FINAL

ENVIRONMENTAL ASSESSMENT

For

Replacement of Heavy Lift Helicopter CH-53E

with Heavy Lift Helicopter CH-53K

At

Marine Corps Air Station New River

April 2020

Responsible Officer: Commanding Officer
Marine Corps Air Station New River
Jacksonville, North Carolina

Prepared by: Department of the Navy
U.S. Marine Corps
In accordance with
Marine Corps Order 5090.2, June 11, 2018
Pursuant to the National Environmental Policy Act

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Abstract

Designation:	Environmental Assessment
Title of Proposed Action:	Replacement of Heavy Lift Helicopter CH-53E with Heavy Lift Helicopter CH-53K
Project Location:	Marine Corps Air Station (MCAS) New River
Lead Agency for the EA:	U.S. Marine Corps
Affected Region:	Onslow County, NC
Action Proponent:	MCAS New River
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Date:	April 2020

The United States Marine Corps (USMC) has prepared this Environmental Assessment in accordance with the National Environmental Policy Act, as implemented by the Council on Environmental Quality Regulations and USMC regulations for implementing National Environmental Policy Act. The Proposed Action would replace the CH-53E heavy lift helicopter with the CH-53K heavy lift helicopter. This would represent a one-for-one replacement of all the CH-53E aircraft authorized at MCAS New River (16 aircraft per squadron, for a total of 60 aircraft). In addition, construction and/or renovation of the facilities at MCAS New River would be necessary to maintain, support, or train pilots and maintainers on the CH-53K and would be included in the Proposed Action. Demolition would be required of hangar AS4100, and construction of a new Module Type II hangar, multi-story parking structure, aircraft apron expansion, a CH-53K aircrew loading training facility, and a regional stormwater infiltration basin. At this time, it is not anticipated that there would be any changes to personnel loading, operations, or training activities associated with the CH-53K. Training and operations would mirror that of the existing CH-53E.This Environmental Assessment evaluates the potential environmental impacts associated with the Proposed Action Alternative and the No Action Alternative to the following resource areas: air quality, water resources, noise, biological resources, land use, and hazardous materials and wastes.

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EXECUTIVE SUMMARY

ES.1 Proposed Action

The United States (U.S.) Marine Corps (USMC) has prepared this Environmental Assessment (EA) to assess the potential environmental impacts associated with replacement of the CH-53E heavy lift helicopter with the CH-53K heavy lift helicopter at Marine Corps Air Station (MCAS) New River, North Carolina. The CH-53E Super Stallion is at the end of its anticipated operational life span, and cannot meet present and future heavy lift requirements. The Proposed Action would also include construction of a new hangar and support facilities to allow for maintenance and training for the CH-53K aircraft.

ES.2 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to replace the CH-53E heavy lift helicopters at MCAS New River with the CH-53K heavy lift helicopters as planned within the 2018 USMC Aviation Plan (USMC 2018b). Replacement of the CH-53E with the CH-53K is needed to ensure that the Marines can conduct the training necessary for mission and battlefield readiness, to maintain battlefield superiority, and execute operational tasking.

ES.3 Alternatives Considered

The USMC is considering one action alternative that meets the purpose of and need for the Proposed Action and a No Action Alternative.

Under the Proposed Action, the CH-53E at MCAS New River would be replaced with the CH-53K. This would represent a one-for-one replacement of all the CH-53E aircraft authorized at MCAS New River (three, 16-aircraft squadrons and one, 12-aircraft Fleet Replacement Squadron, for a total of 60 aircraft). In addition, construction and/or renovation of the facilities at MCAS New River would be necessary to maintain, support, or train pilots and maintainers on the CH-53K and would be included in the Proposed Action. At this time, it is not anticipated that there would be any changes to personnel loading, operations, or training activities associated with the CH-53K. Training and operations would mirror that of the existing CH-53E.

MCAS New River would construct a Module Type II aircraft hangar (approximately 297,000 square feet) to replace the outdated existing CH-53E hangar (Building AS4100). Building AS4100 would be demolished to make space for the new hangar. As part of the CH-53K transition effort, a 230,000-square foot parking structure would be constructed adjacent to the proposed hangar.

This parking structure would provide much needed parking spaces for personnel reporting to the new CH-53K hangar. Vehicular parking along the flight line area is currently limited due to required anti-terrorism/force protection standoff distances. Also included would be the paving of approximately 530,000 square feet (12 acres) of grass infield for an expanded parking apron for aircraft.

The Proposed Action also includes the construction of a Regional Stormwater Infiltration System to the west of the airfield on undeveloped land. The Infiltration System is necessary due to the large amount of impervious surface at MCAS New River. The Regional Stormwater Infiltration System would be used to treat stormwater from existing and future impervious surfaces at MCAS New River, including the new aircraft parking apron. The single, large feature would allow for improved future treatment capacity and prevent MCAS New River from needing to construct many, smaller stormwater features.

Also included in the Proposed Action is the construction of a CH-53K Air Crew Training. This facility is approximately 9,800-square feet and is required to train Marines in loading the new CH-53K.

Under the No Action Alternative, the Proposed Action would not occur. The existing CH-53E heavy lift helicopters at MCAS New River would not be replaced with the CH-53K heavy lift helicopters. There would be no demolition or construction under the No Action Alternative. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, the No Action Alternative is carried forward to serve as a comparative baseline for analysis.

ES.4 Summary of Environmental Resources Evaluated in the EA

Council on Environmental Quality regulations, National Environmental Policy Act, and USMC instructions for implementing the National Environmental Policy Act, specify that Environmental Assessment should address those resource areas potentially subject to impacts. In addition, the level of analysis should be commensurate with the anticipated level of environmental impact.

The following resource areas have been addressed in this EA: Air Quality, Water Resources, Noise, Biological Resources, Coastal Zone, and Hazardous Materials and Wastes. Because potential impacts were considered to be negligible or nonexistent, the following resources were not evaluated in this EA: Socioeconomics, Environmental Justice, Geological Resources, Cultural Resources, and Infrastructure.

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

Table ES-1 provides a tabular summary of the potential impacts to the resources associated with each of the alternative actions analyzed.

ES.6 Public Involvement

The USMC coordinated with North Carolina Department of Environmental Quality (NCDEQ) and the North Carolina State Clearinghouse and solicited comments from various state agencies. A Federal Consistency Determination was provided to NCDEQ on November 15, 2019. Concurrence was received from NCDEQ on January 9, 2020. A notice for public review of the EA was published in the *Jacksonville Daily News* on January 30, 2020. No public comments were received.

Table ES-1. Summary of Potential Impacts to Resource Areas		
Resource Area	***Proposed Action***	***No Action Alternative***
Air Quality	• Estimated annual construction and demolition emissions would not exceed any of the comparative thresholds. • The airfield operations once the transition to the CH-53K has occurred would result in decreases in VOC, CO, PM_{10} and $PM_{2.5}$ emissions. • NO_x and SO_2 emissions would increase, but would not exceed the Comparative Threshold.	• No additional impacts to air quality from existing conditions
Water Resources	• Proposed parking apron would impact approximately 460 linear feet of stream that may require permitting and mitigation for impacts • Proposed construction and demolition activities with ground disturbance would contribute to erosion and sedimentation from stormwater runoff • Impact would be temporary during demolition and construction activities and would be reduced from implementation of best management practices.	• No additional impacts to water resrouces
Noise	• Transition to the CH-53K would cause an additional 39 acres to be exposed to noise levels greater than 65 DNL (dBA). • No areas of noise greater than 65 DNL would extend off of USMC owned property. • No cantonment or residential areas would be exposed to noise above 65 DNL as a result of the Proposed Action. • No Points of Interest would be exposed to noise levels greater than 57 DNL.	• No additional impacts to noise environment
Biological Resources	• The construction would occur within highly urbanized, previously disturbed areas. • The Regional Stormwater Infiltration System would require the cutting of approximately 19 acres of vegetated area. • The forested area would transition to an infiltration basin, with wetland features and functions. • No impacts to any federally listed threatened or endangered species	• No additional impacts to biological resources.
Coastal Zone	• All portions of action are consistent with policies of North Carolina's Coastal Area Management Act, to the maximum extent practicable.	• No additional impacts to land use within the coastal zone.

