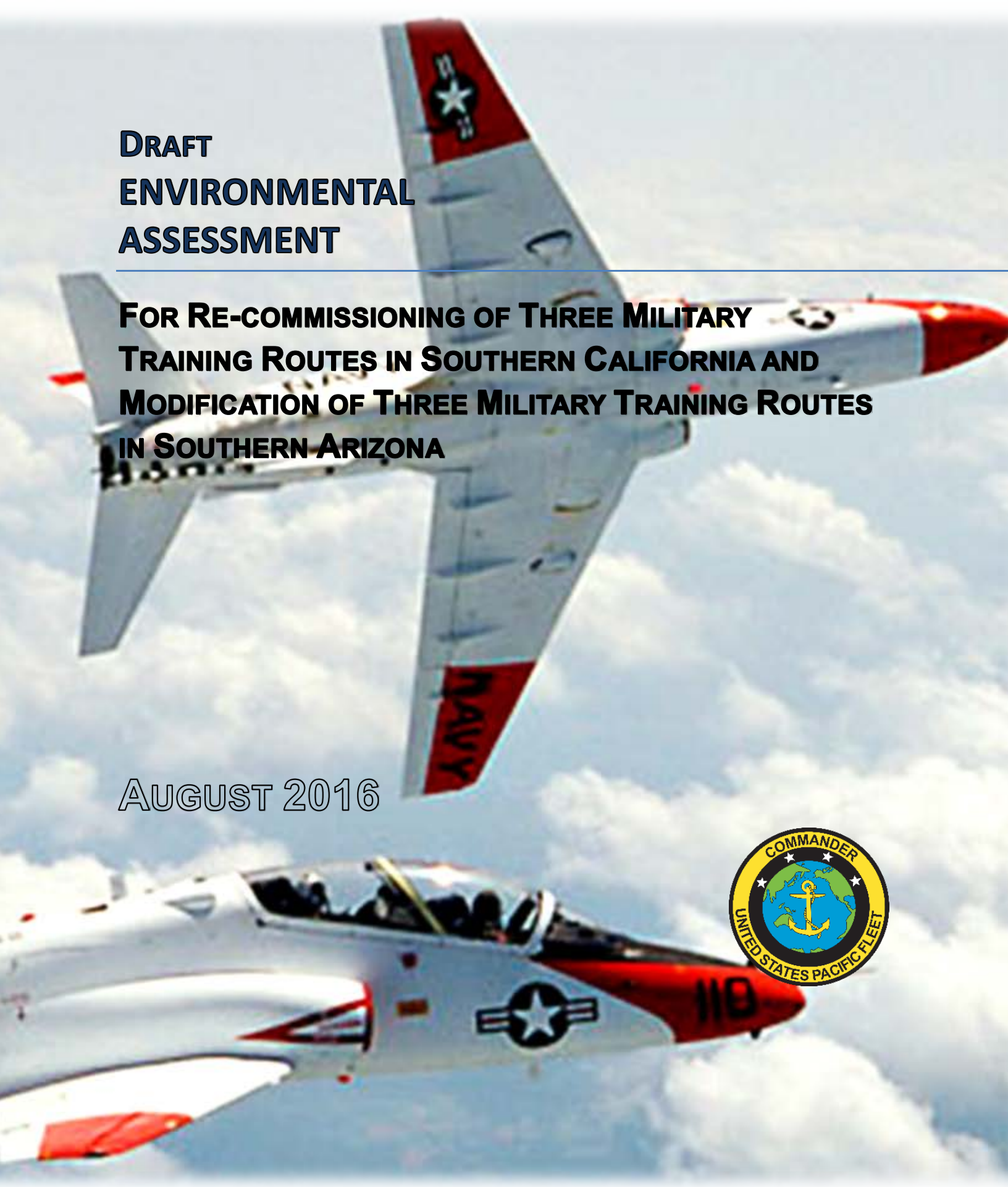

Draft Environmental Assessment

For Re-commissioning of Three Military Training Routes in Southern California and Modification of Three Military Training Routes in Southern Arizona

August 2016

COMMANDER UNITED STATES PACIFIC FLEET

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Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Re-commission Three Military Training Routes in Southern California and Modify Three Military Training Routes in Southern Arizona
Project Location:	Imperial, Riverside, San Bernardino, and San Diego counties, California; and Gila, Graham, La Paz, Maricopa, Mohave, Pima, Pinal, and Yuma counties, Arizona
Lead Agency for the EA:	Department of the Navy
Cooperating Agency:	Federal Aviation Administration
Affected Region:	Airspace and areas underlying the military training routes within Imperial, Riverside, San Bernardino, and San Diego counties, California; and Gila, Graham, La Paz, Maricopa, Mohave, Pima, Pinal, and Yuma counties, Arizona
Action Proponent:	Chief of Naval Air Training
Point of Contact:	Alexander Stone U.S. Navy Pacific Fleet Alexander.stone@navy.mil
Date:	August 23, 2016

The Department of the Navy, along with the Federal Aviation Administration (FAA) as a cooperating agency, has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and Navy regulations for implementing the National Environmental Policy Act (40 Code of Federal Regulations [CFR] parts 1500-1508). The Proposed Action would involve re-commissioning of three Visual Routes (VRs) (VR-289, VR-296, and VR-299) in southeastern California to meet the Navy's Fleet Response Training Plan for the foreseeable future, as well as the modification of three VRs (VR-267, VR-268, and VR-269) in southwestern Arizona to widen the routes and avoid conflicts with Arizona National Guard special use airspace. This EA evaluates the potential environmental impacts associated with the Proposed Action and the No-Action Alternative to the following resource areas: Noise, Biological Resources, Airspace, Air Quality, Cultural Resources, Land Use, Environmental Justice, and Public Health and Safety.

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EXECUTIVE SUMMARY

Proposed Action

The Proposed Action would involve re-commissioning of three Visual Routes (VRs) (VR-289, VR-296, and VR-299) in southeastern California to meet the Navy's Fleet Response Training Plan (FRTP) for the foreseeable future, as well as the modification of three VRs (VR-267, VR-268, and VR-269) in southwestern Arizona to widen the routes and avoid conflicts with Arizona National Guard special use airspace (see Chapter 2 of the Environmental Assessment for a depiction of VRs considered under the Proposed Action). VR-289, VR-296, and VR-299 were returned to the Federal Aviation Administration (FAA) by the U.S. Air Force and de-commissioned in 2013. Aviation training on these routes would involve a partial shift in current training from VR-1266 and VR-1267 (two nearby VRs in southern California) to the re-commissioned routes. The routes under consideration for the Proposed Action pass through portions of Imperial, Riverside, San Bernardino, and San Diego counties, California; and Gila, Graham, La Paz, Maricopa, Mohave, Pima, Pinal, and Yuma counties, Arizona. Chief of Naval Air Training (CNATRA) is serving as the lead agency along with the FAA as a cooperating agency pursuant to 40 CFR 1501.6.

Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to meet the FRTP for the foreseeable future by re-commissioning the three VRs (VR-289, VR-296, and VR-299) in southeastern California. In addition, the purpose of modifying the three VRs (VR-267, VR-268, and VR-269) in southwestern Arizona is to provide additional training flexibility through increased route width (i.e., to 2 NMs from either side of the centerline for the entirety of the routes from a range of 1 to 2 NMs from the centerline) and to avoid conflicts with special use airspace (Restricted Area R-2310, Arizona National Guard). The Proposed Action is necessary to provide a variety of sustainable, low-level routes to fully support current, emerging, and future training requirements for Navy, U.S. Marine Corps (USMC), and other similar military aircraft. Re-commissioning of the three VRs (VR-289, VR-296, and VR-299) in southeastern California would enhance training and operational readiness given the proximity to Naval Air Facility (NAF) El Centro and the El Centro Ranges. It is also likely the Proposed Action would return VR-1266 and VR-1267 to the original utilization that existed prior to the de-commissioning of VR-289, VR-296, and VR-299 after the three VRs are returned to service. Modification of VR-267, VR-268, and VR-269 (AZ) is needed to provide aviators more maneuver flexibility within the routes, and to reduce conflicts with Restricted Area R-2310 when active. Activation of R-2310 has increased in recent years due to increased training of unmanned aerial vehicles, which has led to increased airspace conflicts with the existing configuration of VR-267, VR-268, and VR-269 (AZ).

In addition, the need for the Proposed Action is to provide capabilities for training and equipping combat-capable naval forces ready to deploy worldwide. In this regard, the Proposed Action furthers the Navy’s execution of its congressionally mandated roles and responsibilities under 10 United States Code (U.S.C.) section 5062.

Alternatives Considered

Alternatives were developed for analysis based upon the following reasonable alternative screening factors:

- Routes should avoid the creation of unsafe conditions for the general public, both under and adjacent to the flight corridors.
- Routes should avoid intersections with any existing Restricted Area or areas that would otherwise restrict military training route (MTR) use.
- Routes should avoid noise-sensitive receptors (e.g., residential areas, hospitals, schools) or areas with development that could be incompatible with military training.
- Routes should have adequate capacity to support scheduled training.
- Routes should avoid major bird migration paths to the greatest extent possible.
- Re-commissioned routes should be reasonably located near to NAF El Centro to reduce flight distance and therefore, fuel consumption and travel time.

The Navy is considering one action alternative that meets the purpose and need for the Proposed Action and a No Action Alternative. Alternative 1 (Preferred Alternative) would re-commission three VRs (VR-289, VR-296, and VR-299) in southeastern California and modify three VRs (VR-267, VR-268, and VR-269) in southwestern Arizona to provide aviators additional maneuver flexibility and to avoid conflicts with Arizona National Guard special use airspace. Under the No-Action Alternative, the Proposed Action would not occur. VR-289, VR-296, and VR-299 would not be re-commissioned, and VR-267, VR-268, VR-269, VR-1266, and VR-1267 would continue to be utilized in their current status, as would other MTRs available for training purposes. However, the restrained number of training sorties would not meet the Purpose and Need of the Proposed Action as it would potentially degrade the level of combat readiness of the affected units and in turn would fail to meet the Navy's FTRP for the foreseeable future.

Summary of Environmental Resources Evaluated in the EA

Council on Environmental Quality (CEQ) regulations, National Environmental Policy Act (NEPA), and Navy instructions for implementing NEPA, specify that NEPA documents, including Environmental Assessments (EAs) should address those resource areas potentially subject to impacts, including whether a proposed action would have an effect on the human environment. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

Primary resources of concern include airspace and noise, and associated resource areas that could be impacted from increased noise and aviation training. The following resource areas have been addressed in this EA: Noise, Biological Resources, Airspace, Air Quality, Cultural Resources, Land Use, Environmental Justice, and Public Health and Safety. Because potential impacts were considered to be negligible or nonexistent, the following resources were not evaluated in this EA: Water Resources, Geologic Resources, Infrastructure, Transportation, Hazardous Materials and Waste, and Socioeconomics.

Summary of Potential Environmental Consequences of the Proposed Action 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.

Public Involvement

The Navy circulated the Draft EA for public review from August 23 to September 21, 2016. Comments and responses will be provided in Appendix A following completion of the public comment period.

Table ES-1. Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action*
Noise	There would be no change in baseline noise levels along VR-1266, VR-1267, VR-267, VR-268, and VR-269. Some instantaneous occurrences of up to 119 dB SEL_r would occur, but existing $CNEL_{mr}$ noise conditions would remain below 65 dB; therefore, no significant impacts would occur.	Instantaneous occurrences of up to 119 dB SEL_r would occur along VR-289, VR-296, and VR-299, but existing $CNEL_{mr}$ noise conditions would remain below 65 dB. There would be no change to existing noise conditions along VR-267, VR-268, and VR-269; however, noise exposure would be shifted approximately 2 miles south near the modified portion of the route. Flights in this area are limited to at least 300 feet AGL and $CNEL_{mr}$ would remain below 48 dB. Therefore, no significant impacts would occur.
Biological Resources	Ongoing aviation training along VR-1266, VR-1267, VR-267, VR-268, and VR-269 would continue to result in limited startle effects to wildlife and rare occurrences of avian mortality from bird-aircraft strikes. Overall impacts to wildlife species would be minor; therefore, no significant impacts would occur.	No substantial increase in avian mortality from bird-aircraft strike is expected as a result of the Proposed Action. Introduction of noise elements and low-level overflights to areas that do not currently experience military overflights could temporarily disturb wildlife; however, average noise levels would not be likely to adversely affect wildlife reproduction or survivorship, and it is likely that wildlife would become accustomed to such noise levels. Therefore, no significant impacts would occur.
Air Quality	Air emissions would continue from ongoing military aviation training resulting in continued minor impacts; however, there would be no change from baseline air quality and these levels would not exceed *de minimis* threshold levels. Therefore, no significant impacts to air quality or air resources would occur with implementation of the No Action Alternative.	Air emissions would occur from increases in aviation training; however, the maximum potential emissions in any area would be below the *de minimis* thresholds for all areas and the General Conformity Rule would not apply. Therefore, no significant impacts would occur.
Airspace	The Navy would continue to operate identically to the baseline condition, and traffic congestion on VR-1266 and VR-1267 would continue as the Navy tries to meet its Fleet Response Training Plan. Aircraft utilizing VR-267, VR-268, and VR-269 (AZ) would continue to be required to terminate prior to entering Restricted	No significant impacts to airspace management would result from implementing the Proposed Action. There would be no increases in the annual use of proposed VR-289, VR-296, and VR-299 beyond previously safe levels, and floor altitudes along these routes would remain the same as those flown prior to 2013. Annual use of VR-267, VR-268, and VR-269 would not

Table ES-1. Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action*
	Area R-2310 when in use. Impacts to civilian aircraft would remain unchanged. Therefore, no significant impacts to would occur.	change. Flight activity on the MTRs would continue to be available through the FAA's Flight Service Station by dialing 1-800-WX-BRIEF. Therefore, implementation of the Proposed Action would not result in significant impacts to airspace.
Land Use	Minor land use impacts from noise would continue to occur from military aviation training in areas underlying VR-267, VR-268, VR-269, VR-1266, and VR-1267; however, noise levels from existing aviation training would not exceed typical noise planning levels of 65 dB CNEL. Therefore, no significant impacts would occur.	Minor to moderate land use impacts from noise would occur from military aviation training in areas underlying VR-289, VR-296, and VR-299, VR-267, VR-268, and VR-269; however, noise levels from increased aviation training would not exceed typical noise planning levels of 65 dB CNEL. Therefore, no significant impacts would occur.
Cultural Resources	Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the frequency, location, or altitude of flight operations. No changes to existing levels of noise, vibration or intrusion based effects upon cultural resources would occur. Cultural resources within the area of potential effect (APE) would continue to be managed in accordance with federal regulations. Therefore, no significant impacts to cultural resources would occur with implementation of the No Action Alternative.	Under the Proposed Action, effects upon cultural resources would be limited to minor changes in visual and subsonic noise intrusions and negligible vibration effects from subsonic flights. No supersonic flight operations would be conducted under the Proposed Action. Based on the lack of ground disturbance and the negligible vibration effects associated with the subsonic overflights, no significant adverse effects to archaeological resources are expected to result from the Proposed Action. Consultation with tribal groups is currently underway to identify potentially affected TCPs and determine potential impacts. Appropriate discussion will be included in the Final EA prior to any decision by the Navy.
Environmental Justice	Continued ongoing noise from aviation training along VR-1266, VR-1267, VR-1266, VR-1267, VR-267, VR-268, and VR-269 could continue to adversely affect minority and low-income populations located along the MTRs; however, these impacts would not be disproportionately high and would be experienced	Although minor impacts could occur to minority and low-income populations underlying and adjacent to the MTRs, noise levels would be below the typical noise planning thresholds of 65 dB considered incompatible with residential and other noise sensitive land uses. Implementation of the Proposed Action would not cause disproportionately high and

Table ES-1. Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action*
	equivalently along the length of the routes. Therefore, no significant impacts would occur with the implementation of the No Action Alternative.	adverse human health or environmental effects on any minority or low-income populations.
Public Health and Safety	Ongoing aviation training would have an extremely low potential for aircraft mishap and impact to public health and safety. Therefore, no significant impacts would occur with implementation of the No Action Alternative.	Increased aviation training has the potential for aircraft mishap that could impact public health and safety due to equipment failure, pilot error, BASH, dust, conflicts between civilian VFR pilots and military aircraft, or direct conflicts between military aircraft. However, the potential for these occurrences is extremely low, and the Proposed Action would not result in a substantial increase in risk of mishap. Therefore, implementation of the Proposed Action would not result in significant impacts to public health and safety.

AGL = above ground level; BASH = Bird/Animal Air Strike Hazard; CNEL = community noise exposure level; $CNEL_{mr}$ = Onset-Rate Adjusted Monthly Community Noise Equivalent Level; dB = decibels; FAA = Federal Aviation Administration; MTR = Military Training Route; SEL_r = Onset-Rate Adjusted Sound Exposure Level; VFR = Visual Flight Rules; VR = Visual Route

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Environmental Assessment

Re-commissioning of Three Military Training Routes (MTRs) in Southern California and Modification of Three Military Training Routes in Southern Arizona

Chief of Naval Air Training, California and Arizona

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Abbreviations and Acronyms

Acronym	Definition
ACEC	Areas of Critical Environmental Concern
AGL	above ground level
AMSL	above mean sea level
APE	Area of Potential Effect
AQCR	Air Quality Control Region
AZ	Arizona
BASH	Bird/Animal Aircraft Strike Hazard
BLM	Bureau of Land Management
CA	California
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNATRA	Chief of Naval Air Training
CNEL	community noise equivalent level
$CNEL_{mr}$	Onset-Rate Adjusted Monthly Community Noise Equivalent Level
CNIC	Commander Navy Installations Command
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act
dB	decibel
dBA	A-weighted sound level
dBC	C-weighted sound level
DNL	day-night average sound level
DoD	United States Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FLIP	Flight Information Program
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
FRS	Fleet Replacement Squadron
FRTP	Fleet Response Training Plan
GHG	greenhouse gas
IFR	Instrument Flight Rule
JO	Joint Order
L_{dnmr}	Adjusted Monthly Day-Night Average Sound Level
L_{eq}	Equivalent sound level
L_{max}	Maximum sound level
MBTA	Migratory Bird Treaty Act
MR_NMAP	Military Operating Area and Range Noise Model
MTR	Military Training Route
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NAF El Centro	Naval Air Facility El Centro
NAGPRA	Native American Graves Protection and Reparation Act
Navy	Department of the Navy
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NM	Nautical Miles
NO_2	nitrogen dioxide

Acronym	Definition
NOTAM	Notice to Airmen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
OPNAV	Office of the Chief of Naval Operations
Pb	Lead
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
PSD	Prevention of Significant Deterioration
PV	photovoltaic
ROD	Record of Decision
ROI	Region of Influence
RONA	Record of Non-Applicability
SEL	sound exposure level
SEL_r	Onset-Rate adjusted SEL
SO_2	sulfur dioxide
tpy	Tons per year
U.S.C.	United States Code
USAF	U.S. Air Force
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USMC	U.S. Marine Corps
VOC	Volatile Organic Compound
VFR	Visual Flight Rule
VR	Visual Route

1 Purpose of and Need for the Proposed Action

1.1 Introduction

The Department of the Navy (Navy) has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321, et seq.), the Council on Environmental Quality (CEQ) implementing regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), U.S. Department of Navy Procedures for implementing NEPA (32 CFR Part 775), Chief of Naval Operations Instruction (OPNAV Manual 5090.1D) (January 2014), and other applicable laws. This EA presents an analysis of the potential environmental impacts of the Proposed Action and the No Action Alternative pertaining to the re-commissioning of three aviation military training routes (MTRs) near Naval Air Facility (NAF) El Centro in El Centro, California, as well as the modification of three active MTRs to the east of NAF El Centro in southwestern Arizona. The six MTRs are all classified as Visual Routes (VRs). VRs are flight corridors that must be flown under the Federal Aviation Administration's (FAA) visual flight rules (VFR) and that typically have a minimum altitude of 100 feet above ground level (AGL) and a maximum altitude of up to 5,000 feet AGL (see Section 2.1).

The Chief of Naval Air Training (CNATRA) is based out of Kingsville, Texas. The mission of CNATRA, is to train the world's finest combat quality aviation professionals, delivering them at the right time, in the right numbers, and at the right cost to a Naval Force that is where it matters, when it matters. One of the ways this mission is achieved is through aviation training along MTRs throughout the U.S., including multiple routes in southern California and southwestern Arizona. CNATRA has historically trained out of NAF El Centro because of facility capabilities and geographic characteristics, such as clear weather conditions that allow for year-round training. Over the last 30 years, CNATRA and FRS detachments to NAF El Centro (as well as other Navy and U.S. Marine Corps [USMC] aircraft) diversified low-level training in VR-267, VR-268, VR-269, VR-289, VR-296, and VR-299, so pilots could receive a variety of training, thus improving their airmanship.

In 2013, the U.S. Air Force discontinued use of VR-289, VR-296, VR-299, and returned the routes to the FAA. The FAA subsequently de-commissioned these routes and removed them from the DoD Flight Information Program (FLIP) AP/1B and associated charts. The Proposed Action seeks to find additional MTRs in order to return CNATRA and Fleet Replacement Squadron (FRS) pilots to their original low-level training curriculums. Currently, only VR-267, VR-268, and VR-269 (Arizona [AZ]) are available for use. VR-1266 and VR-1267 are also used by units operating out of NAF El Centro, but are experiencing high congestion due to decommissioning of VR-289, VR-296, and VR-299 (California [CA]). Additional MTRs would reduce congestion on VR-1266 and VR-1267 and return them to their previous operational level prior to decommissioning.

In addition, as presently configured, VR-267, VR-268, and VR-269 (AZ) intersect Arizona National Guard Restricted Area R-2310. When the Restricted Area is active, non-participating aircraft (i.e., aircraft training on the MTRs) may not enter the airspace. Aircraft must conclude training before reaching the Restricted Area, which ultimately constrains training and leads to training inefficiencies. Activation of R-2310 has increased in recent years due to increased training of unmanned aerial vehicles, which has led to increased airspace conflicts with the existing configuration of VR-267, VR-268, and VR-269 (AZ). Modification of these MTRs would reduce these conflicts and increase training efficiencies.

Aircraft training operations along VR-289, VR-296, and VR-299 (CA) were last managed by the 452nd Operations Support Squadron, a U.S. Air Force Reserve command operating out of March Air Reserve

Base, California. The U.S. Air Force also previously maintained authority to schedule training and establish special operating procedures along VR-267, VR-268, and VR-269 (Arizona [AZ]). In 2012, this authority was transferred from the FAA to CNATRA, which primarily flies the T-45 Goshawk.

1.2 Location

The three MTRs to be re-commissioned (i.e., VR-289, VR-296, and VR-299) are located north of NAF El Centro in southeastern California, with a portion of VR-299 also located in southwestern Arizona. The three active MTRs requiring modification (i.e., VR-267, VR-268, and VR-269) are located east of NAF El Centro in southwestern Arizona and travel a similar route, with the exception of different ending points. Refer to Figure 1-1 for a depiction of the general project location.

Further details on the paths of the MTRs are as follows (refer to Figure 2-4 in Chapter 2 for depiction of the routes):

- VR-289 would begin in Imperial County, California and would travel across portions of Riverside, San Diego, and San Bernardino counties, California. The route terminates in San Bernardino County within the Mojave National Preserve in California.
- VR-296 would begin in Imperial County, California and would travel across portions of Riverside and San Bernardino counties, California and La Paz County, Arizona. The route terminates in San Bernardino County within the Mojave National Preserve, California.
- VR-299 would begin in Imperial County, California and would travel across portions of Riverside County, California and Mojave and La Paz counties, Arizona. The route terminates in Mojave County north of Lake Havasu City in Arizona.
- VR-267 begins northeast of the Coronado National Forest in Arizona and travels across portions of Pinal, Gila, Graham, and Pima counties, Arizona. The route has a termination point in portions of Yuma and Maricopa counties, Arizona.
- VR-268 has a similar route to VR-267, with the exception that the ending point is entirely within Maricopa County, Arizona.
- VR-269 has a similar route to VR-267, with the exception of a slightly different ending point in Maricopa County, Arizona.

Figure 1-1. General Project Location

1.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to meet the Navy's Fleet Response Training Plan (FRTP) for the foreseeable future by re-commissioning the three VRs (VR-289, VR-296, and VR-299) in southeastern California. In addition, the purpose of modifying the three VRs (VR-267, VR-268, and VR-269) in southwestern Arizona is to enhance maneuver flexibility within the routes and avoid conflicts with special use airspace (Restricted Area R-2310, Arizona National Guard).

> 10 U.S.C. section 5062: "The Navy shall be organized, trained, and equipped primarily for prompt and sustained combat incident to operations at sea. It is responsible for the preparation of naval forces necessary for the effective prosecution of war 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."

The need for the Proposed Action is to provide a variety of sustainable, low-level routes to fully support current, emerging, and future training requirements for Navy, USMC, and other similar military aircraft. Re-commissioning of the three VRs (VR-289, VR-296, and VR-299) in southeastern California would enhance training and operational readiness given the proximity to NAF El Centro and the El Centro Ranges. It is also likely the Proposed Action would return VR-1266 and VR-1267 to the original utilization that existed prior to the de-commissioning of VR-289, VR-296, and VR-299 after the three VRs are returned to service.

Modification of VR-267, VR-268, and VR-269 (AZ) is needed to provide aviators with additional maneuver flexibility within the routes, and to avoid conflicts with Restricted Area R-2310, which would reduce training flight corridor conflicts when Restricted Airspace is activated.

In addition, the need for the Proposed Action is to provide capabilities for training and equipping combat-ready naval forces ready to deploy worldwide. In this regard, the Proposed Action furthers the Navy's execution of its congressionally mandated roles and responsibilities under 10 U.S.C. section 5062.

1.4 Scope of Environmental Analysis

NEPA and its implementing regulations provide guidance on how to analyze the potential environmental impacts of a proposed action and when the Navy shall prepare an EA or an EIS in accordance with 40 CFR 1501.3 or 40 CFR 1501.4, respectively, as well as OPNAV Manual 5090.1D. An EA is required when the Navy does not know beforehand whether proposed action will significantly affect the human environment or will be controversial regarding the environmental effects. An EA would result in either a decision to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).

This EA identifies and evaluates the direct, indirect, and cumulative impacts associated with the proposed re-commissioning and modifications of MTRs in southeastern California and southwestern Arizona. The scope of this EA is strictly the analysis of proposed low-level MTRs in the national airspace for CNATRA training aircraft, Navy and USMC FRS fighter jets, and other similar military aircraft.

Descriptions of the affected environment and analyses of the potential impacts (direct and indirect) to physical, cultural, and biological resources are provided in Chapters 3 and 4. Cumulative impacts are discussed in Chapter 5. The environmental resource areas analyzed in detail in this EA include the following:

- Air Quality
- Airspace

- Land Use
- Biological Resources
- Cultural Resources
- Noise
- Environmental Justice
- Public Health and Safety

Additional resources were considered in the analysis but dismissed due to lack of anticipated impacts (see Chapter 3).

1.5 Relevant Laws and Regulations

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

- NEPA (42 U.S.C. sections 4321-4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500-1508)
- Navy regulations for implementing NEPA (32 CFR 775), which provides Navy policy for implementing CEQ regulations and NEPA
- Chief of Naval Operations Instruction OPNAV Manual 5090.1D (January 2014)
- Clean Air Act (CAA) (42 U.S.C. section 7401 et seq.)
- Clean Water Act (CWA) (33 U.S.C. section 1251 et seq.)
- National Historic Preservation Act (NHPA) (54 U.S.C. section 306108 et seq.)
- Endangered Species Act (ESA) (16 U.S.C. section 1531 et seq.)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. sections 703-712)
- Bald and Golden Eagle Protection Act (16 U.S.C. section 668-668d)
- Executive Order (EO) 12114, Environmental Effects Abroad of Major Federal Actions
- 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

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 discussed throughout this document and summarized in Chapter 6 (see Table 6-1).

1.6 Public and Agency Participation and Intergovernmental Coordination

The Navy invites public participation through the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better federal decision-making. Agencies, organizations, and members of the public with a potential interest in the Proposed Action are encouraged to participate. Appendix A provides a record of public involvement and agency coordination and consultation conducted in support of preparation of this EA.

The Navy published and distributed the EA on August 23, 2016 for a 30-day public comment period. The start of the comment period was announced in a Notice of Availability, which was published for three consecutive days (i.e., Tuesday – Thursday) in the Imperial Valley Press and Casa Grande Valley Newspaper. The notice initiated the beginning of the public comment period, which ran from August 23 to September 21, 2016. Copies were made available for public review at: El Centro Public Library, 1140

North Imperial Avenue, El Centro, CA 92243 and Florence Community Library, 778 N. Main Street, P.O. Box 985, Florence, AZ 85132. Copies were also made available online at http://www.cnic.navy.mil/regions/cnrsw/om/environmental_support/Public_Review_of_Navy_Projects.html. All applicable comments submitted during the Draft EA public comment period will be considered during preparation of the Final EA. The Navy will consider all comments carefully, address them as necessary, and factor them into the Navy's decision as to whether a FONSI is the appropriate NEPA decision document, per the specified regulations.

The Final EA and FONSI, if applicable, will be available at the library listed above and on the Commander, Navy Region Southwest website. The Notice of Availability for the Final EA and FONSI, if applicable, will appear in the same newspapers that published the notice for the Draft EA listed above.

NEPA requires that federal agencies responsible for preparing NEPA analyses and documentation do so "in cooperation with State and local governments" and other agencies with jurisdiction by law or special expertise (42 U.S.C. 4331[a] and 4332[2]). The Navy notifies relevant federal, state, and local agencies and allows sufficient time for these agencies to make known their environmental concerns specific to the Proposed Action. Comments and concerns submitted by any government agency would be incorporated into the analysis of potential impacts conducted as part of this EA.

Agencies consulted for this Draft EA are listed in Appendix A, along with copies of relevant correspondence. Data contained in these responses have been included within this EA, where appropriate.

CEQ Regulation 1508 defines "Cooperating agency" as any federal agency, other than a lead agency, that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment. The FAA is serving as a cooperating agency for this EA pursuant to 40 CFR 1501.6. A discussion of impact categories addressed in FAA Order 1050.1F, Environmental Impacts: Policies and Procedures and a reference to their consideration in this EA is included in Appendix B.

2 Proposed Action and Alternatives

2.1 Proposed Action

The Navy proposes to re-commission three Visual Routes (VR)s (VR-289, VR-296, and VR-299) in southeastern California and modify three VRs (VR-267, VR-268, and VR-269) in southwestern Arizona.

The Military Training Route (MTR) program is a joint venture by the Federal Air Administration (FAA) and Department of Defense (DoD) to facilitate military readiness by providing low-altitude, high-speed training opportunities while maintaining the greatest practical level of safety for all flight operations. The required maneuvers and high speeds are such that they may occasionally make the see-and-avoid aspect of Visual Flight Rule (VFR) flight more difficult without increased vigilance in areas containing such operations. Generally, MTRs are established below 10,000 feet above mean seal level (AMSL) for operations at speeds in excess of 250 knots (287.7 miles per hour) (FAA 2010).

Each service component (e.g., the Navy) issues written guidance, procedures, regulations, or instructions (e.g., OPNAV 3710.7 series by the Navy) that cover MTR flying requirements. Pilots are expected to comply with Federal Aviation Regulations, Order JO 7610.4t and applicable service guidance when flying Instrument Route/VR MTRs and Slow Speed Routes. FAA Regional Air Traffic Division Managers may authorize deviations from the provisions of Order JO 7610.4t. These deviations meet an appropriate level of safety and are explained in the Route Description, Remarks or Special Operating Procedures for each route. See Figures 2-1 and 2-2 for a general depiction of an MTR. Note that these figures are representative of a typical MTR and are not a depiction of the altitudes flown by a specific MTR analyzed as a part of the Proposed Action. MTRs are flown in one direction as a safety measure to prevent mid-air collision or unsafe flight conditions.

Each MTR has its own unique number consisting of the classification (i.e., VR or Instrument Route) and three or four digits. MTRs that include one or more segments above 1,500 feet above ground level (AGL) have a three-digit identification number (e.g., VR-267). MTRs with no segment above 1,500 feet AGL have a four-digit identification number (e.g., VR-1266).

An MTR may consist of multiple segments designated for specific military aircraft maneuvers rather than point-to-point flight. Each segment has a designated floor, described in feet AGL, and a designated ceiling altitude, which is typically described in feet AMSL although some lower altitude VRs can have ceiling altitudes designated AGL. Lateral boundaries of a segment are described in nautical miles (NM) to the left and right of the centerline, which is the focal point that determines the geographic location of an MTR corridor (but is not always centered in the segment).

Aircraft may maneuver freely within the vertical and lateral parameters of an MTR segment. The vertical and lateral parameters of an MTR corridor may be restricted to avoid sensitive areas, flight hazards, and other conditions of use. Restrictions may also be placed on hours of operation or seasonal use to minimize potential impacts on the human and natural environment.

Important airspace safety measures for MTR training include adequate separation and a means to notify the civilian aviation community wherever and whenever military training is conducted. For flight planning, current MTRs are described in the DoD FLIP AP/1B (DoD 2015) and associated maps.

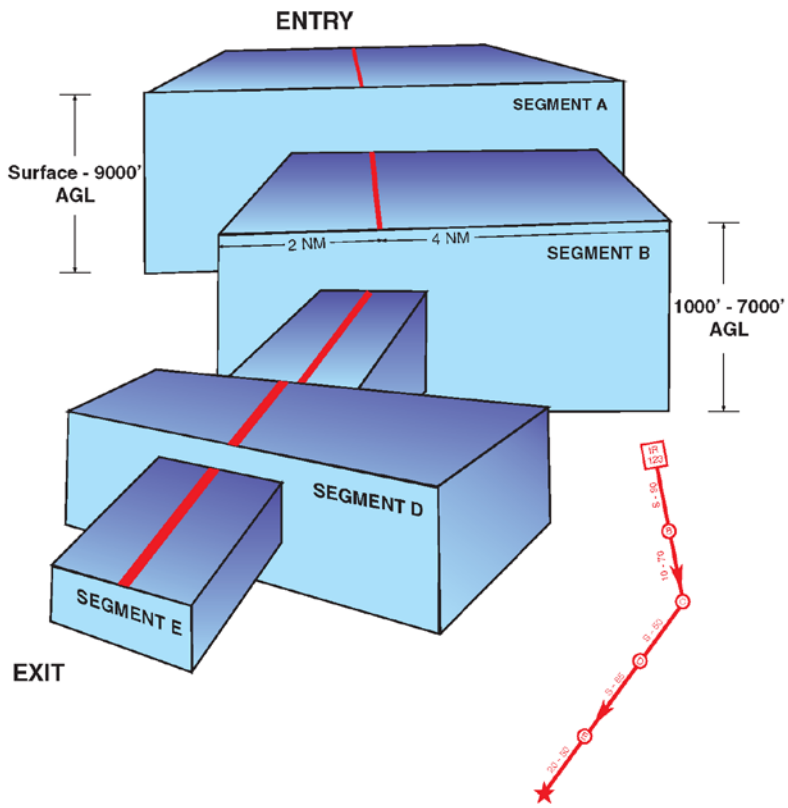

Figure 2-1. Representative Elements of a Military Training Route[1]

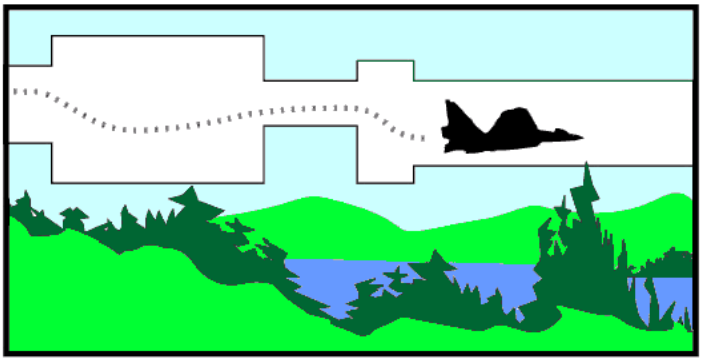

Figure 2-2. Representative Side View of a Military Training Route[1]

[1] Source: Interagency Aviation Management Council, 2003

The aircraft that would use the MTRs under the Proposed Action include the following:

- **T-45 Goshawk.** The T-45 Goshawk is a tandem-seat, carrier capable, jet trainer whose mission is to train Navy and Marine Corps pilots. The T-45 Goshawk is the primary aircraft flown by Chief of Naval Air Training (CNATRA).
- **F/A-18 Super Hornet.** The multi-mission F/A-18 "Super Hornet" provides the battle group commander with a platform that has range, endurance, and ordnance carriage capabilities. The F/A-18 is a Fleet Replacement Squadron (FRS) aircraft flown by Navy and U.S. Marine Corps (USMC) units.
- **AV-8B Harrier.** The AV-8B Harrier is used for close air support and intermediate range intercept, as well as attack missions. The AV-8B is an FRS aircraft flown by Navy and USMC units.
- **MV-22 Osprey.** The MV-22 Osprey is a tiltrotor aircraft, which is a vertical/short takeoff and landing medium lift air vehicle. The MV-22 is intended to provide the speed, endurance, radius of action, payload, and survivability needed to support Navy and USMC operations.
- **F-16 Fighting Falcon.** The F-16 Fighting Falcon is a compact, multi-role fighter aircraft. It is highly maneuverable and is used in air-to-air combat and air-to-surface attacks. The F-16 is flown by U.S. Air Force (USAF) and Navy units.
- **F-15 Eagle.** The F-15 is an extremely maneuverable tactical fighter that is designed to fly combat missions in all weather conditions. The F-15 is flown by USAF units.
- **C-130 Hercules.** The C-130 Hercules primarily performs the tactical portion of an airlift mission and accommodates a wide variety of oversized cargo, including utility helicopters, armored vehicles, and personnel. The C-130 is flown by USAF and USMC units.
- **F-35B Lightning II Short Takeoff/Vertical Landing Variant.** The F-35B is a stealth aircraft capable of supersonic flight. The aircraft is capable of operating from both short-field bases and a range of capable ships, as well as from conventional runways. The F-35B does not currently use the routes analyzed under the Proposed Action, but is anticipated to gradually replace the AV-8B Harrier as that aircraft is phased out of training. The F-35B is flown by USMC units.
- **F-35C Lighting II Joint Strike Fighter Carrier Variant.** The F-35C is a long-range stealth strike fighter designed for naval aircraft carrier operations. The F-35C does not currently use the routes analyzed under the Proposed Action, but is anticipated to begin training on the routes in the near future. The F-35C is flown by Navy units.

Refer to Appendix C for further information and photos on aircraft to be flown under the Proposed Action.

2.1.1 Current MTR Utilization

Military aircraft training generally consists of high-speed, low-level navigational training. Existing MTR use (i.e., sorties)[2] on routes that would be affected by the Proposed Action are indicated in Table 2-1.

[2] An aircraft sortie is a flight operation to and from a specified airspace. An aircraft entering a special use area, conducting its assigned mission, and exiting the airspace is considered one sortie

Table 2-1. Current Utilization Summary of Affected MTRs

	T-45	F/A-18	AV-8B	MV-22	F-16	F-15	C-130
	VR-267						
Sorties/year	0	0	0	0	8	3	3
Sortie Length (min)	0	0	0	0	33	33	90.4
Total Time in MTR (hr/year)	0	0	0	0	4.4	1.7	4.5
Total MTR Usage	**10.6 hours/year**						
	VR-268						
Sorties/year	0	0	0	0	8	3	3
Sortie Length (min)	0	0	0	0	20	20	54.9
Total Time in MTR (hr/year)	0	0	0	0	2.7	1.0	2.7
Total MTR Usage	**6.4 hours/year**						
	VR-269						
Sorties/year	100	0	0	0	8	3	3
Sortie Length (min)	43.4	0	0	0	23	23	63.9
Total Time in MTR (hr/year)	72.3	0.0	0.0	0.0	3.1	1.2	3.2
Total MTR Usage	**79.8 hours/year**						
	VR-289						
Total MTR Usage	**0 hours/year**						
	VR-296						
Total MTR Usage	**0 hours/year**						
	VR-299						
Total MTR Usage	**0 hours/year**						
	VR-1266						
Sorties/year	244	330	156	474	48	0	29
Sortie Length (min)	38	19	31.7	41.3	20	0	55.9
Total Time in MTR (hr/year)	154.5	104.5	82.4	326.3	16.3	0.0	27.0
Total MTR Usage	**711.1 hours/year**						
	VR-1267						
Sorties/year	76	86	99	118	20	0	113
Sortie Length (min)	51.8	25.9	43.2	56.3	28	0	76.2
Total Time in MTR (hr/year)	65.6	37.1	71.3	110.7	9.3	0.0	143.5
Total MTR Usage	**437.5 hours/year**						
Total MTR Use – All Aircraft	**1,245.4 hours/year**						

Source: Wyle, 2016

2.2 Screening Factors

CEQ Regulations for Implementing the Procedural Provisions of NEPA establish policies for federal agencies, including the policy that federal agencies shall use "the NEPA process to identify and assess the reasonable alternatives to the Proposed Action that will avoid or minimize adverse effects of these actions on the quality of the human environment" (40 CFR 1500.2 [e]). This Environmental Assessment (EA) only carries forward for detailed analysis those alternatives that could meet the purpose of and need for the project as defined in Chapter 1. Additionally, this EA considers the following reasonable alternative screening factors:

- Routes should be existing or previously accommodated military air training.
- Routes should have good visibility provided by clear weather.
- Routes should avoid the creation of unsafe conditions for the general public, both under and adjacent to the flight corridors.
- Routes should avoid intersections with any existing Restricted Area or areas that would otherwise restrict MTR use.
- Routes should avoid noise-sensitive receptors (e.g., residential areas, hospitals, schools) or areas with development that could be incompatible with military training.
- Routes should have adequate capacity to conduct scheduled training.
- Routes should avoid major bird migration paths to the greatest extent possible.
- Re-commissioned routes should be reasonably located near to Naval Air Facility (NAF) El Centro to reduce flight distance and therefore, fuel consumption and travel time.
- Routes should allow for training that would maximize flight transit time between training facilities.

2.3 Alternatives Carried Forward for Analysis

Based on the reasonable alternative screening factors and meeting the purpose and need for the Proposed Action, one action alternative, re-commission VR-289, VR-296, and VR-299 (California [CA]) and modify VR-267, VR-268, and VR-269 (Arizona [AZ]), was identified and will be analyzed within this EA.

2.3.1 No Action Alternative

An analysis of the No Action-Alternative is required pursuant to 40 CFR 1502.14(d). The No-Action Alternative serves as the baseline training level and would result in the continued use of VR-267, VR-268, VR-269, VR-1266, and VR-1267, as well as other MTRs available for training purposes. However, the restrained number of training sorties would not meet the Purpose and Need of the Proposed Action as it would potentially degrade the level of combat readiness of the affected units and in turn would fail to meet the Navy's FTRP for the foreseeable future. Under this alternative, there would be no change in military training activities on these VRs; however, this alternative would limit low-level training opportunities and would impact proficiency for detached CNATRA and FRS pilots. Training flights on VR-267, VR-268, and VR-269 (AZ) would have to be scheduled around the activation of the Arizona National Guard Restricted Area, which could negatively affect training capabilities. VR-289, VR-296, and VR-299 would not be re-commissioned and training along VR-1266 and VR-1267 would continue to occur at a high volume. Training flights by CNATRA, Navy and USMC FRS fighter jets, and other similar military aircraft on these routes would be constrained by the amount of training that could be conducted, as well as by the time of year when training can occur, which would degrade overall training capabilities. Refer to Figure 2-3 for VRs to be flown and Table 2-1 for flight training levels under existing conditions.

