56**	**1.53**	**0.37**	**0.20**	**0.18**	**1,126**
VFR Pattern	2,624																		
Approach		2	1.01	5.67	30,091	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	100	628	138	32	22	20	96,731
Climb out		2	1.65	9.52	82,356	0.72	6.72	6.69	1.07	0.29	0.26	3,214.59	59	553	551	88	24	21	264,741
												Subtotal	**159**	**1,181**	**689**	**120**	**46**	**42**	**361,472**
												Total Pattern Emissions in Tons	**0.08**	**0.59**	**0.34**	**0.06**	**0.02**	**0.02**	**180.74**
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	**12.83**	**9.15**	**1.88**	**0.44**	**0.23**	**0.21**	**1,307**

VCT METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	686																		
Taxi Out		2	12.30	8.0	113,353	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	19,849	5,030	355	128	11	10	383,375
Engine Runup		2	0.08	9.5	961	0.72	6.72	5.69	1.07	0.29	0.26	3,214.59	1	6	6	1	0	0	3,093
Takeoff		2	0.50	10.6	6,407	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	3	34	45	7	2	1	20,596
Climbout		2	3.52	9.5	40,784	0.72	6.72	5.69	1.07	0.29	0.26	3,214.59	29	274	272	44	12	11	131,098
Interfacility cruise		2	36.08	5.7	247,677	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	820	5,167	1,137	265	183	166	796,181
												Subtotal	20,702	10,512	1,832	444	208	188	1,334,208
Overhead Break Arrival	686																		
Interfacility cruise		2	36.08	5.7	247,677	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	820	5,167	1,137	265	183	166	796,181
Approach		2	12.02	5.7	82,530	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	273	1,722	379	88	61	55	265,303
Taxi In		2	6.10	8.0	59,146	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	9,844	2,495	176	63	5	5	190,129
												Subtotal	10,937	9,383	1,692	417	250	226	1,251,613
												Total IFR Emissions in Tons	15.82	9.95	1.75	0.43	0.23	0.21	1,293
VFR Pattern	2,332																		
Approach		2	1.93	6.67	26,734	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	88	558	123	29	20	18	85,939
Climb out		2	1.86	9.52	73,168	0.72	6.72	5.69	1.07	0.29	0.26	3,214.59	53	492	489	78	21	19	235,205
												Subtotal	141	1,049	612	107	41	37	321,144
												Total Pattern Emissions in Tons	0.07	0.52	0.31	0.05	0.02	0.02	160.57
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	15.89	10.47	2.06	0.48	0.25	0.23	1,454

PKV METS Alt 2

Type of Operation[1]	Total Number of Operations[1]	No. of Engines in Use	Time in Mode/engine (min)	Fuel Flow per Engine (lb/min)	Total Fuel Used (lb)	Emissions in lbs/1000 lbs fuel VOC	CO	NOx	SO2	PM10	PM2.5	CO2	Total Pounds Annually VOC	CO	NOx	SO2	PM10	PM2.5	CO2e
IFR Departure	377																		
Taxi Out		2	12.30	8.0	74,154	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	12,341	3,128	221	79	7	6	238,375
Engine Runup		2	0.08	9.5	598	0.72	6.72	5.69	1.07	0.29	0.26	3,214.59	0	4	4	1	0	0	1,921
Takeoff		2	0.50	10.6	3,984	0.53	5.36	7.08	1.07	0.26	0.23	3,214.59	2	21	28	4	1	1	12,806
Climbout		2	3.52	9.5	25,340	0.72	6.72	5.69	1.07	0.29	0.26	3,214.59	18	170	170	27	7	7	81,456
Interfacility cruise		2	32.85	5.7	140,271	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	464	2,926	644	150	104	94	450,914
												Subtotal	12,827	6,250	1,067	261	119	108	785,473
Overhead Break Arrival	377																		
Interfacility cruise		2	32.85	5.7	140,271	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	464	2,926	644	150	104	94	450,914
Approach		2	12.02	5.7	51,318	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	170	1,070	236	55	38	34	164,969
Taxi In		2	6.10	8.0	36,776	166.43	42.18	2.98	1.07	0.09	0.08	3,214.59	6,121	1,551	110	39	3	3	118,219
												Subtotal	6,755	5,548	989	244	145	131	734,093
												Total IFR Emissions in Tons	9.79	5.90	1.03	0.25	0.13	0.12	760
VFR Pattern	1,752																		
Approach		2	1.83	5.67	20,145	3.31	20.86	4.59	1.07	0.74	0.67	3,214.59	67	420	92	22	15	14	64,754
Climb out		2	1.65	9.52	55,100	0.72	6.72	5.69	1.07	0.29	0.26	3,214.59	40	370	369	59	16	14	177,221
												Subtotal	106	791	461	81	31	28	241,975
												Total Pattern Emissions in Tons	0.05	0.40	0.23	0.04	0.02	0.01	120.99
												Total Annual METS Alt 2 Aircraft Flight Emissions in Tons	9.84	6.29	1.26	0.29	0.15	0.13	881

SUMMARY - METS ALT 2 ANNUAL OPERATIONAL EMISSIONS (TONS/YR)