Table ES-1. Summary of Potential Impacts to Resource Areas		
Resource Area	***Proposed Action***	***No Action Alternative***
Hazardous Materials and Wastes	• Hazardous materials and creation of hazardous waste would be similar to current conditions aboard MCAS New River. • It is not anticipated that new hazardous waste streams would be created with the operation of the CH-53K • During demolition of AS4100 the contractor could encounter ACMs, LBP, and PCBs and aqueous film forming foam (AFFF) potentially containing per- and polyfluoroakyl substances (PFAS) used in the original construction and operation of the building. MCAS New River would utilize contractors already approved by MCB Camp Lejeune to carry out any required sampling, abatement, and permitting that may be required. • If contaminated media are encountered, they would be identified, characterized, managed, and disposed of in accordance with MCAS New River's Hazardous Waste Management Plan and Permit. • Munitions clearance would need to be conducted before construction of the Regional Stormwater Infiltration System.	• No additional impacts to hazardous materials or wastes.

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Environmental Assessment for Replacement of Heavy Lift Helicopter CH-53E with Heavy Lift Helicopter CH-53K

Marine Corps Air Station New River

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Abbreviations and Acronyms

Acronym	Definition
ACM	Asbestos Containing Material
AICUZ	Air Installations Compatible Use Zones
ATFP	Anti-Terrorism/Force Protection
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CAA	Clean Air Act
CATEX	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CNATT	Center for Naval Aviation Technical Training
CNEL	Community Noise Equivalent Level
CO	Carbon Monoxide
CO_2e	Carbon Dioxide Equivalent
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	Decibel
dBA	A-weighted Decibel
DERP	Defense Environmental Restoration Program
DNL	Day-night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
HAP	Hazardous Air Pollutant
Hz	Hertz
LBP	Lead Based Paint
MAG	Marine Aircraft Group
MBTA	Migratory Bird Treaty Act
MCALF	Marine Corps Auxiliary Landing Field
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
MCO	Marine Corps Order
mgd	million gallons per day
MILCON	Military Construction
MRF	Material Recycling Facility
MSAT	Mobile Source Air Toxics
NAAQS	National Ambient Air Quality Standards
NCDEQ	North Carolina Department of Environmental Quality
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
OPNAVINST	Chief of Naval Operations Instruction
Pb	Lead
PCB	Polychlorinated Biphenyls
PM10	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
POI	Point of Interest

Acronym	Definition
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
ROI	Region of Influence
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
T&P	Treatment and Processing
TLZ	Tactical Landing Zone
TMDL	Total Maximum Daily Load
tpy	tons per year
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USMC	U.S. Marine Corps
VOC	Volatile Organic Compound
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

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1 Purpose of and Need for the Proposed Action

1.1 Introduction

The United States (U.S.) Marine Corps (USMC) has prepared this Environmental Assessment (EA) to assess the potential environmental impacts associated with replacement of the CH-53E heavy lift helicopter with the CH-53K heavy lift helicopter at Marine Corps Air Station (MCAS) New River, North Carolina. The Proposed Action is part of a Marine Corps wide process of replacing its aging fleet of heavy lift helicopters with a modern, more capable CH-53K aircraft. The CH-53E is at the end of its anticipated operational life span, and cannot meet present and future heavy lift requirements. The Proposed Action also includes renovating and constructing facilities to house and maintain the replacement aircraft, as well as constructing facilities for training personnel to develop the skills needed to employ the new aircraft within the fleet.

This EA has been prepared by the USMC in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended; 42 U.S. Code (USC) 4321-4370h, as implemented by the Council on Environmental Quality (CEQ) regulations, 40 Code of Federal Regulations (CFR) Parts 1500-1508 and the NEPA procedures contained in the Marine Corps Order (MCO) 5090.2, Volume 12, dated 11 June 2018, Environmental Compliance and Protection Program, which established procedures for implementing NEPA.

1.2 Background

MCAS New River is located on the west bank of the New River, in eastern North Carolina. It is approximately 3 miles south of downtown Jacksonville, the county seat of Onslow County. MCAS New River is approximately 3,700 acres within the northwest portion of the larger 130,000-acre Marine Corps Base (MCB) Camp Lejeune (**Figure 1.2-1**).

MCAS New River's mission is to "support and enhance the combat readiness of the Marine Corps Aviation Combat Element and Department of Defense units while improving the quality of life for military personnel, their families, and work force assigned to the Air Station". MCAS New River is the premier Marine Corps rotor/tilt-rotor operating facility on the East Coast. Several major tenants of MCAS New River conduct predominately rotary-wing and tilt-rotor operations, including units of the 2nd Marine Aircraft Wing: Marine Aircraft Group (MAG) 26 and MAG 29, and their subordinate aircraft squadrons.

MAG 26 was commissioned in 1952 at MCAS Cherry Point, but relocated to MCAS New River in 1954. MAG 26 consists of six marine medium tilt-rotor squadrons (VMM-162, VMM-261, VMM-263, VMM-264, VMM-266, and VMM-365), tilt-rotor training squadron (VMMT-204), aviation logistics squadron (MALS-26) and wing support squadron (MWSS-272). MAG 29 was commissioned in 1972 at MCAS New River, and consists of two light attack helicopter squadrons (HMLA-167 and HMLA-269), three heavy helicopter squadrons (HMH-366, HMH-461, and HMH-464), one heavy helicopter training squadron (HMHT-302), aviation logistics squadron (MALS-29), and a wing support squadron (MWSS-274). Both MAGs provide direct aircraft support to the USMC Forces Command in the form of troop transport, observation, heavy lift capability, command and control, and light attack.

Legend: MCALF = Marine Corps Auxiliary Landing Field; MCOLF = Marines Corps Outlying Landing Field
Source: ESRI 2018; USMC 2018a.

Figure 1.2-1. General Location and Overview of MCAS New River

1.2.1 CH-53E Super Stallion Aircraft

The CH-53E entered service in 1981 and is the only heavy lift helicopter in the USMC rotary-wing inventory. The CH-53E routinely transports loads in excess of 4.5 tons within a range of 540 nautical miles, and a combat radius of 110 nautical miles, providing the Marine Corps and joint forces with the ability to quickly mass combat power. The Super Stallion's heavy lift capability combined with its global amphibious presence have made it an indispensable asset when responding to both regional hot spots and humanitarian assistance.

Combat operations and humanitarian crises have validated the relevance of vertical heavy lift by both the Marine Air-Ground Task Force and joint force commanders alike. MCAS New River is home to three CH-53E squadrons, each designed and programmed for 16 CH-53E aircraft, and a Fleet Replacement Squadron, which has 12 CH-53E aircraft. Current shortfalls due to service life and age-related issues of the CH-53E have reduced the three fleet squadrons to 12 aircraft per squadron. This equates to 48 CH-53E aircraft currently operating at MCAS New River. Low aircraft inventory is accentuated by aircraft being modified or receiving depot level maintenance and repairs, obsolescence issues, and supply issues associated with an aging airframe. These factors result in a lack of aircraft ready for tasking on the flightline. As such, the CH-53E Super Stallion is at the end of its anticipated operational life span, and cannot meet present and future heavy lift requirements. Service life extension programs and additional aircraft modifications cannot provide the required capabilities and readiness.

1.2.2 CH-53K King Stallion Aircraft

The CH-53K would continue to fulfill the CH-53E mission, but with enhanced capabilities. The CH-53K would have an increased payload (13.5 tons), nearly three times the capability of the CH-53E under similar flying conditions. Major system improvements include: fly-by-wire controls; a composite airframe; more capable and fuel efficient engines; a split torque gearbox to enable increased gross weight; advanced fourth-generation composite main rotor blades; modern interoperable glass cockpit; internal cargo handling systems compatible with U.S. Air Force 463L pallets; triple hook external cargo system allowing for disbursement of three separate loads at three separate locations per sortie (a sortie is an aircraft operation that includes a takeoff, mission, and return); and fourth-generation aircraft survivability equipment. The new aircraft would also have a larger, wider cabin that allows increased internal cargo capacity. The new aircraft has 57 percent more horsepower than the CH-53E and 63 percent fewer parts, increasing capability, reliability, and ease of maintenance. These elements all add to increased performance margins in degraded aeronautical environments. Additionally, the CH-53K would be supported by an upgraded software system that would facilitate condition based maintenance. Once the CH-53K is in operation, the aircraft inventory would be returned to 16 aircraft per fleet squadron, as well as 12 aircraft within the fleet replacement squadron, replacing the current aircraft and filling the existing gaps in each squadron.