Figure 2-3. Military Training Routes flown under the No Action Alternative

2.3.2 Re-commission VR-289, VR-296, and VR-299 (CA) and Modify VR-267, VR-268, and VR-269 (AZ) (Preferred Alternative)

Only one alternative was identified that met the screening factors described in Section 2.2. Therefore, the Proposed Action would be to re-commission VR-289, VR-296, and VR-299 (CA) and modify VR-267, VR-268, and VR-269 (AZ) in order to return CNATRA and FRS pilots to their original low-level training curriculums (see Figures 2-4, 2-5, and 2-6). Re-commissioning of the three VRs (VR-289, VR-296, and VR-299) in southeastern California would reduce congestion on VR-1266 and VR-1267 and return them to their previous operational level prior to decommissioning.

VR-289, VR-296, and VR-299 (CA) are 10 NMs wide (5 NMs from either side of the centerline). Flights along these routes would generally not descend below 300 feet AGL or above 4,000 feet AMSL. . VR-267, VR-268, and VR-269 (AZ) currently range between 2 and 4 NMs in total width throughout their path (1 to 2 NMs from either side of the centerline); however, under the Proposed Action the routes would be widened to 2 NMs from either side of the centerline for the entirety of the routes. In addition, the route floors would be lowered to 300 feet for the entirety of the routes. Flights along these routes would not ascend above 6,000 feet AMSL, and generally must remain below 1,500 feet AGL along most segments. Modification of VR-267, VR-268, and VR-269 would also include the addition of new route segments that would allow the route to avoid R-2310 to the south. Special operating procedures would be in place for all routes to avoid airports, identified noise-sensitive receptors, and areas experiencing wildfire. Appropriate scheduling would also be conducted to de-conflict operations with other VRs and Instrument Routes. Appendix D includes specific widths of route segments, latitudes and longitudes of routes, and all special operating procedures for each route.

CNATRA pilots would primarily use these routes for low-level training to meet its mission of establishing combat readiness among pilots; however, the routes would also support other Navy, USMC, and USAF military aircraft. All training would occur at sub-sonic flight speeds. No supersonic[3] flight training would occur.

The primary aircraft operating within the MTRs under consideration is listed in Table 2-2. The Proposed Action would not require any ground-based improvements or other construction activities. While there would be an increase in flight training activity along the applicable MTRs, the Proposed Action does not include any increase or decrease of permanent personnel at NAF El Centro or any other military installation. Overall MTR usage by aircraft along the routes would increase over baseline conditions shown in Table 2-1 by approximately 1,100 hours/year. Reduction in flights along VR-1266 and VR-1267 would represent approximately 40 percent of the flights along VR-289, VR-296, and VR-299 (CA). Proposed increases in MTR hourly usage represents the planned training requirement, and hourly flight activity could fluctuate annually at lower levels based on available funds and training requirements.

2.4 Alternatives Considered but not Carried Forward for Detailed Analysis

Other potential alternatives were considered, including the use of VRs near Kingsville, Texas and Meridian, Mississippi, where CNATRA units are based. The use of these routes did not meet the purpose and need of this project due to existing air traffic congestion, bird migration paths, and land use compatibility criteria with residential areas or other development around the flight paths. These routes

[3] Supersonic flights are flights that are flown faster than the speed of sound, or approximately 786 miles per hour. Subsonic flight are flights flown under the speed of sound (NASA 2009).

were also dismissed due to inclement weather and decreased visibility in these areas, as appropriate weather and visibility is required to conduct flights under visual flight rules that rely on ground landmarks for navigation. Weather conditions in Texas and Mississippi would limit the amount of time per year when training could be conducted and would not maximize annual training opportunities when compared to the more favorable weather and visibility conditions that exist in southeastern California and southwestern Arizona. Additionally, training on these routes would not be geographically feasible when aircraft are operating out of NAF El Centro for required training.

Other MTRs throughout the southwestern region were evaluated but were dismissed due to their distance, fuel consumption, and travel time from NAF El Centro. Flights on other MTRs in the region further from NAF El Centro would require aircraft to land at other facilities and refuel before returning to NAF El Centro or home station, resulting in increased training and operating costs. This would not satisfy the need to enhance training and operational readiness that would occur when combining MTR training with other training taking place at NAF El Centro.

Variations and mixes of the proposed routes were also considered as alternatives, but did not fully meet the purpose and need of the project.

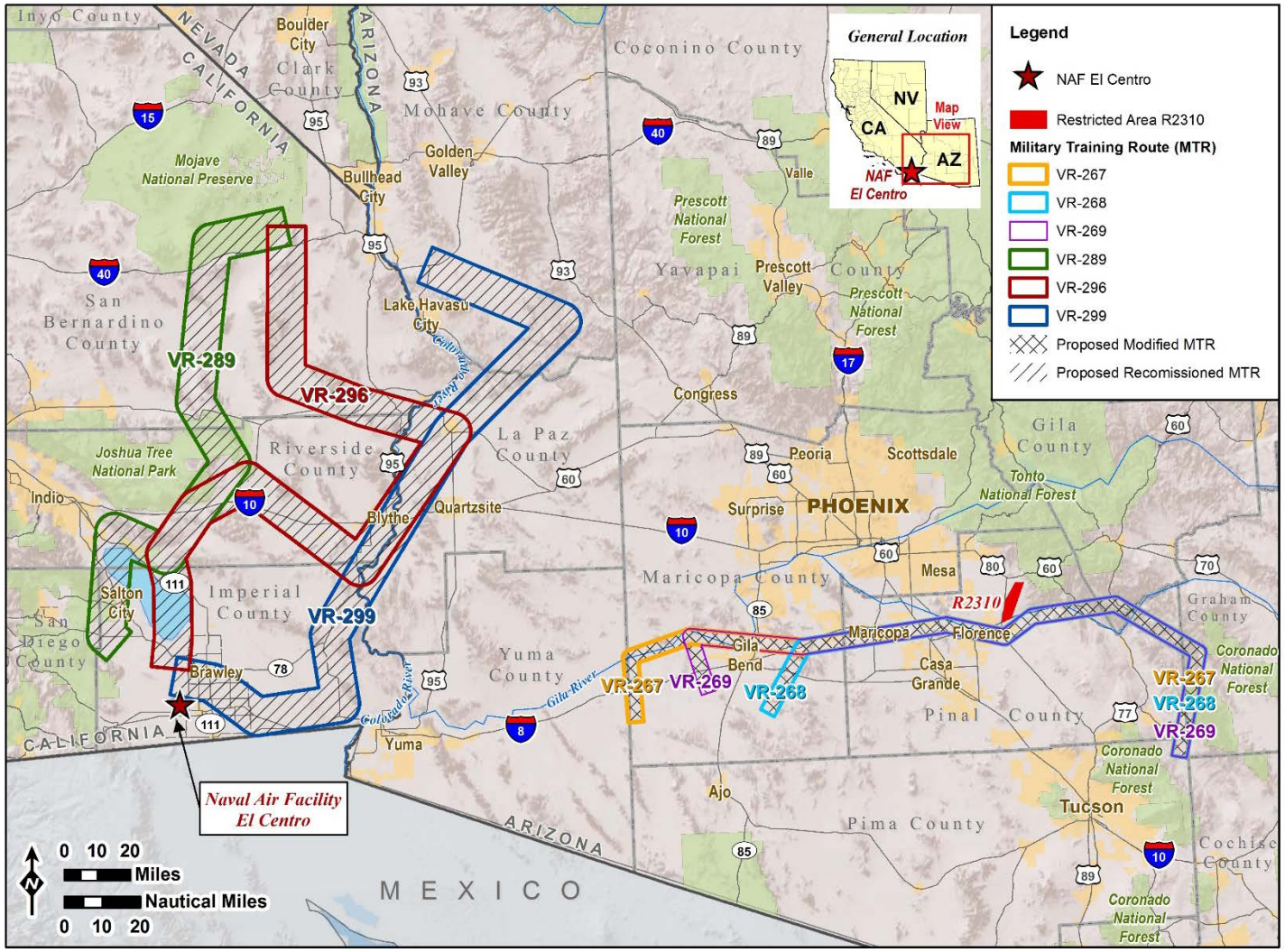

Figure 2-4. Military Training Routes flown under the Proposed Action – Overview

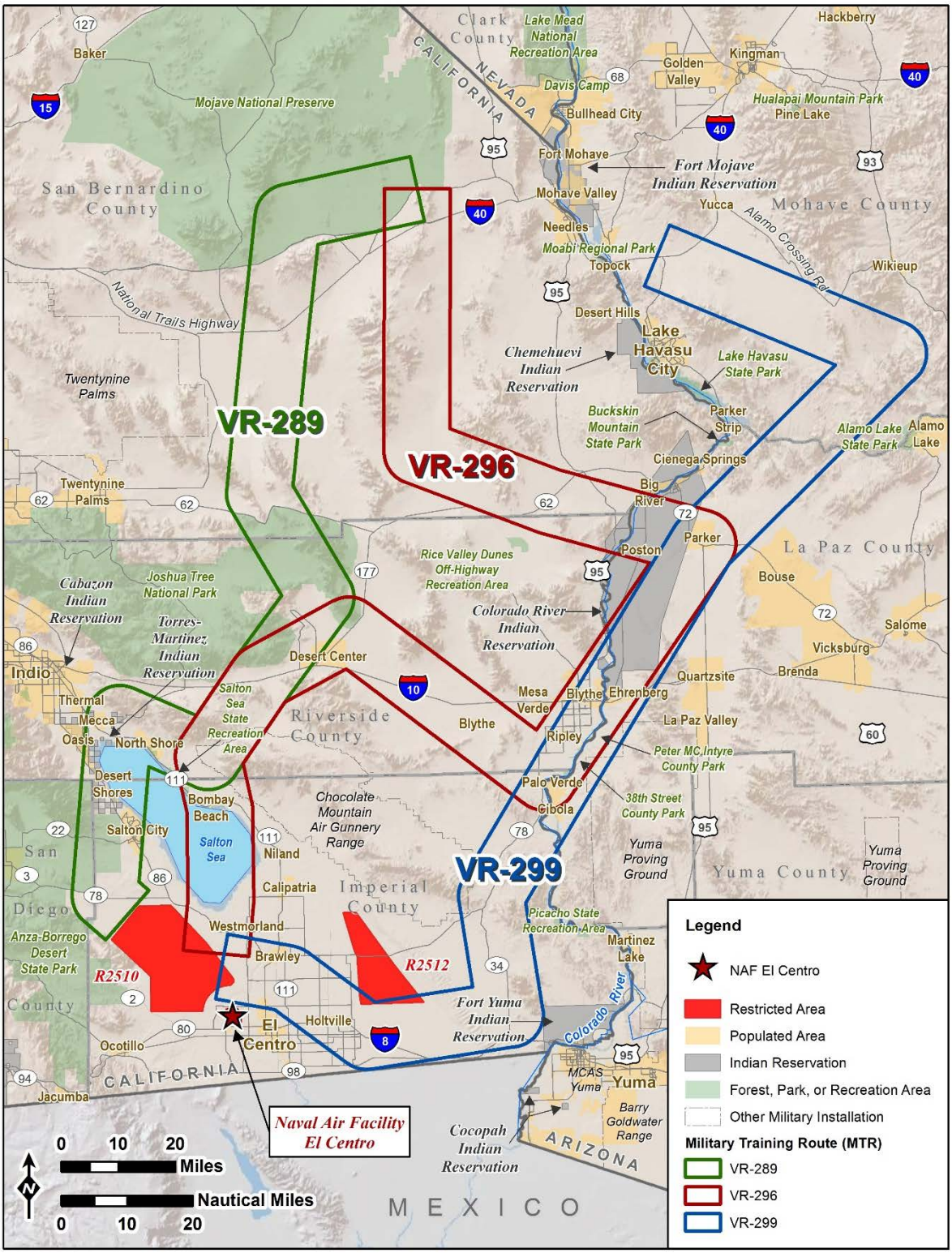

Figure 2-5. Military Training Routes flown under the Proposed Action – California Routes

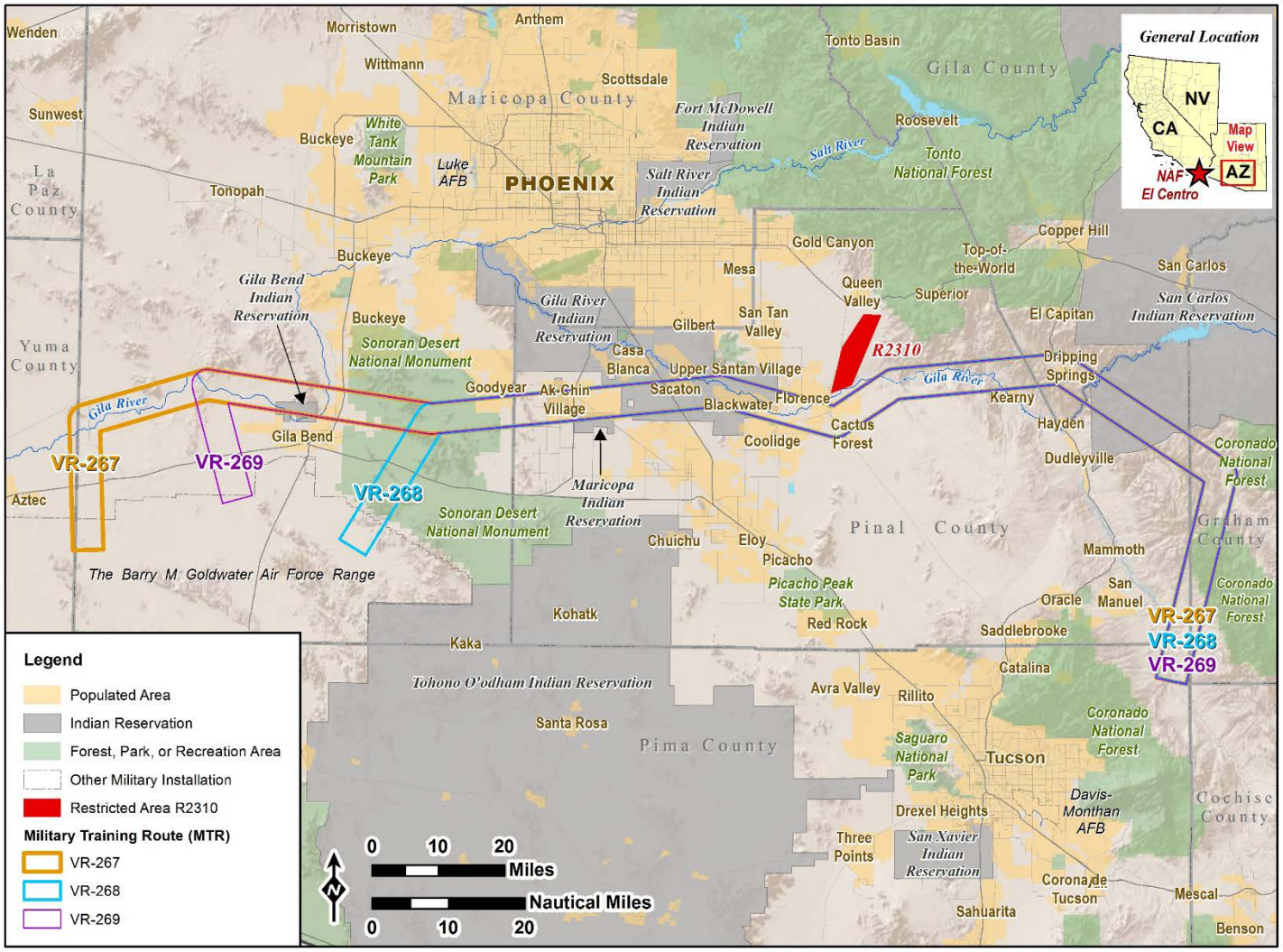

Figure 2-6. Military Training Routes flown under the Proposed Action – Arizona Routes

Table 2-2. Utilization Summary for MTRs under the Proposed Action, by Aircraft and Route

	T-45	F/A-18 [1]	F-35C[1]	AV-8B[1]	F-35B[1]	MV-22	F-16	F-15	C-130
	VR-267								
Sorties/year	0	0	0	0	0	0	8	3	3
Sortie Length (min)	0	0	0	0	0	0	33.1	33.1	90.4
Total Time in MTR (hr/year)	0	0	0	0	0	0	4.4	1.7	4.5
Total MTR Usage	**10.6 hours/year**								
Change from Baseline	**0 hours/year**								
	VR-268								
Sorties/year	0	0	0	0	0	0	8	3	3
Sortie Length (min)	0	0	0	0	0	0	20.1	20.1	54.9
Total Time in MTR (hr/year)	0.0	0.0	0.0	0.0	0.0	0.0	2.7	1.0	2.7
Total MTR Usage	**6.4 hours/year**								
Change from Baseline	**0 hours/year**								
	VR-269								
Sorties/year	100	0	0	0	0	0	8	3	3
Sortie Length (min)	43.4	0	0	0	0	0	23.4	23.4	63.9
Total Time in MTR (hr/year)	72.3	0.0	0.0	0.0	0.0	0.0	3.1	1.2	3.2
Total MTR Usage	**79.8 hours/year**								
Change from Baseline	**0 hours/year**								
	VR-289								
Sorties/year	309	14	7	2	2	300	0	0	0
Sortie Length (min)	37.6	18.8	20.4	31.3	20.4	40.9	0	0	0
Total Time in MTR (hr/year)	193.6	4.4	2.4	1.0	0.7	204.5	0.0	0.0	0.0
Total MTR Usage	**406.6 hours/year**								
Change from Baseline	**406.6 hours/year**								
	VR-296								
Sorties/year	330	14	7	2	2	300	0	0	0
Sortie Length (min)	54.2	27.1	29.4	45.1	29.4	58.9	0	0	0
Total Time in MTR (hr/year)	298.1	6.3	3.4	1.5	1.0	294.5	0.0	0.0	0.0
Total MTR Usage	**604.8 hours/year**								
Change from Baseline	**604.8 hours/year**								

Table 2-2. Utilization Summary for MTRs under the Proposed Action, by Aircraft and Route

	T-45	F/A-18 [1]	F-35C[1]	AV-8B[1]	F-35B[1]	MV-22	F-16	F-15	C-130
	VR-299								
Sorties/year	330	14	7	2	2	300	0	0	0
Sortie Length (min)	49.9	24.9	27.1	41.6	27.1	54.2	0	0	0
Total Time in MTR (hr/year)	274.5	5.8	3.2	1.4	0.9	271.0	0.0	0.0	0.0
Total MTR Usage	**556.7 hours/year**								
Change from Baseline	**556.7 hours/year**								
	VR-1266								
Sorties/year	146	198	0	93	0	284	29	0	18
Sortie Length (min)	38	19	0	31.7	0	41.3	20.4	0	55.9
Total Time in MTR (hr/year)	92.5	62.7	0.0	49.1	0.0	195.5	9.9	0.0	16.8
Total MTR Usage	**426.4 hours/year**								
Change from Baseline	**-284.6 hours/year**								
	VR-1267								
Sorties/year	46	51	0	59	0	71	12	0	68
Sortie Length (min)	51.8	25.9	0	43.2	0	56.3	27.8	0	76.2
Total Time in MTR (hr/year)	39.7	22.0	0.0	42.5	0.0	66.6	5.6	0.0	86.4
Total MTR Usage	**262.8 hours/year**								
Change from Baseline	**-174.8 hours/year**								
Total MTR Use – All Aircraft	**2,354.2 hours/year**								
Change from Total Baseline	**1,108.8 hours/year**								

Source: Wyle, 2016

1. The F-35B or F-35C are not currently training on these routes; however, training is anticipated to replace training of the AV-8B and F/A-18, respectively along these routes over time. For purposes of analysis, one-third of the AV-8B and F/A-18 sorties have been allocated to the F-35B and F-35C, respectively.

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3 Affected Environment

This chapter presents a description of the environmental resources and baseline conditions that could be affected from implementing any of the alternatives.

All potentially relevant environmental resource areas were initially considered for analysis in this Environmental Assessment (EA). In compliance with National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ), and 32 Code of Federal Regulations (CFR) 775 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.

"Significantly," as used in NEPA, requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. 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 (40 CFR 1508.27). Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact would be expected to be significant.

This chapter includes an analysis of Noise, Biological Resources, Air Quality, Airspace, Land Use, Cultural Resources, Environmental Justice, and Public Health and Safety.

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

Water Resources: The Proposed Action would not result in contact or runoff to any water feature, to include Wild and Scenic Rivers, or would not result in contact or direct impacts to wetlands; therefore, this resource has not been carried forward for detailed analysis.

Coastal Resources: The Military Training Routes (MTR)s are more than 100 miles inland from the Pacific Ocean, and no aspect of the Proposed Action would directly affect any natural resource, land use, or water use in the coastal zone. In addition, no pathways for indirect effects to coastal resources have been identified; therefore, this resource has not been carried forward for detailed analysis.

Geological Resources: The Proposed Action would not result in ground disturbance that could affect geological or soil resources; therefore, this resource has not been carried forward for detailed analysis.

Infrastructure: The Proposed Action would not require any utility usage or construction of new infrastructure. Existing infrastructure is available at nearby air bases that aircraft would use under the Proposed Action. As impacts to infrastructure would be negligible, this resource has not been carried forward for detailed analysis.

Transportation: Flights along the MTRs would occur at levels that would not interfere with commercial aviation. The Proposed Action would not interfere with any ground transportation. Low-flying traffic could cause minor driver distraction on Interstate-8 and State Route 98; however, overflights are not anticipated to increase accident incidence or otherwise affect traffic or transportation. Therefore, this

resource has not been carried forward for detailed analysis. Impacts to private aviation are discussed in Section 4.4, Airspace.

Hazardous Materials and Wastes: The Proposed Action would not require the handling of bulk quantities hazardous materials or result in the generation of any hazardous waste; therefore, this resource has not been carried forward for detailed analysis.

Socioeconomics: The Proposed Action would not result in any changes to local population, income and revenue, or housing. As described in Section 4.5, Land Use, long-term impacts on livestock from noise are not anticipated, and subsequent adverse socioeconomic impacts would not occur. Therefore, this resource has not been carried forward for detailed analysis. Impacts to the environmental health and safety of children are considered in Section 4.8, Public Health and Safety.

3.1 Noise

This discussion of noise includes the types or sources of noise and the associated noise sensitive receptors in the human environment. Noise in relation to biological resources and wildlife species is discussed in the Biological Resources section.

Sound is a physical phenomenon consisting of vibrations that travel through a medium, such as air or water, and are sensed by the human ear. Noise is generally described as unwanted sound. Unwanted sound can be based on objective effects (such as hearing loss or damage to structures) or subjective judgments (community annoyance). The response of different individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day, the type of activity during which the noise occurs, and the sensitivity of the individual. Noise also may affect wildlife through disruption of nesting, foraging, migration, and other life-cycle activities (see Section 4.2, Biological Resources).

Sound is expressed in the logarithmic unit of the decibel (dB). A sound level of 0 dB approximates the threshold of human hearing and is barely audible under extremely quiet listening conditions. Normal speech has a sound level of approximately 60 dB; sound levels above 120 dB begin to be felt inside the human ear as discomfort. Sound levels between 130 to 140 dB are felt as pain (Berglund and Lindvall 1995).

All sounds have a spectral content, which means their magnitude or level varies 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 usually employ an "A-weighted" scale that de-emphasizes very low and very high frequencies to replicate the reduced human sensitivity to those frequencies. It is common to add the "A" to the measurement unit to identify that the measurement was made with this filtering process, for instance dBA. In accordance with Department of Defense (DoD) guidelines and standard practice for environmental impact analysis documents, this report uses A-weighted sound levels denoted as "dB" unless specified differently. Table 3.1-1 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Table 3.1-1. Subjective Responses to Changes in A-Weighted 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

Figure 3.1-1 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.

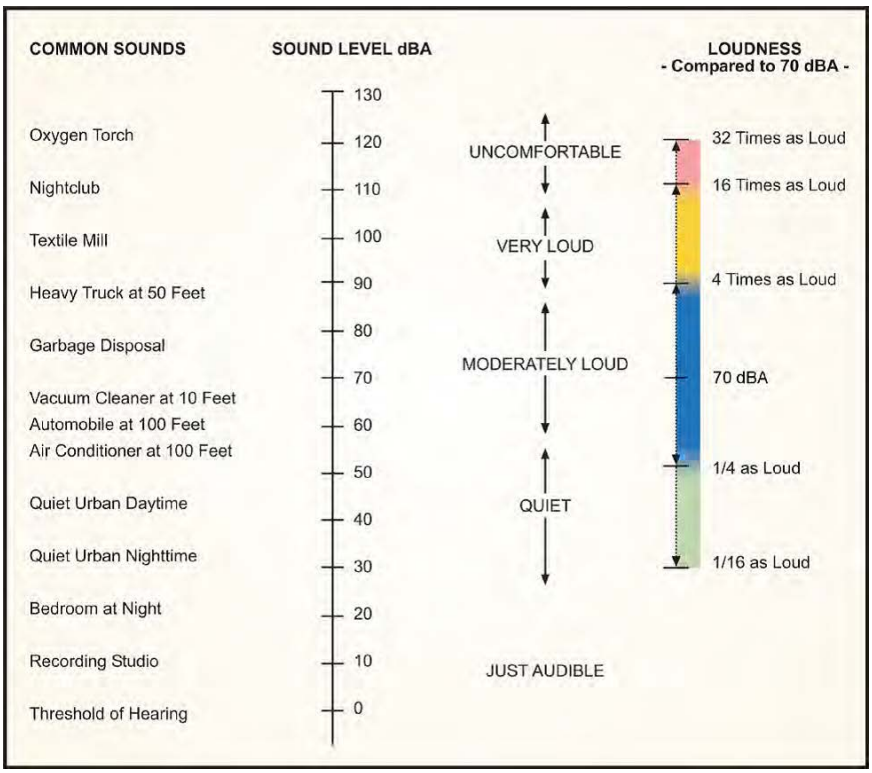

Figure 3.1-1. A-Weighted Sound Levels from Typical Sources[4]

[4] Sources: Harris (1979) and Federal Interagency Committee on Aviation Noise (1997).

3.1.1 Noise Metrics

3.1.1.1 Maximum Sound Level (L_{max}) and Sound Exposure Level (SEL)

Aircraft overflight events are considered to start when noise levels begin to increase beyond ambient or background levels. Noise levels continue to increase while the aircraft approaches reaching their maximum during or slightly after the aircraft is at the closest distance to the observer. As the distance between the aircraft and the observer increases, the noise levels reduce and the overflight event is considered to end when noise levels return to background levels. An example of the variation in sound level with time is shown by the solid line in Figure 3.1-2. The Maximum Sound Level (L_{max}) is the instantaneous maximum sound level measured/heard during the event. The L_{max} is important in judging the interference caused by a noise event with conversation, television, radio listening, sleep, or other common activities. Although it provides some measure of the intrusiveness of the event, it does not completely describe the total event, because it does not include the duration of time that the sound is heard.

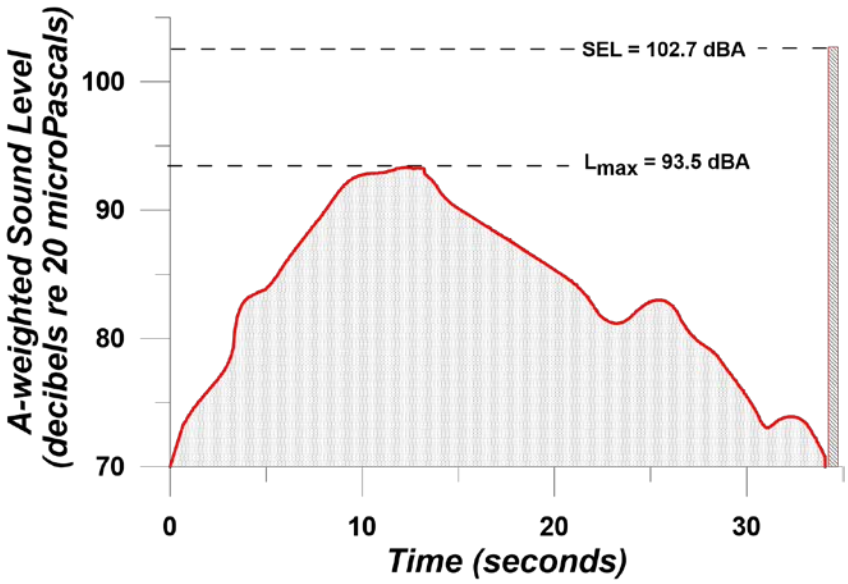

Figure 3.1-2. Example of L_{max} and SEL from an Individual Event

As a composite metric, Sound Exposure Level (SEL) represents all of the sound energy of the single event and includes both the intensity of a sound and its duration. The SEL metric is the best metric to compare noise levels from overflights of different aircraft types. For sound from military aircraft overflights near airfields, the SEL is usually 5 to 10 dB greater than the L_{max}. For example, the L_{max} of the sample event in Figure 3.1-2 is 93.5 dB whereas the SEL is 102.7 dB. However, for sound from military aircraft overflights on MTRs, the SEL is usually 3 to 5 dB greater than the L_{max}, with the difference generally lessening for decreasing altitude and increasing speed (Plotkin et al., 1987; Plotkin and Bradley, 1992).

3.1.1.2 Community Noise Equivalent Level (CNEL)

The noise measure used for assessing aircraft noise exposures in communities in the vicinity of California airfields/airports is the CNEL, in units of the dB (State of California, 1990). It is the daily or 24-hour A-weighted Equivalent Sound Level ($L_{eq(24h)}$) with sounds occurring during the evening period penalized by 5 dB and sounds occurring during the nighttime period penalized by 10 dB. $L_{eq(24h)}$ is the continuous sound level that would be present if all of the variations in sound level that occur over a 24-hour period

were smoothed out so as to contain the same total sound energy. Evening is defined as the hours between 7 p.m. to 10 p.m. (1900-2200). Nighttime is defined as the hours between 10 p.m. and 7 a.m. (2200-0700).

Like SEL, CNEL does not represent the sound level heard at any particular time, but represents the total sound energy received. While it is normalized as an average, it represents all of the sound energy, and is therefore a cumulative measure. The penalties of the CNEL metric accounts for the added intrusiveness of sounds during evening and nighttime hours when people are typically enjoying home recreation (i.e., television viewing), conversation, and sleep. The penalties also account for people's increased sensitivity to noise during those periods and for ambient sound levels 5 and 10 dB lower than during daytime hours.

Because it is an energy-based quantity, CNEL tends to be dominated by the noisier events. As a simple example, consider a case in which only one daytime aircraft overflight occurs over a 24-hour period, creating a sound level of 100 dB for 30 seconds. During the remaining 23 hours, 59 minutes and 30 seconds of the day, the ambient sound level is 50 dB. The resultant CNEL would be 66 dB. In comparison, consider a second example that 10 such 30-second overflights occur during daytime hours instead, with the same ambient sound level of 50 dB during the remaining 23 hours and 55 minutes. The resultant CNEL would be 76 dB. The energy averaging of noise over a 24-hour period does not ignore the louder single events and tends to emphasize both the sound levels and the number of those events.

Figure 3.1-3 graphically describes CNEL using notional Hourly Equivalent Sound Levels ($L_{eq(h)}$) for each hour of the day as an example. Note the $L_{eq(h)}$ for the hours between 7 p.m. and 10 p.m. have a 5 dB penalty assigned and the hours between 10 p.m. and 7 a.m. have a 10 dB penalty assigned. The CNEL for the example noise distribution shown in Figure 3.1-3 is 66 dB.

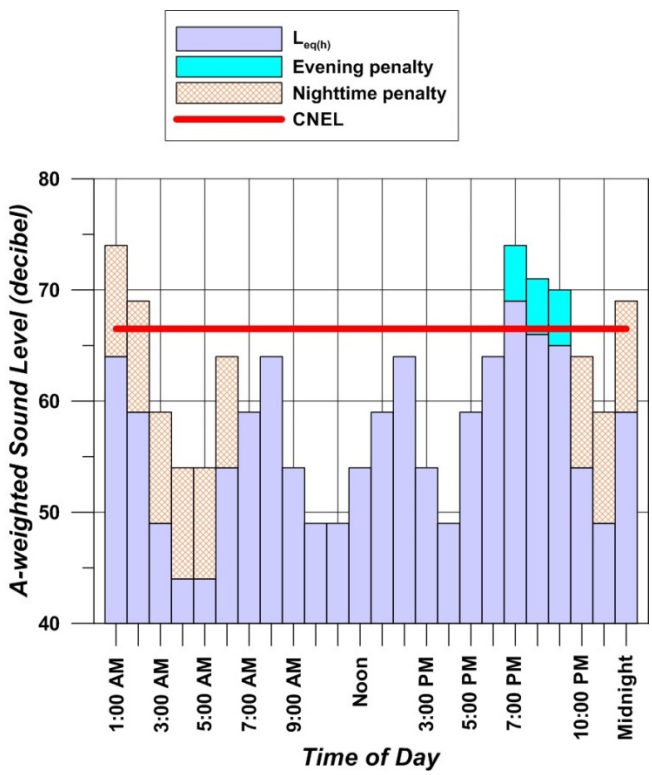

Figure 3.1-3. Example of Community Noise Equivalent Level Computed from Hourly Equivalent Sound Levels

Figure 3.1-4 shows the ranges of CNEL that occur in various types of communities. Under a flight path at a major airport, the day-night average sound level (DNL) may exceed 80 dB, while rural areas may experience DNL less than 45 dB.

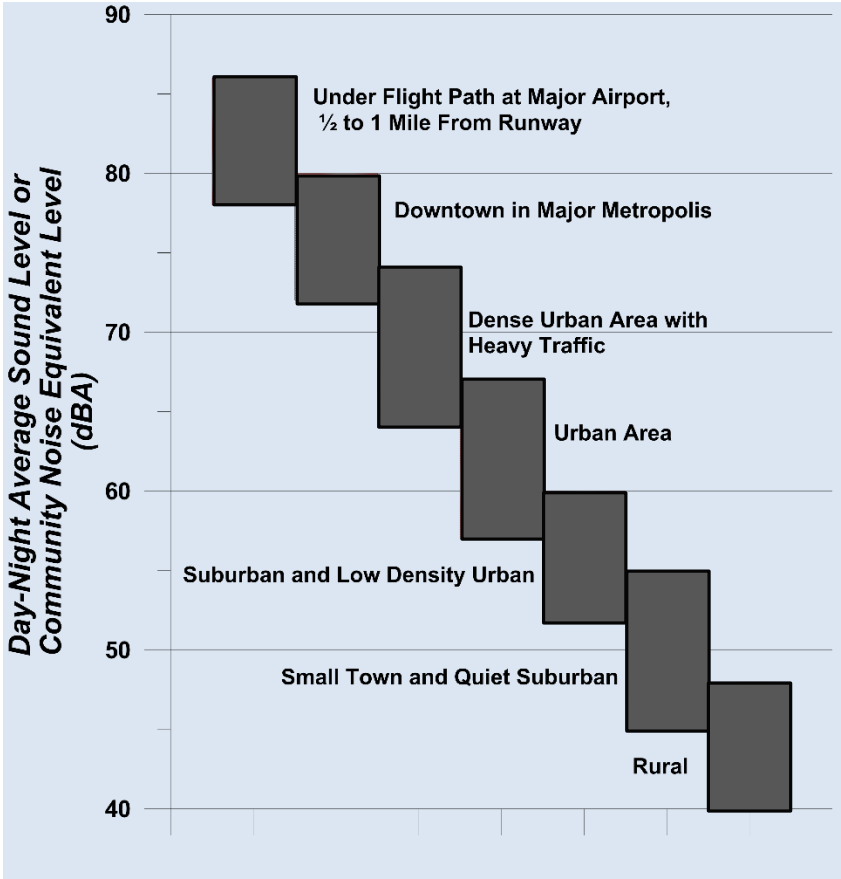

Figure 3.1-4. Typical DNL or CNEL Ranges in Various Types of Communities

3.1.1.3 Onset-Rate Adjusted Monthly Day-Night Average Sound Level (L_{dnmr}) and Onset-Rate Adjusted Monthly Community Noise Equivalent Level ($CNEL_{mr}$)

Military aircraft operating in MTRs generate a noise environment that is somewhat different from that associated with airfield operations. As opposed to patterned or continuous noise environments associated with airfields, aircraft noise events in MTRs are highly sporadic and often seasonal, ranging from several events per hour to one event every few weeks. Individual military overflight events also differ from typical community noise events in that noise from a low-altitude, high-airspeed flyover can have a rather sudden onset, exhibiting a rate of increase in sound level (onset rate) of up to 150 dB per second.

To represent these differences, the conventional SEL metric is adjusted to account for the “surprise” effect of the sudden onset of aircraft noise events on humans with an adjustment ranging up to 11 dB above the normal SEL (Stusnick and Bradley 1992). Onset rates between 15 to 150 dB per second

require an adjustment of 0 to 11 dB, while onset rates below 15 dB per second require no adjustment. The adjusted SEL is designated as the onset-rate adjusted SEL (SEL_r).

Because of the sporadic characteristic of MTR activity, noise assessments are normally conducted for the month with the most operations or sorties denoted as the busiest month. In the noise study prepared for this EA (see Appendix F), data for the busiest month of operation was not readily available so, per the DoD's Military Operating Area and Range Noise Model (MR_NMAP) software Version 2.2 guidelines, busiest month activity has been modeled as a 10 percent increase over annual average monthly operations.

The cumulative exposure to noise in these areas is computed by the DNL[5] over the busiest month, but using SEL_r instead of SEL. This monthly average is denoted L_{dnmr}. If onset rate adjusted DNL is computed over a period other than a month, it would be designated L_{dnmr} and the period must be specified. In the state of California, a variant of the L_{dnmr} includes the penalty for evening operations (7 p.m. to 10 p.m.) and is denoted $CNEL_{mr}$.

3.1.2 Noise Model

When aircraft flight tracks are not well defined and are distributed over a wide area, such as in MTRs with wide corridors, noise is often assessed using the MR_NMAP program Version 2.2 (Lucas and Calamia, 1996). MR_NMAP is a distributed flight track and area model that allows for entry of airspace information, the distribution of operations, flight profiles (average power settings, altitude distributions, and speeds), and numbers of sorties. "Distribution of operations" refers to the modeling of airspace utilization via three general representations: broadly distributed operations for modeling of military operating areas and range events, operations laterally distributed for modeling of MTR events, and operations on specific tracks for modeling of unique military operating areas, range, MTR, or target area activity. The core program, MR_NMAP, incorporates:

- the number of operations during the busiest month by time,
- specified distributions,
- volume of the airspace being modeled,
- and profiles of the aircraft.

The above information is used primarily to calculate $CNEL_{mr}$ at many points on the ground, the average $CNEL_{mr}$ for entire airspaces, or maximum $CNEL_{mr}$ under MTRs or specific tracks.

In calculating time-average sound levels for airspace, the reliability of the results varies at lower sound levels (below 55 dB $CNEL_{mr}$). Time-averaged outdoor sound levels less than 45 dB are well below any currently accepted guidelines for aircraft noise compatibility. In the noise study prepared for this EA, time-average sound levels less than 45 dB are denoted as "<45" if applicable.

3.1.3 Affected Environment

The affected environment for noise includes those areas underlying military aircraft operating in VR-289, VR-296, VR-299, VR-267, VR-268, and VR-269. To fully examine the environment, aircraft activity

[5] DNL is a composite metric similar to CNEL but has only two temporal periods: daytime (7a.m. to 10 p.m.; 0700-2200) and nighttime (10 p.m. to 7 a.m.; 2200-0700). Events during the nighttime period are penalized by 10 dB.

occurring on other MTRs in the vicinity (VR-1257, VR-1266, VR-1267, VR-1267A, and VR-1268) are also analyzed.

In terms of single-events, Table 3.1-2 presents SEL_r values at representative altitudes for the aircraft most frequently using the visual routes addressed in this study. Typically, the cumulative noise environment is dominated by the aircraft performing the majority of operations, although it could be dominated by fewer operations of louder aircraft as is the case of the F/A-18 with an SEL_r of 119 dB at 300 feet above ground level (AGL). Military flights do not currently occur on VR-289, VR-296, or VR-299, so the maximum SEL_r is generated by non-military sources (i.e., vehicular, wind, etc.) which cannot be accurately determined without noise monitoring.

Table 3.1-2. SEL_r (dBA) for Aircraft at Typical Altitudes Along Visual Routes

Aircraft Type	*Airspeed (knots)*	*Power Setting (%)*	*SEL_r (dBA)*		
			300 ft AGL	*500 ft AGL*	*1,000 ft AGL*
T-45	250	100%	N/A	111	105
F/A-18	500	90.5	119	113	109
AV-8B	300	95	115	111	104
MV-22	230	85	94	91	86
F-16 (G100 engine)	465	94	N/A	96	92
C-130E	170	970 deg C[1]	98	96	90

1. Turbine Inlet Temperature
2. N/A reflects altitudes not flown on routes analyzed in this study.
3. SEL_r computed using MR_NMAP v2.2 with weather conditions of 71 degree Fahrenheit and Relative Humidity of 29 percent.

Table 3.1-3 shows the computed greatest maximum centerline $CNEL_{mr}$ is 64 dB, which occurs on segment AB of VR-1266. Segment AB is overlapped by VR-1267 and VR-1268, which are also exposed to 64 dB $CNEL_{mr}$. Of the routes to be modified (VR-267, VR-268, and VR-269) the greatest maximum centerline $CNEL_{mr}$ of 48 dB occurs on all segments except EF of VR-268 which is less than 45 dB $CNEL_{mr}$. Figure 3.1-5 depicts the 60 dB $CNEL_{mr}$ contour, which coincides only with VR-1266. The primary contributor to the 60 dB $CNEL_{mr}$ is the F/A-18 on VR-1266. Table 3.1-3 does not include existing $CNEL_{mr}$ levels for VR- 289, VR-296, and VR-299 because no military activity exists currently. It is not practical to determine the exact $CNEL_{mr}$ levels in those areas without noise monitoring; however, existing levels are likely consistent with Figure 3.1-4 for rural/small towns which corresponds to 45 and 50 dB $CNEL_{mr}$. The routes of interest (VR-267, VR-268, VR-269, VR-289, VR-296, and VR-299) do not generate 60 dB $CNEL_{mr}$ or greater (see Appendix F).

Table 3.1-3. Maximum Centerline $CNEL_{mr}$ Under Existing Conditions

Segment	*Visual Route- (VR)*							
	267	*268*	*269*	*1266*	*1267*	*1267A*	*1257*	*1268*
A-B	48	48	48	64	64	49	55	64
B-C	48	48	48	62	58	58	<45	58
C-D	48	48	48	62	58	58	55	58
D-E	48	48	48	62	57	58	55	56
E-F	48	<45	48	62	58		55	49
F-G	48		48	63	58		55	49
G-H				63	58		46	49
H-I					58		46	49
I-J							46	49
J-K							46	49
K-L							46	58
L-M							55	58
M-N							<45	58
N-O							55	
O-P							62	
P-Q							63	
Q-R							63	

1. $CNEL_{mr}$ between 60 and 65 dB highlighted yellow representing locations exposed to the majority of noise; No $CNEL_{mr}$ above 65 dB exists.
2. See Appendix F for a depiction of route segments.