Location	VOC	CO	NOx	SO_2	PM_{10}	$PM_{2.5}$	CO_2
NASCC[1]	393.66	211.40	56.05	6.77	2.58	2.34	20,351
NDIP Cabaniss	45.01	22.79	6.29	1.80	0.47	0.43	3,900
ALI - Alice International	75.01	39.75	7.79	1.81	0.82	0.74	5,446
CRP - Corpus Christi International	78.64	29.10	5.42	1.30	0.48	0.43	3,910
HRL - Valley International	54.15	39.43	7.78	1.83	0.99	0.89	5,504
PIL - Port Isabel	23.21	17.62	3.73	0.85	0.45	0.41	2,065
PSX - Palacios Municipal	12.83	9.15	1.69	0.34	0.23	0.21	1,307
VCT - Victoria Regional	15.89	10.47	2.06	0.48	0.25	0.23	1,454
PKV - Calhoun County	9.84	6.29	1.26	0.29	0.15	0.13	881
Total	**688.41**	**369.72**	**91.84**	**14.78**	**6.75**	**5.67**	**44,432**

Notes: [1]Includes maintenance operations that occur at NASCC.

TAB F. Emissions Summary

SUMMARY - T-44C BASELINE ANNUAL OPERATIONAL EMISSIONS (TONS/YR)							
Location	**NOx**	**VOC**	**CO**	**SO2**	**PM10**	**PM2.5**	**CO2**
NASCC	44.45	319.09	148.38	5.12	1.95	1.78	15,410
NOLF Cabaniss	5.29	37.51	18.99	1.08	0.39	0.35	3,250
ALI - Alice International	6.49	62.51	33.13	1.51	0.69	0.62	4,538
PKV - Calhoun County	1.05	8.20	5.24	0.24	0.12	0.11	734
CRP - Corpus Christi International	4.51	65.53	24.25	1.08	0.40	0.36	3,258
PSX - Palacios Municipal	1.57	10.69	7.62	0.36	0.19	0.17	1,089
PIL - Port Isabel	3.10	19.34	14.68	0.71	0.38	0.34	2,138
HRL - Valley International	6.48	45.13	32.86	1.53	0.82	0.74	4,586
VCT - Victoria Regional	1.72	13.24	8.73	0.40	0.21	0.19	1,211
Total	**74.66**	**581.25**	**293.89**	**12.05**	**5.14**	**4.67**	**36,215**

SUMMARY - METS ALT 1 ANNUAL OPERATIONAL EMISSIONS (TONS/YR)							
Location	**NOx**	**VOC**	**CO**	**SO2**	**PM10**	**PM2.5**	**CO2**
NASCC	51.38	351.69	184.61	6.20	2.35	2.14	18,655
NOLF Cabaniss	5.82	41.26	20.89	1.19	0.43	0.39	3,575
ALI - Alice International	7.14	68.76	36.45	1.66	0.75	0.68	4,992
PKV - Calhoun County	1.15	9.02	5.77	0.27	0.14	0.12	807
CRP - Corpus Christi International	4.96	72.09	26.68	1.19	0.44	0.39	3,584
PSX - Palacios Municipal	1.72	11.76	8.38	0.40	0.21	0.19	1,198
PIL - Port Isabel	3.41	21.28	16.15	0.78	0.41	0.37	2,352
HRL - Valley International	7.13	49.65	36.15	1.68	0.90	0.82	5,045
VCT - Victoria Regional	1.89	14.57	9.60	0.44	0.23	0.21	1,332
Total	**84.61**	**640.07**	**344.68**	**13.82**	**5.86**	**5.32**	**41,541**
Net Change from Baseline in Tons per Year	**9.94**	**58.82**	**50.79**	**1.77**	**0.72**	**0.65**	**5,326**

SUMMARY - METS ALT 2 ANNUAL OPERATIONAL EMISSIONS (TONS/YR)							
Location	**NOx**	**VOC**	**CO**	**SO2**	**PM10**	**PM2.5**	**CO2**
NASCC	56.05	383.66	201.40	6.77	2.56	2.34	20,351
NOLF Cabaniss	6.35	45.01	22.79	1.30	0.47	0.43	3,900
ALI - Alice International	7.79	75.01	39.76	1.81	0.82	0.74	5,446
PKV - Calhoun County	1.26	9.84	6.29	0.29	0.15	0.13	881
CRP - Corpus Christi International	5.42	78.64	29.10	1.30	0.48	0.43	3,910
PSX - Palacios Municipal	1.88	12.83	9.15	0.44	0.23	0.21	1,307
PIL - Port Isabel	3.72	23.21	17.62	0.85	0.45	0.41	2,565
HRL - Valley International	7.78	54.16	39.43	1.83	0.99	0.89	5,504
VCT - Victoria Regional	2.06	15.89	10.47	0.48	0.25	0.23	1,454
Total	**92.30**	**698.26**	**376.02**	**15.08**	**6.39**	**5.80**	**45,317**
Net Change from Baseline in Tons per Year	**17.64**	**117.01**	**82.12**	**3.03**	**1.25**	**1.13**	**9,102**