1.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to replace the CH-53E heavy lift helicopters at MCAS New River with the CH-53K heavy lift helicopters as planned within the 2018 USMC Aviation Plan (USMC 2018b). This action would also include construction of the necessary support facilities to achieve training and operational mission requirements of the CH-53K. Replacement of the CH-53E with the CH-53K is needed to ensure that the Marines can conduct the training necessary for mission and battlefield readiness, to maintain battlefield superiority, and execute operational tasking.

1.4 The Environmental Review Process

1.4.1 The National Environmental Policy Act

NEPA requires Federal agencies to consider the environmental impacts of their actions before they are implemented, document these considerations, and involve the public in the review process. An EA is a concise public document that provides sufficient analysis for determining whether the potential environmental impacts of a proposed action are not significant, resulting in the preparation of a Finding of No Signification Impact (FONSI), or are significant, resulting in the preparation of an Environmental Impact Statement (EIS).

1.4.2 Key Documents

Key documents are sources of information incorporated into this EA. Documents are considered to be key because of similar actions, analyses, or impacts that may apply to this Proposed Action. CEQ guidance encourages incorporating documents by reference. Documents incorporated by reference in part or in whole include:

- Record of Decision for Introduction of the V-22 to the Second Marine Aircraft Wing in Eastern North Carolina (USMC 1999)

1.4.3 Relevant Laws and Regulations

The Marine Corps 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 of 1969, as amended (42 USC sections 4321-4370h)
- CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR parts 1500-1508)
- Department of Navy regulations for implementing NEPA, as amended (32 CFR part 775)
- MCO 5090.2, USMC Environmental Compliance and Protection Program, Volume 12
- Clean Air Act of 1963, as amended (CAA) (42 USC section 7401 et seq.)
- Clean Water Act of 1973, as amended (CWA) (33 USC section 1251 et seq.)
- Coastal Zone Management Act (CZMA) (16 USC section 1451 et seq.)
- Endangered Species Act (ESA) (16 USC section 1531 et seq.)
- Migratory Bird Treaty Act (MBTA) (16 USC section 703-712)
- Bald and Golden Eagle Protection Act (BGEPA) (16 USC section 668-668d)
- Executive Order (EO) 11988, Floodplain Management
- EO 11990, Protection of Wetlands
- EO 13834, Efficient Federal Operations

1.4.4 Public Involvement

According to CEQ regulations (40 CFR section 1506.6), agencies are directed to make diligent efforts to involve the public in preparing and implementing their NEPA procedures. Through the public involvement process, the Marine Corps coordinates with relevant Federal, state, and local agencies and notifies them and the public of the Proposed Action.

A notice of availability of the EA for public review was published in the Jacksonville Daily News on January 30, 2020. No public comments were received.

1.4.5 Agency Consultation and Permit Requirements

The Marine Corps delivered a Federal Coastal Consistency Determination to the North Carolina Department of Environmental Quality (NCDEQ), Division of Coastal Management on November 15, 2019 (**Appendix A**). Concurrence by the NCDEQ, Division of Coastal Management was received on January 9, 2020 . Consultation with the State Historic Preservation Officer (SHPO) wasn't necessary, as the action doesn't impact any cultural resources at MCAS New River. This conclusion was based on the SHPO approved Integrated Cultural Resources Management Plan (MCB Camp Lejeune 2018) and confirmed with MCB Camp Lejeune's Cultural Resource Manager (personal communication Richardson 2019). An informal list of federally listed species that have the potential to be within the project area was generated on October 2, 2019 from US Fish and Wildlife's Information for Planning and Consultation website (Consultation Code 04EN2000-2020-SLI-0007). Consultation with US Fish and Wildlife Service was deemed unnecessary, due to the lack of appropriate habitat for threatened and endangered species within the project areas. The document was provided to the North Carolina State Clearinghouse for review and comment on November 25, 2019 (**Appendix D**). The only comments received were from North Carolina's Natural Heritage Program. Those comments were addressed in the biological resources section of this document.

The potential does exist for wetland and stream impacts. Because of this, Section 401 and 404 permits for stream and wetland impacts may be required from the US Army Corps of Engineers and NC Department of Environmental Quality prior to any construction work being done.

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2 Proposed Action and Alternatives

2.1 Proposed Action

The Marine Corps proposes the replacement of existing CH-53E Super Stallion heavy lift helicopter located at MCAS New River with the new CH-53K King Stallion heavy lift helicopter, as planned in the 2018 USMC Aviation Plan (USMC 2018b). The CH-53E Super Stallion is at the end of its anticipated operational life span, and cannot meet present and future heavy lift requirements. The Proposed Action would also include construction of a new hangar and support facilities to allow for maintenance and training for the CH-53K aircraft.

2.2 Alternatives Development

CEQ regulations, 40 CFR Parts 1500-1508 and the NEPA procedures contained in MCO 5090.2, dated 11 June 2018, *Environmental Compliance and Protection Program*, provide guidance on the consideration of project alternatives and promote the objective evaluation of reasonable alternatives. Reasonable alternatives must meet the stated purpose and need for the Proposed Action, which is to replace the aging CH-53E with the CH-53K at MCAS New River, along with any necessary facility updates to achieve this goal.

MAG 29 has been continuously stationed at MCAS New River since 1972. The requirement of USMC is to continue the heavy lift helicopter presence at MCAS New River due to the location, which allows the squadrons to support training operations at MCB Camp Lejeune, as well as supporting the Aviation Combat Element of a Marine Expeditionary Unit. MCAS New River currently houses the existing and necessary MAG infrastructure of which the CH-53E heavy lift helicopter is an integral part. As such, no other locations were considered for CH-53K transition for this EA.

The location of a hangar is functionally dependent on proximity to the flight line. The existing CH-53E hangars at MCAS New River are outdated and do not meet the technical requirements for the proposed CH-53K; therefore, it was determined that renovations were not feasible and a new hangar and support facilities would have to be constructed. The area around the runways at MCAS New River is heavily developed with little area available for new construction. Siting of the proposed hangar and support facilities took into consideration minimizing the environmental impact, specifically the impact to wetlands. With so little area available for development on the flight line, there were no other feasible locations for the proposed hangar and support facilities other than what is proposed in this EA.

2.2.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. The existing CH-53E heavy lift helicopters at MCAS New River would not be replaced with the CH-53K heavy lift helicopters. There would be no demolition or construction under the No Action Alternative. The No Action Alternative would not meet the purpose and need for the Proposed Action; however, the No Action Alternative is carried forward to serve as a comparative baseline for analysis.

2.2.2 Proposed Action (Preferred Alternative)

Under the Proposed Action, the CH-53E at MCAS New River would be replaced with the CH-53K. This would represent a one-for-one replacement of all the CH-53E aircraft authorized at MCAS New River (three, 16-aircraft squadrons and one, 12-aircraft Fleet Replacement Squadron, for a total of 60 aircraft).

In addition, construction and/or renovation of the facilities at MCAS New River would be necessary to maintain, support, or train pilots and maintenance personnel on the CH-53K and would be included in the Proposed Action. At this time, it is not anticipated that there would be any changes to personnel loading, operations, or training activities associated with the CH-53K. Training and operations would mirror that of the existing CH-53E. Details on the construction projects to support the CH-53K are provided below.

Construction and Demolition Projects

In order to achieve the transition from CH-53E to CH-53K at MCAS New River, several construction and demolitions projects would be included (**Figure 2.2-1** and **Table 2.2-1**).

Table 2.2-1. Construction and Demolition Projects Associated with the Proposed Action

Facility	*Approximate Size (Square Feet)*	*Description/Usage*
Construction Projects		
CH-53K Hangar	297,000	Three Module, Type II Hangar for CH-53K Maintenance.
Aircraft Parking Apron Expansion	530,000	Paved area to expand aircraft parking capacity.
Parking Structure	230,000	Four-level parking structure for CH-53K personnel and to make up for existing parking deficiency. .
CH-53K Air Crew Training Facility	10,000	Training facility for loading crews for CH-53K.
Regional Stormwater Infiltration System	530,000	Single infiltration system to treat stormwater from existing and future impervious surface at MCAS New River. Would include a pump station at south end of airfield to feed into infiltration basin.
Demolition Projects		
AS4100	31,000	Existing CH-53E Maintenance Hangar would be demolished to make way for new CH-53K hangar.