Figure 3.1-5. Baseline 60 dB $CNEL_{mr}$ Contours

3.2 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 are divided into three major categories: (1) terrestrial vegetation, (2) terrestrial wildlife, and (3) threatened, endangered, and other special-status species. Table 3.2-1 lists all federally-listed species that are potentially present within the MTRs.

3.2.1 Regulatory Setting

For the purposes of this EA, special-status species are those species listed as threatened or endangered under the Endangered Species Act (ESA), and species afforded federal protection under Migratory Bird Treaty Act (MBTA) (16 U.S.C. 668(a); 50 CFR 22).

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 federal agencies to coordinate with the U.S. Fish and Wildlife Service (USFWS) 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.

Birds, both migratory and most native-resident bird species, are protected under the MBTA, and their conservation by federal agencies is mandated by Executive Order (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 migratory birds during authorized military readiness activities. The final rule authorizing the DoD to take migratory birds in such cases includes a requirement that the Armed Forces must confer with the USFWS if the action will have a significant adverse effect on the sustainability of a population of a migratory bird species to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the Proposed Action.

Bald and golden eagles are protected by the Bald and Golden Eagle Protection Act. This act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or 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.”

3.2.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under biological resources within the California and Arizona MTRs.

3.2.2.1 Terrestrial Vegetation

Vegetation includes terrestrial plant communities and constituent plant species. The Region of Influence (ROI) in this EA for Biological Resources includes portions of southeastern California and southcentral Arizona. Four U.S. Environmental Protection Agency (USEPA) Level III ecoregions occur in this area, including Arizona/New Mexico Mountains, Madrean Archipelago, Mojave Basin and Range, and Sonoran Basin and Range (USEPA, 2015a). Vegetation underlying the affected airspace is characteristic of these

ecoregions. Vegetation communities were determined by examining data available from the United States Geological Survey (USGS) Gap Analysis Program database (USGS, 2011). The following vegetation communities occur within the four ecoregions: semi-desert, non-vascular and sparse vascular rock vegetation, shrubland and grassland, forest and woodland, aquatic vegetation, open water, agricultural, recently disturbed or modified, and developed (USGS, 2011). Refer to Figure 3.2-1 for the distribution of vegetation types across the MTRs. The following subsections describe the vegetation communities between ecoregions within the MTRs.

- **Arizona/New Mexico Mountains** – Typical types of terrain found in this ecoregion include steep foothills and mountains, as well as some deeply dissected high plateaus. Vegetation is indicative of drier, warmer environments compared to nearby mountainous ecoregions to the north. Chaparral is common on the lower elevations, pinyon-juniper and oak woodlands are found on lower and middle elevations, and the higher elevations are mostly covered with open to dense ponderosa pine forests. (USEPA, 2015a). A small amount of this ecoregion is found in the far northeastern portion of VR-267, 268, and 269.
- **Madrean Archipelago** – The region has ecological significance as both a barrier and bridge between two major cordilleras of North America, the Rocky Mountains and the Sierra Madre Occidental. Semi-desert grasslands and shrub steppe are common in basins, Madrean oak-juniper woodlands are common on mountain slopes, and ponderosa pine (*Pinus ponderosa* var. *ponderosa*) is predominant at higher elevations (USEPA, 2015a). This ecoregion extends along the national border in southeast Arizona, southwest New Mexico, and northern Sonora and encompasses the southeastern portions of VR-267, 268, and 269 in Arizona.
- **Mojave Basin and Range** – Typical terrain associated with this ecoregion includes scattered north-south trending mountains, broad basins, valleys, and old lakebeds with long alluvial fans. Typical land cover consists of sparse desert vegetation, predominantly creosote bush (*Larrea tridentata*), white bursage (*Ambrosia dumosa*), and yucca (*Yucca* sp.). On alkali flats, saltbush (*Atriplex lentiformis*), saltgrass (*Distichlis spicata*) and iodine bush (*Allenrolfea occidentalis*) are common. On mountains, big sagebrush (*Artemisia tridentata*), juniper (*Juniperus* sp.), and singleleaf pinyon (*Pinus monophylla*) occur. At high elevations, some ponderosa pine, and other pine species occur (USEPA 2015a). This ecoregion occurs in southeastern California, southern Nevada, southwest Utah, and northwest Arizona and encompasses the northern portions of VR-289, 296, and 299.
- **Sonoran Basin and Range** – Similar to the Mojave basin and range to the north, this ecoregion contains fault-block mountain ranges, scattered low mountains, alluvial fans, and alluvial valleys. Vegetation mainly consists of large areas of palo-verde (*Parkinsonia texana*) shrub and giant saguaro cactus (*Carnegiea gigantea*). Other species commonly associated with this ecoregion include creosote bush, white bur sage, ocotillo, catclaw acacia (*Acacia greggii*), desert ironwood (*Olneya tesota*), screwbean mesquite (*Prosopis pubescens*), and several species of cacti. Small areas of intensive irrigated cropland also occurs (USEPA, 2015a). This ecoregion occurs in southeastern California, southwestern Arizona, northeastern Baja California, and northwestern Sonora, and encompasses the majority of the land cover underneath V-289, 296, and 299 and VR-267, 268, and 269.

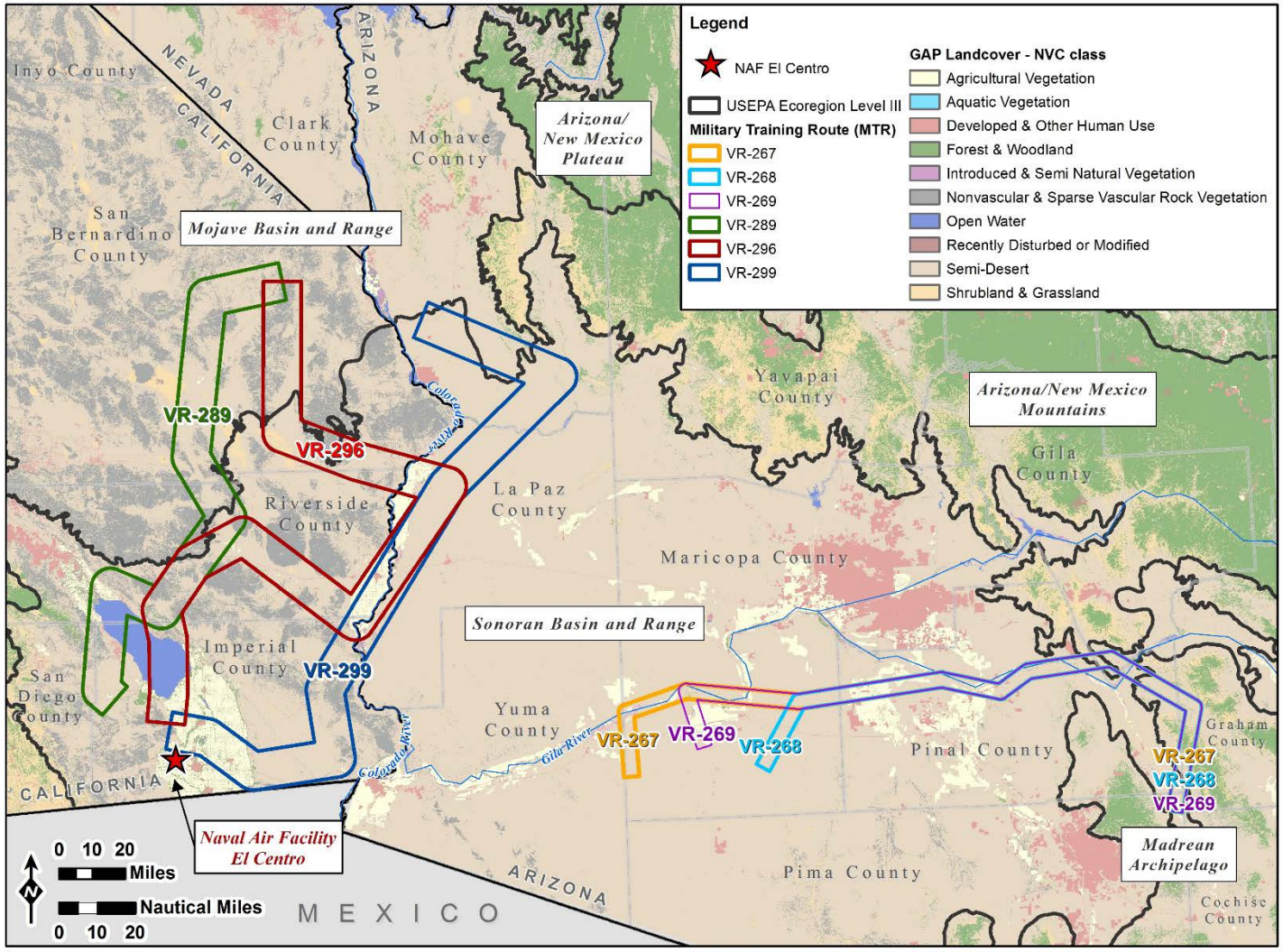

Figure 3.2-1. Vegetation Communities Underlying the California and Arizona MTRs

3.2.2.2 Terrestrial Wildlife

Wildlife includes all animal species (i.e., insects and other invertebrates, fish, amphibians, reptiles, birds, and mammals) focusing on the species and habitat features of greatest potential to be affected by the Proposed Action.

The MTRs under consideration occur over a variety of habitat types that support a broad range of wildlife species typical of the four ecoregions described above. Common wildlife associated with the ecoregions within the MTRs include:

- **Arizona/New Mexico Mountains** – Canyon wren (*Catherpes mexicanus*), Cooper's hawk (*Accipiter cooperii*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), bighorn sheep (*Ovis canadensis*), black-tailed jackrabbit (*Lepus californicus*), bobcat (*Lynx rufus*), cougar (*Puma concolor*), coyote (*Canis latrans*), kit fox (*Vulpes macrotis*), mule deer (*Odocoileus hemionus*), ringtail (*Bassariscus astutus*), and tassel-eared squirrel (*Sciurus aberti*). The northern extent of some Mexican wildlife species occurs in this region.
- **Madrean Archipelago** – Gila monster (*Heloderma suspectum*), western diamondback rattlesnake (*Crotalus atrox*), western whiptail lizard (*Aspidoscelis tigris*), acorn woodpecker (*Melanerpes formicivorus*), ash-throated flycatcher (*Myiarchus cinerascens*), canyon wren, Cooper's hawk, elf owl (*Micrathene whitneyi*), greater roadrunner (*Geococcyx californianus*), raven (*Corvus corax*), red-tailed hawk, turkey vulture, antelope jackrabbit (*Lepus alleni*), bobcat, cougar, coyote, Mexican fox squirrel (*Sciurus nayaritensis*), and mule deer.
- **Mojave Basin and Range** – Desert tortoise (*Gopherus agassizii*), rattlesnake (*Crotalus* sp.), greater roadrunner, Gambel's quail (*Callipepla gambelii*), mourning dove (*Zenaida macroura*), black-tailed jackrabbit, coyote, desert cottontail rabbit (*Sylvilagus audubonii*), desert bighorn sheep, kit fox, and pronghorn (*Antilocapra americana*).
- **Sonoran Basin and Range** – Red-spotted toad (*Anaxyrus punctatus*), desert horned lizard (*Phrynosoma platyrhinos*), desert tortoise, kingsnake (*Lampropeltis getula*), western diamondback rattlesnake, elf owl, Gambel's quail, Gila woodpecker (*Melanerpes uropygialis*), red-tailed hawk, black-tailed jackrabbit, bobcat, coyote, desert bighorn sheep, desert kangaroo rat (*Dipodomys deserti*), desert pocket mouse (*Chaetodipus penicillatus*), gray fox (*Urocyon cinereoargenteus*), javelina (*Pecari tajacu*), kit fox, ringtail, and southern mule deer.

The Proposed Action is located entirely within the Pacific Flyway, a major north-south flyway for migratory birds in America, extending from Alaska to Patagonia (Figure 3.2-2). Large numbers of birds, particularly waterfowl, fly through the region (including the affected airspace) during spring and fall migrations. Radar studies document that 95 percent of migratory movements occur below 10,000 feet AGL, although migratory birds can and do fly at altitudes exceeding 20,000 feet AGL. Migratory flight altitude varies depending on migration distance (long distance migrants fly higher to reduce drag and conserve energy), time of day (nocturnal migrants typically fly at higher altitudes), and weather (poor weather conditions can cause migrants to fly lower). Waterfowl commonly migrate at lower altitudes (near surface to several hundred feet AGL) (USGS, 2010).

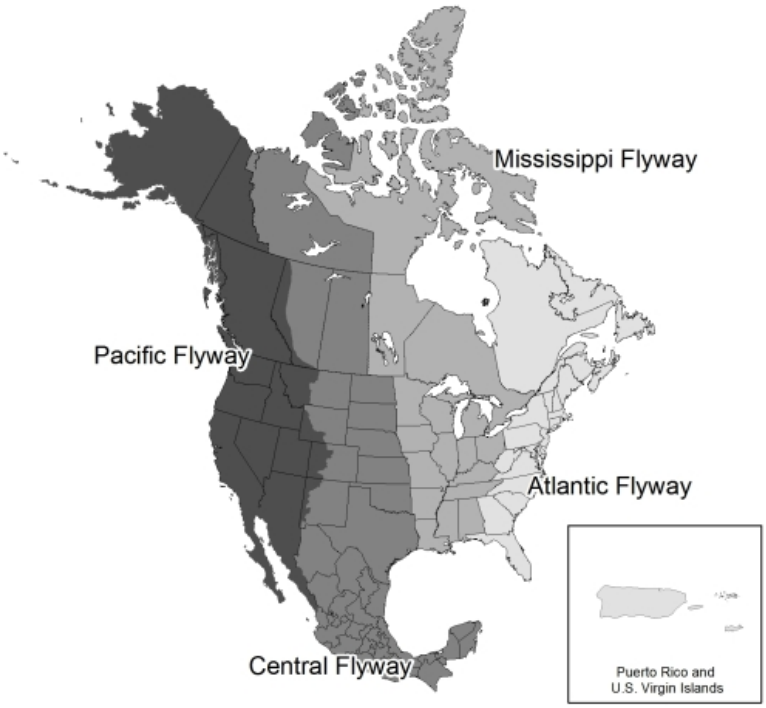

Figure 3.2-2 Map of U.S. Flyways[6]

Two wildlife refuges occur within the land underlying VR-289, VR-296, and VR-299 (see Figure 3.2-3). These refuges include the Cibola National Wildlife Refuge and Sonny Bono Salton Sea National Wildlife Refuge. The Cibola National Wildlife Refuge provides wintering grounds for migratory birds and other wildlife. Visitors can enjoy wildlife-dependent recreation, including wildlife watching and photography, hunting, fishing and environmental education programs. The Sonny Bono Salton Sea National Wildlife Refuge is located within the Pacific Flyway, and the habitats (including the Salton Sea) within it are vital to migrating birds as a resting place and wintering area. Primary objectives on this Refuge include endangered species production and maintenance, sensitive species production and maintenance, wintering waterfowl maintenance, and other migratory bird management.

No wildlife refuges occur within the land underlying VR-267, 268, and 269 in Arizona.

3.2.2.3 Threatened and Endangered Species

The ESA of 1973 and its amendments provide for the conservation of threatened and endangered species and the habitats in which they are found. As required under Section 7 of the ESA, the Navy conducts consultations for any action that may affect a federally-listed threatened or endangered species. Although protection of state-listed species is not legally mandated for federal agencies, the Navy encourages cooperation with states to protect such species, to the extent consistent with an installation's mission.

All of the MTRs under consideration overlie areas of USFWS Designated Critical Habitat (see Figure 3.2-3). Federally threatened or endangered species included in these areas of designated critical habitat

[6] Source: USFWS 2016.

include: Pierson's milkvetch (*Astragalus magdalenae* var. *piersonii*), razorback sucker (*Xyrauchen texanus*), desert tortoise (*Gopherus agassizii*), northern Mexican gartersnake (*Thamnophis eques megalops*), southwestern willow flycatcher (*Empidonax traillii extimus*), yellow-billed cuckoo (*Coccyzus americanus*), and Peninsular big-horn sheep (*Ovis canadensis nelsonii*). Table 3.2-1 lists the federally-listed species with potential to occur under the MTRs, including species with Designated Critical Habitat.

In addition to those listed in Table 3.2-1, there are approximately 58 bird species with potential to occur within the MTRs that are listed as federal birds of conservation concern by the USFWS (see Appendix E). The 1988 amendment to the Fish and Wildlife Conservation Act mandates the USFWS to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA of 1973." The overall goal of the Birds of Conservation Concern program is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent the highest conservation priorities. Bird species considered for inclusion include nongame birds, gamebirds without hunting seasons, subsistence-hunted nongame birds in Alaska; and ESA candidate, proposed endangered or threatened, and recently delisted species (USFWS, 2008).

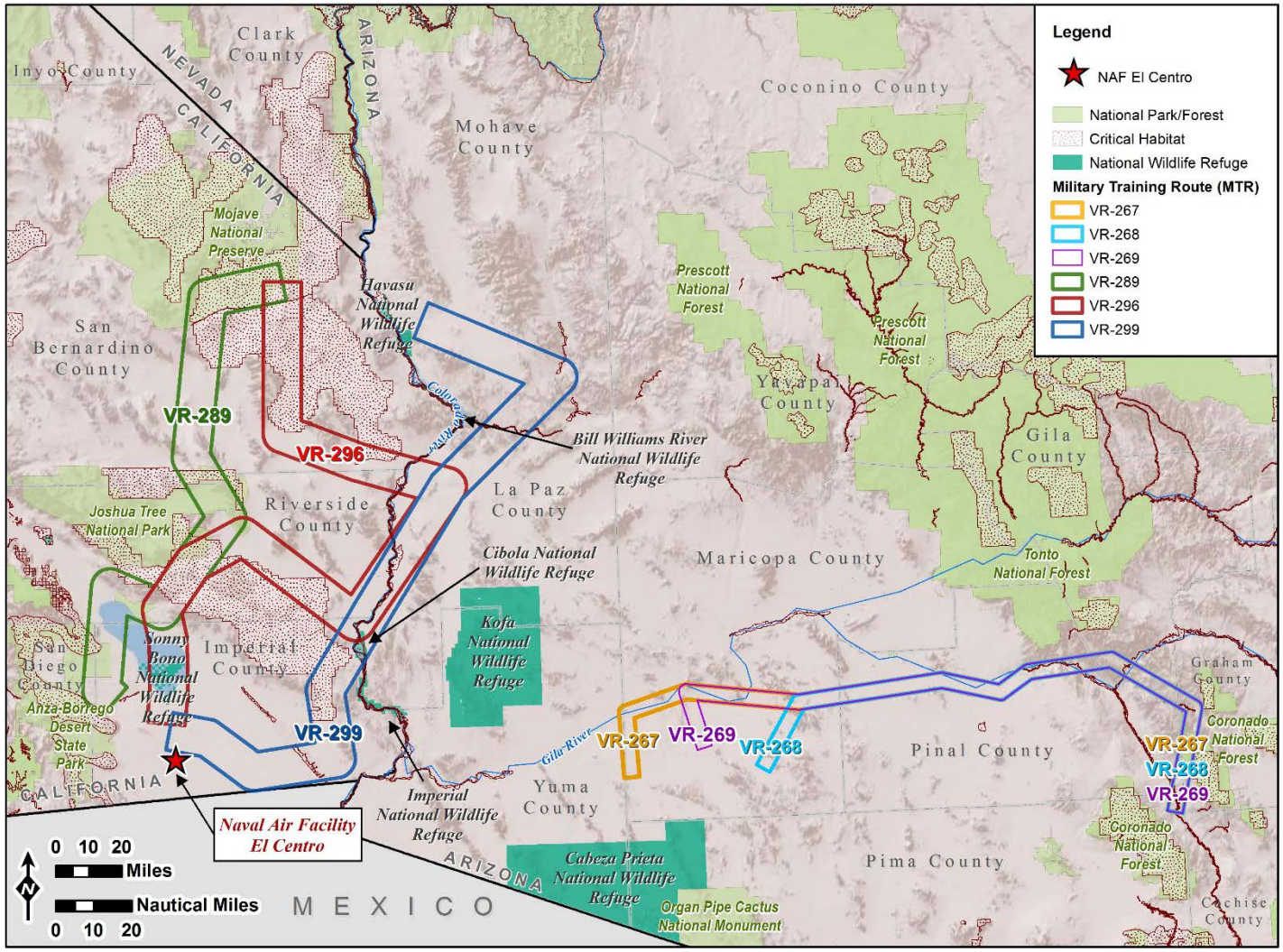

Figure 3.2-3. Critical Habitat and Wildlife Refuges underlying the California and Arizona MTRs

Table 3.2-1. Federally-Protected ESA Species within the California (CA) and Arizona (AZ) MTRs

Common Name	*Scientific Name*	*Federal Listing Status*	*State Listing Status*[1]	*Critical Habitat within MTRs (acres)*
Plants				
Acuna cactus	*Echinomastus erectocentrus var. acunensis*	Endangered	AZ – HS CA – None	None
Arizona cliff-rose	*Purshia subintegra*	Endangered	AZ – HS CA – None	None
Nichol turk's head cactus	*Echinocactus horizonthalonius var. nicholii*	Endangered	AZ – HS CA – None	None
Pierson's milkvetch	*Astragalus magdalenae var. piersonii*	Threatened	AZ – None CA – Endangered	VR-299: 7,127
Wright's marsh thistle	*Cirsium wrightii*	Candidate	AZ – None CA – None	None
Invertebrates				
Huachuca springsnail	*Pyrgulopsis thompsoni*	Candidate	AZ – 1A CA – None	None
Fishes				
Bonytail chub	*Gila elegans*	Endangered	AZ – 1A CA – Endangered	None
Desert pupfish	*Cyprinodon macularius*	Endangered	AZ – 1A CA – Endangered	None
Gila chub	*Gila intermedia*	Endangered	AZ – 1A CA - None	None
Gila topminnow	*Poeciliopsis occidentalis*	Endangered	AZ – 1A CA – None	None
Headwater chub	*Gila nigra*	Proposed Threatened	AZ – 1A CA – None	None
Loach minnow	*Tiaroga cobitis*	Endangered	AZ – 1A CA – None	None
Razorback sucker	*Xyrauchen texanus*	Endangered	AZ – 1A CA – Endangered	VR-296: 5,093 VR-299: 9,364
Roundtail chub	*Gila robusta*	Proposed Threatened	AZ – 1A CA – None	None
Spikedace	*Meda fulgida*	Endangered	AZ – 1A CA – None	None
Amphibians				
Arizona treefrog	*Hyla wrightorum*	Candidate	AZ – 1C CA – None	None
Chiricahua leopard frog	*Lithobates chiricahuensis*	Threatened	AZ – 1A CA – None	None

Common Name	*Scientific Name*	*Federal Listing Status*	*State Listing Status*[1]	*Critical Habitat within MTRs (acres)*
Relict leopard frog	*Lithobates onca*	Candidate	AZ – 1A CA – None	None
Reptiles				
Desert tortoise	*Gopherus agassizii*	Threatened	AZ – 1A CA – Threatened	VR-289: 466,970 VR-296: 579,475 VR-299: 99,909
Northern Mexican gartersnake	*Thamnophis eques megalops*	Threatened	AZ – 1A CA – None	VR-267: 1,570 VR-268: 1,570 VR-269: 1,570 VR-299: 2,801
Sonoran desert tortoise	*Gopherus morafkai*	Candidate	AZ – 1A CA – None	None
Sonoyta mud turtle	*Kinosternon sonoriense longifemorale*	Candidate	AZ – 1A CA – None	None
Birds				
California condor	*Gymnogyps californianus*	Endangered	AZ – 1A CA – Endangered	None
California least tern	*Sternula antillarum browni*	Endangered	AZ – 1A CA – Endangered	None
Least Bell's vireo	*Vireo bellii pusillus*	Endangered	AZ – None CA – Endangered	None
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	AZ – 1A CA – None	None
Southwestern willow flycatcher	*Empidonax traillii extimus*	Threatened	AZ – 1A CA – Endangered	VR-267: 5,788 VR-268: 5,788 VR-269: 5,788 VR-299: 3,788
Sprague's pipit	*Anthus spragueii*	Candidate	AZ – 1A CA – None	None
Western snowy plover	*Charadrius alexandrines nivosus*	Threatened	AZ – None CA – Species of Special Concern	None
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	AZ – 1A CA – Endangered	VR-267: 7,307 VR-268: 7,307 VR-269: 7,307 VR-296: 31,507 VR-299: 33,637
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered	AZ – 1A CA – Threatened	None
Mammals				
Jaguar	*Panthera onca*	Endangered	AZ – 1A CA – None	None

Common Name	*Scientific Name*	*Federal Listing Status*	*State Listing Status*[1]	*Critical Habitat within MTRs (acres)*
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered	AZ – 1A CA – None	None
Ocelot	*Leopardus pardalis*	Endangered	AZ – 1A CA – None	None
Peninsular bighorn sheep	*Ovis canadensis nelsonii*	Endangered	AZ – None CA – Threatened	VR-289: 12,774
Sonoran pronghorn	*Antilocapra americana sonoriensis*	Endangered	AZ – 1A CA – None	None

Sources: USFWS, 2015; Arizona Department of Agriculture, 2008; Arizona Game and Fish Department, 2012; CNDDB, 2016
HS = Highly Safeguarded: no collection allowed.
Arizona Game and Fish Department assigns vulnerability rankings for Species of Greatest Conservation Need based on the following criteria: Extirpated from Arizona, Federal or State status, Declining status, Disjunct status, Demographic status, Concentration status, Fragmentation status, Distribution status. The tiers for ranking include:

- 1A - Scored "1" for Vulnerability in at least one of the eight categories and matches at least one of the following: Federally-listed as endangered or threatened under the ESA; Candidate species under ESA; Is specifically covered under a signed conservation agreement or a signed conservation agreement with assurances; Recently removed from ESA and currently requires post-delisting monitoring; Closed season species (i.e., no take permitted) as identified in Arizona Game and Fish Commission Orders 40, 41, 42 or 43.
- 1B - Scored "1" for Vulnerability in at least one of the eight categories, but match none of the above criteria.
- 1C - Unknown status species. Scored "0" for Vulnerability in one of the eight categories, meaning there are no data with which to address one or more categories, and vulnerability status cannot be assessed. These species are those for which we are unable to assess status, and thus represent priority research and information needs. As more information becomes available, their tier status will be re-evaluated.

3.3 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.

3.3.1 Regulatory Setting

3.3.1.1 Criteria Pollutants and National Ambient Air Quality Standards

The principal pollutants defining the air quality, called "criteria pollutants," include carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, suspended particulate matter less than or equal to 10 microns in diameter (PM_{10}), fine particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), and lead (Pb). CO, SO_2, Pb, and some particulates are emitted directly into the

atmosphere from emissions sources. Ozone, NO_2, 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), the USEPA has established National Ambient Air Quality Standards (NAAQS) (40 CFR 50) for these 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. Each state has the authority to adopt standards stricter than those established under the federal program. The State of California adopted slightly stricter standards for 24-hour PM_{10}, while the State of Arizona accepts the federal standards (CARB, 2015).

Areas that are and have historically been in compliance with the NAAQS are designated as attainment areas. Areas that violate a federal air quality standard are designated as nonattainment areas. According to the severity of the pollution problem, nonattainment areas can be categorized as marginal, moderate, serious, severe, or extreme. 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.

The CAA requires states to develop a general plan to attain and maintain the NAAQS in all areas of the country and a specific plan to attain the standards for each area designated nonattainment for a NAAQS. These plans, known as State Implementation Plans, are developed by state and local air quality management agencies and submitted to USEPA for approval.

3.3.1.2 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 emissions thresholds that trigger requirements for a conformity analysis are called *de minimis* levels. *De minimis* levels (in tons per year [tpy]) vary by pollutant and also depend on the severity of the nonattainment status for the air quality management area in question.

A conformity applicability analysis is the first step of a conformity evaluation and assesses if a federal action must be supported by a conformity determination. This is typically done by quantifying applicable direct and indirect emissions that are projected to result due to implementation of the federal action. Indirect emissions are those emissions caused by the federal action and originating in the region of interest, but which can occur at a later time or in a different location from the action itself and are reasonably foreseeable. The federal agency can control and will maintain control over the indirect action due to a continuing program responsibility of the federal agency. Reasonably foreseeable emissions are projected future direct and indirect emissions that are identified at the time the conformity evaluation is performed. The location of such emissions is known and the emissions are quantifiable, as described and documented by the federal agency based on its own information and after reviewing any information presented to the federal agency. If the results of the applicability analysis indicate that the total emissions would not exceed the *de minimis* emissions thresholds, then the conformity evaluation process is completed. *De minimis* threshold emissions are presented in Table 3.3-1.

Table 3.3-1. General Conformity *De Minimis* Levels

Pollutant	*Area Type*	*De Minimis Threshold (tpy)*
Ozone (VOC or NO_x)	Serious nonattainment	50
	Severe nonattainment	25
	Extreme nonattainment	10
	Other areas outside an ozone transport region	100
Ozone (NO_x)	Marginal and moderate nonattainment inside an ozone transport region	100
	Maintenance	100
Ozone (VOC)	Marginal and moderate nonattainment inside an ozone transport region	50
	Maintenance within an ozone transport region	50
	Maintenance outside an ozone transport region	100
Carbon monoxide, SO_2 and NO_2	All nonattainment & maintenance	100
PM-10	Serious nonattainment	70
	Moderate nonattainment and maintenance	100
$PM_{2.5}$ Direct emissions, SO_2, NO_x (unless determined not to be a significant precursor), VOC or ammonia (if determined to be significant precursors)	All nonattainment & maintenance	100
Lead (Pb)	All nonattainment & maintenance	25

tpy = tons per year

3.3.1.3 Climate and 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 predicted to produce negative economic and social consequences across the globe.

Revised draft guidance from CEQ, dated December 18, 2014, recommends that agencies consider both the potential effects of a proposed action on climate change, as indicated by its estimated GHG emissions, and the implications of climate change for the environmental effects of a proposed action. The guidance also emphasizes that agency analyses should be commensurate with projected GHG emissions and climate impacts, and should employ appropriate quantitative or qualitative analytical methods to ensure useful information is available to inform the public and the decision-making process in distinguishing between alternatives and mitigations. It recommends that agencies consider 25,000 metric tons of carbon dioxide equivalent (CO_2e) emissions on an annual basis as a reference point below which a quantitative analysis of GHG is not recommended unless it is easily accomplished based on available tools and data.

The USEPA issued the Final *Mandatory Reporting of Greenhouse Gases Rule* on September 22, 2009. GHGs covered under the Final *Mandatory Reporting of Greenhouse Gases Rule* are carbon dioxide (CO_2), methane, nitrogen oxide (NO_x), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and other fluorinated gases, including nitrogen trifluoride and hydrofluorinated ethers. Each GHG is assigned a global warming potential. The global warming potential is the ability of a gas or aerosol to trap heat in the atmosphere. The global warming potential rating system is standardized to CO_2, which has a value of one. The equivalent CO_2 rate 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. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of mobile sources and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions as CO_2e are required to submit annual reports to USEPA.

In an effort to reduce energy consumption, reduce GHGs, reduce dependence on petroleum, and increase the use of renewable energy resources, the Navy has implemented a number of renewable energy projects. The Navy has established Fiscal Year 2020 GHG emissions reduction targets of 34 percent from a Fiscal Year 2008 baseline for direct GHG emissions and 13.5 percent for indirect emissions. Examples of Navy-wide GHG reduction projects include energy efficient construction, thermal and photovoltaic solar systems, geothermal power plants, and the generation of electricity with wind energy. The Navy continues to promote and install new renewable energy projects.

3.3.2 Affected Environment

3.3.2.1 Criteria Pollutants and National Ambient Air Quality Standards

The MTRs associated with the Proposed Action are within 12 counties throughout southeast Arizona and southwest California. Table 3.3-2 outlines the air quality control region, the attainment status, and the *de minimis* threshold under the General Conformity Rule for the counties in which the Proposed Action would take place. Because several of the counties are nonattainment or maintenance areas for the O_3, $PM_{2.5}$, or the PM_{10} NAAQS, a general conformity evaluation is required.

The most recent (2011) emissions inventory for the counties in which the Proposed Action would take place is shown in Table 3.3-3. VOC and NO_x emissions are used to represent ozone generation because they are precursors of ozone.

3.3.2.2 Permitting

New major stationary sources and major modifications at existing major stationary sources are required by the CAA to obtain an air pollution permit before commencing construction. A proposed project may have to meet the requirements of nonattainment new source review for the pollutants for which the area is designated as nonattainment and Prevention of Significant Deterioration (PSD) for the pollutants for which the area is in attainment. PSD permitting may also apply to a new major stationary source that is constructed within 6.2 miles of a Class I area. Generally, Class I areas are the most pristine, and any substantial emission sources in or near them have strict limits set by regulatory agencies. The USEPA provides rigorous safeguards to prevent deterioration of air quality in Class I areas as specified in 40 CFR 81.421(e). The PSD program designates USEPA Mandatory Class I areas as all international parks, all national wilderness areas, and national memorial parks that exceed 5,000 acres, and all national parks that exceed 6,000 acres in existence on August 7, 1977. Table 3.3-4 contains a list of all the Class I areas within 100 miles of the MTRs under consideration.

Table 3.3-2. Attainment Status and the *De Minimis* Thresholds for Affected Counties

County	*MTRs*	*Air Quality Control Region*	*Attainment Status*	*De Minimis Thresholds (tpy)*
California				
Imperial	VR-296, VR-299	Southeast Desert Intrastate Air Quality Control Region (AQCR)	Moderate nonattainment $PM_{2.5}$ Moderate nonattainment PM_{10} Maintenance for 8-Hour O_3	100 tpy for $PM_{2.5}$, SO_2, NO_x, PM_{10}, and VOC
Riverside	VR-296, VR-299		Serious nonattainment for PM_{10} Severe nonattainment for 8-Hour O_3	70 tpy for PM_{10} 25 tpy for NO_x and VOC
San Bernardino	VR-289		Moderate nonattainment for PM_{10} Severe nonattainment for 8-Hour O_3	100 tpy for PM_{10} 25 tpy for NO_x and VOC
San Diego	VR-289	San Diego Intrastate AQCR	Marginal nonattainment for 8-Hour O_3	100 NO_x and VOC
Arizona				
Pinal	VR-267, VR-268, VR-269	Central Arizona Intrastate AQCR	Moderate nonattainment $PM_{2.5}$ Moderate nonattainment PM_{10} Maintenance for 8-Hour O_3	100 tpy for $PM_{2.5}$, SO_2, NO_x, PM_{10}, and VOC
Yuma	VR-267	Mohave-Yuma Intrastate AQCR	Moderate nonattainment PM_{10}	100 tpy for PM_{10}
Maricopa	VR-267, VR-268, VR-269	Maricopa Intrastate AQCR	Maintenance 8-Hour O_3	100 tpy for NO_x and VOC
Gila	VR-267, VR-268, VR-269	Central Arizona Intrastate AQCR	Attainment/Unclassifiable	None
Graham	VR-267, VR-268, VR-269	Southeast Arizona Intrastate AQCR		
La Paz	VR-296, VR-299	Mohave-Yuma Intrastate AQCR		
Mohave	VR-296, VR-299			
Pima	VR-267, VR-268, VR-269	Pima Intrastate AQCR		

Source: U.S. Environmental Protection Agency 2016a; 40 CFR 81 2016.
CO = carbon monoxide, NO_x = oxides of nitrogen, $PM_{2.5}$ = particulate matter, less than 2.5 microns in diameter PM_{10} = particulate matter less than 10 microns in diameter, SO_x = oxides of sulfur, tpy = tons per year, VOC = Volatile Organic Compound, *de minimis* = of minimal importance

Table 3.3-3. Air Emissions Inventory by County (2011)

	Emissions (tpy)					
Location	***NO_x***	***VOC***	***CO***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***
California						
Imperial	11,519	99,233	57,695	144	27,835	4,562
Riverside	36,093	26,796	122,705	378	18,014	5,556
San Bernardino	67,611	35,285	182,888	1,930	28,577	10,615
San Diego	41,919	60,020	259,686	1,095	31,396	4,639
Arizona						
Gila	2,620	10,854	15,332	32,136	16,553	4,919
Graham	1,324	5,750	24,319	189	26,942	5,023
La Paz	5,010	2,651	14,055	43	4,384	1,005
Maricopa	86,732	80,315	453,298	1,467	37,487	11,352
Mohave	14,680	12,021	58,614	134	12,761	2,568
Pima	155,372	27,348	26,235	2,505	44,723	8,360
Pinal	13,640	11,105	59,362	173	37,665	6,452
Yuma	7,217	7,143	35,614	86	9,223	1,733

Source: U.S. Environmental Protection Agency 2016b.
tpy = tons per year.

Table 3.3-4. USEPA Designated Class I Areas

Area Name	***Acreage***	***Distance (Miles)***
Joshua Tree Wilderness Area	429,690	0
Galiuro Wilderness Area	52,717	8
Saguaro Wilderness Area	71,400	39
Sierra Ancha Wilderness Area	20,850	78
Superstition Wilderness Area	124,117	52

Source: U.S. Environmental Protection Agency 2016c.

3.4 Airspace

This discussion of airspace includes current uses and controls of the airspace. The Federal Aviation Administration (FAA) manages all airspace within the United States and the U.S. territories. Airspace, which is defined in vertical and horizontal dimensions and also by time, is considered to be a finite resource that must be managed for the benefit of all aviation sectors, including commercial, general, and military aviation.

3.4.1 Regulatory Setting

Under Title 49, U.S.C. 40103, Sovereignty and Use of Airspace and Public Law 103-272, the U.S. government has exclusive sovereignty over the nation's airspace. Specific aviation and airspace management procedures and policies to be used by the Navy are provided by Office of the Chief of Naval Operations Instruction 3710.7, *Naval Aviation Training and Operating Procedure Standardization*. Other applicable regulations regarding special use airspace management include FAA Order 7490, *"Policies and Procedures for Air Traffic Environmental Actions;"* FAA Order 7610.4H, *"Special Military Operations;"* and the *Memorandum of Understanding Between the Federal Aviation Administration and*

the Department of the Defense Concerning Special Use Airspace Environmental Actions (January 26, 1998).

Similar to the highway system and traffic laws, Federal Aviation Regulations (FAR) rules govern the national airspace system, and the FAA establishes how aircraft must operate in the National Airspace with the objective to make it as safe, effective, and compatible as possible for all users.

FARs serve to safely separate Visual Flight Rule (VFR) and Instrument Flight Rule (IFR) flights from each other either laterally or vertically. All pilots are responsible to see-and-avoid other aircraft and must carefully study aeronautical charts applicable to their intended flights. Under VFR rules pilots must be able to see the ground (i.e., navigate and fly visually using rivers, roads, cities, etc.). Therefore, they are not allowed to fly in weather conditions. VFR pilots typically operate in uncontrolled airspace below 18,000 feet AMSL and are not required to communicate with air traffic controllers. Above 18,000 feet AMSL, IFR rules apply. Regardless of altitude IFR pilots are under control by air traffic controllers at all times. IFR pilots are required to be in constant contact with air traffic control and are allowed to fly in weather conditions because of required navigational instrumentation. Most commercial aircraft fly within the IFR structure, well above the altitudes used by military aircraft in MTRs. All commercial and military pilots are IFR certified.

Pilots operate in a variety of airspace under specific rules and procedures defined by the FAA. For the Proposed Action, MTRs are analyzed. There are two types of MTRs (Instrument Routes and Visual Routes [VR]). MTRs are basically three-dimensional “roads” in the sky, or flight corridors for low-altitude navigation and training. Low-altitude navigation training is important because aircrews may be required to fly at low altitudes for several miles to avoid detection in combat conditions. MTRs allow military aircraft to conduct low-altitude navigation training at airspeeds in excess of 250 Knots Indicated Airspeed (approximately 285 miles per hour). The FAA requires publication of MTR hours of operation so that all pilots, both military and civilian, are aware of their potential activation periods.

Each military organization responsible for a MTR develops a daily schedule and submits it to the FAA for deconfliction. Although the FAA designates MTRs for military use, other pilots may transit the airspace whenever it’s inactive.

MTRs are designed based on guidance from FAA Advisory Circular AC 91-36D, VFR Flight Near Noise Sensitive Areas, instructs, “pilots operating noise producing aircraft… over noise-sensitive areas should make every effort to fly not less than 2,000 feet AGL, weather permitting (FAA 2004). MTR design also incorporates FAR 91.119, “[Avoid]… congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft, [or fly above]… an altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.” Military organizations may establish additional avoidance restrictions under MTRs.

3.4.2 Affected Environment

The affected environment for airspace management includes the centerline, lateral, and vertical confines of the VR-289, VR-296, VR-299, VR-267, VR-268, and VR-269.

3.4.2.1 Military Aircraft Operations

Prior to decommissioning in 2013, VR-289, VR-296, and VR-299 were managed by the 452nd Operations Support Squadron operating out of March Air Reserve Base, California. Chief of Naval Air Training (CNATRA) currently owns and manages VR-267, VR-268, and VR-269, operating out of Naval Air Station Kingsville, Texas.

Data used for this analysis were obtained from the DoD Flight Information Program (FLIP) AP/1B (2008/2015). The Special Operating Procedures (SOPs) section of the DoD FLIP provides notification, operational procedures, and avoidance criteria for noise-sensitive receptors, airfields, environmentally sensitive areas, flight safety considerations, obstructions, and other areas of concern within the VRs. Examples include notices of intersections or coincidences with other VRs or Instrument Routes, military operations areas, or proximity to other special use airspace; proximity to local airports; presence of high fixed wing or helicopter traffic; locations of residential areas; presence of forest fires; and presence of parachute operations. These SOPs change periodically as needed but the core route configuration (points, segments, altitudes, and widths) remains constant (see Appendix D).

Five additional MTRs (VR-1257, VR-1266, VR-1267, VR-1267A, and VR-1268) either overlap or are within proximity to the MTRs described above such that they may contribute to the overall noise environment of the primary MTRs under consideration within this EA. Table 2-1 shows the number of annual sorties for each route which were estimated through an analysis of flight records from January 2014 to December 2015 provided by NAF El Centro as documented in the noise study prepared for this EA (see Appendix F). The most frequent aircraft are the T-45, MV-22, and F/A-18. VR-267, VR-268, and VR-269 contain 14, 14, and 114 annual sorties, respectively. The maximum number of annual sorties occurs on VR-1266 estimated at 1,281 (see Table 2-1).

3.4.2.2 Civilian Aircraft Operations

Given the vast expanses of land and the importance of ranching and farming, there is a long tradition of civil aviation as well. Today, civil aviation activities in the affected environment include weather modification (cloud seeding), pest (e.g., boll weevils) eradication, crop spraying, range distribution and water assessments for livestock, emergency medical flights, pipeline surveillance, predator (e.g., coyotes) control, wildlife management, drug interdiction, and pleasure flights. Neither the FAA nor state aviation agencies maintain comprehensive records on visual flight rules traffic for civil aviation. Jet routes and federal airways also transit the study area, and thousands of commercial flights use them every year but at high altitudes, typically greater than 10,000 feet. The highest ceiling of the six MTRs addressed in this EA is 6,000 feet AMSL.