*All in tons

Activity	***No Action***	***Alt 1 CO₂***	***Alt 1 Comp to NAA***	***Alt 2 CO₂***	***Alt 2 Comp to NAA***		
Construction (2 separate years)	0	1,398	1,398	1,398	1,398		
Additional worker commutes (every year)	0	0	0	108	108		
Flight operations (every year)	15,410	18,655	3,245	20,351	4,941	5,049	<Alt 2 worker/flight
Lifetime (25-year) operations plus construction emissions	385,251	467,774	82,523	512,872	127,621		

*All in metric tons 0.907185 metric tons per ton

Activity	***No Action***	***Alt 1 CO₂***	***Alt 1 Comp to NAA***	***Alt 2 CO₂***	***Alt 2 Comp to NAA***		
Construction (1 year)	0	1,268	1,268	1,268	1,268		
Additional worker commutes (every year)	0	0	0	98	98		
Flight operations (every year)	13,980	16,924	2,944	18,462	4,482	4,580	<Alt 2 worker/flight
Lifetime (25-year) operations plus construction emissions	349,494	424,358	74,864	465,270	115,776		

Individual Location Summaries

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
Baseline NASCC	44.45	319.09	148.38	5.12	1.95	1.78	15,410
NASCC Alt 1	51.38	351.69	184.61	6.20	2.35	2.14	18,655
Alt 1 Net Change (aircraft)	**6.92**	**32.61**	**36.24**	**1.08**	**0.40**	**0.36**	**3,245**
NASCC Alt 2	56.05	383.66	201.40	6.77	2.56	2.34	20,351
Alt 2 Net Change	**11.59**	**64.58**	**53.02**	**1.64**	**0.61**	**0.55**	**4,941**

Max Annual Construction Emissions (2027)	2.26	0.24	2.70	0.00	1.95	0.42	868
Alt 1 Total @ NASCC	**9.19**	**32.85**	**38.94**	**1.08**	**2.34**	**0.78**	**4,113**
Additional Worker Commute-Alt 2 Only	0.02	0.01	1.29	0.00	1.30	0.20	108
Alt 2 Total @ NASCC	**13.88**	**64.83**	**57.02**	**1.65**	**3.86**	**1.17**	**5,917**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
NOLF Cabaniss Baseline	5.29	37.51	18.99	1.08	0.39	0.35	3,250
NOLF Cabaniss Alt 1	5.82	41.26	20.89	1.19	0.43	0.39	3,575
Alt 1 Net Change	**0.53**	**3.75**	**1.90**	**0.11**	**0.04**	**0.04**	**325**
NOLF Cabaniss Alt 2	6.35	45.01	22.79	1.30	0.47	0.43	3,900
Alt 2 Net Change	**1.06**	**7.50**	**3.80**	**0.22**	**0.08**	**0.07**	**650**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
ALI -Baseline	6.49	62.51	33.13	1.51	0.69	0.62	4,538
ALI - Alt 1	7.14	68.76	36.45	1.66	0.75	0.68	4,992
Alt 1 Net Change	**0.65**	**6.25**	**3.31**	**0.15**	**0.07**	**0.06**	**454**
ALI - At 2	7.79	75.01	39.76	1.81	0.82	0.74	5,446
Alt 2 Net Change	**1.30**	**12.50**	**6.63**	**0.30**	**0.14**	**0.12**	**908**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
PKV - Baseline	1.05	8.20	5.24	0.24	0.12	0.11	734
PKV - Alt 1	1.15	9.02	5.77	0.27	0.14	0.12	807
Alt 1 Net Change	**0.10**	**0.82**	**0.52**	**0.02**	**0.01**	**0.01**	**73**
PKV - Alt 2	1.26	9.84	6.29	0.29	0.15	0.13	881
Alt 2 Net Change	**0.21**	**1.64**	**1.05**	**0.05**	**0.02**	**0.02**	**147**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
CRP - Baseline	4.51	65.53	24.25	1.08	0.40	0.36	3,258
CRP - Alt 1	4.96	72.09	26.68	1.19	0.44	0.39	3,584
Alt 1 Net Change	**0.45**	**6.55**	**2.43**	**0.11**	**0.04**	**0.04**	**326**
CRP - Alt 2	5.42	78.64	29.10	1.30	0.48	0.43	3,910
Alt 2 Net Change	**0.90**	**13.11**	**4.85**	**0.22**	**0.08**	**0.07**	**652**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
PSX - Baseline	1.57	10.69	7.62	0.36	0.19	0.17	1,089
PSX - Alt 1	1.72	11.76	8.38	0.40	0.21	0.19	1,198
Alt 1 Net Change	**0.16**	**1.07**	**0.76**	**0.04**	**0.02**	**0.02**	**109**
PSX - Alt 2	1.88	12.83	9.15	0.44	0.23	0.21	1,307
Alt 2 Net Change	**0.31**	**2.14**	**1.52**	**0.07**	**0.04**	**0.03**	**218**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
PIL - Baseline	3.10	19.34	14.68	0.71	0.38	0.34	2,138
PIL - Alt 1	3.41	21.28	16.15	0.78	0.41	0.37	2,352
Alt 1 Net Change	**0.31**	**1.93**	**1.47**	**0.07**	**0.04**	**0.03**	**214**
PIL - Alt 2	3.72	23.21	17.62	0.85	0.45	0.41	2,565
Alt 2 Net Change	**0.62**	**3.87**	**2.94**	**0.14**	**0.08**	**0.07**	**428**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
HRL - Baseline	6.48	45.13	32.86	1.53	0.82	0.74	4,586
HRL - Alt 1	7.13	49.65	36.15	1.68	0.90	0.82	5,045
Alt 1 Net Change	**0.65**	**4.51**	**3.29**	**0.15**	**0.08**	**0.07**	**459**
HRL - Alt 2	7.78	54.16	39.43	1.83	0.99	0.89	5,504
Alt 2 Net Change	**1.30**	**9.03**	**6.57**	**0.31**	**0.16**	**0.15**	**917**