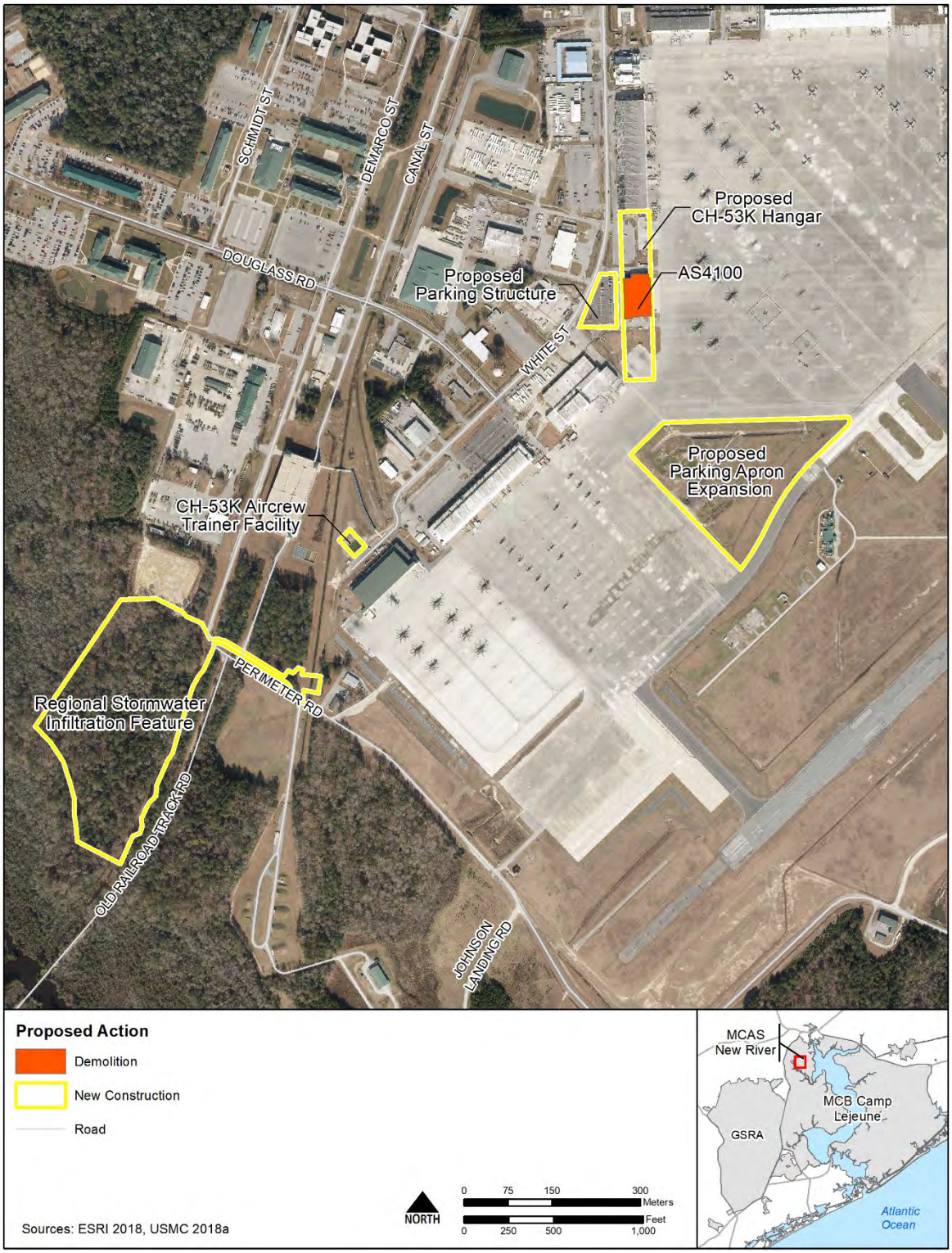

Figure 2.2-1. Proposed Projects under the Proposed Action at MCAS New River

MCAS New River would construct a Module Type II aircraft hangar (approximately 297,000 square feet) to replace the outdated existing CH-53E hangar (Building AS4100). Demolition of building AS4100 would occur to make space for the new hangar. As part of the CH-53K transition effort, a 230,000-square foot parking structure would be constructed adjacent to the proposed hangar.

This parking structure would provide much needed parking spaces for personnel reporting to the new CH-53K hangar. Vehicular parking along the flight line area is currently limited due to required anti-terrorism/force protection standoff distances. Also included would be the paving of approximately 530,000 square feet (12 acres) of grass infield for an expanded parking apron for aircraft.

The Proposed Action also includes the construction of a Regional Stormwater Infiltration System to the west of the airfield on undeveloped land. The Infiltration System is necessary due to the large amount of impervious surface at MCAS New River. The installation is predominately built out, with little natural area left within its boundary. The Regional Stormwater Infiltration System would be used to treat stormwater from existing and future impervious surfaces at MCAS New River, including the new aircraft parking apron. The single, large feature would allow for improved future treatment capacity and prevent MCAS New River from needing to construct many, smaller stormwater features. The new single system would provide stormwater storage capacity and be designed to allow infiltration and discharge into an adjacent wetland area. This feature would also allow MCAS New River to remove the many, smaller stormwater features that occupy valuable space within the MCAS New River boundary.

Also included in the Proposed Action is the construction of a CH-53K Air Crew Training Facility. This facility is approximately 9,800-square feet and is required to keep Marines trained in loading the new CH-53K.

3 Affected Environment and Environmental Consequences

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

This section includes air quality, water resources, noise, biological resources, coastal zone, and hazardous materials and wastes.

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:

Socioeconomics: The transition of the CH-53E to the CH-53K would not require any additional personnel at MCAS New River. The CH-53K, while new, is very similar to the CH-53E and would fulfill the same mission. As such, there would be little to no additional impact to the local economy. The transition would require construction of a new hangar, parking structure, and two instructional facilities. The construction may provide some minor, temporary beneficial impacts to the local economy from construction related jobs and purchasing, but would not require any long-term employment as a result of the aircraft transition. As such, there would be no lasting impacts to socioeconomics. Therefore Socioeconomics is not discussed further in this EA.

Environmental Justice: The transition of the CH-53E to the CH-53K and the associated construction would not have any disproportionate impacts to minority or low-income populations. The action would occur entirely on MCAS New River, and the CH-53K would operate the same as the CH-53E, using the same airspace and ranges for training. No aspect of the Proposed Action would create any dangers to children. Construction activities would all occur on MCAS New River, with contractors following all necessary and required safety procedures set forth by MCAS New River. As such, Environmental Justice is not discussed further in this EA.

Geological Resources: The Proposed Action would require construction of an updated hangar, expanded aircraft parking apron, parking structure, and two training facilities, as well as the construction of the Regional Stormwater Infiltration System. The structures would all be constructed in areas that are developed or have been previously disturbed. Construction of the Regional Stormwater Infiltration System would involve minor disturbance to soils, but would not impact underlying geology. Paving the grass infield area for the expanded aircraft parking apron would add approximately 12 acres of new impervious surface and permanently cover that area of land with concrete. All construction would require adherence to MCAS New River's Stormwater Management Plan and all Erosion and Sediment Control Procedures. This would ensure that any impacts to geological resources would remain negligible.

Cultural Resources: The Regional Stormwater Infiltration System would intersect with three known archaeological sites at MCAS New River. The sites (31ON1366**, 31ON1379, and 31ON1378/1378**) have been surveyed and were deemed ineligible for inclusion on the National Register of Historic Places. Preliminary environmental documentation for the Regional Stormwater Infiltration System included notation that the Environmental Conservation Branch, Archaeology Section had reviewed the sites and had no objections to the project occurring (personal communication Richardson 2019).

Infrastructure. At this time, it is not anticipated that there would be any changes to personnel loading, operations, or training activities associated with the CH-53K. Training and operations would mirror that of the existing CH-53E. There would be no change in demand for potable water and electricity or

wastewater generation under the Proposed Action. During construction and demolition activities, contractors are responsible for the removal of construction debris. Waste concrete would be crushed and staged for later use, or if unsuitable would be disposed of at an approved Construction and Demolition Debris landfill. The Regional Stormwater Infiltration System would remove the need for many, smaller stormwater basins that are constructed on a case by case basis. The new infiltration system would provide increased stormwater control capacity, as well as consolidating many individual stormwater features into a single well maintained facility. This would allow development along the flightline while conveying stormwater away from the immediate vicinity for primary treatment and infiltration. As such, there would be negligible impacts on MCAS New River's infrastructure.