Numerous federal airways, jet routes, and civil aviation airports exist within the affected environment. Ranchers, crop dusters, and other local VFR pilots may operate at lower altitudes equivalent to those of MTRs. FAA charts, publications, and procedures provide the means for VFR pilots to plan for and safely transit an MTR. Air traffic control procedures, charting of MTRs for pilot awareness, pilot compliance with FAA flight procedures, and required “see-and-avoid” techniques collectively make MTR use compatible with civil aviation activities.

Airfields ranging from regional county airports to small airstrips on ranches are located within the affected environment. By design, MTRs have little effect on such airports and airfields since they avoid busier airports altogether or employ specific avoidance procedures for smaller airfields. For the affected

environment, in southeastern California and southwestern Arizona, several small airports and airstrips lie near the MTR airspace.

3.5 Land Use

This discussion of land use includes current and planned uses and the regulations, policies, or zoning that may control the proposed land use. The term land use refers to real property classifications that indicate either natural conditions or the types of human activity occurring on a parcel. Two main objectives of land use planning are to ensure orderly growth and compatible uses among adjacent property parcels or areas. However, there is no nationally recognized convention or uniform terminology for describing land use categories. As a result, the meanings of various land use descriptions, labels, and definitions vary among jurisdictions. Natural conditions of property can be described or categorized as unimproved, undeveloped, conservation or preservation area, and natural or scenic area. There is a wide variety of land use categories resulting from human activity. Descriptive terms often used include residential, commercial, industrial, agricultural, institutional, and recreational.

The discussion of land use also includes visual resources, which include the natural and built features of the landscape visible from public views that contribute to an area's visual quality. Visual perception is an important component of environmental quality that can be impacted through changes created by various projects. Visual impacts occur as a result of the relationship between people and the physical environment. Public concern over adverse visual impacts can be a major source of project opposition.

3.5.1 Regulatory Setting

Several land use planning laws affect land management agency administration of the land within the affected environment. These laws include the Wilderness Act, the Federal Land Policy and Management Act (FLPMA), the California Desert Protection Act, the Arizona Desert Wilderness Act, and the National Wildlife Refuge System Administration Act.

The Wilderness Act (16 U.S.C. 1131 et seq.), enacted in 1964, established a National Wilderness Preservation System composed of federally-owned areas to be administered for the use and enjoyment of the American people. Wilderness areas are federal lands that have been designated by Congress as part of the National Wilderness Preservation System. Land use in wilderness areas is undeveloped open space and primitive recreational uses. In accordance with the directives of the Wilderness Act, the lands are to be left in their natural condition.

FLPMA, enacted in 1976 (43 U.S.C. 1701 et seq.), established Congressional policy relating to the use and management of public lands, which have influenced the management of Bureau of Land Management (BLM)-administered lands in California and Arizona. The FLPMA also designated approximately 25 million acres of California desert, including portions of Riverside and San Diego counties and all of San Bernardino and Imperial counties as the California Desert Conservation Area.

Another result of the implementation of FLPMA was the definition of the concept of Areas of Critical Environmental Concern (ACECs). These ACECs are designated as areas within BLM lands where special management attention is required in order to protect their unusual or unique natural or cultural values. ACEC designations highlight areas where special management attention is needed to protect and prevent irreparable damage to important historic, cultural and scenic values, fish and wildlife resources, or other natural systems and processes.

The California Desert Protection Act, enacted in 1994, significantly changed the status of over 7 million acres in the California deserts. Sixty-nine wilderness areas were created on public lands managed by the

BLM and the Joshua Tree National Monument was enlarged. Language in the Act states that nothing in the Act shall restrict or preclude the establishment or continuation of low-level military overflights, including those on existing flight training routes, over the lands designated in the Act. The language further clarifies that nothing in the Act shall be construed as requiring revision of existing policies or procedures applicable to the designation of units of special airspace or the establishment of flight training routes over any federal lands affected by the Act.

The Arizona Desert Wilderness Act of 1990 designated 39 wilderness areas on BLM lands and 4 wilderness areas on USFWS wildlife refuges, amounting to over 1.1 million acres of new wilderness areas. Similar to the California Desert Protection Act, language is provided within the Arizona Desert Wilderness Act that states that nothing in the Act shall restrict or preclude continuation of low-level military overflights (including those on existing flight training routes), the designation of new units of special airspace, or the use or establishment of military flight training routes over the lands designated in the Act.

The National Wildlife Refuge System Administration Act of 1966 establishes management guidelines and public uses for the National Wildlife Refuge System. This Act allows for authorized or permitted uses of national wildlife refuges by other federal agencies, including those necessary to facilitate military preparedness, consistent with existing laws and interagency agreements.

Local general or comprehensive plans, and the zoning regulations established to implement them, determine the type and extent of land uses allowable in specific areas, and are often intended to protect specially designated or environmentally sensitive areas. Management plans generally have been prepared for federal lands that are exempt from state and local planning requirements. Federal management plans establish sustainable management principles and practices, and address environmental stewardship.

3.5.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under land use resources within the California and Arizona MTRs.

The ROI considered in this EA for land use includes the 12 counties underlying the MTRs under consideration (see Figure 2-2). The California and Arizona MTRs overlay an area comprising approximately 7,922 square miles (5.07 million acres) in southeastern California and southwestern Arizona. Given the area covered, land use is varied across each MTR. Land use beneath and nearby the flight paths includes military installations; land preservation through national parks, forests, and wilderness areas; recreation, grazing, mining, range land, timber production, and preservation on BLM-managed lands; Native American reservations; recreation; and community and private developments, including residences. In some cases, the land is modified to meet economic or residential needs, while in other cases, land is preserved to protect natural resources or provide recreational pursuits. Because of the environmentally sensitive nature, some special land uses, such as wilderness areas, are afforded greater protection. Land use densities vary from developed to sparsely populated areas.

Table 3.5-1 provides a distribution of land ownership underlying the California and Arizona MTRs. Refer to the discussion following the table and Figure 3.5-1 for a general depiction of land use features.

Table 3.5-1. Land Ownership within the California and Arizona MTRs

MTR	*Federal Lands[1] (%)*	*State Lands (%)*	*Tribal Lands (%)*	*DoD Lands (%)*	*Local Gov.[2] (%)*	*Private Lands (%)*
California MTRs						
VR-289	70	8	2	2	2	16
VR-296	63	3	11	2	3	17
VR-299	63	8	8	1	0	20
Arizona MTRs						
VR-267	40	20	17	3	0	20
VR-268	36	20	22	3	0	19
VR-269	37	21	19	1	0	22

1. For purposes of this table, federal lands include BLM land, national forests, national monuments, wildlife refuges, and national parks, but exclude DoD and military training lands.
2. Local Government includes county lands and those classified as "other."

California MTRs

VR-289 – Land within VR-289 is predominantly federally owned and undeveloped with a combination of BLM, Bureau of Reclamation, DoD, National Park Service, and U.S. Forest Service (USFS) lands. The Mojave National Preserve, Joshua Tree National Park, Anza Borrego Desert State Park, and Salton Sea State Recreation Area occur within this MTR and provide hiking, camping, wildlife viewing, boating, fishing, and other recreational activities to visitors. There are no grazing allotments within VR-289. Wilderness areas flown over by this route include Cadiz Dunes, Chuckwalla Mountains, Clipper Mountain, Fish Creek, Joshua Tree, Mecca Hills, Mojave, Orocopia, Santa Rosa, Sheephole Valley, and Trilobite Wilderness Areas. Tribal lands include the Cabazon and Torres-Martinez Reservations. The populated communities of Salton City, Desert Shores, Oasis, Mecca, North Shore, and Desert Center, and portions of the Salton Sea also occur under this MTR.

VR-296 – Land within VR-296 is predominantly federally owned and undeveloped with a combination of BLM, Bureau of Reclamation, DoD, National Park Service, and USFWS land. Portions of Joshua Tree National Park and Mojave National Preserve also occur within this MTR. There are seven livestock grazing allotments[7] mainly within BLM lands. Wilderness areas flown over by this route include Big Maria Mountains, Chuckwalla Mountains, Joshua Tree, Little Chuckwalla Mountains, Old Woman Mountains, Orocopia Mountains, Palen/McCoy, Palo Verde Mountains, Piute Mountains, Riverside Mountains, and Turtle Mountains Wilderness Areas. Tribal land includes the Colorado River Reservation. The Salton Sea State Recreation Area, 38th Street County Park, and Peter McIntyre County Park provide outdoor recreation activities to the public. The populated communities of Westmorland, Bombay Beach, Desert Center, Cibola, Palo Verde, Ripley, Blythe, Ehrenberg, Poston, Parker, and Big River are within VR-296. Portions of the Salton Sea and Colorado River also occur under VR-296.

VR-299 – Land within VR-299 is predominantly federally owned and undeveloped with a combination of BLM, Bureau of Reclamation, DoD, and USFWS land. NAF El Centro employs an agricultural out-lease program, including areas at the periphery of NAF El Centro (off-installation), that serve to control dust

[7] A grazing allotment is defined by the BLM as an area where one or more livestock operators graze their livestock. An allotment generally consists of federal land but may include parcels of private or state-owned land.

and weeds around the installation (Navy 2000). Grazing of livestock is not permitted within the out-lease areas; however, there are 20 livestock grazing allotments in other areas of the MTR, mainly on BLM land. Cibola and Sonny Bono National Wildlife Refuges provide hiking, wildlife viewing, boating, fishing, and hunting opportunities to visitors. Wilderness areas flown over by this route include Arrastra Mountain, Aubrey Peak, Big Maria Mountains, East Cactus Plain, Gibraltar Mountain, Indian Pass, Palo Verde Mountains, Picacho Peak, Swansea, and Warm Springs Wilderness Areas. Tribal lands include the Colorado River and Fort Yuma-Quechan Reservations. 38th Street County Park and Peter McIntyre County Park provide outdoor recreation activities to the public. The populated communities of El Centro, Brawley, Holtville, Cibola, Palo Verde, Ripley, Blythe, Ehrenberg, and Parker are within VR-299. Portions of the Salton Sea and Colorado River also occur under VR-299.

Arizona MTRs

VR-267 – Land within VR-267 is predominantly federally owned and undeveloped with a combination of BLM, Bureau of Reclamation, DoD, NPS, and USFS land. There are 43 livestock grazing allotments mainly within the BLM land. Recreational areas include the Sonoran Desert and Casa Grande Ruins National Monuments, which provide hiking and picnic areas for the public. Coronado National Forest contains eight designated wilderness areas, and provides hiking, horseback riding, camping, hunting, and fishing opportunities to the public. Hang gliding is common near Oatman Mountain. Wilderness areas include Aravaipa Canyon, Needles Eye, North Maricopa Mountains, South Maricopa Mountains, and Woolsey Peak Wilderness Areas. Tribal lands include the Ak-Chin, Gila Bend, Gila River, San Carlos, and Tohono Reservations. McFarland State Historic Park is located in downtown Florence, Arizona and consists of a preserved courthouse and other buildings dating to the Arizona Territory period. The populated communities of Gila Bend, Goodyear, Ak-Chin Village, Sacaton, Blackwater, Valley Farms, Florence, Cactus Forest, and Dripping Springs are within VR-267. Portions of the Gila River also occur under VR-267.

VR-268 – Because the majority of VRs- 267, 268, and 269 overlie each other, land use within VR-268 is the same as VR-267 except that there are only 29 livestock grazing allotments, the route does not fly over North or South Maricopa Wilderness Areas, and the Gila Bend Reservation and community of Gila Bend are not within VR-268.

VR-269 – Because the majority of VRs- 267, 268, and 269 overlie each other, land use within VR-269 is the same as VR-267 except that there are 35 livestock grazing allotments mainly within the BLM lands.

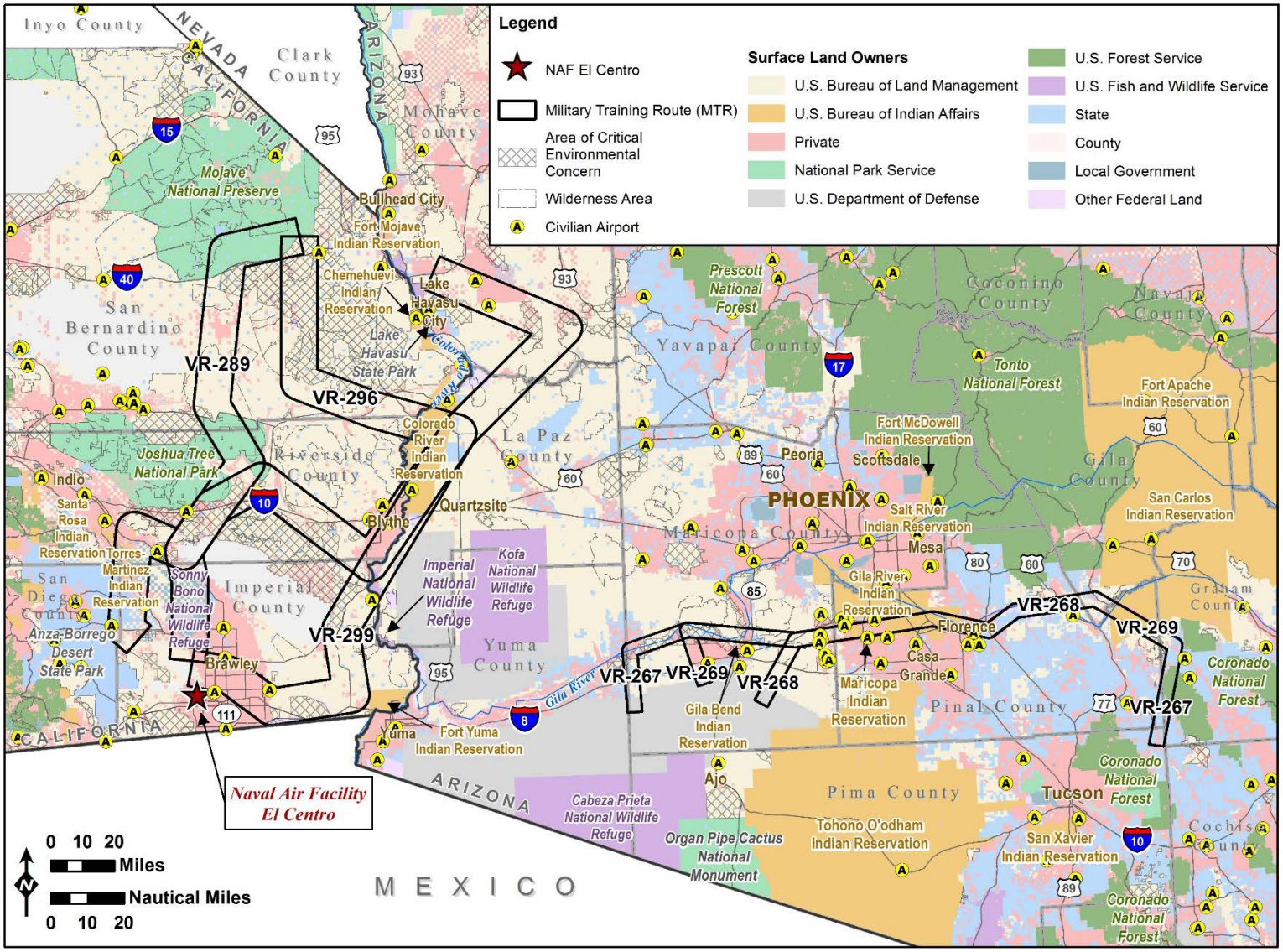

Figure 3.5-1. Land Use Underlying the California and Arizona MTRs

3.6 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. Cultural resources can be divided into three major categories:

- Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left deposits of physical remains.
- Architectural resources include standing buildings, structures, landscapes, and other built-environment resources of historic or aesthetic significance.
- Traditional cultural properties may include archaeological resources, structures, neighborhoods, prominent topographic features, habitat, plants, animals, and minerals that Native Americans or other groups consider essential for the preservation of traditional culture.

3.6.1 Regulatory Setting

Cultural resources are governed by other federal laws and regulations, including the National Historic Preservation Act (NHPA), Archeological and Historic Preservation Act, American Indian Religious Freedom Act, Archaeological Resources Protection Act of 1979, and the Native American Graves Protection and Repatriation Act (NAGPRA) of 1990. 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. 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. Cultural resources also may be covered by state, local, and territorial laws.

3.6.2 Affected Environment

Cultural resources that are listed in the National Register of Historic Places (NRHP) or eligible for listing in the NRHP are "historic properties" as defined by the NHPA. The list was established under the NHPA and is administered by the National Park Service on behalf of the Secretary of the Interior. The NRHP includes properties on public and private land. Properties can be determined eligible for listing in the NRHP by the Secretary of the Interior or by a federal agency official with concurrence from the applicable State Historic Preservation Office. A NRHP-eligible property has the same protections as a property listed in the NRHP. The historical properties include archaeological and architectural resources.

The area of potential effect (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 all lands underlying the MTRs in California and Arizona.

3.6.2.1 Archaeological and Architectural Resources

The lands underlying the MTRs in California and Arizona are generally within the arid Colorado and southern Mojave Deserts, a region that humans have occupied with varying degrees of intensity for approximately the past 12,000 years (Huckell 2014; Schaefer and Laylander 2007; Sutton et al. 2007). For the majority of this interval, prehistoric lifeways centered on small, mobile groups that relied on hunting and gathering plant foods. Agriculture was introduced in southern Arizona by approximately

2100 B.C., gradually increasing in importance and eventually spreading into California's Imperial Valley by approximately A.D. 700 (Schaefer and Laylander 2007). In southern Arizona, prehistoric agriculture supported large, stable settlements and relatively dense populations at many locations (McGuire and Schiffer 1982), while in other areas a mobile, hunting and gathering lifeway was maintained until historic contact. The arrival of Europeans in the region initiated broad changes to the landscape that were related to mining, development of towns and cities, transportation, military training, and many other activities.

Cultural resources in this region include a wide variety of prehistoric and historic sites and architectural resources. Prehistoric sites typically consist of artifact scatters, but may include a range of habitation debris, rock art, cooking features, mortuary sites, and trails, as well as the remains of prehistoric houses and agricultural features. In the vicinity of the California MTRs, the margins of the Imperial Valley are particularly notable for prehistoric habitation areas associated with the shorelines of ancient Lake Cahuilla, which formed intermittently when the Colorado River diverted to the west (Schaefer and Laylander 2007). Also important is the region just west of the lower Colorado River, which was not only a key area for habitation but also was central to the mythology of the native groups in this region. Physical manifestations that have been specifically associated with this spiritual landscape include trails, trail shrines, geoglyphs, and rock art (Cleland and Apple 2003). In southern Arizona, the Gila and Salt Rivers basin contain an especially rich record of Formative period cultures such as the Hohokam, Salido, and Paquime (Gumerman and Haury 1979; Whittlesey et al. 1994).

The region's historic resources exhibit a similar variety, and may include homesteads, mining sites and associated structures and artifacts, refuse disposal, cemeteries, historic trail segments such as the Mojave Road and Bradshaw Trail, roads and roadside debris, and historic buildings. Also found throughout the region are scattered remains of military training such as those associated with the World War II-era Desert Training Center (later the California-Arizona Maneuver Area), or Desert Training Center California-Arizona Maneuver Area, which encompassed about 18,000 square miles within the deserts of southeastern California and southwestern Arizona. In 2010, the California Energy Commission recommended that the Desert Training Center California-Arizona Maneuver Area be assumed eligible for the National Register of Historic Places as the Desert Training Center California-Arizona Maneuver Area Cultural Landscape (AECOM 2016).

3.6.2.2 Traditional Cultural Properties

To identify historic properties of traditional religious or cultural significance that may be affected by the undertaking, the Navy is consulting with federally recognized Native American tribes whose lands fall within the APE. Specifically, information is being solicited regarding areas or locations in which any traditional cultural uses or activities would be encroached by the proposed re-commissioning or modifications, or any areas of recurring ceremonial use that are established as Traditional Cultural Properties. The following tribes are being consulted (refer to Figure 3.5-1 for locations of tribes):

- Ak-Chin Indian Community, Maricopa, Arizona
- Cabazon Band of Mission Indians, Indio, California
- Colorado River Indian Tribes, Parker, Arizona
- Gila River Indian Community of the Gila River Indian Reservation, Sacaton, Arizona
- Gila Bend Indian Reservation, Gila Bend, Arizona
- Los Coyotes Band of Cahuilla and Cupeño Indians, Warner Springs, California
- Quechan Tribe of the Fort Yuma Reservations, Winterhaven, California

- San Carlos Apache Tribe of the San Carlos Reservation, San Carlos, Arizona
- Tohono O'odham Nation of Arizona, Sells, Arizona
- Torres Martinez Desert Cahuilla Indians, Thermal, California

3.7 Environmental Justice

The 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, 2015b).

3.7.1 Regulatory Setting

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.

3.7.2 Affected Environment

The geographic distribution of minority and low-income population groups described in this analysis is based on demographic data from the 2010 Census (U.S. Census Bureau, 2011) and the 2014 American Community Survey (U.S. Census, 2016).

A minority population is defined as belonging to one or more of the following races: Black or African-American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, as well as Hispanic or Latino of any race. The U.S. Census Bureau measures minority populations down to the Census block group[8].

Individuals who fall below the poverty line are considered to be low-income. The poverty line takes into account family size and the ages of individuals in the family. The U.S. Census Bureau measures low income populations down to the Census tract[9].

Guidance proposed by the CEQ stipulates that a "meaningfully greater" minority or low-income population exists where the percentage of minority or low-income persons in any geographic unit is more than 20 percent higher than the reference geographic unit. A minority or low-income population also exists in any geographic unit where the number of low-income persons exceeds 50 percent of the total population. The ROI includes all 12 counties crossed by the California and Arizona MTRs, and the census tracts and block groups within. Population density is low in many parts of these counties due to the undeveloped or rural nature of a large portion of the area traversed by the MTRs.

Table 3.7-1 provides low-income and minority population compositions and the criteria used to determine meaningfully greater environmental justice populations. The distribution of minority and low income populations across census tracts and block groups is discussed by MTR below and shown in Figure 3.7-1.

[8] A block group is a geographical unit used by the U.S. Census Bureau that represent a statistical division of a census tract, and generally contains between 600 and 3,000 people (U.S. Census Bureau 2012a).
[9] A census tract is a geographical unit used by the U.S. Census Bureau that represents a statistical division of a county, and generally contains between 1,200 and 8,000 people (U.S. Census Bureau 2012b).

Table 3.7-1. Minority and Low-Income Populations and Meaningfully Greater in Counties within Affected MTRs

County	*Total Minority Population (%)*	*Meaningfully Greater Criteria – Minority Populations (%)*	*Total Low Income Population (%)*	*Meaningfully Greater Criteria – Low Income Populations (%)*
Imperial, CA	86.3	100.0[1]	16.9	20.3
Riverside, CA	60.3	72.4	19.2	23.0
San Bernardino, CA	66.7	80.0	14.7	17.6
San Diego, CA	51.5	61.8	21.7	26.0
Gila, AZ	34.1	41.0	21.7	26.0
Graham, AZ	47.7	57.2	18.4	22.1
La Paz, AZ	37.3	44.7	17.1	20.5
Maricopa, AZ	41.3	49.6	19.9	23.9
Mohave, AZ	20.4	24.5	19.0	22.8
Pima, AZ	44.7	53.7	16.8	20.2
Pinal, AZ	41.3	49.6	20.7	24.8
Yuma, AZ	64.7	77.7	23.4	28.1

1. The 'meaningfully greater' criteria, or 1.2 times the total minority population of the county, for Imperial County exceeds 100 percent due to the high minority composition of the county; however, the criteria is capped at 100 percent.

Minority Populations

- **VR-289 –** Minority populations along VR-289 are predominately comprised of Hispanic or Latino populations. Of the 17 block groups along VR-289, 14 block groups have environmental justice populations. All 14 of these block groups have minority populations that exceed at least 50 percent of the population; however, given the comparatively high minority populations in the counties along the routes, only 8 block groups have minority populations that are meaningfully greater than the county minority populations.
- **VR-296 –** Minority populations along VR-296 are predominately Hispanic or Latino, as well as some areas of Black or African American and American Indian populations. Of the 32 block groups along VR-296, 24 block groups have environmental justice populations. All 24 of these block groups have minority populations that exceed at least 50 percent of the population; however, given the comparatively high minority populations in the counties along the routes, only 8 block groups have minority populations that are meaningfully greater than the county minority populations. American Indian populations are concentrated around the Colorado River Indian Reservation.
- **VR-299 –** Minority populations along VR-299 are predominately Hispanic or Latino, as well as some areas of Black or African American and American Indian populations. Of the 63 block groups along VR-296, 46 block groups have environmental justice populations. All 46 of these block groups have minority populations that exceed at least 50 percent of the population; however, given the comparatively high minority populations in the counties along the routes, only 6 block groups have minority populations that are meaningfully greater than the county minority populations. American Indian populations are concentrated around the Colorado River Indian Reservation.

- **VR-267 –** Minority populations along VR-267 are predominately Hispanic or Latino and American Indian. Of the 44 block groups along VR-267, 21 block groups have environmental justice populations. All 21 of these block groups have minority populations that exceed at least 50 percent of the population; however, given the comparatively high minority populations in the counties along the routes, 20 block groups have minority populations that are meaningfully greater than the county minority populations. American Indian populations are concentrated around the Gila River, Gild Bend, and Maricopa Indian reservations.
- **VR-268 –** Minority populations along VR-268 are similar to along VR-267, with the exception being that there are 18 block groups with environmental justice populations. These block groups have minority populations that both exceed at least 50 percent of the population and are meaningfully greater than the county.
- **VR-269 –** Minority populations along VR-269 are similar to along VR-267, with the exception being that there are 20 block groups with environmental justice populations. These block groups have minority populations that both exceed at least 50 percent of the population and are meaningfully greater than the county.

Low Income Populations

The distribution of low-income populations is discussed by MTR below and shown in Figure 3.7-1.

- **VR-289** – Of the 12 census tracts located along VR-289, there are no tracts with low income populations greater than 50 percent of the total population; however, 6 census tracts have low income populations that are meaningfully greater than the low income populations of their respective counties.
- **VR-296** – Of the 26 census tracts located along VR-296, there are no tracts with low income populations greater than 50 percent of the total population; however, 12 census tracts have low income populations that are meaningfully greater than the low income populations of their respective counties.
- **VR-299** – Of the 30 census tracts located along VR-299, there are no tracts with low income populations greater than 50 percent of the total population; however, 12 census tracts have low income populations that are meaningfully greater than the low income populations of their respective counties.
- **VR-267** – Of the 31 census tracts located along VR-267, there are 2 tracts that have low income populations that exceed 50 percent of the total population (Pinal and Maricopa counties). In addition, 13 census tracts along this MTR have low income populations that are meaningfully greater than the low income populations of their respective counties.
- **VR-268** – Low income populations along VR-268 are similar to along VR-267, with the exception being that there are 27 total census tracts along the route.
- **VR-269** – Low income populations along VR-269 are similar to along VR-267, with the exception being that there are 29 total census tracts along the route.

Native American populations are discussed further in Section 3.6, Cultural Resources.

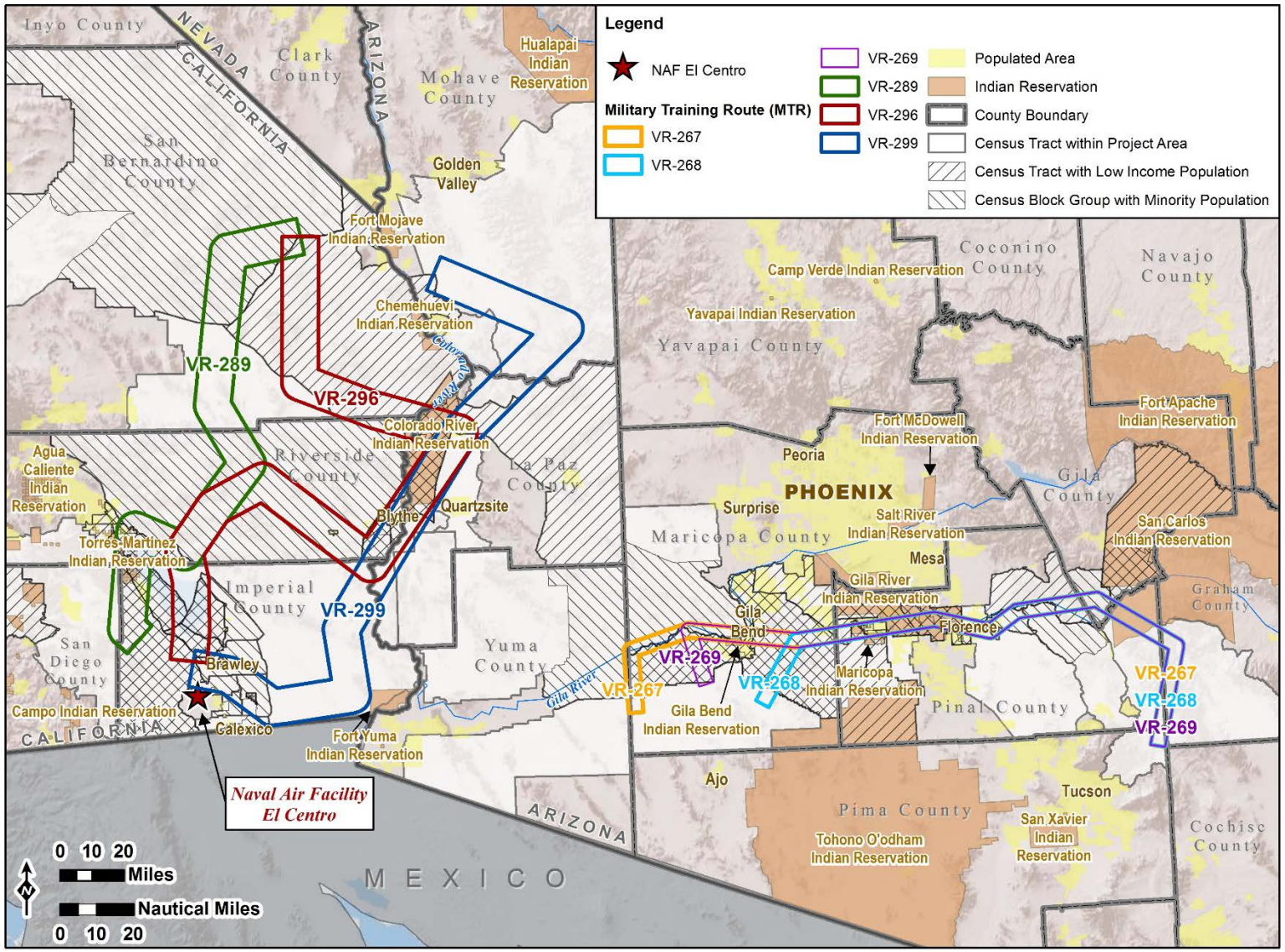

Figure 3.7-1. Minority and Low Income Populations along the California and Arizona MTRs

3.8 Public Health and Safety

This discussion of public health and safety includes consideration for any activities, occurrences, or operations that have the potential to affect the safety, well-being, or health of members of the public. The primary goal is to identify and prevent potential accidents or impacts on the general public.

A safe environment is one in which there is no, or optimally reduced, potential for death, serious bodily injury or illness, or property damage. Human health and safety addresses public safety during all aspects of military operations and training. Various stressors in the environment can adversely affect human health and safety. Identification and control or elimination of these stressors can reduce risks to health and safety to acceptable levels or eliminate risk entirely.

Emergency services are organizations that ensure public safety and health by addressing different emergencies. The three main emergency service functions include police, fire and rescue service, and emergency medical service.

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.

3.8.1 Regulatory Setting

Aircraft safety is based on the physical risks associated with aircraft flight. Military aircraft fly in accordance with Federal Aviation Regulation Part 91, *General Operating and Flight Rules*, which govern such things as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. These rules include the use of tactical training and maintenance test flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations. In addition, naval aviators must also adhere to the flight rules, air traffic control, and safety procedures provided in Navy guidance.

Executive Order (EO) 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, requires federal agencies to “make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.”

3.8.2 Affected Environment

Public health and safety in the affected area is primarily related to the potential for midair collisions and aircraft crashes that then affect the underlying lands.

While flight training on MTRs certainly carries some risk, by far most aircraft losses (aside from airfield take-off and landing operations) occur during training activities within restricted airspace or military operating areas. This is a result of the high performance and high stress missions flown for training in air combat maneuvering (i.e., air-to-air combat) and air-to-ground attack, including actual ordnance delivery.

Overall, military service-wide aircraft losses are rare due to the high quality and capabilities of the equipment flown, excellent aircraft maintenance, and extensive aircrew training. To complement flight training, all military pilots use state-of-the-art simulators extensively where all facets of flight operations and comprehensive emergency procedures can be demonstrated safely which helps to reduce pilot error during actual flight. Additionally, highly trained maintenance crews perform regular aircraft

maintenance and inspections in accordance with military regulations. Their activities are monitored to ensure all aircraft are maintained to the highest level of standards to safely meet the rigors of flight operations.

As discussed in Section 3.5, some of the low-level routes overlie areas incorporated within city limits, and residences; however, the majority of the lands underlying the low-level flight routes consist of sparsely populated areas and most of the area is public land used for a variety of wild land and open space purposes. The Special Operating Procedures section of the DoD FLIP provides notification, operational procedures, and avoidance criteria for sensitive receptors (e.g., schools, hospitals, residences), flight safety considerations, obstructions, and other areas of concern within the VRs (see Section 3.4, Airspace).

Another major concern with regard to flight safety is Bird/Animal Aircraft Strike Hazard (BASH). The velocity of an aircraft moving through the air and the weight of large birds makes a bird-aircraft impact (bird strike) a serious event especially for low-level flights. Bird strikes may result in minor damage to, in very rare instances, an aircraft or severe damage resulting in an aircraft accident and aircrew fatalities. The extent of damage to aircraft depends of factors such as speed, the size of bird, and the location of the strike on the aircraft.

Aircraft may encounter birds at altitudes exceeding 20,000 feet AGL. However, most birds fly close to the ground. FAA statistics have shown that 95 percent of bird strikes occur below 3,000 feet AGL and within 5 miles of the airfield (Commander Navy Installations Command [CNIC], 2010). The potential for bird-aircraft strikes is higher in areas used as migratory corridors (i.e., flyways) or where birds congregate for foraging or resting (e.g., open water bodies and wetlands) (see Section 3.2, Biological Resources). Flyways are routes that migratory birds have historically used as they move between seasonal habitats. During the spring and fall migratory seasons, migratory birds can often be found in higher concentrations along these routes than elsewhere in the country. Although flyways are often referred to and sometimes depicted as single pathways with well-defined boundaries, they are in reality composed of numerous smaller migratory routes that are subject to change based on environmental factors. Thus, it is difficult to accurately determine the precise physical boundaries of flyways at a given point in time and the highest numbers or concentrations of migrating birds are not always confined within the boundaries of mapped flyways. The Proposed Action is within the Pacific Flyway. As discussed in Section 3.2, Biological Resources, migratory movements mostly occur below 10,000 feet AGL but can vary based on multiple factors such as migration distance, time of day, and weather.

Per OPNAVISNT 3750.6Q, “the objective of a command aviation safety program is to eliminate hazards within the command and within naval aviation and to enhance safety awareness in all personnel.” In an effort to comply with this regulation, the Navy BASH program was established to minimize the risk for collisions of birds and aircraft and the subsequent loss of life and property. The CNIC Bird/Animal Aircraft Strike Hazard Manual prescribes measures that are incorporated into installation-specific BASH plans. Measures to reduce BASH risk include active controls (e.g., pyrotechnics, bio-acoustics) and passive controls (e.g., vegetation management) near airfields. Other measures include issuances of wildlife activity advisories to issue operational changes (e.g., reduce airspeed, alter flight altitude, avoidance of training during dawn/dusk flying times or during major bird movements, minimization of flight time, etc.). Pre-flight briefings also ensure pilot safety in the event of BASH hazard, including review of potential bird problems along the proposed route of flight, actions to take if birds are

encountered during flight, engine failure procedures if birds fly into an engine, or crew egress procedures if control cannot be maintained (CNIC, 2010).

A number of other factors can also reduce flight visibility such as blowing sand and dust, precipitation, fog/mist, haze, smoke/smog, and in coastal areas sea spray under the right conditions.

Flight planning prior to training considers a variety of conditions along the route, including existing BASH hazard and visibility levels. During low threat conditions, normal operations prevail. Under moderate threat conditions, some restrictions apply, such as limiting takeoffs, increasing altitude, and decreasing speed on low-level training routes. During severe threat conditions, all flying activity is either stopped, or greatly curtailed, until the threat is reduced.

Military installations maintain detailed emergency and mishap response plans to react to an aircraft accident, should one occur. These plans assign agency responsibilities and prescribe functional activities necessary to react to mishaps, whether on or off the installation. Response would normally occur in two phases. The initial response focuses on rescue, evacuation, fire suppression, safety, elimination of explosive devices, ensuring security of the area, and other actions immediately necessary to prevent loss of life or further property damage. The initial response element usually consists of fire-fighting and crash-rescue personnel, medical personnel, security police, and crash-recovery personnel from the applicable local jurisdiction. The second phase is the mishap investigation, which involves an array of organizations whose participation would be governed by the circumstances associated with the mishap and actions required to be performed (DoD 2011).

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4 Environmental Consequences

This chapter presents an analysis of the potential direct and indirect effects of each alternative on the affected environment. The following discussion elaborates on the nature of the characteristics that might relate to resources. "Significantly," as used in National Environmental Policy Act (NEPA), requires considerations of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (e.g., human, national), the affected region, the affected interests, and the locality. 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 (40 Code of Federal Regulations (CFR) 1508.27). Intensity refers to the severity or extent of the potential environmental impact, which can be thought of in terms of the potential amount of the likely change. In general, the more sensitive the context, the less intense a potential impact needs to be in order to be considered significant. Likewise, the less sensitive the context, the more intense a potential impact would be expected to be significant.

4.1 Noise

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

Noise levels above 65 decibel (dB) community noise equivalent level (CNEL) (analogous to onset-rate adjusted monthly CNEL [$CNEL_{mr}$]) are typically considered not compatible with residential and other noise sensitive land uses such as schools or places of worship.

Noise Potential Impacts:

- No Action: Minor Effects
- Proposed Action: Long-term noise increase in several areas but would not exceed 65 dB CNEL planning threshold

4.1.1 No-Action Alternative

Under the No-Action Alternative, ongoing aviation training along VR-1266, VR-1267, VR-267, VR-268, and VR-269 would continue; however, the Proposed Action would not occur and there would be no change to baseline noise levels discussed in Section 3.1. Therefore, no significant impacts to the noise environment would occur with implementation of the No-Action Alternative.

4.1.2 Proposed Action

As described in Section 3.1, Noise, potential noise levels resulting from aircraft operations along the routes were calculated using the Department of Defense (DoD)'s Military Operating Area and Range Noise Model (MR_NMAP) program to compute the $CNEL_{mr}$. Other potential environmental impacts associated with changes in the noise environment are evaluated in the appropriate sections of this chapter for each environmental resource or land use that might be affected.

Under the Proposed Action, the areas beneath Visual Route (VR)-289, VR-296, and VR-299 would be exposed to a maximum of 119 dB on-set rate adjusted sound exposure level (SEL_r) due to F/A-18 flights, as per Table 4.1-1. However, F/A-18 and other similar aircraft usage would be fairly infrequent with approximately two events per month. The T-45 and MV-22 would generate nearly all of the activity with approximately 25 events each per month with SEL_r of 111 dB and 94 dB, respectively. The F-35B would operate on average less than once per month at or above 1,000 feet above ground level (AGL) with a maximum SEL_r of 114 dB. These estimated levels would be consistent with those that had occurred

previously underneath VR-289, VR-296, and VR-299 prior to de-commissioning but would be quite noticeably louder than would occur under the No Action alternative where the routes would remain de-commissioned.

Single event noise levels described in terms of SEL_r would remain the same as the No Action Alternative for all segments of VR-267, VR-268, and VR-269 except segments DE and EF, as shown in Table 3.1-2. The Proposed Action would modify a portion of the routes 2 miles south to avoid R-2310 (refer to Figure 2-6). The change in location of this section allows lowering that portion's minimum altitude from 1,000 feet AGL to 300 feet AGL to be consistent with the remaining existing segments of VR-267, VR-268, and VR-269. The SEL_r would be the same underneath all segments of these three routes. Areas underneath the new DE and EF segments would experience increases in single event aircraft overflights from essentially none currently to 10 to 15 per month with nearly all from the T-45 with a typical SEL_r of 111 dB. The area underneath the existing segments DE of VR-267, VR-268, and VR-269 would no longer experience military MTR overflights.

Table 4.1-1. SEL_r (dBA) for Aircraft at Typical Altitudes Along Visual Routes considered under the Proposed Action

Aircraft Type	*Airspeed (knots)*	*Power Setting (%)*	*SEL_r (dBA)*		
			300 ft AGL	*500 ft AGL*	*1,000 ft AGL*
T-45	250	100	N/A	111	105
F/A-18	500	90.5	119	113	109
AV-8B	300	95	115	111	104
MV-22	230	85	94	91	86
F-16 (G100 engine)	465	94	N/A	96	92
C-130E	170	970 deg C[1]	98	96	90
F-35B	460	100	N/A	N/A	114

1. Turbine Inlet Temperature

Using the methodology described in Section 3.1, Noise, MR_NMAP was used to compute the maximum $CNEL_{mr}$ for the route centerline and $CNEL_{mr}$ contours of 60 dB through 85 dB presented in Table 4.1-2 and Figure 4.1-1, respectively. The greatest centerline $CNEL_{mr}$ among all segments would be less than 65 dB; therefore, Figure 4.1-1 only shows the 60 dB $CNEL_{mr}$ contour.

Table 4.1-2. Proposed Maximum Centerline $CNEL_{mr}$ Under Affected MTRs

Segment	*Visual Route- (VR)*										
	289	*296*	*299*	*267*	*268*	*269*	*1266*	*1267*	*1267A*	*1257*	*1268*
A-B	53	54	55	48	48	48	62	62	49	55	62
B-C	53	54	57	48	48	48	60	58	57	<45	58
C-D	53	58	57	48	48	48	60	56	57	55	56
D-E	55	58	62	48	48	48	61	59	57	55	59
E-F	61	58	54	48	48	48	61	56		55	49

Table 4.1-2. Proposed Maximum Centerline $CNEL_{mr}$ Under Affected MTRs

Segment	*Visual Route- (VR)*										
	289	*296*	*299*	*267*	*268*	*269*	*1266*	*1267*	*1267A*	*1257*	*1268*
F-G	61	56	54	48	48	48	61	57		55	49
G-H	61	62	54	48	<45	48	61	57		46	49
H-I	61	59	55	<45		48		57		46	49
I-J	55	54		<45						46	49
J-K		55								46	55
K-L										46	56
L-M										55	56
M-N										<45	56
N-O										55	
O-P										61	
P-Q										61	
Q-R										61	

Note: $CNEL_{mr}$ between 60 and 65 dB highlighted yellow representing locations exposed to the majority of noise; No $CNEL_{mr}$ above 65 dB exists.