Location	NOx	VOC	CO	SO2	PM10	PM2.5	CO2
VCT - Baseline	1.72	13.24	8.73	0.40	0.21	0.19	1,211
VCT - Alt 1	1.89	14.57	9.60	0.44	0.23	0.21	1,332
Alt 1 Net Change	**0.17**	**1.32**	**0.87**	**0.04**	**0.02**	**0.02**	**121**
VCT - Alt 2	2.06	15.89	10.47	0.48	0.25	0.23	1,454
Alt 2 Net Change	**0.34**	**2.65**	**1.75**	**0.08**	**0.04**	**0.04**	**242**

Tab G. Aircraft Emissions Factors

U.S. Air Force Air Emissions Guide for Mobile Sources, June 2021
Table 2-5. Military Airframe/Engine/APU Combination

Aircraft Model	Time In Mode Category	Engine Model(s) (Number of Engines)	APU Model(s) (Number of APUs)	APU Hours of Operation Per LTO
C-12J	General Aviation: Turboprop	PT6A-60A (2)	–	–

Emissions factors from U.S. Air Force Air Emissions Guide for Mobile Sources, June 2021 Table 2-4

Baseline & Alt 1-2: PT6A-60A (per engine) Note: current C-12 engine variant for ACAM modeling

Power Setting	Percent Thrust/hp	Fuel Flow Rate (lb/hr)	Fuel Flow Rate (lb/min)	NOx	SOx	CO	VOC	HAPs	PM10	PM2.5	CO2e
Idle (Taxi)	–	480	8.0	2.98	1.07	42.18	166.43	–	0.39	0.08	3,214.59
Approach	–	340	5.7	4.59	1.07	20.86	3.31	–	0.74	0.67	3,214.59
Climb out	–	571	9.5	6.69	1.07	6.72	0.72	–	0.29	0.20	3,214.59
Takeoff	–	639	10.6	7.08	1.07	5.36	0.53	–	0.26	0.23	3,214.59

Emissions factors from U.S. Air Force Air Emissions Guide for Mobile Sources, June 2021
Table 3-2. Military Aircraft and GSE Assignments – C-12 (all variants)

Aircraft	GSE Type	GSE Model	Operating Time Per Sortie
C-12, -12A, -12C, -12D, -12E, -12F, -12J, -12R, -12S, -12T, -12U	Generator Set	A/M32A-86D	0.75

Table 3-3. Military Aircraft GSE Emission Factors

GSE Name	Fuel Flow Rate	NOx	SOx	CO	VOC	PM10	PM2.5	CO2e
A/M32A-86D	6.47	6.102	0.047	0.457	0.294	0.091	0.089	346.08

Construction Equipment & On-Road Emissions Factors (from MOVES3 - diesel for construction equipment and EPA default fuel for onroad vehicle

Equipment Name	Unit	Engine HP	Load Factor	VOC	CO	NOx	SO_2	PM10	PM2.5	CO_2
Diesel Generator	g/hp-hr	40	0.43	0.2425	0.8267	3.3412	0.0018	0.1643	0.1594	585.6837
Scissor Lift	g/hp-hr	83	0.59	0.5862	3.1895	3.3436	0.0022	0.4822	0.4159	694.3080
Skid-Steer Loader	g/hp-hr	67	0.59	0.7613	3.9327	4.4858	0.0022	0.5473	0.5309	693.3046
All Terrain Forklift	g/hp-hr	84	0.59	0.0691	0.6341	1.5199	0.0017	0.1040	0.1009	595.9753
Onsite trucks - Idle	g/hr	N/A	N/A	0.8469	4.4775	7.0727	0.0098	0.3876	0.4552	1,701.0500
Onsite trucks - 10 MPH	g/VMT	N/A	N/A	5.2289	21.9858	32.9817	0.0195	2.5996	2.3364	5,727.9200
Delivery Truck	g/VMT	N/A	N/A	0.3066	1.7382	3.0738	0.0033	1.3723	0.3327	972.7910
Passenger car	g/VMT	N/A	N/A	0.0254	3.4225	0.0643	0.0015	3.4459	0.5175	285.4833
Crane	g/hp-hr	330	0.58	0.0519	0.2326	0.9853	0.0015	0.0759	0.0942	530.3961
Telehandler	g/hp-hr	99	0.59	0.0992	0.2635	0.3616	0.0015	0.0569	0.0566	596.8792
Air Compressor	g/hp-hr	49	0.59	0.1061	0.8390	2.6121	0.0016	0.0329	0.0319	590.0527
Excavator	g/hp-hr	349	0.59	0.0165	0.0571	0.2346	0.0014	0.0126	0.0124	596.7917
Loader	g/hp-hr	37	0.23	0.0455	0.5642	1.4336	0.0016	0.0894	0.0867	596.0272
Rubber-Tired Dozer	g/hp-hr	145	0.59	0.0208	0.1381	0.4611	0.0014	0.0323	0.0313	536.7723
Dump Truck	g/VMT	N/A	N/A	0.3066	1.7382	3.0738	0.0033	1.3723	0.3327	972.7910