3.1 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.

3.1.1 Regulatory Setting

3.1.1.1 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 CAA, the U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) (40 CFR part 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.

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. 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 (SIPs), are developed by state and local air quality management agencies and submitted to USEPA for approval.

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

3.1.1.2 Mobile Sources

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

3.1.1.3 General Conformity

The USEPA General Conformity Rule applies to federal actions occurring in nonattainment or maintenance areas when the total direct and indirect emissions of nonattainment pollutants (or their precursors) exceed specified thresholds. Because MCAS New River is in an area designated as attainment/unclassified for all criteria pollutants, General Conformity does not apply and is not carried forward in the air quality analysis.

3.1.1.4 Permitting

New Source Review (Preconstruction Permit)

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. This permitting process for major stationary sources is called New Source Review and is required whether the major source or major modification is planned for nonattainment areas or attainment and unclassifiable areas. In general, permits for sources in attainment areas and for other pollutants regulated under the major source program are referred to as Prevention of Significant Deterioration (PSD) permits, while permits for major sources emitting nonattainment pollutants and located in nonattainment areas are referred to as nonattainment new source review permits. In addition, 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 PSD for the pollutants for which the area is attainment. Additional PSD permitting thresholds apply to increases in stationary source GHG emissions. PSD permitting can also apply to a new major stationary source (or any net emissions increase associated with a modification to an existing

major stationary source) that is constructed within 6.2 miles of a Class I area, and which would increase the 24-hour average concentration of any regulated pollutant in the Class I area by 1 microgram per cubic meter or more. USMC installations shall comply with applicable permit requirements under the PSD program per 40 CFR section 51.166.

Title V (Operating Permit)

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

3.1.1.5 Greenhouse Gases

GHGs are gas emissions that trap heat in the atmosphere. These emissions occur from natural processes and human activities. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

In an effort to reduce energy consumption, reduce GHGs, reduce dependence on petroleum, and increase the use of renewable energy resources the Navy and USMC have implemented a number of renewable energy projects. The Navy/USMC have 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 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 and USMC continue to promote and install new renewable energy projects.

3.1.2 Affected Environment

The most recent emissions inventory for Onslow County is shown in **Table 3.1-1**. Volatile organic compound (VOC) and nitrogen oxides (NO_x) emissions are used to represent ozone generation because they are precursors of ozone.

Table 3.1-1. Onslow County North Carolina Air Emissions Inventory (2014)

Location	*NO_x (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*
Onslow County	4,196	29,259	44,921	1,098	4,908	2,660

Source: USEPA 2019
Key: tpy = tons per year.

MCAS New River is covered under the MCB Camp Lejeune Title V Operating Permit Number 06591T38 that includes air quality requirements for fuel burning equipment, external combustion sources (e.g., boilers and heaters); internal combustion engines (e.g., diesel emergency power generators); surface coating operations (e.g., painting for maintenance of aircraft, and facilities); gasoline dispensing storage tanks for motor vehicles; solvent degreasing for maintenance operations; abrasive blasting related to

aircraft maintenance; and woodworking shops for facility maintenance, packing, and shipping. Recent annual criteria pollutants emissions for MCB Camp Lejeune, including MCAS New River, are shown in **Table 3.1-2.**

Table 3.1-2. MCB Camp Lejeune (including MCAS New River) Air Emissions Inventory

Year	*NO_x (tpy)*	*VOC (tpy)*	*CO (tpy)*	*SO_2 (tpy)*	*PM_{10} (tpy)*	*$PM_{2.5}$ (tpy)*
2017	135	118.9	35	176.2	11.7	9.2

Source: NCDEQ 2019a
Key: tpy = tons per year.

3.1.3 Environmental Consequences

Effects on air quality are based on estimated direct and indirect emissions associated with the proposed action and alternatives. The region of influence (ROI) for assessing air quality impacts is the County in which the project is located, Onslow County.

Air Quality Potential Impacts:

- No Action: No change from current emissions
- Proposed Action (Preferred Alternative): Moderate increases in CO, NO_x, and SO_2

3.1.3.1 No Action Alternative

Estimated emissions from a proposed federal action are typically compared with the relevant national and state standards to assess the potential for increases in pollutant concentrations. **Table 3.1-3** presents the baseline emissions associated with pertinent airfield activities, which include 48 CH-53E and 108 MV-22 aircraft currently based at the airfield (see **Section 2.2.2.1**) under the No Action Alternative. While the CH-53K would not replace the CH-53E, an additional squadron of MV-22B tilt-rotor aircraft would stand up at MCAS New River in 2020/2021, as was set forth with the Introduction of the V-22 to the East Coast Record of Decision (USMC 1999). The No Action Alternative also includes a temporary uptick in MV-22B operations from U.S. Navy and foreign military pilot training through VMMT-204, until these organizations can set up their own pilot training centers.

The airfield activities include those portions of landings, take-offs, and patterns that are below the default mixing height of 3,000 feet. The mixing height is the upper vertical limit of the volume of air in which emissions may affect air quality. Emissions released above the mixing height are typically restricted from affecting ground level ambient air quality in the region, while emissions of pollutants released below the mixing height may affect ground level concentrations. The portion of the atmosphere that is completely mixed begins at ground level and may extend up to heights of a few thousand feet. Mixing height varies from region to region based on daily temperature changes, amount of sunlight, and other climatic factors. The USEPA has defined a default mixing height as 3,000 feet above ground level. Airfield operations also include static engine testing.

Table 3.1-3. No Action Alternative Airfield Operation Emissions						
	Annual Tons per Year					
Baseline Operations	***VOC***	***CO***	***NO_x***	***SO_2***	***$PM_{10/2.5}$***	***CO_2e***
CH-53E Flight	25.68	46.65	22.58	7.87	8.86	13,093
CH53E-Engine Testing	4.70	9.66	6.20	2.64	1.87	3,828
MV-22 Flight	0.24	15.65	34.59	9.59	5.92	13,903
MV-22 Engine Testing	1.15	40.07	58.84	19.44	6.01	28,528
Total Baseline Emissions	**31.76**	**112.03**	**122.21**	**39.54**	**22.66**	**59,352**

Notes: CO_2e = carbon dioxide equivalent

3.1.3.2 Proposed Action (Preferred Alternative)

Potential Impacts

Implementation of the Proposed Action would involve demolition and construction activities, as well as replacing the aircraft inventory from CH-53E to CH-53K. For the air quality analysis, it should be noted that the CH-53K uses a different powerplant model than the CH-53E (the CH-53E uses the T64-GE-415 and the CH-53K uses the GE38-1B).

Construction and demolition is estimated to occur over a two-year period and includes demolition of one existing building, construction of a Module Type II hangar, expand the existing apron, and addition of a parking structure, CH-53K Cargo Loading Facility, and a Regional Stormwater Infiltration System. The Regional Stormwater Infiltration System would include the clearance of 12.2 acres of land currently in tree/shrub cover. For the air quality analysis, it is assumed the parking structure would be four stories. Detailed emissions calculations are located in **Appendix B**. **Table 3.1-4** presents the results of the construction and demolition emission analysis.

Table 3.1-4. Estimated Annual Construction and Demolition Emissions							
	VOC	***CO***	***NO_x***	***SO_2***	***PM_{10}***	***$PM_{2.5}$***	***CO_2e***
Estimated Emissions	**1.74**	**10.74**	**24.59**	**0.33**	**64.99**	**7.68**	**2,384**
Comparative Threshold	250	250	250	250	250	250	NA
Exceed? Yes/No	**No**	**No**	**No**	**No**	**No**	**No**	NA

Estimated annual construction and demolition emissions would not exceed any of the comparative thresholds (250 tons per year, as defined in the Clean Air Act). As a result, none of the emissions would be considered significant. Once construction is complete, there would be some operational emissions associated with stationary sources such as boilers and emergency and fire pump generators. These operations are anticipated to be small and likely covered as insignificant activities in the MCB Camp Lejeune Title V air permit. None of these stationary sources are anticipated to be significant sources of air emissions.

The transition of the CH-53E squadrons to CH-53K squadrons would not change the total number of helicopters stationed at MCAS New River. The new CH-53K aircraft are powered by a different engine than the CH-53E. The airfield operations evaluated for the air quality analysis includes annual operations for the full complement of 60 CH-53K as well as the 108 MV-22 anticipated to be stationed at MCAS New River by the time this action would occur (see **Section 2.2.2.2**). **Table 3.1-5** shows the calculated

emissions for the Proposed Action compared to the No Action Alternative. Detailed emissions calculations are located in **Appendix B**.