Under the Proposed Action, $CNEL_{mr}$ on VR-289, VR-296, and VR-299 would be between 53 and 62 dB with portions greater than 60 dB to occur only where overlapping VR-1266, which would remain the primary contributor. $CNEL_{mr}$ in this range is consistent with typical suburban and low density urban areas. No areas underlying or in the vicinity of VR-267, VR-268, VR-269, VR-289, VR-296, or VR-299 would reach or exceed 65 dB $CNEL_{mr}$. $CNEL_{mr}$ on VR-267, VR-268, and VR-269 would not increase beyond the 48 dB estimated for the No Action Alternative. However, modification of the route would move the exposure approximately 2 miles south of R-2310. $CNEL_{mr}$ in this range are consistent with rural areas or small towns. Flights in the area around Florence, Arizona are limited to at least 300 feet AGL.

The largest calculated increase in $CNEL_{mr}$ of 6 dB would occur on the portion of segment JK of VR-1268 overlapped by VR-299 with levels increasing from 49 to 55 dB. A similar but more modest calculated increase of 3 dB would occur on the portion of segment DE of VR-1268 due to being overlapped by VR-296 and VR-299. All segments of VR-1266 and most segments of VR-1267 would experience decreases of up to 2 dB $CNEL_{mr}$ due to a reduction of flight operations. Both the existing $CNEL_{mr}$ on VR-289, VR-296, VR-299 and the resulting $CNEL_{mr}$ increases due to the Proposed Action could not be computed because there is no existing military activity to analyze. The current conditions have been estimated to be within the ranges of Rural/Small Town, as depicted in Figure 3.1-4, which suggest estimated increases due to the Proposed Action of 3 to 16 dB $CNEL_{mr}$. These increases are not considered significant because $CNEL_{mr}$ would not reach or exceed 65 dB. Under the Proposed Action, the temporal distribution of sorties on VR-289, VR-296, and VR-299 would be 10 percent of the sorties during the evening (7 p.m. to 10 p.m.) and up to 8 percent of the sorties during the nighttime (10 p.m. to 7 a.m.). The percentage of day/evening/nighttime sorties would remain unchanged on VR-267, VR-268, and VR-269 from existing conditions.

The Special Operating Procedures section of the DoD FLIP provides notification, operational procedures, and avoidance criteria for noise-sensitive receptors, airfields, environmentally sensitive areas, flight

safety considerations, obstructions, and other areas of concern within the VRs (see Section 3.4, Airspace). Noise levels in such avoidance areas would likely be lower than those presented above.

Noise sensitive receptors in areas underlying VR-289, VR-296, VR-299, VR-267, VR-268, or VR-269 would not be exposed to $CNEL_{mr}$ equal or greater than 65 dB due to aviation training; therefore, implementation of the Proposed Action would not result in significant impacts to the noise environment.

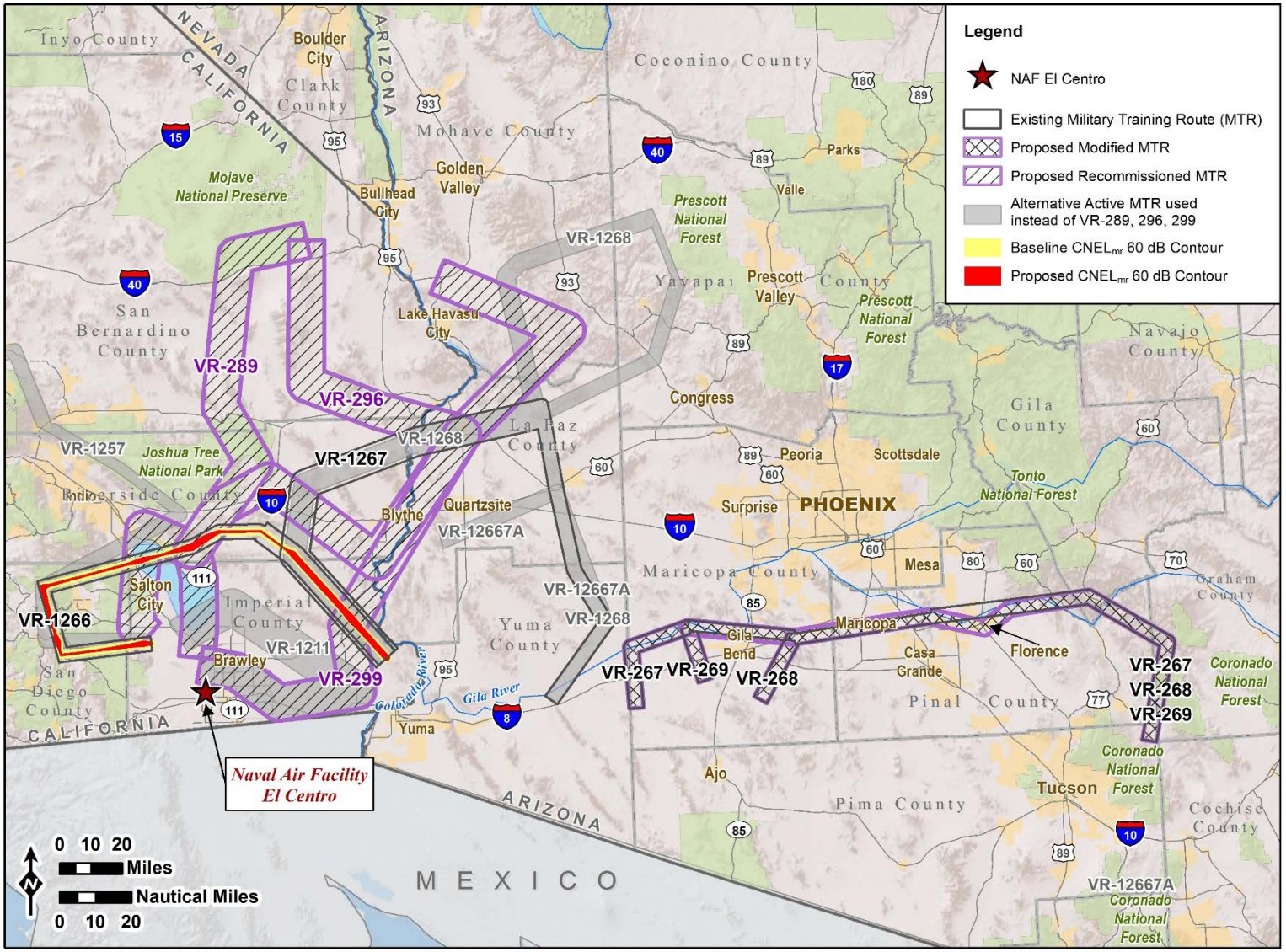

Figure 4.1-1. Proposed 60 dB $CNEL_{mr}$ Noise Contours

4.2 Biological Resources

This analysis focuses on wildlife or vegetation types that are important to the function of the ecosystem or are protected under federal or state law or statute.

Biological Resource Potential Impacts:

- No Action: Minor Effects
- Proposed Action: Long-term Minor Adverse Effects

4.2.1 No Action Alternative

Under the No Action Alternative, continued use of VR-267, VR-268, VR-269, VR-1266, and VR-1267, as well as other Military Training Routes (MTR)s available for training purposes would occur. Ongoing aviation training along VR-1266, VR-1267, VR-267, VR-268, and VR-269 would continue to result in limited startle effects to wildlife and rare occurrences of avian mortality from bird-aircraft strikes. Therefore, no significant new impacts to biological resources would occur with the No Action Alternative.

4.2.2 Proposed Action

The study area for the analysis of effects to biological resources associated with the Proposed Action includes portions of southeastern California and south-central Arizona underlying the MTRs under consideration. The Proposed Action would involve re-commissioning VR-289, VR-296, and VR-299 in California and modifying VR-267, VR-268, and VR-269 in Arizona in order to return Chief of Naval Air Training (CNATRA), Fleet Replacement Squadron (FRS), and other military pilot programs to their original low-level training curriculums (see Figures 2-4, 2-5, and 2-6).

Overall usage by aircraft along the California MTRs would increase by approximately 1,100 flight hours/year over baseline conditions, as shown in Table 2-1 and 2-3. Usage of the Arizona MTRs would not change, although minor geographic adjustments to the MTRs would be implemented to avoid restricted airspace. Because the Proposed Action would not result in any construction or ground disturbance, the potential effects of the Proposed Action on biological communities would be limited to noise and potential bird strikes. There would be no effect to vegetation communities and habitats.

4.2.2.1 Potential Impacts

Vegetation

The Proposed Action would not require ground disturbance and therefore would not result in vegetation loss. There would be no direct impacts to vegetation under the Proposed Action. The Proposed Action would not affect habitat contiguity because it would not involve land use conversions or physical habitat fragmentation. In the absence of physical habitat conversion, only very intense noise-related impacts would cause wildlife to permanently vacate areas on a scale equivalent to habitat fragmentation.

Terrestrial Wildlife

In the absence of ground disturbance associated with the Proposed Action, the potential for impacts to terrestrial wildlife would be in the form of potential bird strikes and/or noise disturbance.

Bird-Aircraft Strikes

Although all of the MTRs are within the Pacific Flyway (Figure 3.2-2) and portions of VR-289 and VR-296 occur over the Salton Sea, the potential for bird strikes with implementation of the Proposed Action is minimal. This is because while the Proposed Action would increase the number of sorties within the affected airspace, the sorties would be spread across a larger area and existing management strategies (see below discussion on Bird/Animal Aircraft Strike Hazard [BASH] management) would continue to be

applied to reduce risks of strikes. Bird strikes are not known to have adversely affected bird populations along the existing Arizona MTRs or during historic training along the California MTRs, and are not expected to under the Proposed Action. The potential for bird-aircraft strikes would be greatest during the spring and fall migratory seasons when migratory birds can often be found in higher concentrations along the Pacific Flyway. Migratory flight altitudes can vary depending on migration distance, time of day, and weather; however, typically occur below 10,000 feet AGL. While some incidental occurrences of bird mortality are likely to occur, the overall incidence of bird-aircraft strikes is not anticipated to substantially increase, as training levels would only increase by approximately 1,100 hours/year under the Proposed Action and training would be redistributed throughout the region.

In recognition of the dynamic nature of bird migrations, the Navy has implemented a training response outlined in the BASH Manual (Commander Navy Installations Command [CNIC] 2010). The manual identifies potential areas of concern and establishes procedures for minimizing the threat of aircraft striking birds and other animals. The management strategies covered in this plan include bird avoidance and control through harassment, grounds maintenance, habitat modification, and depredation, in accordance with applicable laws (i.e., Endangered Species Act, MBTA, and Bald and Golden Eagle Protection Act). See Section 3.8, Public Health and Safety for additional discussion of bird avoidance measures. Individual Naval installations also have their own BASH plans based on the conditions present at each airfield. The BASH plan is intended for use by aircrews, schedulers, natural resource managers, air traffic controllers, airfield managers, and others in charge of flight safety and natural resource management (CNIC 2010).

Potential Noise Effects on Wildlife

Potential noise impacts on biological resources resulting from airspace modifications were analyzed by comparing baseline sound levels and sortie rates for the existing MTRs to the sound levels and sortie rates that are projected to result from the Proposed Action. The potential for disturbance was then evaluated based on the projected change in sound level and, where relevant, the predicted or documented response of the species or species groups to similar changes in sound level. For this analysis, the effects of both single event and average noise levels were considered. Sections 3.1 and 4.1 of this EA provide more detailed discussions of aircraft noise calculation and interpretation.

Under the Proposed Action, single event noise levels in VR-289, VR-296, and VR-299 in California would increase to a maximum of 119 dB SEL_r due to F/A-18 flights (see Table 4.1-1). Single event noise levels described in terms of sound exposure level (SEL_r) would remain the same as the No Action Alternative (up to 119 dB) along VR-267, VR-268, and VR-269 (Table 3.1-2) in Arizona, although the shift in route location near Florence, Arizona would introduce this noise level to new, potentially less populated areas.

Under the Proposed Action, the $CNEL_{mr}$ on VR-289, VR-296, and VR-299 (California [CA]) would be between 53 and 62 dB, with portions greater than 60 dB occurring only where the recommissioned routes overlap VR-1266 (an unrelated, existing route which is the primary noise contributor). $CNEL_{mr}$ on VR-267, VR-268, and VR-269 (Arizona [AZ]) would remain at the existing maximum of 48 dB.

Introduction of noise elements and low-level overflights to areas that do not currently experience military overflights (VR-289, 296, and 299 [CA], and the new segment of VR-267, 268, and 269 over Florence, Arizona) could temporarily disturb wildlife from increased noise. The land underlying these areas includes populated areas, agricultural land, and open areas with potential low to moderate wildlife use (see Section 3.5 for a discussion of land use underlying the MTRs). Land underlying the MTRs

also includes some national and state park and preserve land where wildlife usage would be moderate to high.

The effects of noise and associated startle responses on wildlife have been examined in a variety of studies and data/literature reviews. These studies document a wide variety of animal responses to aircraft overflights (or simulated aircraft noise) by different types of animals, and differing responses by the same species at different times of the year. Mammals have been observed reacting to sound levels above 90 dB with behaviors such as retreating from the sound source, freezing, or a strong startle response (Manci et al., 1988). While single event noise levels associated with the Proposed Action could exceed 90 dB, these would be transient (lasting only a few seconds) events with many hours of significantly quieter noise levels in between them. Most past studies have reported that impacts on wildlife from noise events appeared to be minor and temporary and, when evaluated, did not cause acute (near-term) effects on reproduction, mortality, or survivorship (Radle, 2007).

Although they may startle briefly in response to noise, birds and mammals have been frequently observed to habituate to noise, especially that which occurs on a regular basis (Air Force Flight Test Center, Environmental Management Directorate, 2005). Average noise levels (represented by $CNEL_{mr}$) along most of the MTRs would remain at levels typical of undeveloped rural or agricultural lands, while some small areas (typically where the recommissioned MTRs intersect other existing MTRs in California) would experience average noise levels more typical of suburban residential areas. These average noise levels would not be likely to adversely affect wildlife reproduction or survivorship, and it is likely that wildlife would become accustomed to such noise levels. Noise effects on livestock and other domestic animals are discussed in Section 4.5.2.

Threatened and Endangered Species

Approximately 36 federally threatened, endangered, and candidate species have potential to occur within the study area of the Proposed Action (USFWS, 2015). Species most likely to be affected by noise generated by Proposed Action include birds and large ungulate species such as peninsular bighorn sheep and Sonoran pronghorn. Areas of USFWS-designated critical habitat that underlie the VR-289, 296, and 299 (see Figure 3.2-3) were taken into consideration when originally designing the flight plans for the routes. The floor of these areas was originally set to avoid conflict with designated critical habitat and to minimize potential effects to threatened and endangered species such as peninsular bighorn sheep.

Studies on the effects of overflights on wildlife have been mainly focused on avian species and ungulates such as bighorn sheep. As with wildlife in general, there is limited information available on the specific responses of species such as wild ungulates to ranges of aircraft noise levels due to the difficulty of assessing these effects in the field without a controlled environment or control population. Most studies suggest that deer and bighorn sheep would either not be affected by noise from low altitude overflights, or would habituate to it. Although wild ungulates appear to be more sensitive to noise disturbance than domestic livestock (Weisenberger, et al., 1996), especially in areas of low vegetative cover (Manci et al., 1988), observations of wild mule deer and bighorn sheep exposed to simulated military overflights in Arizona suggested they displayed similar behaviors to that of animals not exposed to regular military activity (Weisenberger et al., 1996). Observations of wild ungulates in Alaska exposed to rotary and fixed wing aircraft showed panic reactions when overflights were less than 200 feet AGL, decreased with increased altitude of overflights, and stopped completely when overflights were more than 500 feet in altitude (USMC, 2013). In general, studies have shown that close, loud, and sudden noises that are combined with a visual stimulus produce the most intense reactions from wildlife. Rotary wing aircraft

induce the startle response more frequently than fixed-wing aircraft (Gladwin et al., 1988). Due to the nature of training and altitude floors (i.e., 300 feet to 1,000 feet AGL) occurring within the MTRs, wildlife in areas underlying the MTRs, including threatened and endangered species, would not be significantly affected by the Proposed Action.

While the Proposed Action could initially result in negligible impacts to threatened and endangered terrestrial species along most areas of the California MTRs, these impacts would be temporary as those species would likely become acclimated to the increased noise levels. Most of those species' populations within the existing MTRs in Arizona are likely already habituated to the noise levels associated with existing aviation training activities. The Proposed Action would not further threaten the existence of any protected species or critical or sensitive habitats in either California or Arizona.

Raptors, including bald and golden eagles, have been shown to be relatively unaffected by low-level flights by aircraft. In most cases, reactions were brief and not detrimental to reproductive success (Ellis, 1981). Documented responses of bald eagles and other raptors to aircraft overflights range from no response to startle responses, including movement from the affected area (White and Sherrod, 1973). Pagel et al. (2010) observed that most golden eagles respond to survey aircraft by remaining on their nests and continuing to roost. A study of the effects of low-level aircraft activity on red-tailed hawks suggested that individuals in affected areas eventually habituate to low-level air traffic and the incidence of avoidance behavior decreased over time (Andersen, 1989).

The Proposed Action would not result in any ground disturbance or an increase in potential bird-aircraft strikes, and noise effects on wildlife, to include threatened and endangered species, would be low to negligible. Therefore, implementation of the Proposed Action would not result in significant impacts to biological resources. Refer to Chapter 6 for regulatory conclusions associated with the Proposed Action, including under the Endangered Species Act.

4.3 Air Quality

Effects on air quality are based on estimated direct and indirect emissions associated with the Proposed Action. The region of influence (ROI) for assessing air quality impacts is the air basins in which the project is located (i.e., the air basins southwest Arizona and southeast California as described in Table 3.3-3).

Air Quality Potential Impacts:

- No Action: Minor Effects
- Proposed Action: Long-term Minor Adverse Effects

4.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline air quality. Air emissions would still result from ongoing military aviation training resulting in continued minor impacts; however, there would be no change from baseline air quality and these levels would not exceed *de minimis* threshold levels. Therefore, no significant impacts to air quality or air resources would occur with implementation of the No Action Alternative.

4.3.2 Proposed Action

Under the Proposed Action, re-commissioning of VR-289, VR-296, and VR-299 (CA) and modification of VR-267, VR-268, and VR-269 (AZ) would occur, and military aviation training would occur along these routes.

4.3.3 Potential Impacts

Long-term minor effects would be expected. Long-term effects would be from the redistribution of aircraft training activities and associated air emissions from the reestablishment of the MTRs. Effects would be minor as emissions would not exceed the *de minimis* threshold levels, exceed the greenhouse gas (GHG) threshold in the draft Council on Environmental Quality (CEQ) guidance, or contribute to a violation of any federal, state, or local air regulation. The Proposed Action does not include the establishment of new stationary sources of air emissions subject to air permitting.

4.3.3.1 General Conformity

Table 4.3-1 lists the net change in direct and indirect emissions resulting from the aircraft operations under the Proposed Action. These emissions reflect the maximum aircraft training (both aircraft types and hours of training) that would take place in any county under the Proposed Action. This would constitute a reasonable upper bound of effects. For purposes of analysis, it was assumed that aircraft training activities would be distributed based on the percentage each MTR was within each county. The maximum potential emissions in any area would be below the *de minimis* thresholds for all areas; therefore, the General Conformity Rule would not apply, and the level of effect would be less than significant. Moderate changes in the types of aircraft and the hours of training and vehicles used would not substantially change these emissions estimates, the determination under the General Conformity Rule, or the level of effects under NEPA. Detailed emissions calculations and a Record of Non-Applicability (RONA) are in Appendices G and H, respectively.

Table 4.3-1. Estimated Air Emissions Compared to *De Minimis* Thresholds

Activity/Source	*CO*	*NO_x*	*VOC*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
Maximum Air Emissions In Any Area	17.3	4.8	0.2	0.8	4.8	3.8
De Minimis Threshold	100[1]	25 (100)[2]	25 (100)[2]	100	70 (100)[3]	100
Exceeds *De Minimis* Threshold	No	No	No	No	No	No

1. Although no counties have been designated nonattainment or maintenance areas for CO, a *de minimis* threshold of 100 tons per year (tpy) has been carried forward to determine the level of effect under NEPA.
2. *De minimis* thresholds for Riverside and San Bernardino counties for NO_x and VOC are 25 tpy.
3. *De minimis* threshold for Riverside County for PM_{10} is 70 tpy.

4.3.3.2 Permitting

The Proposed Action does not include the establishment of new stationary sources of air emissions subject to air permitting. Prevention of Significant Deterioration (PSD) would not apply, and there would be no effects to nearby Class I Areas.

4.3.3.3 Greenhouse Gases

The total aircraft training (both aircraft types and hours of training) under the Proposed Action combined would generate approximately 2,720 tons (2,473 metric tons) of CO_{2e}, which would be below the CEQ threshold of 25,000 metric tons per year. These emissions account for all annual aircraft training activities within the MTRs. The limited amount of GHG emissions would not contribute to global warming to any discernible extent.

GHG emissions from the aircraft operations would be generated regardless of the selected MTR location. However, the MTRs that would be reactivated under the Proposed Action would be closer to Naval Air Facility (NAF) El Centro, and the total time in flight and total fuel burned would likely be less

when compared to the No Action Alternative. Centrally locating the VRs nearer to NAF El Centro would assist DoD in reaching its GHG reduction goals in accordance with EO 13693.

Therefore, implementation of the Proposed Action would not result in significant impacts to air quality.

4.4 Airspace

The analysis of airspace management and use involves consideration of many factors, including the types, locations, and frequency of aerial operations, the presence or absence of already designated (controlled) airspace, and the amount of air traffic using or transiting through a given area. This assessment included analyzing the capability of affected airspace elements to accommodate projected military and civil flight activities, and determining whether the Proposed Action would have any adverse impacts on overall airspace use in the area. Considerations of the interaction of the proposed use of MTR airspace with adjacent controlled, uncontrolled, or other military training airspace, possible impacts to other non-participating civil and military aircraft operations, and possible impacts to civil airports that underlie or are proximate to the airspace involved in the proposal is also included.

Airspace Potential Impacts:

- No Action: No Effects
- Proposed Action: Minor Effects

4.4.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to airspace. The Navy would not re-commission VR-289, VR-296, and VR-299 (CA) and would continue to operate identically to the baseline condition (see Table 2-1). By adopting this alternative, the traffic congestion on VR-1266 and VR-1267 would continue as the Navy tries to meet its Fleet Response Training Plan (FRTP). Aircraft utilizing VR-267, VR-268, and VR-269 (AZ) would continue to be required to terminate prior to entering Restricted Area R-2310 when in use. Impacts to civilian aircraft would remain unchanged. Therefore, no significant impacts to airspace would occur with implementation of the No Action Alternative.

4.4.2 Proposed Action

4.4.2.1 Potential Impacts

Under the Proposed Action VR-289, VR-296, and VR-299 would occupy the same airspace with the same floor (300 feet AGL) and ceiling altitudes (1,000 feet to 4,000 feet above mean sea level [AMSL]) as existed previously, prior to 2013. VR-267, VR-268, and VR-269 would each be modified by increasing their width to 2 nautical miles on either side of the centerline for all segments, and adding two additional points to shift a portion of the existing segments C-D approximately 2 miles to the south to avoid Restricted Area R-2310. The route floor along the entire routes would be 300 feet AGL. Refer to Figure 4.4-1 for the proposed airspace configuration under the Proposed Action.

Annual sorties by aircraft type are identified in Table 2-2. Aircraft sorties on VR-267, VR-268, and VR-269 would remain the same as under existing conditions. Annual sorties on VR-289, VR-296, and VR-299 would increase to an estimated 634, 655, and 655, respectively. The T-45 would comprise approximately half of the sorties. When VR-289, VR-296, and VR-299 were de-commissioned, VR-1266 and VR-1267 experienced increases in activity due to the reduced number of available routes. Under the Proposed Action, this situation would reverse as sorties would be more evenly spread across the additional MTRs.

Civilian Aircraft Operations

No significant impacts to airspace management would result from implementing the Proposed Action. There would be no increases in the annual use of proposed VR-289, VR-296, and VR-299 beyond previously safe levels. Floor altitudes would remain the same as those flown prior to 2013. Annual use of VR-267, VR-268, and VR-269 would not change. The DoD FLIP would be updated to include information on the MTRs under consideration. Proposed airspace structural and procedural components of these routes would meet all requirements for supporting the operation of all existing aircraft types with an adequate margin of safety for all airspace users, including civilian aircraft. The Proposed Action would not affect FAA's ability to use the national airspace for commercial traffic. Flight activity on the MTRs would continue to be available through the FAA's Flight Service Station by dialing 1-800-WX-BRIEF.

Therefore, implementation of the Proposed Action would not result in significant impacts to airspace.

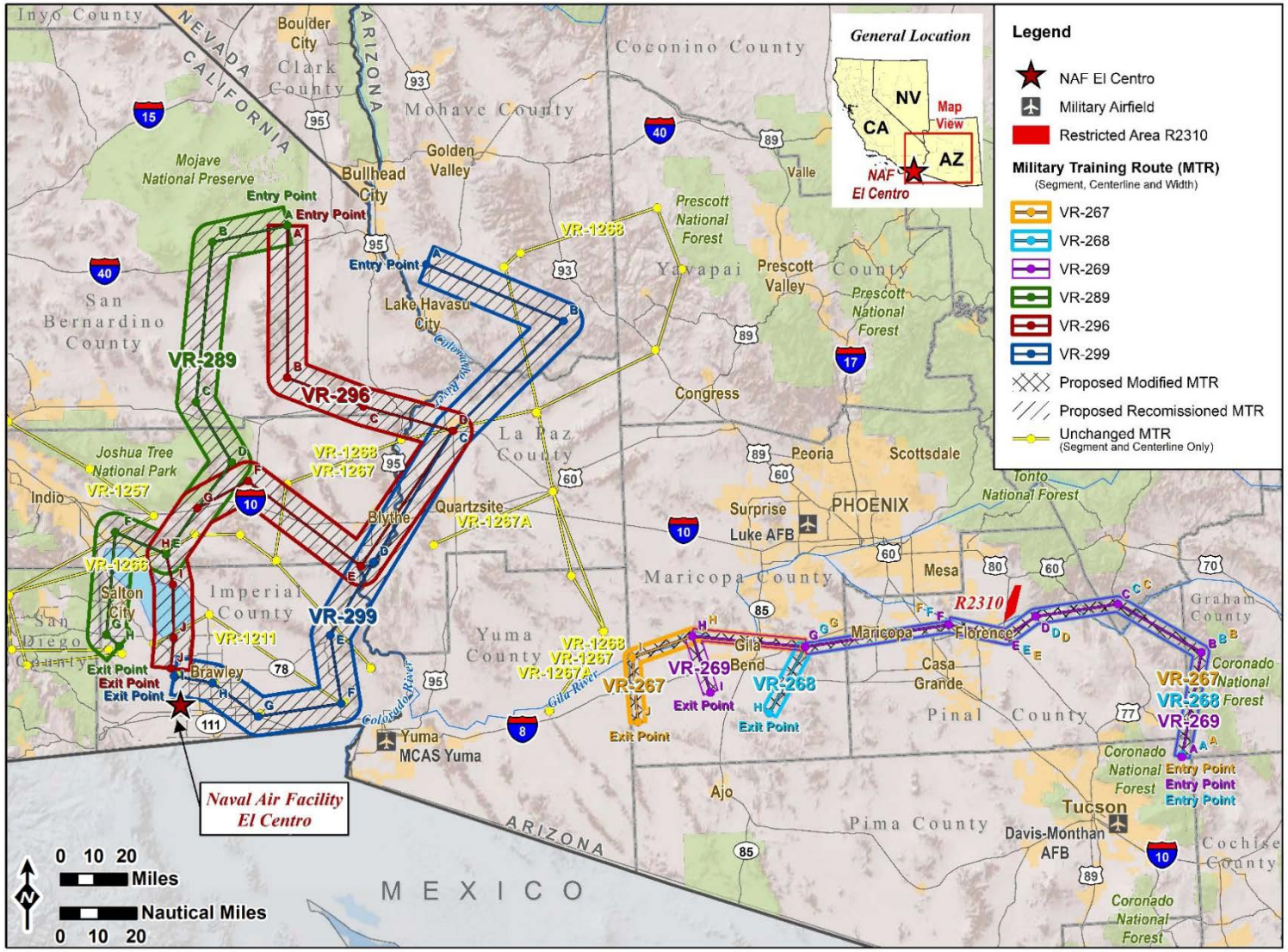

Figure 4.4-1. Proposed Airspace Configuration

4.5 Land Use

Land Use Potential Impacts:

- No Action: Minor Effects
- Proposed Action: Minor to Moderate Effects

The location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. The foremost factor affecting a proposed action in terms of land use is its compliance with any applicable land use or zoning regulations. Other relevant factors include matters such as existing land use at the project site, the types of land uses on adjacent properties and their proximity to a proposed action, the duration of a proposed activity, and its permanence.

As discussed in Section 4.1, noise levels above 65 dB CNEL (analogous to $CNEL_{mr}$) are typically considered not compatible with residential and other noise sensitive land uses such as schools or places of worship. Additionally, the U.S. Environmental Protection Agency (USEPA) acknowledges that in outdoor areas where quiet is a basis for use, it is unlikely that there would be adverse noise effects when sound levels are 55 dB day-night average sound level (DNL) (analogous to $CNEL_{mr}$) or less (USEPA 1974).

4.5.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to land use. Military overflights would continue to occur along VR-267, VR-268, VR-269, VR-1266, and VR-1267, generating noise and visual intrusions, and adverse indirect land use impacts to residences, wilderness areas, and recreational areas on lands underlying these routes. Noise levels would be greatest along VR-1266 and VR-1267, which would be as high as 62 dB $CNEL_{mr}$ under existing conditions (see Section 3.1, Noise). Similarly, visual intrusions would be greatest in areas underlying VR-1266 and VR-1267, as overflights would be greatest under these routes (see Table 2-1). Minor impacts would continue to occur to sensitive receptors along these routes in areas where quiet is a basis for use, such as wilderness areas; however, noise levels from existing aviation training would not exceed typical noise planning levels of 65 dB CNEL. Therefore, no significant impacts would occur with implementation of the No Action Alternative.

4.5.2 Proposed Action

The site or area proposed for the Proposed Action and adjacent lands define the study area for land use analyses. The Proposed Action would not require any ground-based improvements or other construction activities; however, there would be an overall increase in flight training activity compared to current conditions. Overall MTR usage by aircraft along the routes would increase by approximately 1,100 hours. The increase in training would be concentrated along the California MTRs to be re-commissioned; usage of the Arizona MTRs would not change. The route would be slightly modified to provide aviators with additional maneuver flexibility and to avoid the Air National Guard Restricted Airspace (R-2310).

4.5.2.1 Potential Impacts

The Proposed Action would not involve land use conversions and would not preclude any existing land uses. However, the compatibility of existing land use is associated with aircraft noise and low-level flight operations and high-speed flyover associated with MTR training can generate noise, vibration, and visual intrusions that can potentially impact underlying and adjacent land uses.

The Proposed Action would cause increases in instantaneous noise of up to 119 dB SEL_r along VR-289, VR-296, and VR-299. In addition, $CNEL_{mr}$ along segments of these routes which overlap with VR-1266 would be between 53 and 62 dB. Overflights along these routes would re-introduce visual intrusions

from overflights to all areas underlying the MTRs, which could result in disruption to receptors underlying the routes, particularly in rural or undeveloped settings that currently do no experience overflights. Minor to moderate impacts would occur to sensitive receptors along the California MTRs in areas where quiet is a basis for use, such as wilderness areas, as well as to other recreational users of national parks, preserves, wildlife refuges underlying the MTRs as described in Section 3.5. Increased noise and visual disturbance could disrupt recreational activities (e.g., hiking, camping, wildlife viewing, boating, fishing) occurring in these areas and result in increased complaints from users underlying the MTRs. However, noise levels from existing aviation training would not exceed typical noise planning levels of 65 dB CNEL. As discussed in Section 3.5, some of the low-level routes overlie areas incorporated within city limits, and residences in these areas and in other remote areas along the California MTRs could experience minor impacts to land use from noise. The majority of the lands underlying the low-level flight routes consist of sparsely populated areas and most of the area is public land used for a variety of wild land and open space purposes.

Single event noise levels described in terms of SEL_r would remain the same as the No Action Alternative for all segments of VR-267, VR-268, and VR-269 as shown in Table 3.1-2. Noise levels along VR-267, VR-268, and VR-269 would remain unchanged and $CNEL_{mr}$ would not exceed 48 dB along any portion of the routes. However, modification of the route would move noise exposure and visual intrusions approximately 2 miles south near Florence, Arizona and R-2310. $CNEL_{mr}$ in this range are consistent with rural areas or small towns. Impacts to land use along the remainder of the route would remain unchanged.

Public lands (e.g., national parks, preserves, wildlife refuges, and wilderness areas) are managed to protect and preserve natural and cultural resources. All of these areas also typically provide recreational opportunities that may attract people to these areas. National wildlife refuges are managed for the benefit of wildlife as the first priority; however, as noted in Section 3.5.1, actions necessary to facilitate military preparedness are permitted on or near national wildlife refuges by other federal agencies consistent with existing laws and interagency agreements. Similarly, low-level military overflights are permitted over wilderness areas as prescribed in the California Desert Protection Act and Arizona Desert Wilderness Act. Non-wilderness lands under the jurisdiction of the USFS or the Bureau of Land Management (BLM) are managed as multiple uses, which may include timber production, livestock grazing, mining, watershed protection, and recreation. The presence and use of the MTRs overlying any of these various public land areas does not impair the long-term protection, conservation, or access to the environmental resources of these lands, nor are the routes, as structured, in conflict with some of the affected public lands. While the noise associated with some low-level route use is not always consistent with the objectives to manage national parks and wilderness areas for natural quiet, the extent to which over flights on these low level routes would disrupt natural quiet is limited to the close vicinities of the paths and times of over flights. Future special land use areas, which are often designated through resource management plans prepared for the lands underlying the airspace, must be continually reviewed for their potential to have negative impacts on the effectiveness of these routes.

The Special Operating Procedures section of the DoD FLIP provides notification, operational procedures, and avoidance criteria for noise-sensitive receptors, airfields, environmentally sensitive areas, flight safety considerations, obstructions, and other areas of concern within the VRs (see Section 3.4, Airspace). As such, noise levels in such avoidance areas would likely be lower than those presented in Section 4.1.2 and discussed above. While noise levels along the California MTRs that would occur as a result of the Proposed Action would be a change from current conditions, it should be noted they would

be consistent with noise levels previously experienced prior to decommissioning of these routes in 2013. Aviation training along the Arizona MTRs under the Proposed Action would increase noise levels in the modified portions of the routes, including increases in 10 to 15 single event aircraft overflights over the portion of the route modified south near Florence, Arizona; however, $CNEL_{mr}$ along these routes would not exceed 48 dB.

Special operating procedures are also prescribed in DoD Flight Planning Information AB/1B for VR-267 to exercise caution for hang glider activity originating out of Oatman Mountain while transiting the route.

Effects of Noise on Livestock

All of the MTRs, with the exception of VR-289, occur over livestock grazing allotments (BLM 2012). To date, there have been no documented noise complaints to Navy regarding livestock within the project area. The documented effects of noise on livestock are highly variable, both in terms of the response and duration of the response. Responses to jet noise observed in livestock include reduced milk yield, increased heart rate, changes in feeding behavior and feed intake, changes in the size/weight of certain internal organs, hearing impairment, and various metabolic effects. It is extremely difficult to extrapolate effects from one study to another because the effects of any sound on livestock are dependent on numerous variables such as sound intensity, duration of exposure, rapid or gradual onset of the noise, and many others. Most of these effects have been transient and have not had permanent effect on the test subjects (Manci et al., 1988).

It is impractical to predict the individual response of every individual or herd to every overflight. Stampeding, running, and jumping are often associated with sonic booms rather than noise from subsonic flight, and all proposed aircraft in the affected airspace would fly at subsonic speeds. Although animals could react to low-altitude subsonic flight noise, wildlife appear more likely to run or stampede as a result of overflights than domestic livestock (Manci et al., 1988). Many studies on the effects of noise disturbance on cattle have either failed to show a direct cause and effect connection between aircraft noise and impacts to livestock, or have provided no evidence that aircraft overflights affect the intake, growth, or production rates of domestic animals (Cottereau, 1978). In a report to Congress, the USFS concluded that evidence from field studies of wild ungulates and laboratory studies of domestic stock indicate that the risks of damage are small (from aircraft approaches of 50 to 100 meters [164 to 328 feet]), as animals take care not to damage themselves (U.S. Forest Service, 1992). These results suggest that, although the confining of cattle could magnify animal response to aircraft overflight, there is no proven cause-and-effect link between startling cattle from aircraft overflights and abortion rates or lower milk production (USMC, 2013).

Domestic horses have been observed reacting to low-flying aircraft overflights, however, these reactions vary by study and are generally minor and temporary in nature. The USFS documented three incidents in which horses were spooked by low-flying military jets in USFWS wilderness between 1979 and 1989 resulting in injury to either horse or rider. No other aircraft-related accidents were documented on USFS land during that 10 year period (U.S. Forest Service, 1992). Other documented incidents of injury or death to horses caused by military aircraft overflights were rare (around one per year from all nationwide MTRs combined). This involved a loss of 1.22 horses per year as a result of all low level aircraft activity across the country (Bowles, 1990). Several studies have shown that horses eventually habituate to frequent aircraft overflights. In addition, while horses have been observed noticing overflights, it did not appear to affect survivability or reproductive success (Bowles, 1990).

No areas underlying or in the vicinity of the MTRs under consideration would exceed 65 dB $CNEL_{mr}$ as a result of the Proposed Action. Mammals, including domestic livestock, appear to react to noise at sound levels higher than 90 dB by startling, freezing, and/or fleeing from the sound source, but are not affected by noise levels below 80 to 90 dB. Many studies on domestic animals suggest that some species can habituate to some forms of sound disturbance, including aircraft overflights that occur on a regular basis (Manci et al., 1988). Study results also suggest that confined cattle show an increased response to aircraft overflight compared to those that are free-roaming. However, there is no proven cause-and-effect link between startling cattle from aircraft overflights and long-term detrimental effects to livestock (U.S. Forest Service, 1992).

Overall aircraft noise from training would be below 65 dB CNEL and the limits for land use compatibility would not be exceeded; therefore, implementation of the Proposed Action would not result in significant impacts to land use.

4.6 Cultural Resources

Cultural Resources Potential Impacts:

- No Action: No Effects
- Proposed Action: Minor Effects

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. Indirect impacts may include 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.

4.6.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the frequency, location, or altitude of flight operations. No changes to existing levels of noise, vibration or intrusion based effects upon cultural resources would occur. Cultural resources within the area of potential effect (APE) would continue to be managed in accordance with federal regulations. Therefore, no significant impacts to cultural resources would occur with implementation of the No Action Alternative.

4.6.2 Proposed Action

The APE for cultural resources analysis for the Proposed Action is defined as all land underlying the affected MTRs in California and Arizona.

4.6.2.1 Potential Impacts

Under the Proposed Action, effects upon cultural resources would be limited to indirect effects due to minor changes in visual and subsonic noise intrusions and negligible vibration effects from subsonic flights. No supersonic flight operations (a more significant source of vibration effects) would be conducted under the Proposed Action. The potential for a direct effect due to an aircraft crash to occur anywhere within the study area is extremely low (see Section 4.8 of this EA) and the potential for direct impact of a crash on any particular resource are not considered reasonably foreseeable. Discussions of potential effects to different categories of cultural resources are discussed below.

4.6.2.2 Archaeological Resources

Indirect effects from vibration and noise due to overflights would be transient in nature and brief in duration. Based on the lack of ground disturbance and the negligible vibration effects associated with the subsonic overflights, no significant adverse effects to archaeological resources are expected to result from the Proposed Action.

4.6.2.3 Architectural Resources

Analyses of vibration effects associated with subsonic fixed-wing aircraft (USACE 2000) have indicated that overflights above 200 feet AGL do not generate significant levels of noise-induced structural vibration. Vibration effects are more likely to occur with subsonic aircraft flights below 200 feet AGL, helicopter overflight, and/or supersonic flight operations. Furthermore, the flights are transient in nature and brief in duration. Therefore, no significant adverse effects to historic structures are expected to result from the Proposed Action.

4.6.2.4 Traditional Cultural Properties

Consultation with tribal groups described in Section 3.6 is currently underway to identify potentially affected TCPs and determine potential impacts. Appropriate discussion will be included in the Final EA prior to any decision by the Navy.

4.7 Environmental Justice

This analysis focuses on the potential for a disproportionate and adverse exposure of specific off-base population groups to the projected adverse consequences discussed in the previous sections of this chapter.

4.7.1 No Action Alternative

Environmental Justice Potential Impacts:

- No Action: Minor Effects
- Proposed Action: Minor Effects

Under the No Action Alternative, the Proposed Action would not occur and there would be no effects to Environmental Justice. Continued ongoing noise from aviation training along VR-1266, VR-1267, VR-1266, VR-1267, VR-267, VR-268, and VR-269 could continue to adversely affect minority and low-income populations located along the MTRs; however, these impacts would not be disproportionately high and would be experienced equivalently along the length of the routes. Therefore, no significant impacts would occur with the implementation of the No Action Alternative.

4.7.2 Proposed Action

The study area for environmental justice analysis for the Proposed Action is defined as the census tracts and block groups underlying the MTRs as shown in Figure 3.7-1.

4.7.2.1 Potential Impacts

Potential impacts to environmental justice populations underlying and adjacent to the MTRs would be primarily from noise disturbance as a result of military aviation training along the MTRs. As discussed in Section 4.1, Noise, flights at 300 feet AGL could experience single event noise levels of up to 119 dB as described in terms of $SEL_{r.}$ However, the maximum $CNEL_{mr}$ would be up to 62 dB along the California MTRs, and up to 48 dB along the Arizona MTRs. As discussed in Section 4.5, these levels would be below the typical noise planning thresholds of 65 dB considered incompatible with residential and other noise sensitive land uses. Training is currently conducted along the Arizona MTRs, and there would be no

change in use of these routes under the Proposed Action. Although both low-income and minority populations are located along these routes and single event noise levels could result in adverse impacts to receptors, noise levels would generally not change from existing conditions with the exception of the modified portion of the route near Florence, Arizona and the segments with modified widths and floors. No new environmental justice populations would be overflown as a result of the route modification. As discussed in Section 4.1, $CNEL_{mr}$ along these routes would not exceed 48 dB, and therefore no disproportionately high or adverse impacts to environmental justice populations would occur.

As stated in Section 1.1, the California MTRs were decommissioned in 2013, and prior to this military aviation training occurred along these routes. Training would re-introduce noise levels, air emissions, and a marginal increase in public health and safety risk into this area; however, impacts to environmental justice populations would be consistent with levels previously experienced under historical training conditions. Although adverse impacts could occur to minority and low-income populations underlying and adjacent to the MTRs, these impacts would not be disproportionate when compared to impacts to other populations along the MTRs as impacts would be equally experienced along the MTRs. Noise levels would be below the typical noise planning thresholds of 65 dB considered incompatible with residential and other noise sensitive land uses.

Implementation of the Proposed Action would not cause disproportionately high and adverse human health or environmental effects on any minority or low-income populations. Overall impacts to environmental justice populations would be minor.