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Appendix G
Newspaper Notices

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Caller Times
PART OF THE USA TODAY NETWORK

CERTIFICATE OF PUBLICATION

[redacted]

STATE OF WISCONSIN
COUNTY OF BROWN

I, being first duly sworn, upon oath depose and say that I am a legal clerk and employee of the publisher, namely, the Corpus Christi Caller-Times, a daily newspaper published at Corpus Christi in said City and State, generally circulated in Aransas, Bee, Brooks, Duval, Jim Hogg, Jim Wells, Kleberg, Live Oak, Nueces, Refugio, and San Patricio, Counties, and that the publication of which the annexed is a true copy, was inserted in the Corpus Christi Caller-Times on the following dates:

6/16/2023, 6/18/2023, 6/19/2023

On this June 19th, 2023, I certify that the attached document is a true and exact copy made by the publisher:

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1-7-25

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THIS IS NOT AN INVOICE

The U. S. Navy Invites Public Comments

on its Draft Environmental Assessment
Multi-Engine Training System, Corpus Christi, TX

The Navy has released a draft Environmental Assessment (EA) for the Multi-Engine Training System (METS). The METS would replace 54 of the over 40-year-old T-44C Pegasus aircraft with 58 new T-54A aircraft at Naval Air Station (NAS) Corpus Christi, Texas. The new aircraft would conduct training operations in the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. To accommodate the new aircraft several short- and long-term construction projects for Naval support facilities at NAS Corpus Christi would be required.

Please provide comments on the analysis presented in the Draft EA by 11:59 PM Eastern Standard Time on 17 July 2023. Comments may be submitted by:

Website: www.nepa.navy.mil/mets

U.S. Postal Service Mail:
METS EA Project Manager
Naval Facilities Engineering Systems Command Atlantic
Attn: Code EV22
6506 Hampton Blvd, Norfolk, VA 23508

The EA is available for review at:

- **www.nepa.navy.mil/mets**
- **Libraries:**
  - Nueces County Law Library
  - Owen R. Hopkins Public Library
  - Mary and Jeff Bell Library - Texas A&M
  - Janet F. Harte Public Library
  - Dr. Clotilde P. Garcia Library
  - Anita & W.T. Neyland Public Library
  - Harlingen Public Library (Cameron County)
  - Victoria Public Library (Victoria County)
  - Palacios Library Inc. (Matagorda County)
  - Alicia Salinas Public Library (Jim Wells County)

CC-GCI1073882-01

2A | MONDAY

PEOPLE

PEOPLE IN THE NEWS FROM WIRE REPORTS

Prince Harry, Markle part ways with Spotify

The production company founded by Prince Harry and his wife, Meghan, is splitting ways with Spotify less than a year after the debut of their podcast "Archetypes."

It is unclear why the podcast, hosted by Meghan, is leaving the platform but Spotify and Archewell Audio said in a joint statement that the decision was mutual.

Archewell landed a multiyear partnership with Spotify in 2020 to create podcasts and shows that would tell stories through diverse voices and perspectives. The podcast premiered in August last year with tennis great Serena Williams as a guest and it was an instant hit.

It topped Spotify charts in seven countries, including the U.S. and the U.K., and it won the top podcast award at the People's Choice awards last year.

"I loved digging my hands into the process, sitting up late at night in bed, working on the writing and creative. And I loved digging deep into meaningful conversation with my diverse and inspiring guests, laughing and learning with them, and with each of you listening," said Meghan, the Duchess of Sussex at the time.

The show also had as guests Mariah Carey, Trevor Noah, Mindy Kaling and Paris Hilton.

Tech companies have been cutting costs in a rough economic environment and Spotify has not been immune. Six months after announcing that it would cut 6% of its global workforce, or about 600 jobs, Spotify said last week that it was trimming another 200 jobs.

Harry and Meghan ANGELA WEISS, AFP/GETTY IMAGES

Davidson charged with reckless driving after Beverly Hills crash

Los Angeles prosecutors charged former "Saturday Night Live" star Pete Davidson with reckless driving Friday, three months after authorities said he crashed into a Beverly Hills home.

The Los Angeles County District Attorney's Office filed one misdemeanor count of reckless driving against the actor and writer but did not release details about the March 4 collision in Beverly Hills.

"We believe that Mr. Davidson engaged in reckless driving, which ultimately resulted in his involvement in a serious collision into a home," the DA's office wrote. "Luckily, no one was seriously injured as a result of this collision."

Davidson's arraignment is set for July 27. His representatives and Beverly Hills police did not immediately return requests for comment.

Prosecutors used the high-profile case to highlight the "devastating consequences" of reckless driving.

"In 2022, traffic fatalities in Los Angeles have reached the highest levels seen in 20 years," the office wrote in its statement. "This is an alarming trend that we cannot ignore. As a result, it's crucial that we take all allegations of reckless driving seriously and hold those responsible accountable."