Table 3.1-5. Proposed Action Airfield Operation Emissions Compared to No Action Alternative Emissions

No Action Alternative Operations	*Annual Tons per Year*					
	VOC	***CO***	***NO_x***	***SO_2***	***$PM_{10/2.5}$***	***CO_2e***
CH-53E Flight	25.68	46.65	22.58	7.87	8.86	13,093
CH-53E Engine Testing	4.70	9.66	6.20	2.64	1.87	3,828
MV-22 Flight	0.24	15.65	34.59	9.59	5.92	13,903
MV-22 Engine Testing	1.15	40.07	58.84	19.44	6.01	28,528
Total No Action Alternative Emissions	**31.76**	**112.03**	**122.21**	**39.54**	**22.66**	**59,352**
Proposed Action Operations						
CH-53K Flight	2.34	18.28	58.66	11.11	1.92	17,295
CH-53K Engine Testing	0.37	3.90	18.36	4.28	0.23	6,142
MV-22 Flight	0.24	15.65	34.59	9.59	5.92	13,903
MV-22 Engine Testing	1.15	40.07	58.84	19.44	6.01	28,528
Total Proposed Action Emissions	**4.09**	**77.91**	**170.46**	**44.42**	**14.07**	**65,869**
Net Change from No Action Alternative	**-27.75**	**-34.91**	**44.57**	**4.02**	**-8.64**	**5,288**
Comparative Threshold	250	250	250	250	250	NA
Exceed? Yes/No	**No**	**No**	**No**	**No**	**No**	NA

The airfield operations once the transition has occurred would result in decreases in VOC, CO, PM_{10} and $PM_{2.5}$ emissions. NO_x and SO_2 emissions would increase, but would not exceed the Comparative Threshold. In conclusion, implementation of the Preferred Alternative would not result in significant impacts to air quality.

Greenhouse Gases

Implementation of the Proposed Action would contribute directly to emissions of GHGs from the combustion of fossil fuels. Demolition, construction, and clearing activities would generate approximately 2,384 tons of CO_2e. Once the facilities are operational, small quantities of CO_2e emissions would be generated from operation of boilers and intermittently used generators, as described above.

Airfield operations would result in an increase in GHG emissions of 5,288 tons per year. This is equivalent to putting an additional 1,033 cars on the road driving the national average of 11,500 miles per year.

3.2 Water Resources

This discussion of water resources includes surface water, wetlands, and floodplains. This section also discusses the physical characteristics of wetlands, etc.; wildlife and vegetation are addressed in **Section 3.4**, Biological Resources.

Surface water resources generally consist of wetlands, lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. A Total Maximum Daily Load (TMDL) is the maximum amount of a substance that can be assimilated by a water body without causing impairment. A water body can be deemed impaired if water quality analyses conclude that exceedances of water quality standards occur.

Wetlands are jointly defined by USEPA and U.S. Army Corps of Engineers (USACE) as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include "swamps, marshes, bogs and similar areas."

Floodplains are areas of low-level ground present along rivers, stream channels, large wetlands, or coastal waters. Floodplain ecosystem functions include natural moderation of floods, flood storage and conveyance, groundwater recharge, and nutrient cycling. Floodplains also help to maintain water quality and are often home to a diverse array of plants and animals. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplain boundaries are most often defined in terms of frequency of inundation, that is, the 100-year and 500-year flood. Floodplain delineation maps are produced by the Federal Emergency Management Agency (FEMA) and provide a basis for comparing the locale of the Proposed Action to the floodplains.

3.2.1 Regulatory Setting

The CWA establishes federal limits, through the National Pollutant Discharge Elimination System (NPDES) program, on the amounts of specific pollutants that can be discharged into surface waters to restore and maintain the chemical, physical, and biological integrity of the water. The NPDES program regulates the discharge of point (i.e., end of pipe) and nonpoint sources (i.e., stormwater) of water pollution.

The North Carolina NPDES stormwater program requires construction site operators engaged in clearing, grading, and excavating activities that disturb one acre or more to obtain coverage under an NPDES Construction General Permit for stormwater discharges. Construction or demolition that necessitates an individual permit also requires preparation of a Notice of Intent to discharge stormwater and a Stormwater Pollution Prevention Plan that is implemented during construction. As part of the 2010 Final Rule for the CWA, titled *Effluent Limitations Guidelines and Standards for the Construction and Development Point Source Category*, activities covered by this permit must implement non-numeric erosion and sediment controls and pollution prevention measures.

Wetlands are currently regulated by the USACE under Section 404 of the CWA as a subset of all "Waters of the United States." Waters of the United States are defined as (1) traditional navigable waters, (2) wetlands adjacent to navigable waters, (3) nonnavigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow perennially or have continuous flow at least seasonally (e.g., typically 3 months), and (4) wetlands that directly abut such tributaries under Section 404 of the CWA, as amended, and are regulated by USEPA and the USACE. The CWA requires that North Carolina establish a Section 303(d) list to identify impaired waters and establish TMDLs for the sources causing the impairment.

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredge or fill into wetlands and other Waters of the United States. Any discharge of dredge or fill into Waters of the United States requires a permit from the USACE.

Section 438 of the Energy Independence and Security Act establishes storm water design requirements for development and redevelopment projects. Under these requirements, federal facility projects larger than 5,000 ft^2 must "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow."

EO 11990, *Protection of Wetlands,* requires that federal agencies adopt a policy to avoid, to the extent possible, long- and short-term adverse impacts associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.

EO 11988, *Floodplain Management*, requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development unless it is the only practicable alternative. Flood potential of a site is usually determined by the 100-year floodplain, which is defined as the area that has a one percent chance of inundation by a flood event in a given year.

3.2.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under water resources at MCAS New River. Water Resources can be seen in **Figure 3.2-1**.

3.2.2.1 Surface Water

MCAS New River is bounded to the east by the New River and to the southwest by Southwest Creek. Both the New River and Southwest Creek are classified by NCDEQ as SC, NSW, and HQW. These classifications are explained below:

- SC: all tidal salt waters protected for secondary recreation such as fishing, boating, or other activities involving minimal skin contact; fish and noncommercial shellfish consumption; aquatic life propagation and survival; and wildlife.
- NSW: Nutrient Sensitive Waters; supplemental classification intended for waters needing additional nutrient management due to being subject to excessive growth of microscopic and macroscopic vegetation.
- HQW: High Quality Waters; supplemental classification intended to protect waters which are rated excellent based on biological and physical/chemical characteristics through NCDEQ monitoring or special studies, primary nursery areas designated by Marine Fisheries Commission, and other functional nursery areas designated by Marine Fisheries Commission.