4.8 Public Health and Safety

The safety and environmental health analysis contained in the respective sections addresses issues related to the health and well-being of military personnel and civilians living on or in the vicinity of the MTRs. Specifically, this section provides information on hazards associated with military aviation training. Additionally, this section addresses the environmental health and safety risks to children.

Public Health and Safety Potential Impacts:

- No Action: No Effects
- Proposed Action: Minor Effects

4.8.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to public health and safety. Ongoing aviation training would have an extremely low potential for aircraft mishap and impact to public health and safety. Therefore, no significant impacts would occur with implementation of the No Action Alternative.

4.8.2 Proposed Action

The ROI for Public Health and Safety includes both the airspace within the MTRs as well as the areas underlying and adjacent to the MTRs.

4.8.2.1 Potential Impacts

Under the Proposed Action, military aviation training would be re-introduced to the California MTRs, and overall military aviation training would increase by approximately 1,100 hours per year. The increase in aviation training would occur along the California MTRs, particularly by T-45 Goshawk and MV-22 Ospreys. Increases in training can result in an increased potential for mishap along the MTRs or threat to flight safety related to the public or environment. Potential mishap can occur from equipment

failure, pilot error, BASH, dust, or conflicts between civilian visual flight rule (VFR) pilots and military aircraft, or direct conflicts between military aircraft. The FY14 Navy Safety Center Annual Mishap Overview provides analysis of Navy mishap experience for aviation training. Navy flight mishap data and potential increase in mishaps under the Proposed Action is displayed in Table 4.8-1.

Table 4.8-1. Potential Mishap Rates under Proposed Action

Mishap Rate[1]	*Mishap Severity (per 100,000 Flying Hours)*		
	Class A[2]	*Class B*[3]	*Class C*[4]
10-Year Rate for all Navy Aviation Training	1.8	2.2	7.2
Mishap Potential from Baseline Training	0.022	0.027	0.09
Mishap Potential from Proposed Training	0.042	0.052	0.17
Change in Mishap Potential	0.02	0.025	0.08

1. Mishap rate calculated by multiplying the 10-Year, Navy-wide cumulative mishap rate by the hourly utilization data from Table 2-2 and dividing by 100,000.
2. A Class A mishap is a mishap with the intent for flight and where the total cost of damage is $2,000,000 or more and/or involves destroyed aircraft and/or fatal injury and/or permanent total disability.
3. A Class B mishap is a mishap with the intent for flight and where the total cost of damage is between $500,000 and $2,000,000 and/or involves permanent partial disability and/or inpatient hospitalization of three or more personnel.
4. A Class C mishap is a mishap with the intent for flight and where the total cost of damage is between $50,000 and $500,000 and/or involves nonfatal injury resulting in loss of time from work beyond day/shift when the injury occurred.

Generally, the occurrence of aircraft mishap is extremely rare; however, aircraft mishap events are highly visible and publicized events. As shown in Table 4.8-1, based on existing Navy-wide mishap potential rates, the increase in potential for mishap during aviation training is minimal, and the Proposed Action would not have a perceptible effect on the overall likelihood for aircraft mishap. Standard operating procedures, including scheduling requirements are prescribed in DoD Flight Planning Information AP/1B that would de-conflict any direct conflict with other military aircraft operating in the region. In addition, conflicts with civilian aircraft are not anticipated to significantly affect safety due to the following reasons:

- Civilian pilots in the area are accustomed to sharing airspace with military traffic on existing low-level routes in the region.
- The local air traffic control center would transmit the location and altitude of all known civilian aircraft to all military aircraft operating in the airspace by use of radar and transponder interrogators.
- All pilots are trained to see and avoid aircraft at the speeds they would be traveling within the affected airspace.
- Military aircraft training along the MTRs would be equipped with radar and air-to-air interrogators capable of detecting other aircraft at distances in excess of 60 miles, which would allow pilots to undertake necessary avoidance maneuvers before the civilian pilot is aware of the military aircraft's presence.
- The FAA maintains that checking Notices to Airmen (NOTAM) has become an expected preflight action that is required by Federal Aviation Regulation 91.103

- The Proposed Action would predominately maintain existing flight conditions along the Arizona MTRs, and re-store aviation training along the California MTRs in an area where training has historically occurred.

The remote possibility of mishap could occur if some private aviators (particularly pilots operating from remote airstrips) operate within or around the MTRs that:

- do not have access to the internet or phone and therefore cannot check the notices from the FAA to pilots of conditions that could pertain to their flight (known generically as NOTAM);
- do not have access to a phone to call the unit or Western Area Defense Sector prior to taking off;
- do not fly out of an airport/airfield with a flight service desk; or
- unknowingly fly into the MTRs during training. In these situations the same measures which have prevented accidents from occurring on the low level routes to date (e.g., see and avoid; weather restrictions imposed on low-level training by CNATRA, FRS, and other similar military aircraft; and the use of onboard radar and interrogators) would be relied upon to ensure safety within the MTRs.

In the unlikely event that a mishap did occur along the MTRs, the potential for an aircraft to hit developed property or an inhabited area is very low as lands underlying the MTR routes are largely remote. In addition, the Special Operating Procedures section of the DoD FLIP provides notification, operational procedures, and avoidance criteria for sensitive receptors (e.g., schools, hospitals, residences), flight safety considerations, obstructions, and other areas of concern within the VRs (see Section 3.4, Airspace) to further avoid developed areas. The initial response would be the responsibility of the civilian authorities nearest the crash site. They would provide emergency services such as fire suppression, police, and medical assistance. Civilian authorities should notify the nearest military installation of the accident, who would then notify the nearest major Navy installation. Upon notification of the accident, appropriate response personnel would be deployed that would assists in matters of site security, fire suppression, medical evacuation, accident evaluation and investigation, and protective measures. Potential impacts to pilot safety could occur from bird strikes, as BASH risk is high at altitudes flown under the Proposed Action. However, BASH risk would be mitigated through adherence to Navy BASH management practices as described in Section 3.8, including preflight review and use of wildlife advisories to modify training as necessary.

In accordance with EO 13045, significant environmental health and safety risks to children would result if the project generates effects that would disproportionately affect populations of children (i.e., local residences or schools) within the study area. While a training mishap poses the potential for injury or loss of life, as described above the likelihood of a mishap from military training is extremely low and would not result in a disproportional safety hazard for children. In addition, based on the analysis of impacts presented in Sections 4.1 through 4.7, there are no environmental health and safety risks associated with the Proposed Action, including increased noise levels, which would disproportionately affect children. Aircraft noise is short term in duration, and Special Operating Procedures to avoid sensitive receptors where children would be located (e.g., schools, hospitals, residences) would limit adverse environmental health and safety impacts to children. Therefore, no significant impacts to environmental health or safety risks to children would result from implementation of the Proposed Action.

As the impacts discussed above would not result in a substantial increase in risk of mishap, implementation of the Proposed Action would not result in significant impacts to public health and safety.

4.9 Summary of Potential Impacts to Resources

A summary of the potential impacts associated with the Proposed Action and the No Action Alternative is presented in Table 4.9-1.

Table 4.9-1. Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action*
Noise	There would be no change in baseline noise levels along VR-1266, VR-1267, VR-267, VR-268, and VR-269. Some instantaneous occurrences of up to 119 dB SEL_r would occur, but existing $CNEL_{mr}$ noise conditions would remain below 65 dB; therefore, no significant impacts would occur.	Instantaneous occurrences of up to 119 dB SEL_r would occur along VR-289, VR-296, and VR-299, but existing $CNEL_{mr}$ noise conditions would remain below 65 dB. There would be no change to existing noise conditions along VR-267, VR-268, and VR-269; however, noise exposure would be shifted approximately 2 miles south near the modified portion of the route. Flights in this area are limited to at least 300 feet AGL and $CNEL_{mr}$ would remain below 48 dB. Therefore, no significant impacts would occur.
Biological Resources	Ongoing aviation training along VR-1266, VR-1267, VR-267, VR-268, and VR-269 would continue to result in limited startle effects to wildlife and rare occurrences of avian mortality from bird-aircraft strikes. Overall impacts to wildlife species would be minor; therefore, no significant impacts would occur.	No substantial increase in avian mortality from bird-aircraft strike is expected as a result of the Proposed Action. Introduction of noise elements and low-level overflights to areas that do not currently experience military overflights could temporarily disturb wildlife; however, average noise levels would not be likely to adversely affect wildlife reproduction or survivorship, and it is likely that wildlife would become accustomed to such noise levels. Therefore, no significant impacts would occur.
Air Quality	Air emissions would continue from ongoing military aviation training resulting in continued minor impacts; however, there would be no change from baseline air quality and these levels would not exceed *de minimis* threshold levels. Therefore, no significant impacts to air quality or air resources would occur with implementation of the No Action Alternative.	Air emissions would occur from increases in aviation training; however, the maximum potential emissions in any area would be below the *de minimis* thresholds for all areas and the General Conformity Rule would not apply. Therefore, no significant impacts would occur.
Airspace	The Navy would continue to operate identically to the baseline condition, and traffic congestion on VR-1266 and VR-1267 would continue as the Navy tries to meet its Fleet Response Training Plan. Aircraft utilizing VR-267, VR-268, and VR-269 (AZ) would continue to be required to terminate prior to entering Restricted Area R-2310 when in use. Impacts to civilian aircraft would	No significant impacts to airspace management would result from implementing the Proposed Action. There would be no increases in the annual use of proposed VR-289, VR-296, and VR-299 beyond previously safe levels, and floor altitudes along these routes would remain the same as those flown prior to 2013. Annual use of VR-267, VR-268, and VR-269 would not change. Flight activity on the MTRs

Table 4.9-1. Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action*
	remain unchanged. Therefore, no significant impacts to would occur.	would continue to be available through the FAA's Flight Service Station by dialing 1-800-WX-BRIEF. Therefore, implementation of the Proposed Action would not result in significant impacts to airspace.
Land Use	Minor land use impacts from noise would continue to occur from military aviation training in areas underlying VR-267, VR-268, VR-269, VR-1266, and VR-1267; however, noise levels from existing aviation training would not exceed typical noise planning levels of 65 dB CNEL. Therefore, no significant impacts would occur.	Minor to moderate land use impacts from noise would occur from military aviation training in areas underlying VR-289, VR-296, and VR-299, VR-267, VR-268, and VR-269; however, noise levels from increased aviation training would not exceed typical noise planning levels of 65 dB CNEL. Therefore, no significant impacts would occur.
Cultural Resources	Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the frequency, location, or altitude of flight operations. No changes to existing levels of noise, vibration or intrusion based effects upon cultural resources would occur. Cultural resources within the area of potential effect (APE) would continue to be managed in accordance with federal regulations. Therefore, no significant impacts to cultural resources would occur with implementation of the No Action Alternative.	Under the Proposed Action, effects upon cultural resources would be limited to minor changes in visual and subsonic noise intrusions and negligible vibration effects from subsonic flights. No supersonic flight operations would be conducted under the Proposed Action. Based on the lack of ground disturbance and the negligible vibration effects associated with the subsonic overflights, no significant adverse effects to archaeological resources are expected to result from the Proposed Action. Consultation with tribal groups is currently underway to identify potentially affected TCPs and determine potential impacts. Appropriate discussion will be included in the Final EA prior to any decision by the Navy.
Environmental Justice	Continued ongoing noise from aviation training along VR-1266, VR-1267, VR-1266, VR-1267, VR-267, VR-268, and VR-269 could continue to adversely affect minority and low-income populations located along the MTRs; however, these impacts would not be disproportionately high and would be experienced equivalently along the length of the routes. Therefore,	Although minor impacts could occur to minority and low-income populations underlying and adjacent to the MTRs, noise levels would be below the typical noise planning thresholds of 65 dB considered incompatible with residential and other noise sensitive land uses. Implementation of the Proposed Action would not cause disproportionately high and adverse human health or

Table 4.9-1. Summary of Potential Impacts to Resource Areas

Resource Area	*No Action Alternative*	*Proposed Action*
	no significant impacts would occur with the implementation of the No Action Alternative.	environmental effects on any minority or low-income populations.
Public Health and Safety	Ongoing aviation training would have an extremely low potential for aircraft mishap and impact to public health and safety. Therefore, no significant impacts would occur with implementation of the No Action Alternative.	Increased aviation training has the potential for aircraft mishap that could impact public health and safety due to equipment failure, pilot error, bird-aircraft strike hazard, dust, conflicts between civilian VFR pilots and military aircraft, or direct conflicts between military aircraft. However, the potential for these occurrences is extremely low, and the Proposed Action would not result in a substantial increase in risk of mishap. Therefore, implementation of the Proposed Action would not result in significant impacts to public health and safety.

AGL = above ground level; BASH = Bird/Animal Air Strike Hazard; CNEL = community noise exposure level; $CNEL_{mr}$ = Onset-Rate Adjusted Monthly Community Noise Equivalent Level; dB = decibels; FAA = Federal Aviation Administration; MTR = Military Training Route; SEL_r = Onset-Rate Adjusted Sound Exposure Level; VFR = Visual Flight Rules; VR = Visual Route

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5 Cumulative Impacts

This section: 1) defines cumulative impacts, 2) describes past, present, and reasonably foreseeable future actions relevant to cumulative impacts, 3) analyzes the incremental interaction the Proposed Action may have with other actions, and 4) evaluates cumulative impacts potentially resulting from these interactions.

5.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of National Environmental Policy Act (NEPA), Council on Environmental Policy (CEQ) regulations, and CEQ guidance. Cumulative impacts are defined in 40 Code of Federal Regulations (CFR) 1508.7.

The impact on the environment that results from the incremental impact of the action when added to the other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

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

In addition, CEQ and U.S. Environmental Protection Agency (USEPA) have published guidance addressing implementation of cumulative impact analyses—Guidance on the Consideration of Past Actions in Cumulative Effects Analysis (CEQ, 2005) and Consideration of Cumulative Impacts in USEPA Review of NEPA Documents (USEPA, 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 impacts 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 in close proximity 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 impacts. To identify cumulative impacts, 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?

5.2 Scope of Cumulative Impacts Analysis

The scope of the cumulative impacts 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 impacts analysis. In general, the study area will include those areas previously identified in Chapter 4 for the respective resource areas. The time frame for cumulative impacts centers on the timing of the Proposed Action.

Another factor influencing the scope of cumulative impacts 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 Studies (EIS)s and EAs, management plans, land use plans, and other planning related studies.

5.3 Past, Present, and Reasonably Foreseeable Actions

This section will focus on past, present, and reasonably foreseeable future projects at and near the Military Training Routes (MTR)s under consideration in this EA. In determining which projects to include in the cumulative impacts analysis, a preliminary determination was made regarding past, present, or reasonably foreseeable actions. Specifically, using the first fundamental question included in Section 5.1, 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 impacts 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 inform decision-making. Note that projects and documents reviewed considered management plans associated with national forests, wilderness areas, and national monument lands underlying the MTRs flown under the Proposed Action (see Section 3.5, Land Use); however, no actions were identified that would result in cumulative effects. Projects included in this cumulative impacts analysis are listed in Table 5-1 and briefly described in the following subsections (see Figure 5.3-1).

Table 5-1. Cumulative Action Evaluation

Action	***Level of NEPA Analysis Completed***
California MTRS	
Past Actions	
Genesis Solar Energy Project	Final EIS and Record of Decision (ROD)
Present and Reasonably Foreseeable Future Actions	
Quartzsite Solar Energy Project	Final EIS and ROD
Seville Solar Farm Complex	Final EIR
Blythe Solar Power Project	Final EIS and ROD
Rancho Los Lagos Community Development	Final EIR
West Chocolate Mountains Renewable Energy Evaluation Area	Final EIS and ROD
Southern California Metroplex Project	Draft EA
Arizona MTRs	
Past Actions	
Sandstone Solar Power Project	Final EA

Table 5-1. Cumulative Action Evaluation

Action	*Level of NEPA Analysis Completed*
Present and Reasonably Foreseeable Future Actions	
Maricopa Solar Park Project	Scoping Completed; EIS Under Development
Regional Projects	
Past Actions	
U.S. Navy F-35C West Coast Homebasing Project[1]	Final EIS and ROD
U.S. Navy West Coast Basing of the MV-22[1]	Final EIS and ROD

1. Note that while the basing location for the F-35C and MV-22 is outside of the project area (and not shown in Figure 5.3-1), these units could utilize the MTRs considered under the Proposed Action.

5.3.1 Past Actions

California MTRs

The Genesis Solar Energy Project is a concentrated solar electric generating facility located in Riverside County, California that has been operational since October 2014. The project consists of two independent solar electric generating facilities with a nominal net electrical output of 125 megawatts (MW) each. Electrical power is produced via solar steam generators that receive heated transfer fluid from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The project is located approximately 25 miles west of the city of Blythe, California, on lands managed by the BLM in an undeveloped area of the Sonoran Desert (California Energy Commission, 2016). This project underlies VR-296.

Arizona MTRs

The Sandstone Solar Power Plant is a 45 MW photovoltaic solar plant located on a 300 acre parcel near Florence, Arizona. The project was built on previously disturbed agricultural land near the intersection of Hunt Highway and Attaway Road. Facilities under the jurisdiction of the Bureau of Indian Affairs San Carlos Irrigation Project border the solar plant site to the north, east, and south. The electric system required road, wireline, and conduit crossings of the North Side Canal, Well Site #11 (Arizona Newspapers Association, 2015). The project would underlie VR-267, VR-268, and VR-269.

Regional

The U.S. Navy F-35C West Coast Homebasing Project would provide facilities and functions of the west coast of the U.S. to support homebasing F-35C aircraft in the Navy Pacific Fleet in order to replace aging Navy Pacific Fleet F/A-18 Hornet aircraft with F-35C aircraft while meeting pilot training and readiness requirements. Seven Pacific Fleet F/A-18 squadrons (70 total aircraft) currently based at Naval Air Station (NAS) Lemoore would progressively transition to the new F-35C aircraft beginning in 2015 with the transition to be complete by 2028. The plan would also involve the establishment no earlier than 2017 of an F-35C FRS consisting of approximately 30 F-35C aircraft to meet the requirements for training Navy pilots. A ROD was signed in October 2014 to base the F-35C at NAS Station Lemoore (Navy 2014).

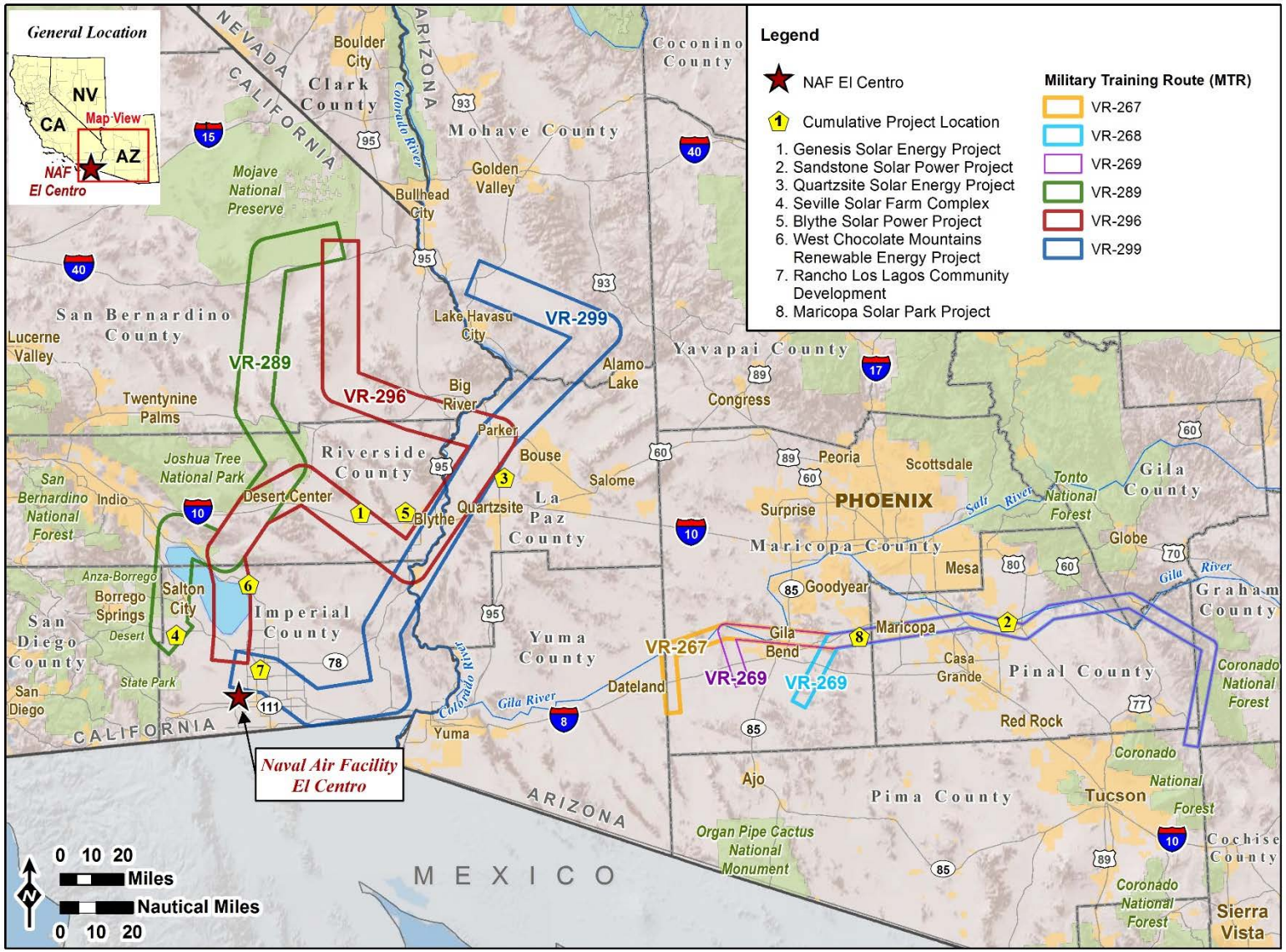

Figure 5.3-1. Past, Present, and Reasonably Foreseeable Future Actions Within or Near the MTRs

The Navy West Coast Basing of the MV-22 addressed in the Final EIS (Navy 2009) would include: basing up to 10 squadrons (120 aircraft) of the MV-22 on the West Coast; construction and/or renovation of airfield facilities necessary to accommodate and maintain the MV-22 squadrons; and conducting MV-22 readiness and training operations and special exercise operations to attain and maintain proficiency in the operational employment of the MV-22. The proposed action would also replace nine helicopter squadrons (114 aircraft) currently authorized for basing on the West Coast. The MV-22 would use seven MTRs located within southern California and western Arizona as part of their training operations. These include IR-216, IR-217, IR-218, VR-1266, VR-1267, VR-1267A, and VR-1268. The introduction of up to 10 squadrons of the MV-22 to the training environment along the MTRs would result in an increase of an estimated 2,085 MTR sorties per year, with an increase in sorties per MTR ranging from 18 percent to over 2,700 percent compared to existing conditions (Navy, 2009a). A ROD for the Preferred Alternative to split base at MCAS Miramar and MCAS Camp Pendleton in San Diego County, California was signed on November 18, 2009 (Navy, 2009b).

5.3.2 Present and Reasonably Foreseeable Actions

California MTRs

The Quartzsite Solar Energy Project is a proposed concentrating solar plant approximately 10 miles north of Quartzsite, Arizona in La Paz County, Arizona. The project would include a circular solar array with a radius of 4,650 feet and a 653-foot solar collecting tower, as well as other energy-generating infrastructure. The project is directly adjacent to VR-296 and VR-299 (Western Area Power Administration, 2011).

The Seville Solar Farm Complex is a solar generation facility capable of producing approximately 135 MW on approximately 1,200 acres of private land in the west-central Imperial County off of Highway 78. The project also includes approximately 3 miles of transmission line for interconnection to the existing IID Anza Substation, approximately 2 miles of which would be constructed atop an existing distribution line. This project underlies the southern portion of VR-289 (Imperial County, 2014).

The Blythe Solar Power Project is a concentrated solar thermal electric generating facility with four adjacent, independent, and identical solar plants of 250 MW nominal capacity each. Electrical power is produced via solar steam generators that receive heated transfer fluid from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The project site is located approximately 2 miles north of I-10 and 8 miles west of the City of Blythe in an unincorporated area of Riverside County, California. The area inside the project's security fence, within which all project facilities will be located, will occupy approximately 5,950 acres (California Energy Commission, 2016). The project is located adjacent to VR-296.

The West Chocolate Mountains Renewable Energy Evaluation Area established an energy development area that would allow for a maximum of 29,758 acres (9,066 acres on BLM land) to be developed for solar energy (including an estimated 3,306 MW of power production), as well as geothermal production. The Evaluation Area designation allows solar energy development applications to qualify for priority processing. The Evaluation Area is located along the eastern edge of the Salton Sea, adjacent to the Chocolate Mountains Aerial Bombing Gunnery Range, and underlying portions of VR-296 (BLM, 2013).

The Rancho Los Lagos Community Development includes construction of residential, commercial, and light industrial components in an unincorporated area of Imperial County (Imperial County, 2012). The Rancho Los Lagos Specific Plan encompasses 1,076 acres of unincorporated land adjacent to the City of

Brawley in Imperial County. The project is designed as a pedestrian-oriented residential community where parks, schools and other facilities would be within a short walk of residences. The project establishes that a maximum number of 3,830 dwelling units would be developed. The project has four main components: a family residential area; an active adult, age restricted residential area; a golf course; and a business park. Within these major areas are other proposed uses, including warehouse industrial, commercial, retail, mixed use, parks, and schools. As phases are developed, infrastructure and public facilities would be developed concurrently and would be appropriate based on the percentage of residential development within the respective phase. The project would be located approximately 14 miles northeast of NAF El Centro and underlies VR-299.

The Southern California Metroplex Project would include implementation of procedures for arriving and departing aircraft operating under Instrument Flight Rules at study area airports within southern California. These procedures would improve the predictability and segregation of routes, as well as increase flexibility in providing air traffic services. This action would not increase the number of aircraft operations (i.e., flights) or require physical construction of facilities such as additional runways or taxiways. No study area airports underlie the MTRs; however, the general study area boundary lies within VR-289 and VR-296.

Arizona MTRs

The Maricopa Solar Park Project is a proposed 300 MW photovoltaic solar power plant proposed to be constructed on approximately 1,730 acres in Maricopa County, Arizona. The project is located just south of the town of Mobile in Maricopa County, Arizona and west of the town of Maricopa in Pima County, Arizona, and 30 miles southwest of Phoenix, Arizona. The project would be constructed on BLM-administered lands on the Sonoran Desert National Monument (BLM, 2014). The project would underlie VR-267, VR-268, and VR-269.

5.4 Cumulative Impact Analysis

Where feasible, the cumulative impacts 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 impacts related to this EA where possible. The analytical methodology presented in Chapter 4, which was used to determine potential impacts to the various resources analyzed in this document, was also used to determine cumulative impacts.

5.4.1 Noise

5.4.1.1 Description of Geographic Study Area

The Region of Influence (ROI) for cumulative noise impacts includes the areas underlying the MTRs.

5.4.1.2 Relevant Past, Present, and Future Actions

All solar projects identified in Section 5.3 could introduce temporary noise impacts near their construction sites.

5.4.1.3 Cumulative Impact Analysis

Cumulative noise impacts from past, present, and future actions identified in Section 5.3 would be less than significant because they would not appreciably alter the noise environment underlying the MTRs.

Construction of these projects would result in temporary noise impacts from earth moving, equipment usage, and traffic; however, these impacts would be short-term and cease following construction. All solar projects identified in Section 5.3 are located away from major population areas in rural areas, and would only result in minor noise impacts from temporary increases in construction traffic. The Rancho Los Lagos Community development is located adjacent to the City of Brawley near a residential area and would represent new sensitive receptors that could be exposed noise impacts from overflights, although construction or operation is not anticipated to result in long term changes to the noise environment. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant noise impacts within the ROI.

5.4.2 Biological Resources

5.4.2.1 Description of Geographic Study Area

The ROI for cumulative biological resource impacts generally includes southeastern California and southwestern Arizona within the general vicinity of the MTRs under consideration.

5.4.2.2 Relevant Past, Present, and Future Actions

All solar projects discussed in Section 5.3 have the potential to contribute to cumulative impacts to biological resources from the possible increase in avian mortality. Homebasing of the MV-22 and F-35 could result in slight increases in avian mortality from modified and increased flight operations in the region.

5.4.2.3 Cumulative Impact Analysis

As discussed in Section 5.4.8, there has been general public concern at solar sites that installation of large solar power generating facilities (both photovoltaic (PV) and other technologies) can result in increased attraction of birds and other wildlife, potentially resulting in increased bird mortality due to the “lake effect”. “Lake effect” is where birds may mistake PV panels for a body of water. Although PV panels are inherently absorptive (i.e., non-reflective), they do reflect horizontally polarized light similar to the way a lake’s smooth, dark surface horizontally polarizes reflected sunlight and skylight. This feature may confuse birds that use polarized light for orientation or behavioral cues (Desert Renewable Energy Conservation Plan Independent Science Advisors, 2010). The U.S. Fish and Wildlife Service (USFWS) Forensics Lab concluded in 2014 that birds attracted to water may mistake the sky reflected in PV panels or horizontal polarized light source as a body of water (USFWS, 2014).

While some mortality of individual birds could occur from a “lake effect”, it is unlikely to be statistically significant compared to other common causes of avian mortality. Existing studies have evaluated bird fatality counts of less than 100 per site (with an unknown percentage attributable to lake effect), while, for comparison purposes, bird fatalities associated with impacts with plate-glass windows are estimated to number in the hundreds of millions nationwide.

Increased regional flights of MV-22 and F-35 could also result in some increased avian mortality; however, these impacts would be on a large scale and would not result in a substantial loss of bird populations. Modified procedures for arriving and departing aircraft under the Southern California Metroplex Project would occur above 3,000 feet, and are not expected to result in increased impacts to birds. As discussed in Section 4.2, no significant impacts to bird species are anticipated under the Proposed Action. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts to biological resources within the ROI.

5.4.3 Air Quality

5.4.3.1 Description of Geographic Study Area

The ROI for air quality cumulative impacts includes the Air Quality Control Regions (AQCR)s the MTRs are located within, including the Southeast Desert, San Diego, Central Arizona, Mohave-Yuma, Maricopa, Southeast Arizona Intrastate, and Pima Intrastate AQCRs.

5.4.3.2 Relevant Past, Present, and Future Actions

All solar projects identified in Section 5.3 would generate short term air emissions from construction equipment and earth moving activities. Implementation of the Southern California Metroplex Project and homebasing of the MV-22 and F-35 would result in long-term increases in regional air emissions from flight operations.

5.4.3.3 Cumulative Impact Analysis

The States of California and Arizona take into account the effects of all past, present, and reasonably foreseeable emissions during the development of their State Implementation Plans. The states account for all significant stationary, area, and mobile emission sources in the development of these plans. Similarly, regional monitoring is conducted to evaluate existing ambient air quality in the states of California and Arizona, which account indirectly for smaller, discrete emission sources such as from increased regional flights of the MV-22 and F-35. Estimated emissions generated by the Proposed Action would be *de minimis* and it is understood that activities of this limited size and nature would not contribute significantly to adverse cumulative effects to air quality. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant air quality impacts within the ROI.

5.4.4 Airspace

5.4.4.1 Description of Geographic Study Area

The ROI for airspace cumulative impacts includes the airspace occupied by the MTRs under consideration within this EA as described in Appendix D.

5.4.4.2 Relevant Past, Present, and Future Actions

All projects discussed in Section 5.3 have the potential to contribute to cumulative impacts to airspace from solar energy production operations. Implementation of the Southern California Metroplex Project would result in modified procedures for arriving and departing civilian aircraft. Homebasing of the MV-22 and F-35 would result in regional increases in military flight training.

5.4.4.3 Cumulative Impact Analysis

Cumulative adverse impacts to airspace use could occur from the introduction of possible sources of glint, glare, and BASH hazard, which could adversely affect aviator safety during airspace use (see Section 5.4.8). However, overall impacts to public health and safety are anticipated to be minor; therefore, impacts to airspace use would also be minor.

Other military airspace activities on other MTRs intersecting the MTRs under consideration in this EA would be scheduled accordingly to avoid confliction. In addition, flight activity on the MTRs would continue to be available to private aviators through the Federal Aviation Administration (FAA)'s Flight Service Station by dialing 1-800-WX-BRIEF and via NOTAM. Airspace conflicts with other military aviation

activities in the area would be de-conflicted by standard operating procedures, flight rules, and other avoidance, design, and scheduling practices discussed in Section 3.4. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant airspace impacts within the ROI.

5.4.5 Land Use

5.4.5.1 Description of Geographic Study Area

The ROI for land use cumulative impacts includes the land use underlying the MTRs under consideration within this EA.

5.4.5.2 Relevant Past, Present, and Future Actions

All present and future solar projects identified in Section 5.3 could introduce temporary noise impacts near their construction sites, which could indirectly affect land use. In addition, the Genesis Solar Energy Project, West Chocolate Mountains Renewable Energy Evaluation Area, and Maricopa Solar Park Project occur on or directly adjacent to BLM-administered lands. Homebasing of the MV-22 and F-35 would result in regional increases in military overflights.

5.4.5.3 Cumulative Impact Analysis

As discussed in Section, 5.4.1.1, cumulative noise impacts from projects identified in Section 5.3 would be short term and minor, and would be located in primarily undeveloped areas; therefore, indirect impacts on land use from noise would be negligible. The solar projects identified in Section 5.4.5.2 would be located on BLM-lands that could provide recreational function. The combination of re-introduced aviation training in these areas and introduction of solar infrastructure to previously undeveloped areas may further degrade the recreational character of the specific areas near the infrastructure; however, these actions are not anticipated to substantially alter the existing conditions or use of the larger area. Impacts from MV-22 and F-35 overflights on nearby MTRs due to homebasing actions could result in cumulative adverse land use impacts to recreation areas and overall rural character when considered on a regional scale; however, these effects are not anticipated to substantially degrade land use compatibility in the region. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

5.4.6 Cultural Resources

5.4.6.1 Description of Geographic Study Area

The study area for cultural resources analysis for cumulative impacts is defined as all land underlying the affected MTRs in California and Arizona.

5.4.6.2 Relevant Past, Present, and Future Actions

All solar projects discussed in Section 5.3 have the potential to contribute to cumulative impacts to cultural resources due to ground disturbance activities.

5.4.6.3 Cumulative Impact Analysis

Effects on cultural resources within the MTRs would be minimal as described above and would not result in any adverse effects. Based on the lack of ground disturbance and the negligible vibration effects associated with the subsonic overflights, no significant impacts to archaeological resources are

expected to result from the Proposed Action. Therefore, implementation of the Proposed Action combined with the past, present and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

5.4.7 Environmental Justice

5.4.7.1 Description of Geographic Study Area

The ROI for the Proposed Action includes the areas underlying the MTRs. As discussed in Section 3.8, minority populations consist primarily of Hispanic or Latino, Black or African American, or American Indian populations.

5.4.7.2 Relevant Past, Present, and Future Actions

All present and future solar projects identified in Section 5.3 could introduce temporary noise impacts near their construction sites, which could adversely impact environmental justice populations in these areas.

5.4.7.3 Cumulative Impact Analysis

Temporary noise, air quality, and land use impacts could occur to environmental justice populations located in Brawley, California and along transportation routes to the solar projects identified in Section 5.3. However, these impacts would be temporary and minor, and would not result in any disproportionately high or adverse impacts on minority or low-income populations. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

5.4.8 Public Health and Safety

5.4.8.1 Description of Geographic Study Area

The ROI for public safety includes the airspace within the MTRs, as well as the area underlying and adjacent to the MTRs in California and Arizona. All solar projects discussed in Section 5.3 have cumulatively increased or would cumulatively increase the potential for glint and glare within the ROI. In addition, the expansion of the Rancho Los Lagos Community Development has increased development underlying the MTRs.

5.4.8.2 Relevant Past, Present, and Future Actions

All projects discussed in Section 5.3 have the potential to contribute to cumulative impacts to public health and safety from solar energy production operations and regional homebasing and training of the MV-22 and F-35.

5.4.8.3 Cumulative Impact Analysis

Cumulative public health and safety impacts that would occur with implementation of the alternatives would include increased potential for glint and glare and BASH hazards from increased solar panel infrastructure, as well as increased potential for mishap in the region due to increased sorties from MV-22 and F-35 overflights.

Increased solar panel construction would result in cumulative public health and safety concerns, as it is possible for solar power facilities to interfere with airport communications systems by either electrical interference or by acting as a physical obstacle between the communicator and receiver.

Solar panels could also result in increased glint (i.e., momentary flash of bright light) and glare (i.e., a continuous source of bright light) along the MTRs, which could result in long term safety concerns for pilots flying over these areas. The FAA has determined that glint and glare from solar energy systems could result in a hazard to pilots and/or air traffic control facilities and compromise the safety of the air transportation system. In 2013, the FAA issued an interim policy in partnership with the Department of Energy to establish a standard for measuring glint and glare, and clear thresholds for when glint and glare would affect aviation safety (FAA, 2013).The FAA policy requires the project sponsor to demonstrate that the proposed solar energy system meets the following standards:

- No potential for glint or glare in the existing or planned airport traffic control tower, and
- No potential for glare or ‘‘low potential for after-image’’ along the final approach path for any existing landing threshold or future landing thresholds. The final approach path is defined as 2 miles from 50 feet above the landing threshold using a standard three-degree glide path.

Solar projects could result in cumulative adverse impacts to military aviation training from increased glint and glare; however, adherence to FAA policy would ensure these impacts are minor.

No cumulative increases to BASH potential would be expected. However, there has been general public concern at solar sites that installation of large solar power generating facilities (both PV and other technologies) can result in increased attraction of birds and other wildlife, potentially resulting in increased BASH risks. These concerns are based on direct observations of birds perching upon solar equipment arrays or seeking shade beneath them, as well as the possibility that birds may mistake solar arrays for surface water bodies while in flight (“lake effect”). Studies conducted on bird attraction to solar infrastructure have predominately observed birds perching, and not posing a threat to aircraft (U.S. Department of Agriculture, 2013). Other studies, including those on the “lake effect”, have either been inconclusive or require additional data or research (Navy, 2015). If there were an increase in BASH potential, it would be mitigated by continued adherence to BASH procedures used at applicable installations to minimize incidences. For example, BASH risk increases during seasonal migration patterns so special briefings are provided to Navy pilots and low altitude flights and some training types are limited (e.g., multiple approaches, closed pattern work) at the airfield during periods of increased BASH potential. As a result, there would be no adverse impacts to public health or safety from BASH from the Proposed Action.

Increased sorties on regional MTRs due to MV-22 and F-35 homebasing could result in a cumulative increase in mishap potential; however, as show in Section 4.8, the potential for Navy aircraft mishap is low and MV-22 and F-35 overflights would have marginal effects on the overall likelihood for aircraft mishap. Therefore, no significant adverse impacts would occur from MV-22 or F-35 homebasing.

While the potential increase in residential development underlying the MTRs such as the Rancho Los Lagos Community development would not increase safety hazards, community development does represent increased sensitive receptors underlying the flight path that could be impacted from a mishap occurrence. As discussed in Section 4.8, the potential increase in mishap under the Proposed Action is minimal, and the Proposed Action would not have a perceptible effect on the overall likelihood for aircraft mishap; therefore, no significant adverse impacts would occur.

Cumulative public health and safety impacts from past, present, and future actions within the ROI would be less than significant because there would not be a substantial increase in mishap under the Proposed Action due to increased glint and glare from solar projects, BASH hazard, or homebasing of MV-22 or F-

35. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant impacts within the ROI.

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

In accordance with 40 Code of Federal Regulations (CFR) 1502.16(c), analysis of environmental consequences shall include discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state and local land use plans, policies, and controls. Implementation of the Proposed Action would comply with existing federal regulations and applicable state, regional, and local policies and programs, while maintaining the Navy's mission. Table 6-1 identifies the principal federal and state laws and regulations that are applicable to the Proposed Action, and indicates where compliance with each law is discussed in the Environmental Assessment (EA).

Table 6-1. Principal Federal Laws Applicable to the Proposed Action

Applicable Federal Laws, Regulations, and Executive Orders	*Discussion of Compliance*	*Status of Compliance*
The National Environmental Policy Act (NEPA) (42 U.S.C. sections 4321-4370h), which requires an environmental analysis for major federal actions that have the potential to significantly impact the quality of the human environment	Chapter 1	The Navy has prepared this Environmental Assessment in accordance with NEPA.
Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500-1508)	Chapter 1	The Navy has prepared this Environmental Assessment in accordance with CEQ regulations.
Navy regulations for implementing NEPA (32 CFR 775), which provides Navy policy for implementing CEQ regulations and NEPA	Chapter 1	The Navy has prepared this Environmental Assessment in accordance with Navy NEPA implementing regulations.
Clean Air Act (CAA) (42 U.S.C. section 7401 et seq.)	Sections 3.4 and 4.4	The Navy has determined that the potential emissions of the Proposed Action would not cause or contribute to a violation of any National Ambient Air Quality Standards or State Ambient Air Quality Standards. Emissions would be below the applicable General Conformity *de minimis* thresholds. The General Conformity Record of Non-Applicability (RONA) is provided in Appendix H.
National Historic Preservation Act (NHPA) (54 U.S.C. section 306108 et seq.)	Sections 3.6 and 4.6	Analyses of vibration effects associated with subsonic fixed-wing aircraft have indicated that overflights above 200 feet AGL do not generate significant levels of noise-induced structural vibration. Therefore, the Proposed Action qualifies for a finding of No Historic Properties affected. Consultation with the CA and AZ state SHPOs is currently ongoing on this finding of effect, and any revision to this conclusion will be included in the Final EA prior to any decision by the Navy.
Endangered Species Act (ESA) (16 U.S.C. section 1531 et seq.)	Sections 3.2 and 4.2	The Navy has determined that the Proposed Action would have no effect on threatened or endangered species.
Migratory Bird Treaty Act (MBTA) (16 U.S.C. sections 703-712)	Sections 3.2 and 4.2	The Navy has determined that the Proposed Action may result in takes of migratory birds. These takes would not result in a significant adverse effect on a population of a migratory bird species. The Proposed Action is a military

Table 6-1. Principal Federal Laws Applicable to the Proposed Action

Applicable Federal Laws, Regulations, and Executive Orders	*Discussion of Compliance*	*Status of Compliance*
		readiness activity; therefore, these takes are in compliance with the Migratory Bird Treaty Act.
Bald and Golden Eagle Protection Act (16 U.S.C. section 668-668d)	Sections 3.2 and 4.2	The Navy has determined that the Proposed Action would have no effect on bald or golden eagles.
Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	Sections 3.7 and 4.7	The Navy has determined that the Proposed Action will not cause disproportionately high and adverse health or environmental effects on any minority or low-income populations.
California Desert Protection Act (16 U.S.C. sections 410aaa through 410aaa-83)	Section 3.5 and 4.5	The Proposed Action is consistent with the multiple land use policies implemented by the federal agencies who manage lands underlying the MTRs.
The Wilderness Act (16 U.S.C. 1131 et seq.)	Section 3.5 and 4.5	The Proposed Action is consistent with the multiple land use policies implemented by the federal agencies who manage lands underlying the MTRs.
Federal Land Policy and Management Act (43 U.S.C. 1701 et seq)	Section 3.5 and 4.5	The Proposed Action is consistent with the multiple land use policies implemented by the federal agencies who manage lands underlying the MTRs.
Arizona Desert Wilderness Act (16 U.S.C. sections 460ddd)	Section 3.5 and 4.5	The Proposed Action is consistent with the multiple land use policies implemented by the federal agencies who manage lands underlying the MTRs.
National Wildlife Refuge System Administration Act (16 U.S.C. 668dd-668ee)	Section 3.5 and 4.5	The Proposed Action is consistent with the multiple land use policies implemented by the federal agencies who manage lands underlying the MTRs.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	Sections 3.8 and 4.8	The Navy has determined that there are no environmental health and safety risks associated with the Proposed Action that would disproportionately affect children.
EO 13175, Consultation and Coordination with Indian Tribal Governments	Sections 3.6 and 4.6	Consultation with tribal groups described in Section 3.6 is currently underway to identify potentially affected TCPs and determine potential impacts. Appropriate discussion will be included in the Final EA prior to any decision by the Navy.