Estefan performs with grandson at Songwriters' Hall of Fame induction

While last year's inductees included more front-and-center names Mariah Carey, Annie Lennox and Pharrell – Thursday's Songwriters' Hall of Fame induction focused on the behind-the-scenes writers and their stories in addition to a big history-making moment for Gloria Estefan, the first Hispanic woman to be inducted into the prestigious music club.

"I have to admit, this is a big one for me," Estefan, who has received a Presidential Medal of Freedom, Gershwin Prize and Kennedy Center honor within the last decade, said.

Inducted by fellow songwriter Valerie Simpson, the "Let's Get Loud" and "Conga" singer-songwriter took the stage recalling her earliest music memories in diapers, to her teenage crushes on David Cassidy and Donny Osmond until finally meeting her future collaborator and husband Emilio Estefan, joining his all-boy gig band.

"Music has saved my life," Estefan said. "Music was my therapy."

After thanking her family with individual, intimate shout outs, Estefan led the crowd into a high-energy medley of songs including "Reach," "Words Get in the Way," and "Anything for You" with her husband and 11-year-old grandson, Sasha.

THINGS TO DO AROUND TOWN

MONDAY, JUNE 19

City pools open for 2023 summer swim season

Corpus Christi Parks & Recreation Department's city pools are open for the 2023 summer general swim season now through Aug. 6. Hours and dates are subject to change. Lap swim hours also available, schedule online. Cost: Free. Information: https://www.cctexas.com/detail/recreational-swim-and-lap-swim-summer-schedule. General swim hours are:

- **Collier Pool**, 3801 Harris Drive: 2-7:30 p.m. Tuesday through Sunday (closed Mondays)
- **Corpus Christi Natatorium**, 3202 Cabaniss Parkway: noon to 8 p.m. Thursday through Tuesday (closed Wednesdays)
- **West Guth Pool**, 9705 Up River Road, and **Greenwood Pool**, 4305 Greenwood Drive: 2-7:30 p.m. Wednesday through Sunday (closed Mondays and Tuesdays)
- **H-E-B Pool**, 1520 Shely St.: 2-7:30 p.m. Friday through Tuesday (closed Wednesdays and Thursdays)

Corpus Christi Parks and Rec splash pads

Corpus Christi Parks & Recreation Department offers splash pads from 8 a.m. to 10 p.m. Tuesdays through Sundays at Lindale Park, 3133 Swantner Drive; Salinas Park, 1354 Airport Road; and Bill Witt Park, 6869 Yorktown Blvd. Each facility offers different interactive water features and is free to the public. Splash pads are normally closed for maintenance Mondays, but will be open for the Juneteenth holiday (will be closed Tuesday). Information: https://www.cctexas.com/corpus-christi-splash-pads.

Coastal Bend Blood Center in need of donations

The Coastal Bend Blood Center is in need of donations to maintain the area's blood and plasma supply. Donors should be well and healthy at the time of donation. Walk-ins and appointments are accepted at the Coastal Bend Blood Center from 8:30 a.m. to 6 p.m. Monday through Friday at 209 N. Padre Island Drive. Mobile blood centers are also stationed around the area. To find a blood mobile location or make an appointment at the walk-in center, call 361-855-4943 or check https://www.coastalbendbloodcenter.org/.

For more events check Caller.com/vivacc.

The U. S. Navy Invites Public Comments

on its Draft Environmental Assessment
Multi-Engine Training System, Corpus Christi, TX

The Navy has released a draft Environmental Assessment (EA) for the Multi-Engine Training System (METS). The METS would replace 54 of the over 40-year-old T-44C Pegasus aircraft with 58 new T-54A aircraft at Naval Air Station (NAS) Corpus Christi, Texas. The new aircraft would conduct training operations in the same locations and within the same airspace as T-44C aircraft but with an increase in the number of operations. To accommodate the new aircraft several short- and long-term construction projects for Naval support facilities at NAS Corpus Christi would be required.

Please provide comments on the analysis presented in the Draft EA by 11:59 PM Eastern Standard Time on 17 July 2023. Comments may be submitted by:

- **Website:** www.nepa.navy.mil/mets
- **U.S. Postal Service Mail:**
  METS EA Project Manager
  Naval Facilities Engineering Systems Command Atlantic
  Attn: Code EV22
  6506 Hampton Blvd, Norfolk, VA 23508

The EA is available for review at:

- www.nepa.navy.mil/mets
- Libraries:
  - Nueces County Law Library
  - Owen R. Hopkins Public Library
  - Mary and Jeff Bell Library - Texas A&M
  - Janet F. Harte Public Library
  - Dr. Clotilde P. Garcia Library
  - Anita & W.T. Neyland Public Library
  - Harlingen Public Library (Cameron County)
  - Victoria Public Library (Victoria County)
  - Palacios Library Inc. (Matagorda County)
  - Alice Salinas Public Library (Jim Wells County)