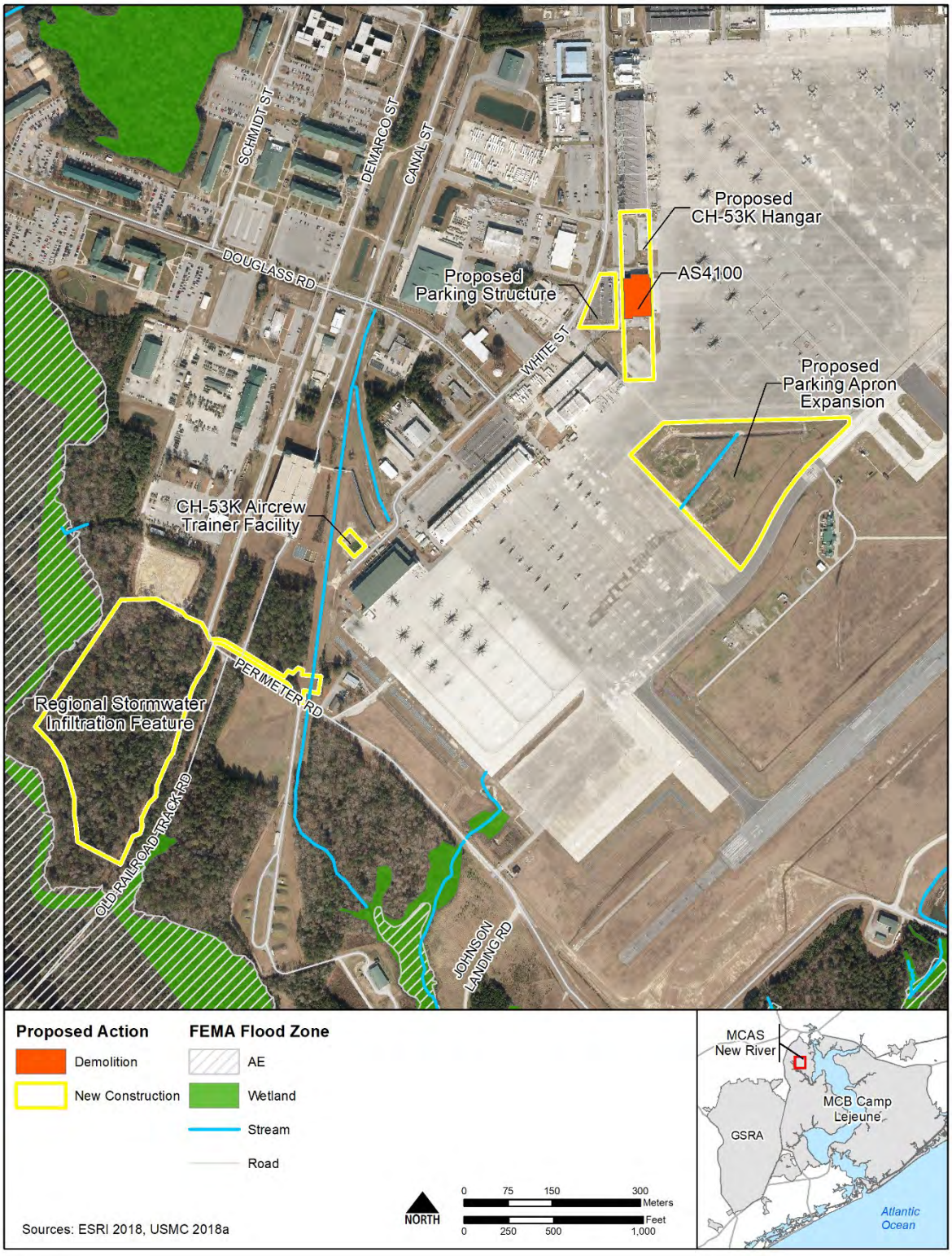

Figure 3.2-1. Water Resources near Proposed Action Area at MCAS New River

While portions of the New River are listed on the CWA 303d list of impaired waters, the areas of the New River and Southwest Creek that are adjacent to MCAS New River are not listed (NCDEQ 2019b). There are numerous unnamed streams which flow into the major creeks surrounding MCAS New River. A small unnamed tributary to Southwest Creek exists within the area for the proposed aircraft parking apron expansion.

3.2.2.2 Wetlands

Wetlands exist along the edges of the New River and along the edges and toward the head of Southwest Creek. These wetlands are generally associated with broad creek basins and coastal marshes. Approximately 325 acres of wetlands have been identified on MCAS New River. Wetlands in the vicinity of the project area can be seen in **Figure 3.2-1**. There are potential wetlands along the unnamed tributary of Southwest Creek within the proposed aircraft parking apron expansion.

3.2.2.3 Floodplains

MCAS New River lies within the 500-year and 100-year floodplains. Approximately 2,700 acres of MCAS New River is within FEMA Zone X, (0.2 percent chance of flooding annually, or the 500-year floodplain). This represents approximately 75 percent of the land area that makes up MCAS New River. The remaining 918 acres (approximate), lies within FEMA Zone AE, (1 percent chance of flooding annually, or the 100-year floodplain). The location of the Zone AE floodplains are shown in **Figure 3.2-1**.

3.2.3 Environmental Consequences

In this EA the analysis of water resources looks at the potential impacts on surface water, wetlands, and floodplains. The analysis of surface water quality considers the potential for impacts that may change the water quality, including both improvements and degradation of current water quality. The impact assessment of wetlands considers the potential for impacts that may change the local hydrology, soils, or vegetation that support a wetland. The analysis of floodplains considers if any new construction is proposed within a floodplain or may impede the functions of floodplains in conveying floodwaters.

Water Resources Potential Impacts:

- Temporary increase in stormwater runoff during construction and demolition
- Improved long-term stormwater management from Regional Stormwater Infiltration System
- Minor impacts to unnamed tributary of Southwest Creek

3.2.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to baseline water resources. Therefore, no significant impacts to water resources would occur with implementation of the No Action Alternative.

3.2.3.2 Proposed Action (Preferred Alternative) Potential Impacts

The Proposed Action would require the construction of a new hangar, support building, expansion of the aircraft parking apron, and construction of the Regional Stormwater Infiltration System. As shown on **Figure 3.2-1**, the proposed facilities and parking apron would be outside of the 100-year floodplain. However, the proposed parking apron would impact an unnamed tributary of Southwest Creek. The filling of this area would require redirection of the stream, or placing a culvert over the stream to allow the area to be covered with concrete. The action would impact approximately 460 linear feet of stream.

Prior to construction, a stream assessment would be required to determine if the stream is jurisdictional under Section 404 of the CWA and to determine what permit mitigations could be required. Mitigation for stream impacts may include in-kind stream restoration, or purchase of mitigation credits. While there would be minor, negative impacts on wetlands and surface waters, these impacts would be lessened through permit required mitigation. Therefore, the impacts to wetlands, surface waters, and floodplains would be less than significant under the Proposed Action.

The proposed construction and demolition activities with ground disturbance would contribute to stormwater runoff which potentially degrades water quality of nearby surface waters from increased sedimentation. This impact would be temporary during demolition and construction activities and would be reduced from implementation of best management practices such as silt fencing around the construction site. The additional paved areas from the proposed parking apron expansion would increase the impervious surface around the airfield, further increasing stormwater runoff. All construction and demolition would be done in adherence to MCAS New River's state-required Stormwater Pollution Prevention Plan, as well as all required Erosion and Sedimentation control procedures. Adherence to these procedures would ensure that surface waters remain protected from uncontrolled erosion and sedimentation from exposed soil during construction activities.

The proposed Regional Stormwater Infiltration System would be constructed near the southwest corner of the airfield. This system would be designed to receive stormwater runoff from the entire airfield eliminating the need for multiple small stormwater ponds designed for single facilities or small areas of development. The Regional Stormwater Infiltration System would consist of an 11 acre basin that would service a drainage area of 273 acres. The system would provide a long-term benefit to the management of stormwater at the airfield and reduce the potential for surface water degradation from runoff. MCAS New River would also be required to update their existing NPDES permit for stormwater discharge from the increase in impervious surfaces (NCDENR 2014). Additionally, low-impact development techniques would be incorporated where practicable to restore and maintain hydrology and groundwater recharge. Implementation of the Preferred Alternative would not result in significant impacts to water resources.

3.3 Noise

This discussion of noise includes the types or sources of noise and the associated sensitive receptors in the human environment.

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

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

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

or suburban environment, they are readily identified by their noise output and are given special attention in this EA.

3.3.1 Basics of Sound and A-Weighted Sound Level

The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The dB is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in cycles per second or Hz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies in order to replicate human sensitivity. It is common to add the "A" to the measurement unit in order to identify that the measurement has been made with this filtering process. In this document, the dB unit refers to A-weighted sound levels (dBA). **Table 3.3-1** provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Table 3.3-1. 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 3.3-1 (Cowan 1994) provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time. A variety of noise metrics have been developed to describe noise over different time periods, as discussed below.

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

3.3.2 Noise Metrics

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, different noise metrics help to quantify the noise environment. The noise metric used in this EA is the Day-Night Average Sound Level (DNL). The DNL metric is described in summary below.

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10-dB penalty assigned to noise events occurring between 10 p.m. and 7 a.m. (acoustic night). DNL values are average quantities, mathematically representing the continuous sound level that would be present if all of the variations in sound level that occur over a 24-hour period were averaged to have the same total

sound energy. The DNL metric quantifies the total sound energy received and is therefore a cumulative measure, but it does not provide specific information on the number of noise events or the individual sound levels that occur during the 24-hour day. DNL is the standard noise metric used by the U.S. Department of Housing and Urban Development, Federal Aviation Administration, USEPA, and DoD. Studies of community annoyance in response to numerous types of environmental noise show that DNL correlates well with impact assessments; there is a consistent relationship between DNL and the level of annoyance. Most people are exposed to sound levels of 50 to 55 DNL or higher on a daily basis.