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Appendix A – Public Involvement [Placeholder – to be updated following public comment period]

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Appendix B – Federal Aviation Administration NEPA Process

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The FAA is responsible for managing navigable airspace for public safety. Additionally, it is responsible for ensuring efficient use of airspace for commercial air traffic, general aviation, and national defense, including special airspace used by the DoD. The FAA has established several policies, including:

- Order 1050.1F, Environmental Impacts: Policies and Procedures (July 16, 2015); and
- Joint Order (JO) 7400.2K, Procedures for Handling Airspace Matters (July 24, 2014).

FAA Order 1050.1F provides the FAA with policies and procedures to ensure agency compliance with NEPA (42 U.S.C. 4321, et seq.) and implementing regulations issued by the CEQ (40 CFR parts 1500-1508).

The Desk Reference of FAA Order 1050.1F identifies 16 impact categories that should be considered during the NEPA process. This EA addresses each resource area to determine if they should be considered as prescribed by FAA Order 1050.1F. The sections where each of these resources are discussed in this EA, or the rationale for excluding a detailed discussion of a specific resource, are provided in Table B-1. FAA JO 7400.2K, Chapter 32, provides guidance to air traffic personnel to assist in applying the requirements in FAA Order 1050.1F to air traffic actions.

Table B-1. FAA Order 1050.1F, Impact Categories Considered

FAA Resource[1]	*Location in EA*	*Rationale for Exclusion*
Air Quality	Section 3.3 and 4.3 – Air Quality	Not excluded
Biological Resources	Section 3.2 and 4.2 – Biological Resources	Not excluded
Climate	Section 3.3 – Air Quality	Not excluded
Coastal Resources	N/A	The MTRs are more than 100 miles inland from the Pacific Ocean, and no aspect of the Proposed Action would directly affect any natural resource, land use, or water use in the coastal zone. In addition, no pathways for indirect effects to coastal resources have been identified.
Department of Transportation Act: Section 4(f)	N/A	According to FAA Order 1050.1F Desk Reference, Section 5.1, military training is exempt from Section 4(f).
Farmlands	N/A	No ground-disturbing activities would occur as part of the Proposed Action, and no conversion of land use or changes to land access would occur. Therefore, this resource was eliminated from further consideration.
Hazardous Materials, Pollutions, Prevention, and Solid Waste	N/A	The Proposed Action does not require the handling of bulk quantities of hazardous materials and would not result in the generation of any hazardous waste. Therefore, this resource was eliminated from further consideration.
Historical, Architectural,	Section 3.6 and 4.6 – Cultural Resources	Not excluded

Table B-1. FAA Order 1050.1F, Impact Categories Considered

FAA Resource[1]	*Location in EA*	*Rationale for Exclusion*
Archeological, and Cultural Resources		
Land Use	Section 3.5 and 4.5 – Land Use	Not excluded
Natural Resources and Energy Supply	N/A	The Proposed Action would not result in increased consumption of energy resources, and would not change the availability of or access to energy resources in the Region of Influence. Therefore, this resource was eliminated from further consideration.
Noise and Compatible Land Use	Section 3.5 and 4.5 – Land Use; Section 3.1 and 4.1 – Noise	Not excluded
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks	Section 3.7 and 4.7 – Environmental Justice	The Proposed Action would not result in any changes to local population, income and revenue, or housing. Therefore, these resource areas are eliminated from further consideration. The MTRs would be located over low income and minority areas; therefore, this resource is discussed in Sections 3.7 and 4.7. Impacts to children's health and safety risks are discussed in Sections 3.8 and 4.8.
Visual Effects	Section 3.5 and 4.5 – Land Use	Not excluded
Water Resources (Wetlands, Floodplains, Surface waters, Groundwater, and Wild and Scenic Rivers)	N/A	The Proposed Action would not result in contact or runoff to any water feature, to include Wild and Scenic Rivers, or would not result in contact or direct impacts to wetlands; therefore, this resource has been eliminated from further consideration.
Construction Impacts	N/A	No construction activities are proposed as part of the Proposed Action; therefore, this resource was eliminated from further consideration.
Secondary (Induced) Impacts	N/A	The Proposed Action is primarily a reorganization of existing activities within controlled military airspace. The Proposed Action would not result in any changes to land use, land and resource access, housing and public services, or transportation and traffic. Therefore, the Proposed Action would not create induced effects upon any resource area.

FAA = Federal Aviation Administration; MTR = Military Training Route; N/A = Not Applicable

Appendix C - Military Aircraft to be Flown under the Proposed Action

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T-45 Goshawk

Service: Navy
Primary Function: Training platform for Navy/Marine Corps pilots
Propulsion: Rolls Royce F405-RR-401 turbofan engine with 5,527 pounds thrust
Length: 39 feet 4 inches
Height: 13 feet 6 inches
Wingspan: 30 feet 10 inches
Weight: Take-off maximum gross - 13,500 pounds; empty - 9,394 pounds
Airspeed: 645 miles per hour
Ceiling: 42,500 feet
Range: 700 nautical miles
Crew: 2

Source: Navy, 2009a

F/A-18 Super Hornet (E/F)

Service: Navy, USMC
Primary Function: Multi-role attack and fighter aircraft
Propulsion: Two F414-GE-400 turbofan engines; 22,000 pounds static thrust per engine
Length: 60.3 feet
Height: 16 feet
Wingspan: 44.9 feet
Weight: Maximum take-off gross weight is 66,000 pounds
Airspeed: Mach 1.8+ (greater than 1,381 mph)
Ceiling: 50,000+ feet
Range: 1,275 nautical miles (combat)
Crew: E model – One; F model - Two

Source: Navy, 2009b

AV-8B Harrier

Service: Navy, USMC
Primary Function: Close air support/intermediate range intercept/attack mission
Propulsion: One Rolls Royce Pegasus F402-RR-406 turbofan engine with approximately 20,280 pounds of thrust.
Length: 46 feet 4 inches
Height: 11 feet 8 inches
Wingspan: 30 feet 4 inches
Weight: 31,000 pounds
Airspeed: 647 mph
Ceiling: 38,000 feet
Range: 2,099 nautical miles
Crew: 1

Sources: Navy, 2016a; Boeing, 2016

MV-22 Osprey

Service: Navy, USMC
Primary Function: Medium-lift assault support.
Propulsion: Two Rolls-Royce Liberty AE1107C engines, each deliver 6,200 shaft horsepower.
Length: 63 feet
Height: 22 feet, 1 inch with nacelles vertical.
Wingspan: 84.6 feet with rotors turning
Weight: Maximum gross weight, vertical take-off - 52,600 lbs; Short take-off - 57,000 lbs
Airspeed: Cruise – 322.2 mph
Ceiling: 25,000 feet
Range: 860 nautical miles
Crew: 3 – pilot, copilot, crew chief; 24 troops

Source: Navy, 2016b

F-16 Fighting Falcon

Service: Navy, USAF
Primary Function: Adversary fighter
Propulsion: One Pratt & Whitney F100-PW-220 turbofan engine of 23,000 pounds static sea level thrust each with afterburner
Length: 47 feet 8 inches
Height: 16 feet 5 inches
Wingspan: 31 feet
Weight: Max. gross, take-off: 37,500 lbs
Airspeed: 1,319 mph at 39,870 feet
Ceiling: 50,000 feet
Range: 1,095 nautical miles
Crew: F16A - 1; F16B - 2

Source: Navy, 2009c

F-15a Eagle

Service: USAF
Primary function: Tactical fighter
Propulsion: Two Pratt & Whitney F100-PW-100, 220 or 229 turbofan engines with afterburners
Length: 63.8 feet
Height: 18.5 feet
Wingspan: 42.8 feet
Weight: 31,700 pounds
Airspeed: 1,875 mph
Ceiling: 65,000 feet
Range: 3,450 miles ferry range with conformal fuel tanks and three external fuel tanks
Crew: 1

Source: USAF, 2015

C-130 Hercules

Service: USAF, USMC
Primary function: Global airlift
Propulsion: Four Rolls-Royce AE 2100D3 turboprops; 4,700 horsepower
Length: 97 feet, 9 inches
Height: 38 feet, 10 inches
Wingspan: 132 feet, 7 inches
Weight: Maximum gross take-off weight - 155,000 pounds
Airspeed: 417 mph at 22,000 feet
Ceiling: 28,000 feet with a maximum 42,000 pounds payload
Range: 2,071 miles at normal payload (34,000 pounds)
Crew: 3 (plus troops being transported; up to 92 combat troops or 64 paratroopers)

Source: USAF, 2003

F-35B Lightning II Short Takeoff/Vertical Landing Variant

Service: USMC
Primary function: Fighter/attack
Propulsion: one F135 P&W turbofan with 25,000 lb engine thrust
Length: 50.5 feet
Height: 15.0 feet
Wingspan: 35 feet
Weight: Maximum takeoff - 60,000 lbs
Airspeed: ~1,200 mph
Ceiling: 45,000 feet
Range: 1,080 nautical miles
Crew: 1

Sources: DoD, 2016; Global Security, 2016

F-35C Lighting II Joint Strike Fighter Carrier Variant

Primary function: Fighter/attack
Propulsion: one F135 P&W turbofan with 25,000 lb engine thrust
Length: 51.5 feet
Height: 15.5 feet
Wingspan: 43 feet
Weight: Maximum takeoff - 60,000 lbs
Airspeed: ~1,200 mph
Ceiling: 45,000 feet
Range: 1,620 nautical miles
Crew: 1

Sources: DoD, 2016; Global Security, 2016

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Appendix D – Military Training Routes Specifications

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Route Description for VR-267				
Altitude	***Point***	***Latitude***	***Longitude***	***Route Width***
At or above 10 AGL, or as assigned	A	N32’26.00”	W110’30.00	2 NM either side of center line
03 AGL B 15 AGL to	B	N32’53.00’	W110’22.00	2 NM either side of center line
03 AGL B 60 MSL to	C	N33’07.00’	W110’47.00’	2 NM either side of center line
03 AGL B 15 AGL to	D	N33’05.00’	W111’13.00’	2 NM either side of center line
03 AGL B 15 AGL to	E	N33’00.00’	W111’22.00’	2 NM either side of center line
03 AGL B 15 AGL to	F	N33’04.00’	W111’40.00’	2 NM either side of center line
03 AGL B 15 AGL to	G	N33’00.00’	W112’25.00’	2 NM either side of center line
03 AGL B 15 AGL to	H	N33’04.00’	W113’00.00’	2 NM either side of centerline
03 AGL B 15 AGL to	I	N32’59.00’	W113’19.00’	2 NM either side of centerline
03 AGL B 15 AGL to	J	N32’42.00’	W113’18.00’	N/A

Route Description for VR-268				
Altitude	***Point***	***Latitude***	***Longitude***	***Route Width***
At or above 10 AGL, or as assigned	A	N32’26.00”	W110’30.00	2 NM either side of center line
03 AGL B 15 AGL to	B	N32’53.00’	W110’22.00	2 NM either side of center line
03 AGL B 60 MSL to	C	N33’07.00’	W110’47.00’	2 NM either side of center line
03 AGL B 15 AGL to	D	N33’05.00’	W111’13.00’	2 NM either side of center line
03 AGL B 15 AGL to	E	N33’00.00’	W111’22.00’	2 NM either side of center line
03 AGL B 15 AGL to	F	N33’04.00’	W111’40.00’	2 NM either side of center line
03 AGL B 15 AGL to	G	N33’00.00’	W112’25.00’	2 NM either side of center line
03 AGL B 15 AGL to	H	N32’43.00’	W112’37.00’	N/A

Route Description for VR-269				
Altitude	***Point***	***Latitude***	***Longitude***	***Route Width***
At or above 10 AGL, or as assigned	A	N32’26.00”	W110’30.00	2 NM either side of center line
03 AGL B 15 AGL to	B	N32’53.00’	W110’22.00	2 NM either side of center line
03 AGL B 60 MSL to	C	N33’07.00’	W110’47.00’	2 NM either side of center line
03 AGL B 15 AGL to	D	N33’05.00’	W111’13.00’	2 NM either side of center line
03 AGL B 15 AGL to	E	N33’00.00’	W111’22.00’	2 NM either side of center line
03 AGL B 15 AGL to	F	N33’04.00’	W111’40.00’	2 NM either side of center line
03 AGL B 15 AGL to	G	N33’00.00’	W112’25.00’	2 NM either side of center line
03 AGL B 15 AGL to	H	N33’04.00’	W113’00.00’	2 NM either side of centerline
03 AGL B 15 AGL to	I	N32’49.00’	W112’55.00’	N/A

Route Description for VR-289				
Altitude	***Point***	***Latitude***	***Longitude***	***Route Width***
As assigned to	A	N34°55.00’	W115°04.00’	5 NM either side of center line
03 AGL B 40 MSL to	B	N34°51.00’	W115°28.00’	5 NM either side of center line
03 AGL B 45 MSL to	C	N34°31.00’	W115°31.00’	5 NM either side of center line
03 AGL B 35 MSL to	D	N34°09.00’	W115°34.00’	5 NM either side of center line
03 AGL B 40 MSL to	E	N33°53.00’	W115°23.00’	5 NM either side of center line
03 AGL B 40 MSL to	F	N33°41.00’	W115°34.00’	5 NM either side of center line
03 AGL B 35 MSL to	G	N33°29.00’	W115°44.00’	5 NM either side of center line
03 AGL B 25 MSL to	H	N33°35.00’	W116°00.00’	5 NM either side of center line
03 AGL B 30 MSL to	I	N33°08.00’	W116°03.00’	5 NM either side of center line
03 AGL B 10 MSL to	J	N33°05.00’	W115°59.00’	N/A

Route Description for VR-296				
Altitude	***Point***	***Latitude***	***Longitude***	***Route Width***
As assigned to	A	N34°55.00’	W115°04.00’	5 NM either side of center line
03 AGL B 40 MSL to	B	N34°15.00’	W115°05.00’	5 NM either side of center line
03 AGL B 35 MSL to	C	N34°07.00’	W114°41.00’	5 NM either side of center line
03 AGL B 32 MSL to	D	N34°00.00’	W114°13.00’	5 NM either side of center line
03 AGL B 25 MSL to	E	N33°25.00’	W114°43.00’	5 NM either side of center line
03 AGL B 25 MSL to	F	N33°48.00’	W115°18.00’	5 NM either side of center line
03 AGL B 40 MSL to	G	N33°41.00’	W115°34.00’	5 NM either side of center line
03 AGL B 35 MSL to	H	N33°29.00’	W115°44.00’	5 NM either side of center line
03 AGL B 20 MSL to	I	N33°21.00’	W115°42.00’	5 NM either side of center line
03 AGL B 10 MSL to	J	N33°07.00’	W115°42.00’	5 NM either side of center line
03 AGL B 10 MSL to	K	N32°59.00’	W115°43.00’	N/A

Route Description for VR-299				
Altitude	***Point***	***Latitude***	***Longitude***	***Route Width***
As assigned to	A	N34°44.00’	W114°20.00’	5 NM either side of center line
03 AGL B 40 MSL to	B	N34°28.00’	W113°37.00’	5 NM either side of center line
03 AGL B 39 MSL to	C	N34°00.00’	W114°13.00’	5 NM either side of center line
03 AGL B 19 MSL to	D	N33°26.00’	W114°39.00’	5 NM either side of center line
03 AGL B 30 MSL to	E	N33°07.00’	W114°53.00’	5 NM either side of center line
03 AGL B 32 MSL to	F	N32°49.00’	W114°50.00’	5 NM either side of center line
03 AGL B 15 MSL to	G	N32°46.00’	W115°16.00’	5 NM either side of center line
03 AGL B 15 MSL to	H	N32°55.00’	W115°30.00’	5 NM either side of center line
03 AGL B 10 MSL to	I	N32°57.00’	W115°42.00’	N/A

Appendix E – Bird Species Present in Study Area

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Table E-1. Bird Species Present in the Study Area

Common Name	***Scientific Name***	***Federal Listing Status***	***State Listing Status[1, 2, 3]***	***MTRs***
American peregrine falcon	*Falco peregrinus anatum*	Bird of Conservation Concern	AZ – 1A CA – FP	AZ CA
Arizona Bell's vireo	*Vireo bellii arizonae*	Bird of Conservation Concern	AZ – None CA – Endangered	CA
Arizona woodpecker	*Picoides arizonae*	Bird of Conservation Concern	AZ – None CA – None	AZ
Bald Eagle	*Haliaeetus leucocephalus*	Bird of Conservation Concern	AZ – 1A CA – Endangered	AZ CA
Bell's sage sparrow	*Amphispiza belli belli*	Bird of Conservation Concern	AZ – None CA – SSC	CA
Bendire's thrasher	*Toxostoma bendirei*	Bird of Conservation Concern	AZ – None CA – SCC	AZ CA
Black skimmer	*Rynchops niger*	Bird of Conservation Concern	AZ – None CA – SSC	CA
Black-chinned sparrow	*Spizella atrogularis*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Black-throated gray warbler	*Dendroica nigrescens*	Bird of Conservation Concern	AZ – None CA – None	AZ
Blue-throated hummingbird	*Lampornis clemenciae*	Bird of Conservation Concern	AZ – None CA – None	AZ
Brewer's sparrow	*Spizella breweri*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
California black rail	*Laterallus jamaicensis coturniculus*	Bird of Conservation Concern	AZ – 1B CA – Threatened, FP	AZ CA
California spotted owl	*Strix occidentalis occidentalis*	Bird of Conservation Concern	AZ – None CA – SSC	CA
Canyon towhee	*Pipilo fuscus*	Bird of Conservation Concern	AZ – None CA – None	AZ

Table E-1. Bird Species Present in the Study Area

Common Name	***Scientific Name***	***Federal Listing Status***	***State Listing Status[1, 2, 3]***	***MTRs***
Cassin's finch	*Carpodacus cassinii*	Bird of Conservation Concern	AZ – None CA – None	CA
Chestnut-collared longspur	*Calcarius ornatus*	Bird of Conservation Concern	AZ – None CA – None	AZ
Common black-hawk	*Buteogallus anthracinus*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Costa's hummingbird	*Calypte costae*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Elegant trogon	*Trogon elegans*	Bird of Conservation Concern	AZ – 1B CA – None	AZ
Elf owl	*Micrathene whitneyi*	Bird of Conservation Concern	AZ – None CA – Endangered	CA
Flammulated owl	*Otus flammeolus*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Fox sparrow	*Passerella iliaca*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Gila woodpecker	*Melanerpes uropygialis*	Bird of Conservation Concern	AZ – None CA – Endangered	CA
Gilded flicker	*Colaptes chrysoides*	Bird of Conservation Concern	AZ – None CA – Endangered	CA
Golden eagle	*Aquila chrysaetos*	Bird of Conservation Concern	AZ – 1B CA – FP, WL	AZ CA
Grace's warbler	*Dendroica graciae*	Bird of Conservation Concern	AZ – None CA – None	AZ
Gray vireo	*Vireo vicinior*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Green-tailed towhee	*Pipilo chlorurus*	Bird of Conservation Concern	AZ – None CA – None	CA

Table E-1. Bird Species Present in the Study Area

Common Name	***Scientific Name***	***Federal Listing Status***	***State Listing Status[1, 2, 3]***	***MTRs***
Gull-billed tern	*Gelochelidon nilotica*	Bird of Conservation Concern	AZ – None CA – SSC	CA
Lark bunting	*Calamospiza melanocorys*	Bird of Conservation Concern	AZ – None CA – None	AZ
Lawrence's goldfinch	*Carduelis lawrencei*	Bird of Conservation Concern	AZ – None CA – None	CA
Le Conte's thrasher	*Toxostoma lecontei*	Bird of Conservation Concern	AZ – 1B CA – SSC	AZ CA
Least bittern	*Ixobrychus exilis*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Lesser yellowlegs	*Tringa flavipes*	Bird of Conservation Concern	AZ – None CA – None	CA
Lewis's woodpecker	*Melanerpes lewis*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Loggerhead shrike	*Lanius ludovicianus*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Long-billed curlew	*Numenius americanus*	Bird of Conservation Concern	AZ – None CA – WL	CA
Lucy's warbler	*Vermivora luciae*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Marbled godwit	*Limosa fedoa*	Bird of Conservation Concern	AZ – None CA – None	CA
Mccown's longspur	*Calcarius mccownii*	Bird of Conservation Concern	AZ – None CA – None	AZ
Mountain plover	*Charadrius montanus*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Northern beardless-tyrannulet	*Camptostoma imberbe*	Bird of Conservation Concern	AZ – 1B CA – None	AZ

Table E-1. Bird Species Present in the Study Area

Common Name	***Scientific Name***	***Federal Listing Status***	***State Listing Status[1, 2, 3]***	***MTRs***
Olive warbler	*Peucedramus taeniatus*	Bird of Conservation Concern	AZ – None CA – None	AZ
Phainopepla	*Phainopepla nitens*	Bird of Conservation Concern	AZ – None CA – None	AZ
Pinyon jay	*Gymnorhinus cyanocephalus*	Bird of Conservation Concern	AZ – None CA – None	CA
Prairie falcon	*Falco mexicanus*	Bird of Conservation Concern	AZ – None CA – WL	AZ CA
Red-faced warbler	*Cardellina rubrifrons*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Rufous-winged sparrow	*Aimophila carpalis*	Bird of Conservation Concern	AZ – None CA – None	AZ
Sage thrasher	*Oreoscoptes montanus*	Bird of Conservation Concern	AZ – None CA – None	CA
Sandwich tern	*Thalasseus sandvicensis*	Bird of Conservation Concern	AZ – None CA – None	CA
Short-eared owl	*Asio flammeus*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Snowy plover	*Charadrius alexandrines*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Sonoran yellow warbler	*Setophaga petechial sonorana*	Bird of Conservation Concern	AZ – None CA – SSC	AZ CA
Sprague's pipit	*Anthus spragueii*	Bird of Conservation Concern	AZ – 1A CA – None	AZ
Swainson's hawk	*Buteo swainsoni*	Bird of Conservation Concern	AZ – None CA – Threatened	CA
Varied bunting	*Passerine versicolor*	Bird of Conservation Concern	AZ – None CA – None	AZ

Table E-1. Bird Species Present in the Study Area

Common Name	***Scientific Name***	***Federal Listing Status***	***State Listing Status[1, 2, 3]***	***MTRs***
Williamson's sapsucker	*Sphyrapicus thyroideus*	Bird of Conservation Concern	AZ – None CA – None	AZ CA
Western burrowing owl	*Athene cunicularia hypugaea*	Bird of Conservation Concern	AZ – 1B CA – SSC	AZ CA

Arizona:

1. 1A - Scored "1" for Vulnerability in at least one of the eight categories and matches at least one of the following: Federally listed as endangered or threatened under the Endangered Species Act (ESA); Candidate species under ESA; Is specifically covered under a signed conservation agreement (CCA) or a signed conservation agreement with assurances (CCAA); Recently removed from ESA and currently requires post-delisting monitoring; Closed season species (i.e., no take permitted) as identified in Arizona Game and Fish Commission Orders 40, 41, 42 or 43.
2. 1B - Scored "1" for Vulnerability in at least one of the eight categories, but match none of the above criteria.

California:

3. FP – Fully Protected; SSC – Species of Special Concern; WL – Watch List

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Appendix F – Noise Study

wyle

Technical Memorandum

To: Sara Reed, NAVFACSW

From: Patrick Kester, Wyle

Subject: **MTR Environmental Assessment – Noise Analysis**

Introduction

The purpose of this memo is twofold: (1) analyze the potential noise impacts of the Navy's proposed action to re-commission three Military Training Routes (MTRs)--Visual Route (VR) 289, VR-296, and VR-299--in southeastern California, shown in Figure 1; and (2) analyze the potential noise impacts from the modification of three VRs (VR-267, VR-268, and VR-269) to avoid special use airspace (Restricted Area R-2310), shown in Figure 2. The re-commissioning of routes is expected to reduce flight activity on existing VR-1257, VR-1266, and VR-1267. Two additional VRs (VR-1267A, and VR-1268) are not part of the Proposed Action but are included in this analysis due to their proximity and potential for contribution to the overall noise environment. See Figure 3 and Figure 4 for details.

Table 1 lists changes to the airspace or operations that would occur under the Proposed Action. The Proposed Action would provide operators with more training options so some activity would shift from more frequented routes to the new re-commissioned routes. Existing VR-1257, VR-1266, and VR-1267 usage is estimated to decrease to the activity levels prior to the de-commissioning of VR-289, VR-296, and VR-299 (Navy 2016a).

Table 1. Visual Routes Analyzed

MTR ID	Changes to Airspace	Changes to Numbers of Operations
VR-289	Re-commision route along previous location	New operations
VR-296		
VR-299		
VR-267	Modify route point to avoid R-2310	No change
VR-268		
VR-269		
VR-1257	No change	Decrease by 5%
VR-1266		Decrease by 40%
VR-1267		Decrease by 40%
VR-1267A		No change
VR-1268		

Baseline

The baseline time period considered for this analysis is calendar year (CY) 2015. Table 2 details the number of sorties generated by each aircraft type during a 12-month period. Although routes in this study have step-off points allowing aircraft to conclude prior to completing an entire route, data detailing the step-offs is not known. For the purposes of this study and for conservatism (estimating more noise than what might actually occur), one sortie is considered to be one aircraft traveling along the complete length of a single route. VR-1266 is the most frequently used with 1,281 annual sorties. For each route, the majority of activity occurs during the $CNEL_{mr}$ Daytime period (7 a.m. to 7 p.m.) with 10 percent during the $CNEL_{mr}$ Evening period (7 p.m. to 10 p.m.), and five percent during the $CNEL_{mr}$ Nighttime period (10 p.m. to 7 a.m.) (Navy 2015a).

Table 2. Baseline Annual Sorties

Route	T-45				F/A-18 E/F				AV-8B				MV-22			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
VR-267	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VR-268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VR-269	85	10	5	100	-	-	-	-	-	-	-	-	-	-	-	-
VR-1266	220	24	-	244	297	33	-	330	140	16	-	156	427	47	-	474
VR-1267	68	8	-	76	77	9	-	86	89	10	-	99	106	12	-	118
VR-289	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VR-296	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VR-299	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VR-1257	1	-	-	1	68	8	-	76	2	-	-	2	5	1	-	6
VR-1267A	2	-	-	2	11	1	-	12	33	4	-	37	100	11	-	111
VR-1268	1	-	-	1	13	1	-	14	23	3	-	26	14	2	-	16
Totals	377	42	5	424	466	52	-	518	287	33	-	320	652	73	-	725

Route	F-16				C-130				TOTALS			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
VR-267	9	1	1	11	3	-	-	3	12	1	1	14
VR-268	9	1	1	11	3	-	-	3	12	1	1	14
VR-269	9	1	1	11	3	-	-	3	97	11	6	114
VR-1266	43	5	-	48	26	3	-	29	1,153	128	-	1,281
VR-1267	18	2	-	20	102	11	-	113	460	52	-	512
VR-289	-	-	-	-	-	-	-	-	-	-	-	-
VR-296	-	-	-	-	-	-	-	-	-	-	-	-
VR-299	-	-	-	-	-	-	-	-	-	-	-	-
VR-1257	4	-	-	4	36	4	-	40	116	13	-	129
VR-1267A	2	-	-	2	38	4	-	42	186	20	-	206
VR-1268	14	2	-	16	3	-	-	3	68	8	-	76
Totals	108	12	3	123	214	22	-	236	2,104	234	8	2,346

Note: (1) No sorties listed for VR-289, VR-296, and VR-299 because routes are not currently in use
(2) Aircraft types tabulated represent primary users

Table 3 summarizes typical aircraft airspeed and power settings utilized while training on the modeled routes (Navy 2015b). When reference acoustic data did not exist for the reported condition the most similar condition was selected for noise modeling and summarized in the "Modeled Profiles" columns (Navy 2015a). The average speeds and power settings are applicable to all routes analyzed in this study. Aircraft altitudes vary by route and by route segment, which are provided in Table A1 at the end of this memo. The majority of activity occurs

from altitudes of 500 ft to 1,000 ft Above Ground Level (AGL) with the lowest route segments extending down to 300 ft AGL.

Table 4 summarizes the noise modeling parameters relative to this work. Weather conditions (i.e., temperature and relative humidity) influence the amount of sound energy absorbed by the air as sound propagates from an aircraft to the ground affecting the level that may be heard by an observer. The average monthly temperature of 71 degrees Fahrenheit and relative humidity of 29 percent, during the month of April, were determined to generate the monthly median conditions for sound absorption during 2014 (NOAA 2015).

Table 3. Aircraft Flight Profiles

Reported Profiles			Modeled Profiles			
Aircraft Type	Average Airspeed	Average Power Setting	Aircraft Type	Average Airspeed	Average Power Setting	Noise Data Type
T-45	360 KCAS	92%	T-45	250 KIAS	100%	Interpolate
FA-18C/D/E/F	450 - 500 KCAS	90 - 95%	FA-18E/F	500 KIAS	90.5%	Fixed,
AV-8B	450 - 475 KCAS	90% - 92%	AV-8B (408 engine)	300 KIAS	95%	Interpolate
MV-22	100-150KCAS/240-250 KCAS	70-80%/85-95%	MV-22B	230 KIAS	85%	Interpolate
F-16	450-480 KCAS	90%	F-16 (G100 engine)	465 KIAS	94%	Fixed, Training Route
C-130	240 KIAS	4200 HP	C-130E	170 KIAS	970 C TIT	Interpolate
F-35A/B/C	450-480 KCAS	90%	F-35B	460 KIAS	90% ETR	Adjusted(1)

Note: Low speed F-35B source data adjusted per *Plotkin and Czech 2010*

Table 4. Modeled Conditions

Software	Analysis	Version
MR_NMAP	Fixed wing aircraft	2.2
Parameter	**Description**	
Receiver Grid Spacing	2,000 ft in x and y	
Metric	L_{dnmr} (dBA)	
Basis	Busy Month (Average month +10%)	
Modeled Weather (April 2014)		
Temperature	71 °F	
Relative Humidity	29%	
Barometric Pressure	29.94 inHg	

This analysis utilizes Version 2.2 of the Department of Defense (DOD) MR_NMAP Program for computation of noise levels (Lucas and Calamia, 1997). The appropriate cumulative noise metric for MTR activity assessment varies by state. California requires $CNEL_{mr}$ while the remaining 49 states utilize L_{dnmr}. The two metrics only differ with respect to the penalties added to events occurring during periods of the day when people are considered to be more sensitive to noise. Both metrics apply a 10 dB penalty to events between 10 p.m. and 7 a.m. but California also adds a 5 dB penalty to events occurring during the evening period between 7 p.m. and 10 p.m. Because this study includes routes in both California and Arizona the more conservative $CNEL_{mr}$ metric, applicable for California, is used for all activity analyzed. $CNEL_{mr}$, like L_{dnmr}, utilizes busiest month for calculation. A busiest month was not identified so the busiest month was modeled using an average month of sorties increased by 10 percent.

Figure 5 depicts the Baseline CNELmr in terms of contours and Table 5 details the computed maximum centerline CNELmr under each segment of the existing routes. A CNELmr of 65 dB represents the threshold above which noise sensitive land uses (i.e., residential and school) are often not compatible with aircraft noise. Because the existing operations analyzed do not produce levels equal or greater than 65 dB, the 60 dB CNELmr is presented. Although CNELmr between 60 dB and 65 dB is compatible with all types of land use, it is included to depict the areas where most of the noise occurs and is closest to next lowest CNELmr when considering 5-dB increments.

The 60 dB CNELmr is centered on VR-1266 and continues along its entire length varying in width from two to three miles wide. The largest portion of aircraft sorties occur on VR-1266. The FA-18, generating 330 annual sorties on VR-1266, is the primary contributor to the CNELmr. Because no military flights currently occur on VR-289, VR-296, and VR-299 the baseline CNELmr could not be computed but is likely consistent with typical conditions in rural areas or small towns which corresponds to approximately 45 to 50 dB CNELmr (DoD 1978).

Table 5. Maximum Centerline $CNEL_{mr}$ Under Route Segments for Baseline

Segment	Visual Route (VR-)							
	267	268	269	1266	1267	1267A	1257	1268
A-B	48	48	48	64	64	49	55	64
B-C	48	48	48	62	58	58	<45	58
C-D	45	45	45	62	58	58	55	58
D-E	45	45	45	62	57	58	55	57
E-F	48	<45	48	62	58		55	49
F-G	<45		48	63	58		55	49
G-H	<45			63	58		46	49
H-I					58		46	49
I-J							46	49
J-K							46	49
K-L							46	58
L-M							55	58
M-N							<45	58
N-O							55	
O-P							62	
P-Q							63	
Q-R							63	

Note: Segments exposed to $CNEL_{mr}$ greater than 60 dB highlighted yellow; no locations exposed to 65 dB or greater

Proposed

The Proposed Action includes the re-commissioning of VR-289, VR-296, and VR-299 in southeastern California and the modification of VR-267, VR-268, and VR-269 to avoid special use airspace R-2310 in Arizona by adding two addition route points. Table 6 details the proposed sorties. Consistent with Baseline the busiest month sorties were modeled as the average monthly sorties increased by 10 percent. Total sorties for the Proposed Action would increase to approximately 3,600 annually. The MV-22 and T-45 would be the primary users of the three re-commissioned routes with ten percent of sorties occurring during the $CNEL_{mr}$ Evening (7 p.m. to 10 p.m.) and eight percent during the $CNEL_{mr}$ Nighttime (10 p.m. to 7 a.m.) (Navy 2015a). Forty percent of the existing activity on VR-1266 and VR-1267 would be shifted to the re-commissioned routes. Similarly, VR-1257 activity would likely return to previous tempos resulting in a decrease of 5 percent from existing activity (Navy 2016a).

Table 6. Proposed Annual Sorties

Route	T-45				F/A-18 E/F				AV-8B				MV-22			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
VR-267	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VR-268	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VR-269	85	10	5	100	-	-	-	-	-	-	-	-	-	-	-	-
VR-1266	131	15	-	146	178	20	-	198	84	9	-	93	256	28	-	284
VR-1267	41	5	-	46	46	5	-	51	53	6	-	59	64	7	-	71
VR-289	253	31	25	309	12	1	1	14	2	-	-	2	246	30	24	300
VR-296	271	33	26	330	12	1	1	14	2	-	-	2	246	30	24	300
VR-299	271	33	26	330	12	1	1	14	2	-	-	2	246	30	24	300
VR-1257	1	-	-	1	64	7	-	71	2	-	-	2	5	1	-	6
VR-1267A	2	-	-	2	11	1	-	12	33	4	-	37	100	11	-	111
VR-1268	1	-	-	1	13	1	-	14	23	3	-	26	14	2	-	16
Total	1,056	127	82	1,265	348	37	3	388	201	22	-	223	1,177	139	72	1,388

Route	F-16 (1)				C-130				F-35B/D				TOTALS			
	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total	Day	Eve	Night	Total
VR-267	9	1	1	11	3	-	-	3	-	-	-	-	12	1	1	14
VR-268	9	1	1	11	3	-	-	3	-	-	-	-	12	1	1	14
VR-269	9	1	1	11	3	-	-	3	-	-	-	-	97	11	6	114
VR-1266	26	3	-	29	16	2	-	18	-	-	-	-	691	77	-	768
VR-1267	11	1	-	12	61	7	-	68	-	-	-	-	276	31	-	307
VR-289	-	-	-	-	-	-	-	-	7	1	1	9	520	63	51	634
VR-296	-	-	-	-	-	-	-	-	7	1	1	9	538	65	52	655
VR-299	-	-	-	-	-	-	-	-	7	1	1	9	538	65	52	655
VR-1257	4	-	-	4	34	4	-	38	-	-	-	-	110	12	-	122
VR-1267A	2	-	-	2	38	4	-	42	-	-	-	-	186	20	-	206
VR-1268	14	2	-	16	3	-	-	3	-	-	-	-	68	8	-	76
Total	84	9	3	96	161	17	-	178	21	3	3	27	3,048	354	163	3,565

Note: (1) Include three F-15 sorties per year on VR-267, VR-268 and VR-269 modeled as F-16
(2) Aircraft types tabulated represent primary users

There would be no changes to aircraft flight profiles (airspeeds and power settings) or altitude utilization, in general, under the Proposed Action but the minimum altitude from points C to G (formerly points C to E) of VR-267, VR-268, and VR-269 would be decreased from 1,000 ft AGL to 300 ft to be consistent with the points A and B (Navy2016b). The altitude ranges that would be used for the three re-commissioned routes are detailed in Table A2. Consistent with the existing activity on other MTRs, aircraft would operate at or above 300 ft AGL on VR-289, VR-296, and VR-299 (Navy 2016c).

Figure 6 depicts the Proposed $CNEL_{mr}$ contours. No 65 dB $CNEL_{mr}$ contours are displayed because the proposed operations would not produce 65 dB $CNEL_{mr}$ along any of the routes

analyzed. The 60 dB $CNEL_{mr}$ contours would be centered on VR-1266 with the width varying between approximately one and two miles. This reduction in width would be due to the shift of 40 percent of operations from VR-1266 to the new routes and the primary contributor would remain the F/A-18 along VR-1266. The widest portion of this 60 dB $CNEL_{mr}$ contour would occur at the intersection with VR-299 (segment DE) due primarily to the F/A-18 on both routes. The intersection of VR-1266 (segment AB), VR-289 (segment FG), and VR-96 (segment GH) would generate the widest portion of the 60 dB $CNEL_{mr}$ contour due to the F/A-18 and T-45 on all three routes.

Tables 7a and 7b detail the computed maximum centerline $CNEL_{mr}$ that would occur under each segment. $CNEL_{mr}$ would increase by up to 3 dB from proposed points C through G (existing points C to E) under VR-267, VR-268, and VR-269 due to the reduction in the minimum altitude from 1,000 ft to 300 ft. The area underneath the new segments DE and EF would be exposed to 48 dB $CNEL_{mr}$ which are not currently experiencing MTR overflights. These increases in noise exposure are not considered significant because $CNEL_{mr}$ would remain far below 65 dB.

Table 7a. Maximum Centerline $CNEL_{mr}$ under Route Segments for Proposed Action

Segments		VR-267			VR-268			VR-269		
Baseline	Proposed	Baseline	Proposed	Increase from Baseline	Baseline	Proposed	Increase from Baseline	Baseline	Proposed	Increase from Baseline
A-B	A-B	48	48	-	48	48	-	48	48	-
B-C	B-C	48	48	-	48	48	-	48	48	-
C-D	C-D	45	48	+3	45	48	+3	45	48	+3
	D-E		48			48			48	
	E-F		48			48			48	
D-E	F-G	45	48	+3	45	48	+3	45	48	+3
E-F	G-H	48	48	-	<45	<45	-	48	48	-
F-G	H-I	<45	<45	-				48	48	-
G-H	I-J	<45	<45	-						

$CNEL_{mr}$ under VR-289, VR-296, and VR-299 would increase to a range of 53 to 62 dB due to the F/A-18 and T-45 that would generate approximately 300 sorties annually on each of the three re-commissioned routes. All locations on VR-289, VR-296, and VR-299 that would reach or exceed 60 dB $CNEL_{mr}$ overlap VR-1266 where F/A-18 and T-45 would continue to be the primary contributors.

Because $CNEL_{mr}$ is a cumulative metric, it cannot be directly heard. In general, increases in $CNEL_{mr}$ can be caused by louder events (i.e., different aircraft type or lower altitude flown), more events per month, or a combination. The largest computed increase of 6 dB would occur where VR-299 overlaps VR-1268 segment JK. The single-event sound levels would not be any louder than currently generated but the frequency of overflight events would increase from about 6 per month to approximately 50 to 60 per month. Segments DE on both VR-1267 and VR-1268 are coincident and $CNEL_{mr}$ would increase 2 dB due to overlapping portions of VR-296 and VR-299 generating an average of 140 overflight events per month compared to the existing 50 events per month. Because no current flight activity occurs over VR-289, VR-296, VR-299 the existing levels cannot be computed directly but were estimated between 45 to 50 dB $CNEL_{mr}$, typical of rural areas or small towns, resulting in estimated increases due to the Proposed Action of 3 to 16 dB $CNEL_{mr}$. These increases in noise exposure are not considered significant because $CNEL_{mr}$ would not exceed 65 dB.

$CNEL_{mr}$ under other routes would either remain unchanged or reduce up to 2 dB as activity from frequented routes is spread to the re-commissioned routes.

Table 7b. Maximum Centerline $CNEL_{mr}$ under Route Segments for Proposed Action (*continued*)

Segments	VR-289			VR-296			VR-299		
	Baseline[1]	Proposed	Increase from Baseline	Baseline[1]	Proposed	Increase from Baseline	Baseline[1]	Proposed	Increase from Baseline
A-B	(45 to 50)	53	(3 to 16)	(45 to 50)	54	(3 to 16)	(45 to 50)	55	(3 to 16)
B-C		53			54			57	
C-D		53			58			57	
D-E		55			58			62	
E-F		61			58			54	
F-G		61			56			54	
G-H		61			62			54	
H-I		61			59			55	
I-J		55			54				
J-K					55				

Segments	VR-1257			VR-1266			VR-1268		
	Baseline	Proposed	Increase from Baseline	Baseline	Proposed	Increase from Baseline	Baseline	Proposed	Increase from Baseline
A-B	55	55	-	64	62	-2	64	62	-2
B-C	<45	<45	-	62	60	-2	58	58	-
C-D	55	55	-	62	60	-2	58	56	-2
D-E	55	55	-	62	61	-1	57	59	+2
E-F	55	55	-	62	61	-1	49	49	-
F-G	55	55	-	63	61	-2	49	49	-
G-H	46	46	-	63	61	-2	49	49	-
H-I	46	46	-				49	49	-
I-J	46	46	-				49	49	-
J-K	46	46	-				49	55	+6
K-L	46	46	-				58	56	-2
L-M	55	55	-				58	56	-2
M-N	<45	<45	-				58	56	-2
N-O	55	55	-						
O-P	62	61	-1						
P-Q	63	61	-2						
Q-R	63	61	-2						

Segments	VR-1267			VR-1267A		
	Baseline	Proposed	Increase from Baseline	Baseline	Proposed	Increase from Baseline
A-B	64	62	-2	49	49	-
B-C	58	58	-	58	57	-1
C-D	58	56	-2	58	57	-1
D-E	57	59	+2	58	57	-1
E-F	58	56	-2			
F-G	58	57	-1			
G-H	58	57	-1			
H-I	58	57	-1			

Notes:
(1) Baseline CNEL for areas without existing flights estimated utilizing typical levels in rural and small towns (DoD 1978)
(2) Segments exposed to $CNEL_{mr}$ greater than 60 dB highlighted yellow; no segments exposed to 65 dB or greater

Single Events Sound Exposure Levels

Table 8 presents SELr values at representative altitudes for the aircraft currently using the visual routes addressed in this study. SELr is a composite metric that represents all of the sound energy of a single event normalized to a one second duration at a constant sound level. SELr also accounts for the startle effect by applying a penalty (increasing reported level) to noise events which have sound levels whose magnitudes rise very quickly. The cumulative noise environment is typically dominated by the aircraft performing the majority of operations, although it could be dominated by fewer operations of louder aircraft as is the case of the FA-18 with an SELr of 119 dB at 300 ft Above Ground Level (AGL).