CELEBRITY BIRTHDAYS

Actor **Gena Rowlands** is 93. Singer **Spanky McFarlane** of Spanky and Our Gang is 81. Actor **Phylicia Rashad** is 75. Singer **Ann Wilson** of Heart is 73. Keyboardist **Larry Dunn** (Earth, Wind and Fire) is 70. Actor **Kathleen Turner** is 69. Country singer **Doug Stone** is 67. Singer **Mark "Marty" DeBarge** of DeBarge is 64. Singer-dancer **Paula Abdul** is 61. Actor **Andy Lauer** ("Caroline in the City") is 60. Singer-guitarist **Brian Vander Ark** of The Verve Pipe is 59. Actor **Mia Sara** ("Ferris Bueller's Day Off") is 56. "Good Morning America" host **Lara Spencer** is 54. Guitarist **Brian "Head" Welch** of Korn is 53. Actor **Jean Dujardin** ("The Artist") is 51. Actor **Robin Tunney** is 51. Actor **Bumper Robinson** ("Sabrina the Teenage Witch") is 49. Actor **Poppy Montgomery** ("Unforgettable," "Without a Trace") is 48. Singer-banjoist **Scott Avett** of The Avett Brothers is 47. Actor **Ryan Hurst** ("The Walking Dead," "Sons of Anarchy") is 47. Actor **Zoe Saldana** is 45. Actor **Neil Brown Jr.** ("SEAL Team") is 43. Actor **Lauren Lee Smith** ("CSI") is 43. Singer **Macklemore** of Macklemore and Ryan Lewis is 41. Actor **Paul Dano** is 39. Actor **Giacomo Gianniotti** ("Grey's Anatomy") is 34. Actor **Chuku Modu** ("The Good Doctor") is 33. Actor **Atticus Shaffer** ("The Middle") is 25.

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CORRECTIONS

The Caller-Times welcomes complaints about errors in our reporting. To seek a correction, please call 361-886-3662 or send email to accuracy@caller.com.

TODAY IN HISTORY

Today is Monday, June 19, the 170th day of 2023. There are 195 days left in the year. This is Juneteenth. On this date in:

1775: George Washington was commissioned by the Continental Congress as commander in chief of the Continental Army.

1865: Union troops arrived in Galveston, Texas, with news that the Civil War was over, and that all remaining slaves in Texas were free – an event celebrated to this day as "Juneteenth."

1910: The first-ever Father's Day was celebrated in Spokane, Washington. (The idea for the observance is credited to Sonora Louise Smart Dodd.)

1911: Pennsylvania became the first state to establish a motion picture censorship board.

1917: During World War I, King George V ordered the British royal family to dispense with German titles and surnames; the family took the name "Windsor."

1944: During World War II, the two-day Battle of the Philippine Sea began, resulting in a decisive victory for the Americans over the Japanese.

1953: Julius Rosenberg, 35, and his wife, Ethel, 37, convicted of conspiring to pass U.S. atomic secrets to the Soviet Union, were executed at Sing Sing Prison in Ossining, New York.

1964: The Civil Rights Act of 1964 was approved by the U.S. Senate, 73-27, after surviving a lengthy filibuster.

1986: University of Maryland basketball star Len Bias, the first draft pick of the Boston Celtics, suffered a fatal cocaine-induced seizure.

1987: The U.S. Supreme Court struck down a Louisiana law requiring any public school teaching the theory of evolution to teach creation science as well.

2014: Rep. Kevin McCarthy of California won election as House majority leader as Republicans shuffled their leadership in the wake of Rep. Eric Cantor's primary defeat in Virginia.

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Affidavit of Publication

STATE OF TEXAS

COUNTY OF Nueces

Before me, the undersigned authority, on this day personally appeared

Janette Park, the publisher of the
(Name) (Title)

The Island Moon, a newspaper having general circulation in
(Name of Newspaper)

Nueces County, Texas, who being by me duly sworn, deposes and

says that the foregoing attached notice was published in said newspaper on the following

date(s), to wit: June 16th 2023 thru - June 22nd 2023

Janette Park
Signature

Subscribed and sworn to before me this the 20 day of

June, ~~19~~ 2023, to certify which witness my hand and seal of office.

Notary Public in and for

MICHELLE MORENO
Notary Public, State of Texas
Comm. Expires 10-05-2025
Notary ID 133371484

Nueces County, Texas.

STATE OF TEXAS
COUNTY OF Nueces
Sworn to (or affirmed) and subscribed before me this 20 day of June 2023 by Janette Park
Notary Public's Signature Michelle Moreno Notary Name
My Commission Expires 10-05-2025

NEWS from the PIPOA

By Drew Diggins

June 14, 2023

PIPOA President

The next monthly meeting of the Padre Isles Property Owner's Association will be held on June 27, 2023, at the Wyndham Corpus Christi Resort located at 15202 Windward Drive. Members are encouraged to attend and give comments.

ACC meeting

The next ACC meeting is scheduled for July 13, 2023, and will be held at the PIPOA offices. The ACC members are reviewing all applications and can approve most in under two weeks. The monthly scheduled meetings are open to the membership and provide an opportunity to ask questions pertaining to the ACC review process as well ask the ACC for a pre-submittal review. The ACC is looking for two additional volunteers to fill vacancies. Association members with engineering, construction or planning expertise are particularly needed. If you have an interest in serving your community, even if you do not possess these skills, please contact the PIPOA office and fill out an application form. If you have questions about your proposed project, please contact Mr. Jordan Ledford, acting ACC Coordinator.

Receptionist needed

With the recent shuffle in office staff to better support the ACC, we are searching for a new receptionist. The opening involves more than just answering phones and could lead to more responsibilities. Past experience in general administrative office skills is welcomed. Anyone interested in filling this position is encouraged to apply at the PIPOA office. Please contact Mr. Gary Kepperich, our Executive Director.

Bulkheads

Bulkheads are essential to our community and continue to be a priority of the Board. Association members need to be aware that our bulkheads were designed for a 40-to-50-year life. We are nearing that life expectancy. There are hard decisions ahead for the Board and for Association members concerning bulkheads. Many member's docks impede access to our bulkheads and the PIPOA has an easement to repair or replace bulkheads, including removal of obstructions to that access (docks, lifts, flatwork, etc.). If you have questions or concerns about the condition of your bulkhead, or the flat work above it, please contact Mr. Gary Kepperich, our Executive Director, to schedule an inspection.

The summer influx of visitors is upon us! The boat ramps and canals are busier than ever. Many boats in the canals are observed throwing large wakes and speeding at full plane. These violators are probably weekend visitors to the island; many are strangers (not local). If you do have guests on the island please convey to them the extent of damage wakes cause to homeowner docks and PIPOA bulkheads. Please encourage them to keep their speed down and respect our local community property.

If you have any questions or concerns, you can reach me at the drew@pipoa.net or at the PIPOA office at 361-949-7025.

The Best Offense

By Pastor Kris Bair

Why is it that offended people think their being offended gives them the green light to be offensive themselves?

And why do they think that the loudest, nastiest person wins (and not necessarily the one who is right)?

I wouldn't know. But I do know that quite frequently they are.

Offensive. In the worst way.

So when I saw this meme on Facebook the other day, I was delighted. All it said was "I wish offended people would react like fainting goats and quietly tip over."

Makes perfect sense to me!

According to etymolonline, a website that displays the history of words, the word "offend" used to mean, literally, "to attack, assail." But that's now "obsolete."

Fooled you, etymolonline.

In the *Star Trek: The Original Series* episode "The Empath," Captain Kirk says, "The best defense is a good offense, and I intend to start offending right now."

Welcome to Earth, Captain Kirk. Terra Infirma.

That noted authority on all things etiquette (the art of being offensive nicely), Miss Manners says "taking offense has become a national pastime."

Who would disagree? Only those who offend, I suppose. And that's pretty much everybody.

No matter your political leaning, or how near the ground you come with it, you must agree—we live in a world where being offensive isn't just tolerated. It's celebrated!

Often it's a barely disguised comment, openly and loudly voiced with threatening motions and ugly facial expressions, and deliberately intended to offend—and to incite another offensive comment in return.

One good turn deserves another, right? Machiavelli is laughing in his grave: "Told you so!"

I'm not against taking a stand. I'm doing so right now, publicly. And I'm well aware that someone(s) will be offended.

But so what? Someone will be offended if I just comment that I love my mother (which I do).

If I can discuss calmly and with reason, I can strongly present a position without offending most people—and without, as Miss Manners would note, being rude.

But there are some who live to be offended and to offend.

The Greek philosopher Epictetus wrote, "When you are offended at any person's fault, turn to yourself and study your own failings. Then you will forget your anger."

Such wisdom—on two levels. First, most often people are offended because they are angry. That anger often manifests in not just words, but offensive actions.

We watch with horror as offended people attack others—often innocents who've done nothing more offensive than being in the right place at the right time—which turned out to be the wrong place in the wrong time.

THAT is the tragedy of mass shootings, serial killings, and attacks on public buildings and the folks who work in them.

Someone got angry and became offensive.

But Epictetus continues, telling us to look into ourselves and study our own failings (N.B.: not "feelings") before we take umbrage with others.

Why do you need to say or do the unacceptable—the rude, the violent, the deadly? Where is that coming from in YOU?

Maybe you need to tip over like that previously mentioned goat and do some self-discernment.

Maybe we all do.

I'm not familiar with the musician Syd, but I love his point: "I think too many people are offended by stuff that doesn't matter."

I'll toast to that—but don't give me any pulque to do it with, thank you!

Oh my. I just used manners to soften an offensive comment! Who woulda thunk it?

Yep, "please and thank-you" are not entirely forgotten concepts. Would that we'd remember to use them more frequently to speak the truth and respect the rights of others.

Talk show host Ricky Gervais once noted, "Just because you're offended doesn't mean you're right."

No matter what our position, no matter the subject, we each need to remember that.

And we also need to remember that sometimes when we ARE right, we're only partially right, and we need to be truthful about that, too.

In the meantime, instead of taking arms against a perceived sea of troubles, we don't have to faint like goats. But if that's what it takes, I'm in, as long as I can do it on the beach!

You can bring your fainting goats or other pets on a leash, along with your folding chair and coffee, to Beach Worship with Island Presbyterian Church—8 a.m. at the end of Whitecap (weather permitting).

Or join us at 10 a.m. in our sanctuary at Gypsy and Fortuna Bay—we have penned-in space for pets and a nursery available during the summer.

Or join us via Zoom or Facebook Livestream—check our website or FB presence for links.

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Attn: Code EV22
6506 Hampton Blvd, Norfolk, VA 23508

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