Table 8. SEL_r (dBA) for Aircraft at Typical Altitudes Along Visual Routes

Aircraft Type	Airspeed (knots)	Power Setting	Altitude (ft AGL)		
			300	500	1000
T-45	250	100%	N/A	111	105
F/A-18E/F	500	90.5%	119	113	109
AV-8B	300	95%	115	111	104
MV-22B	230	85%	94	91	86
F-16 (G100 engine)	465	94%	N/A	96	92
C-130E	170	970 deg C(1)	98	96	90
F-35B(2)	460	100%	N/A	N/A	114

Note: (1) Turbine Inlet Temperature
(2) F-35B only applies to the Proposed Action

The areas beneath VR-267, VR-268, and VR-269 between proposed points C to G (existing C to E) would experience an increase in maximum SELr from 105 dB to 111 dB due to the reduction in minimum altitude of 1,000 ft to 300 ft allowing the T-45 to operate at 500 ft AGL. This increase of 6 dB would be quite noticeable but these events would occur less than 10 times per month. Additionally, proposed segments DE and EF would shifted overflight to the south by approximately two miles exposing different areas to noise. An SEL/SELr standard threshold does not exist so the computed levels can instead be compared to existing activity. Areas beneath all segments of VR-267, VR-268, and VR-269 that would not be modified by the Proposed Action are already exposed to SELr up to 111 dB approximately 10 times per month.

The areas beneath VR-289, VR-296, and VR-299 would experience a maximum of 119 dB SELr due to FA-18 flights, as per Table 8. FA-18 and other similar aircraft usage would be infrequent with approximately two events per month. The T-45 and MV-22 would generate the majority of events at approximately 25 events each per month with SELr of 111 dB and 94 dB, respectively. The F-35B would operate on average less than once per month at or above 1,000 ft AGL with a maximum SELr of 114 dB. Under the Proposed Action all other aircraft would operate within the same altitude ranges as VR-267, VR-268, and VR-269. This would be consistent with the previous VR-289, VR-296, and VR-299 minimum altitude of 300 ft AGL prior to de-commissioning.

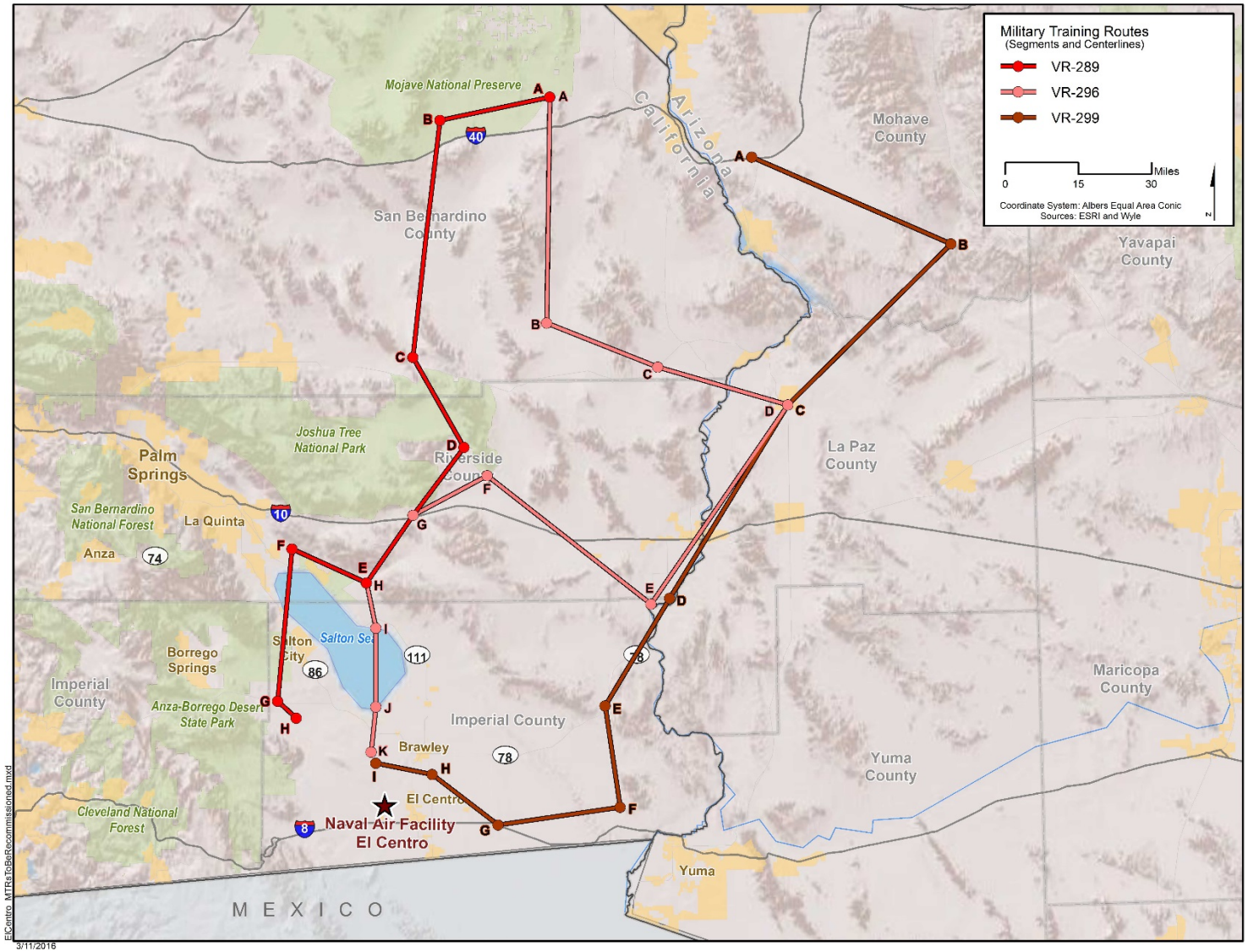

Figure 1. MTRs Proposed To Be Re-Commissioned

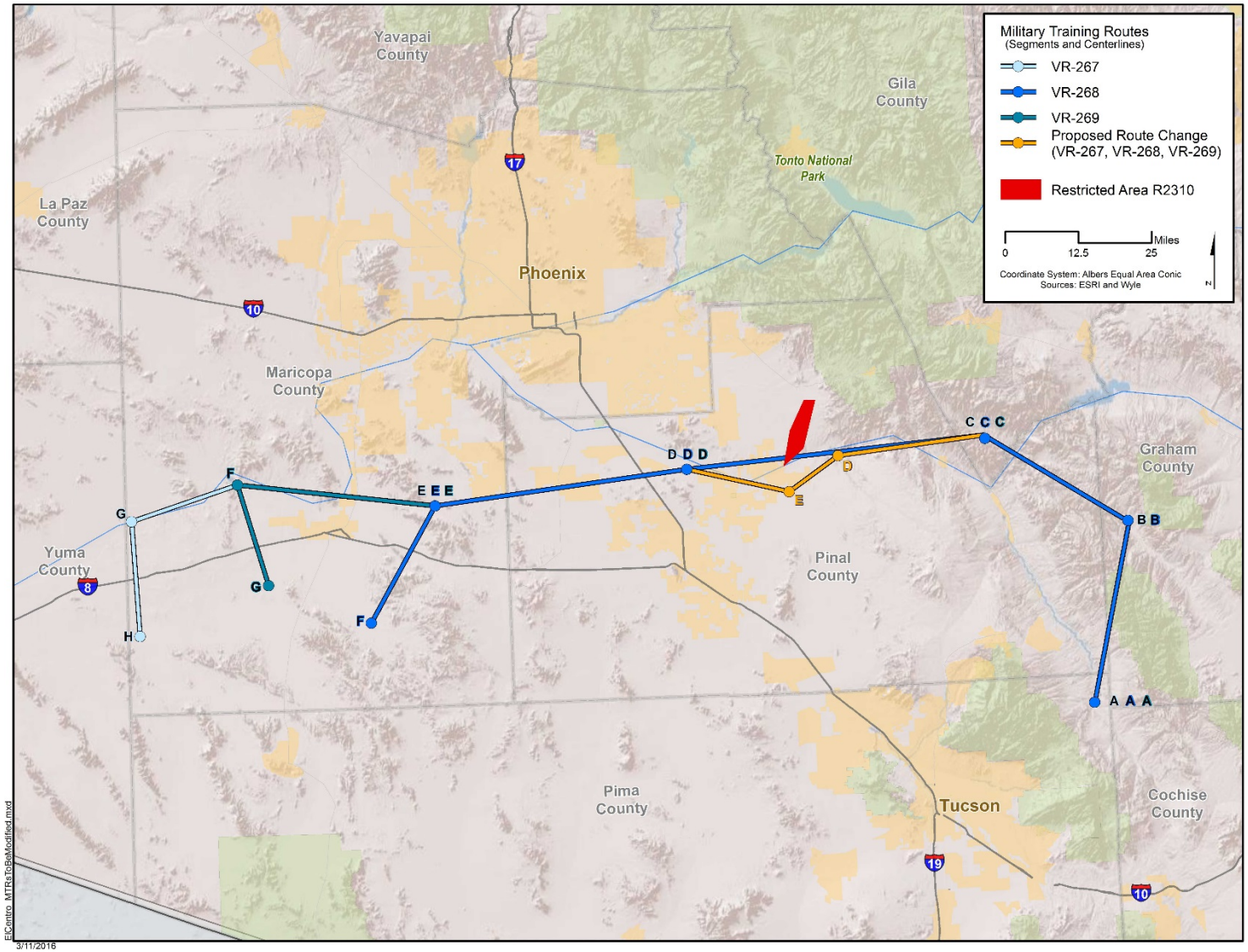

Figure 2. MTRs Proposed To Be Modified

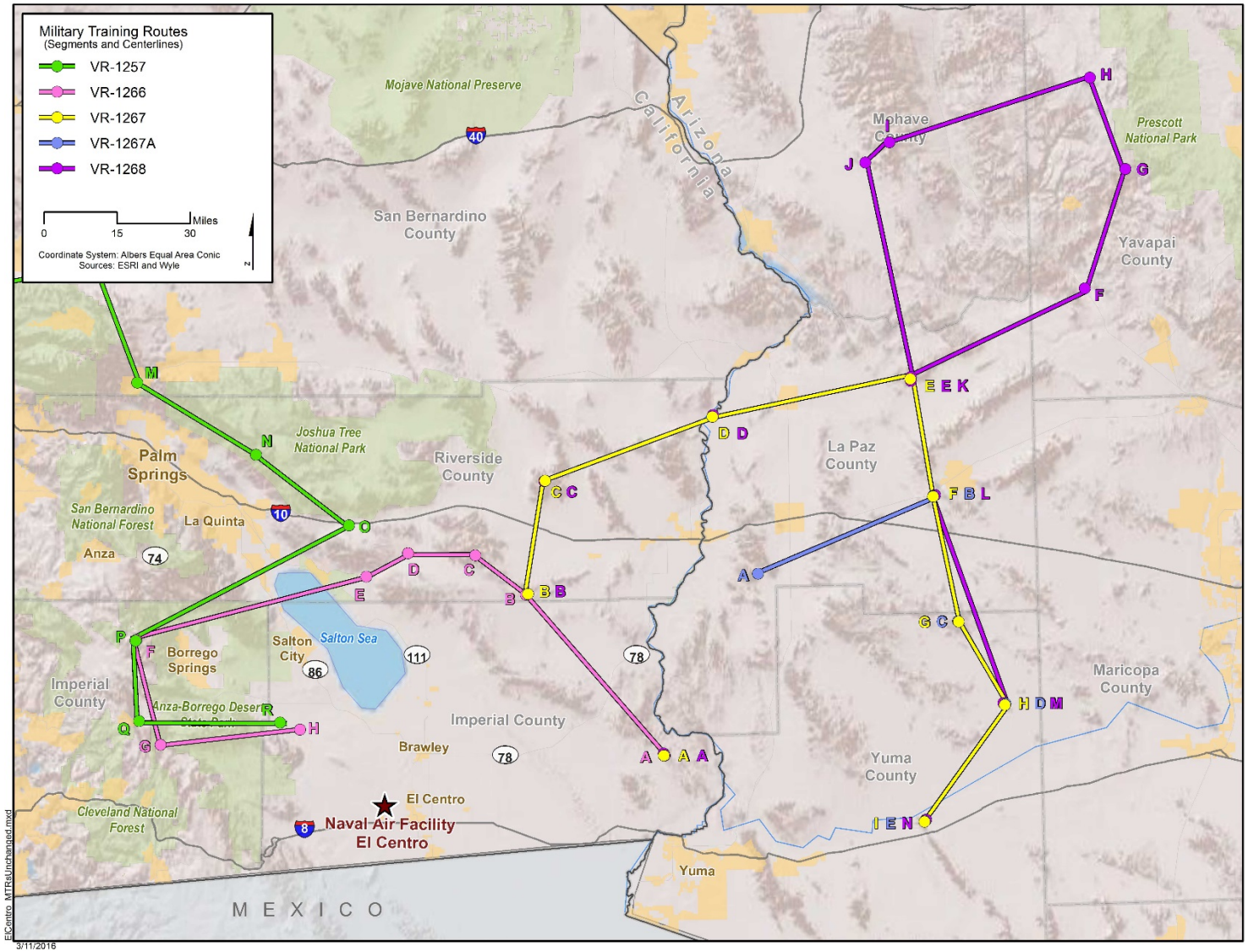

Figure 3. MTRs Included in Analysis to Remain Unchanged

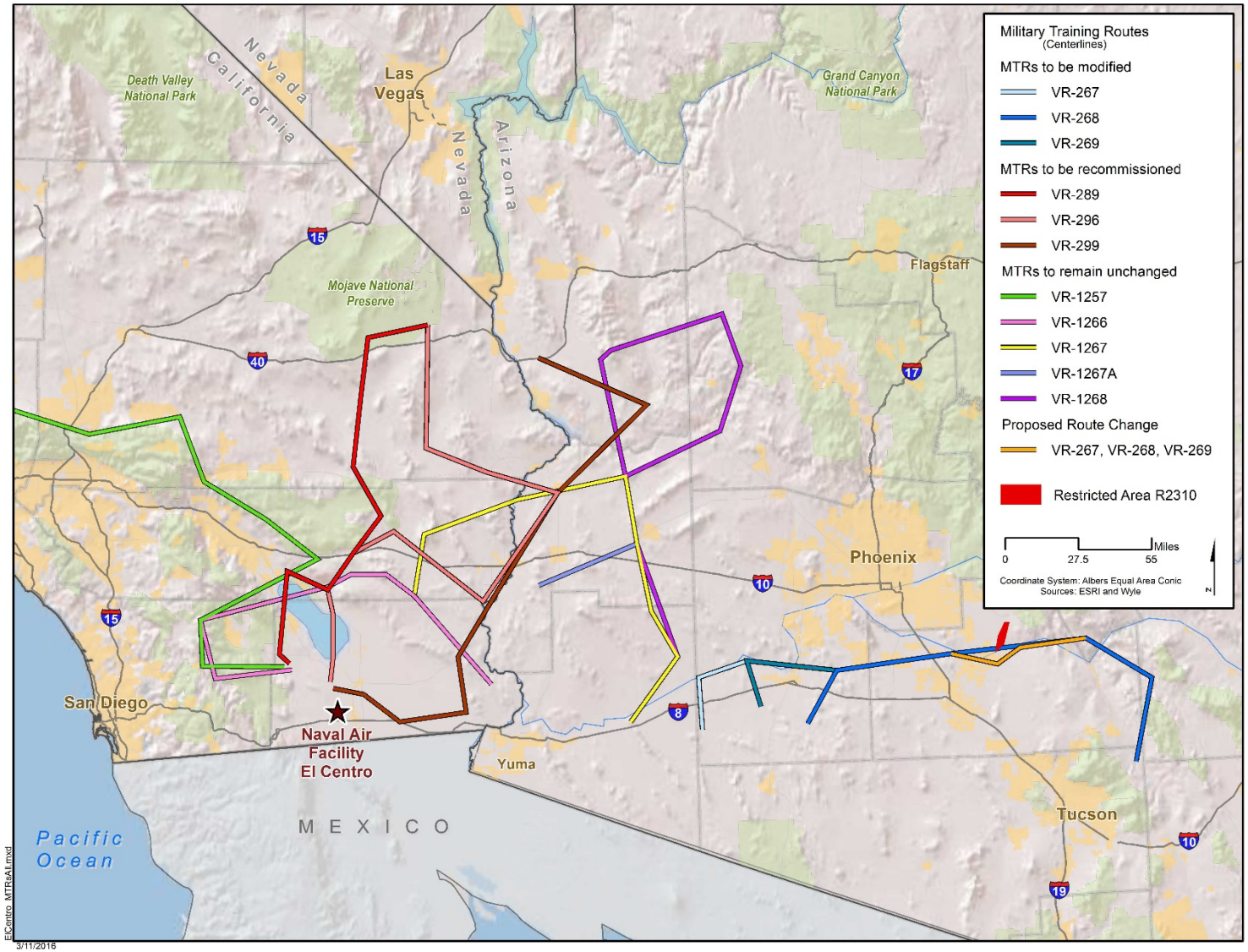

Figure 4. Overview of MTRs Analyzed

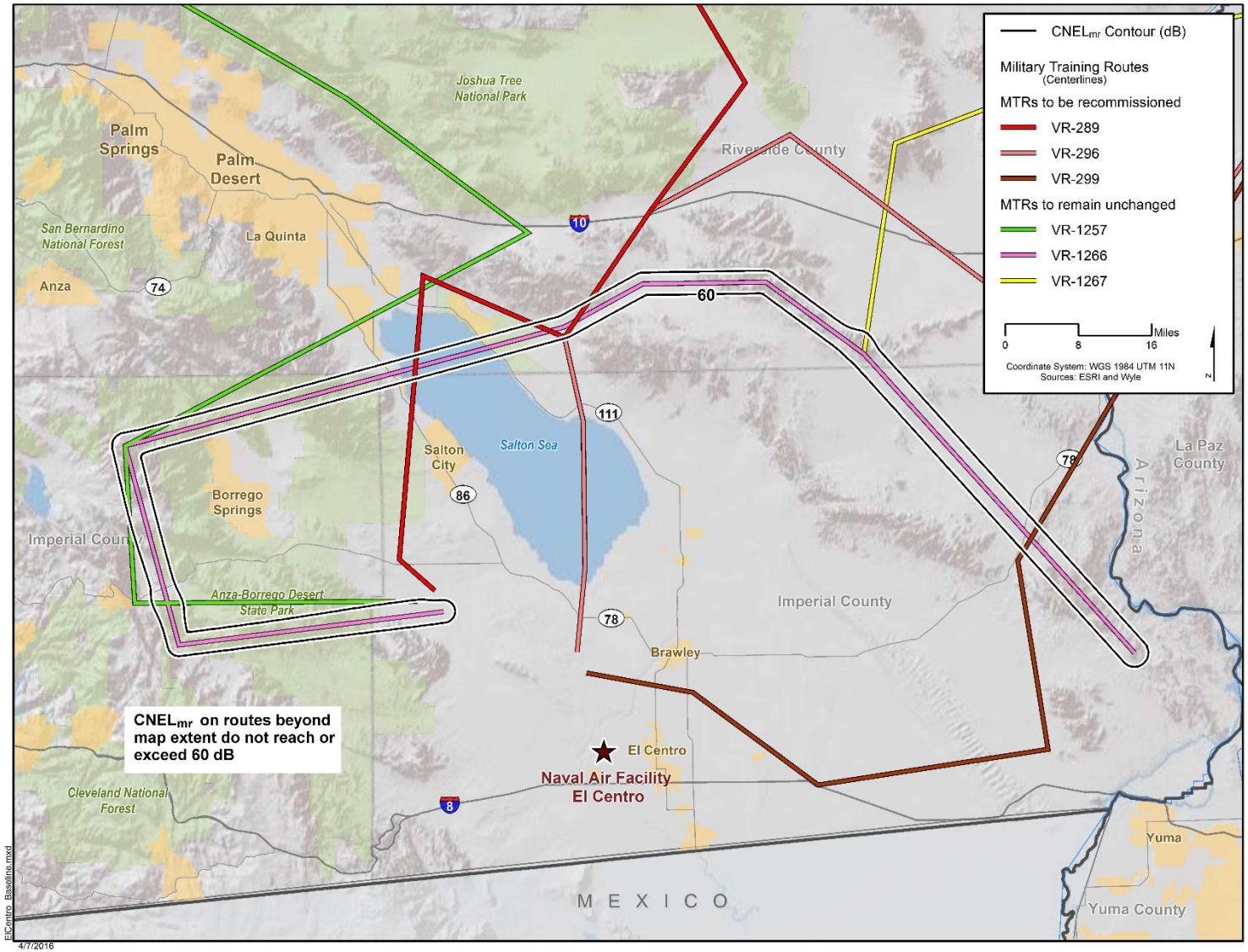

Figure 5. CNELmr Contours for the Baseline Scenario

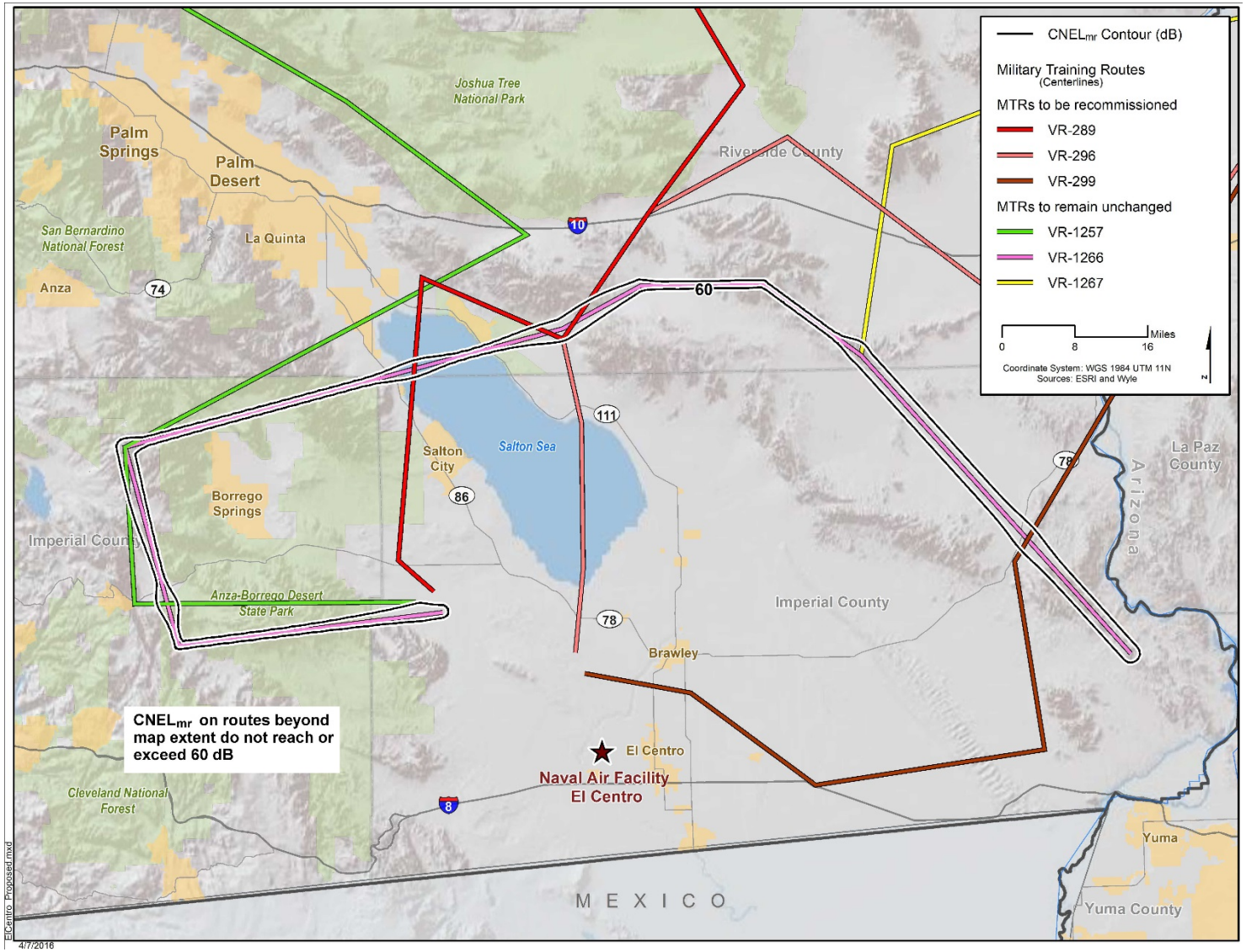

Figure 6. CNEL$_{mr}$ Contours for the Proposed Scenario

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Table A1. Baseline Aircraft Altitude Flight Profiles

VR-267	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT						
Aircraft Type	AB	BC	CD	DE	EF	FG	GH
T-45	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL	1000 - 1200 AGL	500 AGL
F/A-18 C/D/E/F	300 - 500 AGL	300 - 500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300 - 500 AGL	1000 - 1200 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300 AGL	1000 - 1200 AGL	300 AGL
MV-22	300 - 1000 AGL	300 - 1000 AGL	1000 - 1500 AGL	1000 - 1500 AGL	300 - 1000 AGL	1000 - 1500 AGL	300 - 1000 AGL
F-5	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL	1000 - 1200 AGL	500 AGL
F-16	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL	1000 - 1200 AGL	500 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300-500 AGL / 500-1500 AGL	1000 - 1200 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

VR-268	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT				
Aircraft Type	AB	BC	CD	DE	EF
T-45	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300 AGL
MV-22	300 - 1000 AGL	300 - 1000 AGL	1000 - 1200 AGL	1000 - 1500 AGL	300 - 1000 AGL
F-5	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL
F-16	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

VR-269	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT					
Aircraft Type	AB	BC	CD	DE	EF	FG
T-45	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL	500 AGL
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300 - 500 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300 AGL	300 AGL
MV-22	300 - 1000 AGL	300 - 1000 AGL	1000 - 1200 AGL	1000 - 1500 AGL	300 - 1000 AGL	300 - 1000 AGL
F-5	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL	500 AGL
F-16	500 AGL	500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	500 AGL	500 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	1000 - 1200 AGL	1000 - 1200 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

VR-1257	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT						
Aircraft Type	AB	BC	CD	DE	EF	FG	GH
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL
MV-22	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL
F-16	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

Table A1. Baseline Aircraft Altitude Flight Profiles (*continued*)

VR-1266	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT						
Aircraft Type	AB	BC	CD	DE	EF	FG	GH
T-45	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL
MV-22	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL
F-5	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL
F-16	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

VR-1267	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT							
Aircraft Type	AB	BC	CD	DE	EF	FG	GH	HI
T-45	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL
MV-22	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL
F-16	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL	500 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

VR-1267A	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT			
Aircraft Type	AB	BC	CD	DE
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	300 AGL	300 AGL
MV-22	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

VR-1268	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT							
Aircraft Type	AB	BC	CD	DE	EF	FG	GH	HI
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL
MV-22	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

VR-1268	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT				
Aircraft Type	IJ	JK	KL	LM	MN
F/A-18 C/DE/F	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL	300 - 500 AGL
AV-8B	300 AGL	300 AGL	300 AGL	300 AGL	300 AGL
MV-22	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL	200 - 1000 AGL
C-130	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL	1000 - 1200 AGL

Table A2. Proposed Aircraft Altitude Flight Profile Changes

VR-267	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT
Aircraft Type	A through J
T-45	500 AGL
F/A-18 C/DE/F	300 - 500 AGL
AV-8B	300 AGL
MV-22	300-1000 AGL
F-5	500 AGL
F-16	500 AGL
C-130	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL

VR-268	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT
Aircraft Type	A through H
T-45	500 AGL
F/A-18 C/DE/F	300 - 500 AGL
AV-8B	300 AGL
MV-22	300-1000 AGL
F-5	500 AGL
F-16	500 AGL
C-130	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL

VR-269	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT
Aircraft Type	A through I
T-45	500 AGL
F/A-18 C/DE/F	300 - 500 AGL
AV-8B	300 AGL
MV-22	1000 - 1500 AGL
F-5	500 AGL
F-16	500 AGL
C-130	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL

VR-289	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT
Aircraft Type	A through J
T-45	500 AGL
F/A-18 C/DE/F	300 - 500 AGL
AV-8B	300 AGL
MV-22	300-1000 AGL
F-5	500 AGL
F-16	500 AGL
C-130	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL

VR-296	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT
Aircraft Type	A through K
T-45	500 AGL
F/A-18 C/DE/F	300 - 500 AGL
AV-8B	300 AGL
MV-22	300-1000 AGL
F-5	500 AGL
F-16	500 AGL
C-130	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL

VR-299	TYPICAL ALTILTIUDE(s) FLOWN DURING EACH SEGMENT
Aircraft Type	A through I
T-45	500 AGL
F/A-18 C/DE/F	300 - 500 AGL
AV-8B	300 AGL
MV-22	1000 - 1500 AGL
F-5	500 AGL
F-16	500 AGL
C-130	300-500 AGL / 500-1500 AGL
F-35 A/B/C	1000 - 1200 AGL

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Appendix G – Air Emissions Calculations

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Emission Calculations

The Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the General Conformity Rule (40 CFR 93 Subpart B). This report provides a summary of the Emissions Calculations.

Action Title: MTR Re-commissioning and Modification Environmental Assessment

Action Description: Re-commissioning of three VRs (VR-289, VR-296, and VR-299) in southeastern California, as well as the modification of three VRs (VR-267, VR-268, and VR-269) in southwestern Arizona.

Formula for Aircraft Emissions:

AEM_{POL} = (TIM / 60) * (FC / 1000) * EF * NE * LTO / 2000

AEM_{POL}: Aircraft Emissions per Pollutant & Mode (tpy)

TIM: Time in Mode (min)

60: Conversion Factor minutes to hours

FC: Fuel Flow Rate (lb/hr)

1000: Conversion Factor pounds to 1000pounds

EF: Emission Factor (lb/1000lb fuel)

NE: Number of Engines

LTO: Number of Landing and Take-off Cycles (for all aircraft)

2000: Conversion Factor pounds to tpy

Note: It was assumed that all MTR operations would be conducted in climb out mode (i.e., intermediate mode) with power setting of 70-85 percent, and that all associated emissions would be completely within the air basin mixing zone.

Tables G-1 through G-13 present the emissions calculations for each aircraft designation that would be in use with the action.

Table G-1
Total Operational Emissions - Roll-Up

Pollutant	*T-35*	*F-18*	*F-35C*	*AV-8B*	*F-35B*	*CV-22*	Total
VOC	0.18	0.00	0.00	0.00	0.00	0.01	0.2
SO_x	0.36	0.05	0.03	0.01	0.01	0.33	0.8
NO_x	0.61	0.77	0.57	0.25	0.16	2.44	4.8
CO	16.59	0.07	0.02	0.01	0.01	0.56	17.3
PM_{10}	4.17	0.07	0.04	0.02	0.01	0.49	4.8
$PM_{2.5}$	3.27	0.04	0.03	0.01	0.01	0.44	3.8

Notes: Estimated Net Fuel Increase: 1,672,000 lbs per year

Estimated Total CO_{2e}: 2.720 tons per year

Aircraft Designation: F/A-18E

Engine Model: F414-GE-400

Primary Function: Combat

Number of Engines: 2

Time In Mode: 882 Minutes

Table G-2
F-18 Emissions

Pollutant	*Emissions Per Year (tpy)*	*Pollutant*	*Emissions Per Year (tpy)*
VOC	0.003175	$PM_{2.5}$	0.040820
SO_x	0.048077	Pb	0.000000
NO_x	0.772408	NH_3	0.000000
CO	0.069848		
PM_{10}	0.071209		

Table G-3
F-18 Emissions Factors

	Fuel Flow	*Emissions Factors (lb/1000lb fuel)*						
		VOC	*SOx*	*NO_x*	*CO*	*PM_{10}*	*$PM_{2.5}$*	*CO_2e*
Idle	685.00	3.39	1.06	1.70	110.18	4.47	3.10	3252.46
Approach	3111.00	0.04	1.06	7.86	2.02	1.46	0.87	3252.46
Intermediate	6464.00	0.07	1.06	17.03	1.54	1.57	0.90	3252.46
Military	7739.00	0.02	1.06	25.83	1.48	1.61	0.89	3252.46
After Burn	15851.00	1.85	1.06	5.43	50.31	3.57	3.21	3252.46

Aircraft Designation: T-35

Engine Model: J85-GE-5

Primary Function: Trainer

Number of Engines: 2

Time In Mode: 27,000 Minutes

Is Aircraft & Engine a Surrogate? Yes

Original Aircraft Name: T-45

Original Engine Name: F405-RR401

Table G-4
T-35 Emission

Pollutant	*Emissions Per Year (tpy)*	*Pollutant*	*Emissions Per Year (tpy)*
VOC	0.183200	$PM_{2.5}$	3.267067
SO_x	0.359615	Pb	0.000000
NO_x	0.614059	NH_3	0.000000
CO	16.589777		
PM_{10}	4.172889		

Table G-5
T-35 Emissions Factors

	Fuel Flow	Emissions Factors (lb/1000lb fuel)						
		VOC	SO_x	NO_x	CO	PM_{10}	$PM_{2.5}$	CO_2e
Idle	434.00	2.00	1.06	1.34	250.22	4.70	4.02	3252.46
Approach	864.00	1.29	1.06	1.42	154.82	2.80	1.85	3252.46
Intermediate	950.00	0.92	1.06	1.47	104.02	1.79	0.69	3252.46
Military	2740.00	0.12	1.06	2.64	32.91	1.13	0.04	3252.46
After Burn	8138.00	0.05	1.06	1.98	13.46	0.25	0.09	3252.46

Aircraft Designation: F-35C

Engine Model: F135-PW-100

Primary Function: Combat

Number of Engines: 1

Time In Mode: 432 Minutes

Table G-6
F-35C Emissions

Pollutant	Emissions Per Year (tpy)	Pollutant	Emissions Per Year (tpy)
VOC	0.000000	$PM_{2.5}$	0.030878
SO_x	0.032503	Pb	0.000000
NO_x	0.567267	NH_3	0.000000
CO	0.018398		
PM_{10}	0.035906		

Aircraft Designation: AV-8B

Engine Model: F135-PW-100

Primary Function: Combat

Number of Engines: 1

Time In Mode: 120.6 Minutes

Is Aircraft & Engine a Surrogate? Yes

Original Aircraft Name: AV-8B

Original Engine Name: F402-RR-408

Table G-7
AV-8B Emissions

Pollutant	Emissions Per Year (tpy)	Pollutant	Emissions Per Year (tpy)
VOC	0.000000	$PM_{2.5}$	0.013484
SO_x	0.014193	Pb	0.000000
NO_x	0.247715	NH_3	0.000000

CO	0.008034		
PM_{10}	0.015680		

Aircraft Designation: F-35B

Engine Model: F135-PW-600

Primary Function: Combat

Number of Engines: 1

Time In Mode: 60 Minutes

Table G-8
F-35B Emissions

Pollutant	*Emissions Per Year (tpy)*	*Pollutant*	*Emissions Per Year (tpy)*
VOC	0.000000	$PM_{2.5}$	0.008764
SO_x	0.009226	Pb	0.000000
NOx	0.161015	NH_3	0.000000
CO	0.005222		
PM_{10}	0.010192		

Aircraft Designation: CV-22

Engine Model: AE1107C

Primary Function: Transport - Bomber

Number of Engines: 2

Time In Mode: 31,500 Minutes

Table G-9
CV-22 Emissions

Pollutant	*Emissions Per Year (tpy)*	*Pollutant*	*Emissions Per Year (tpy)*
VOC	0.007136	$PM_{2.5}$	0.440576
SO_x	0.328880	Pb	0.000000
NO_x	2.441782	NH_3	0.000000
CO	0.564682		
PM_{10}	0.490218		

Table G-10
CV-22 Emissions Factors

	Fuel Flow	*Emissions Factors (lb/1000lb fuel)*						
		VOC	*SO_x*	*NO_x*	*CO*	*PM_{10}*	*$PM_{2.5}$*	*$CO2_e$*
Idle	362.00	0.10	1.06	4.15	8.35	1.58	1.42	3252.46
Approach	663.00	0.02	1.06	6.05	3.47	1.58	1.42	3252.46
Intermediate	948.00	0.02	1.06	7.87	1.82	1.58	1.42	3252.46
Military	2507.00	0.01	1.06	18.03	0.29	1.58	1.42	3252.46
After Burn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3252.46

Table G-11
Percentage Time Within Affected Counties

	Pinal	*Yuma*	*Maricopa*	*Gila*	*Graham*	*La Paz*	*Mohave*	*Pima*	*Imperial*	*Riverside*	*San Bernardino*	*San Diego*	*Maximum*
VR-1267	0	25	0	0	0	25	0	0	25	25	0	0	25
VR-1266	0	0	0	0	0	0	0	0	40	30	0	30	40
VR-289	0	0	0	0	0	0	0	0	10	35	50	5	50
VR-296	0	0	0	0	0	15	0	0	15	35	35	0	35
VR-299	0	0	0	0	0	45	0	0	35	20	0	0	45
VR-267	40	5	40	0	5	5	0	5	0	0	0	0	40
VR-268	40	5	40	0	5	5	0	5	0	0	0	0	40
VR-269	40	5	40	0	5	5	0	5	0	0	0	0	40

Table G-12
Estimated Net Time In Flight (Minutes)

Overall	*T-45*	*F/A-18*	*F-35C*	*AV-8B*	*F-35B*	*MV-22*	*F-16*	*F-15*	*C-130*
VR-1267	-3,724	-2,508	0	-1,997	0	-7,847	-388	0	-3,724
VR-1266	-1,554	-907	0	-1,728	0	-2,646	-222	0	-1,554
VR-289	11,618	263	143	63	41	12,270	0	0	11,618
VR-296	17,886	379	206	90	59	17,670	0	0	17,886
VR-299	16,467	349	190	83	54	16,260	0	0	16,467
VR-267	0	0	0	0	0	0	0	0	0
VR-268	0	0	0	0	0	0	0	0	0
VR-269	0	0	0	0	0	0	0	0	0
Total Time (minutes)	40,693	-2,423	538	-3,489	154	35,707	-610	0	-4,044
Highest Affected County	***T-45***	***F/A-18***	***F-35C***	***AV-8B***	***F-35B***	***MV-22***	***F-16***	***F-15***	***C-130***
VR-1267	-1,490	-1,003	0	-799	0	-3,139	-155	0	-1,490
VR-1266	-389	-227	0	-432	0	-662	-56	0	-389
VR-289	5,809	132	71	31	20	6,135	0	0	5,809
VR-296	6,260	133	72	32	21	6,185	0	0	6,260
VR-299	7,410	157	85	37	24	7,317	0	0	7,410
VR-267	0	0	0	0	0	0	0	0	0
VR-268	0	0	0	0	0	0	0	0	0
VR-269	0	0	0	0	0	0	0	0	0
Total (minutes)[a]	19,479	421	229	100	65	19,637	0	0	0

[a] Includes only net increases in flight time.

Table G-13
Estimated Emissions Compared to Effects Thresholds

	Criteria Pollutant Emissions (tpy)						*GHG Emissions (metric tpy)*
Activity/Source	***CO***	***NO_x***	***VOC***	***SO_x***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***
Proposed Action	17.3	4.8	0.2	0.8	4.8	3.8	***2,472***
Significant Impact Threshold	100[a]	25 (100)[b]	25 (100)[b]	100	70 (100)[c]	100	25,000
Exceed Threshold?	No	No	No	No	No	No	No

[a] Although no counties have been designated nonattainment or maintenance areas for CO, a *de minimis* threshold of 100 tpy has been carried forward to determine the level of effect under NEPA.
[b] *De minimis* thresholds for Riverside and San Bernardino Counties for NO_x and VOC is 25 tpy.
[c] *De minimis* thresholds for Riverside County for PM_{10} is 70 tpy.

Appendix H – Record of Non-Applicability

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RECORD OF NON-APPLICABILITY
In Accordance with the Clean Air Act - General Conformity Rule for the Recommissioning of Three Military Training Routes in Southwest Arizona and Southeast California

August 18, 2016

The U.S. Navy proposes the reactivation of three military training routes near NAF El Centro. The Proposed Action would generate emission from aircraft training activities. The table below outlines the attainment status and the *de minimis* threshold under the general conformity rule for the counties in which the Proposed Action would take place.

Attainment Status and De Minimis Thresholds

County	*Attainment Status*	*De Minimis Thresholds*
Pinal	Moderate nonattainment for $PM_{2.5}$ Moderate nonattainment for PM_{10} Maintenance for 8-Hour O_3	100 tpy for $PM_{2.5}$, SO_2, NO_x, PM_{10}, VOC
Yuma	Moderate nonattainment for PM_{10}	100 tpy for PM_{10}
Maricopa	Maintenance 8-Hour O_3	100 tpy for NO_x and VOC
Imperial	Moderate nonattainment for $PM_{2.5}$ Moderate nonattainment for PM_{10} Marginal nonattainment for 8-Hour O_3	100 tpy for $PM_{2.5}$, SO_2, NO_x, PM_{10}, VOC
Riverside	Serious nonattainment for PM_{10} Severe nonattainment for 8-Hour O_3	70 tpy for PM_{10} 25 tpy for NO_x and VOC
San Bernardino	Moderate nonattainment for PM_{10} Severe nonattainment for 8-Hour O_3	100 tpy for PM_{10} 25 tpy for NO_x and VOC
San Diego	Marginal nonattainment for 8-Hour O_3	100 tpy for NO_x and VOC
Gila, Graham, La Paz, Mohave, Pima	Attainment/Unclassifiable	None

ATTAINMENT AREA STATUS AND EMISSIONS EVALUATION CONCLUSION

General conformity under the Clean Air Act, Section 176 has been evaluated according to the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 93, Subpart B. The requirements of this rule are not applicable to the action because:

(1) The highest annual direct and indirect emissions from Proposed Action have been estimated at 4.8 tons of NO_x 0.2 tons of VOCs, 4.8 tons of PM_{10}, 3.8 tons of $PM_{2.5}$ and 0.8 tons of SO_2 which are below the *de minimis* threshold values for all areas associated with the Proposed Action; or (2) The action would be in an area designated as attainment for all criteria pollutants.

The maximum emissions would be below the *de minimis* thresholds the Proposed Action; therefore, the General Conformity Rule would not apply. Moderate changes in the types of aircraft and the hours of training would not substantially change these emissions estimates or the determination under the General Conformity Rule. Therefore, further formal Conformity Determination procedures are not required, resulting in this RONA.

RONA Approval:

Date: _____ Signature: _____

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