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

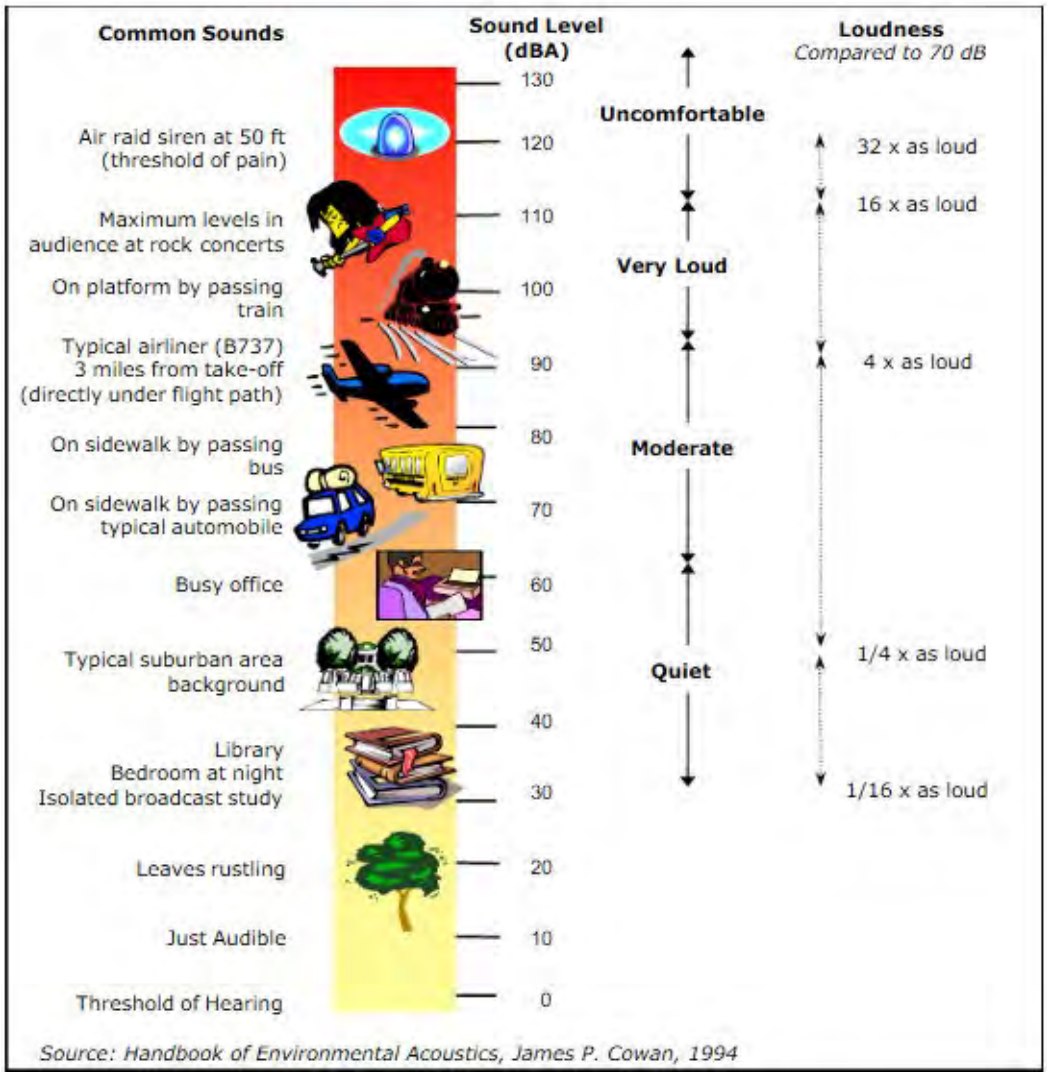

Figure 3.3-1. A-Weighted Sound Levels from Typical Sources

3.3.3 Noise Effects

An extensive amount of research has been conducted regarding noise effects including annoyance, speech interference, sleep disturbance, noise-induced hearing impairment, nonauditory health effects, performance effects, noise effects on children, effects on domestic animals and wildlife, property values, structures, terrain, and archaeological sites.

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

3.3.4 Noise Modeling

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

The noise environment for this EA was modeled using NOISEMAP. NOISEMAP analyzes all the operational data (types of aircraft, number of operations, flight tracks, altitude, speed of aircraft, engine power settings, and engine maintenance run-ups), environmental data (average humidity and temperature), and surface hardness and terrain. The result of the modeling is noise contours; lines connecting points of equal value (e.g., 65 dB DNL and 70 dB DNL). Noise zones cover an area between two noise contours and are usually shown in 5-dB.

3.3.5 Regulatory Setting

Under the Noise Control Act of 1972, the Occupational Safety and Health Administration established workplace standards for noise. The minimum requirement states that constant noise exposure must not exceed 90 dBA over an 8-hour period. The highest allowable sound level to which workers can be constantly exposed is 115 dBA and exposure to this level must not exceed 15 minutes within an 8-hour period. The standards limit instantaneous exposure, such as impact noise, to 140 dBA. If noise levels exceed these standards, employers are required to provide hearing protection equipment that will reduce sound levels to acceptable limits.

The joint instruction, Chief of Naval Operations Instruction (OPNAVINST) 11010.36C and MCO 11010.16, *Air Installations Compatible Use Zones (AICUZ) Program,* provides guidance administering the AICUZ program which recommends land uses that are compatible with aircraft noise levels. Per OPNAVINST 11010.36C, NOISEMAP is to be used for developing noise contours and is the best noise modeling science available today for fixed-wing aircraft until the new Advanced Acoustic Model is approved for use.

3.3.6 Affected Environment

Many components may generate noise and warrant analysis as contributors to the total noise impact. The predominant noise sources at MCAS New River consist of aircraft operations and industrial

operations of an active airfield. Construction, ground support equipment along the runway, and vehicular traffic all contribute to the noise environment, though are generally transitory and provide a negligible contribution to the overall average noise level at MCAS New River. Response to noise varies, depending on the type and characteristics of the noise, distance between the noise source and whoever hears it (the receptor), receptor sensitivity, and time of day. A noise sensitive receptor is defined as a land use where people involved in indoor or outdoor activities may be subject to stress or considerable interference from noise. Such locations or facilities often include residential dwellings, hospitals, nursing homes, educational facilities, and libraries. Sensitive receptors may also include noise-sensitive cultural practices, some domestic animals, or certain wildlife species. Seven noise sensitive locations were identified with input from personnel at MCAS New River for assessment under this Proposed Action. These are labeled as "Points of Interest" (POI) on **Figure 3.3-2**.

3.3.6.1 Aircraft Noise

MCAS New River is the premier Marine Corps rotor/tilt-rotor operating facility on the East Coast. MCAS New River is also located adjacent to MCB Camp Lejeune, where it provides training support for ground maneuvers within the many training ranges at the base. As such, there is a relatively large amount of aircraft activity at MCAS New River, as well as military operations noise from nearby training areas and ranges.

A summary of current aircraft operations is shown in **Table 3.3-2**. The average annual aircraft operations were developed using the last 12 years of aircraft operations data. MCAS New River is home to a variety of rotary wing and tilt-rotor aircraft. Of the 38,738 average annual operations, the majority of those operations are from MV-22B aircraft (36 percent), followed by CH-53E aircraft (32 percent). AH-1W/Z operations make up 15 percent of total operations, while UH-1N/Y aircraft account for approximately 12 percent. The remaining 5 percent of aircraft operations are made up from an assortment of transient aircraft and a small number of based C-12 fixed wing aircraft.

Existing conditions for aircraft operations used for noise analysis includes an additional squadron of MV-22B tilt-rotor aircraft that would stand up at MCAS New River in 2020/2021, as was set forth with the Introduction of the V-22 to the East Coast Record of Decision (USMC 1999). Existing operations also includes a temporary uptick in MV-22B operations from U.S. Navy and foreign military pilot training through VMMT-204, until these organizations can set up their own pilot training centers. See **Appendix C** for specific details on the operation type by aircraft and runway.

Table 3.3-2. Current Annual Aircraft Operations at MCAS New River

Operation Type	*Day (7:00 a.m. – 10:00 p.m)*	*Night (10:00 p.m. – 7:00 a.m.)*	*Total Operations*
Arrivals	11,494	2,335	13,829
Departures	12,851	978	13,829
Patterns	9,856	1,224	11,080
Total	34,201	4,537	38,738

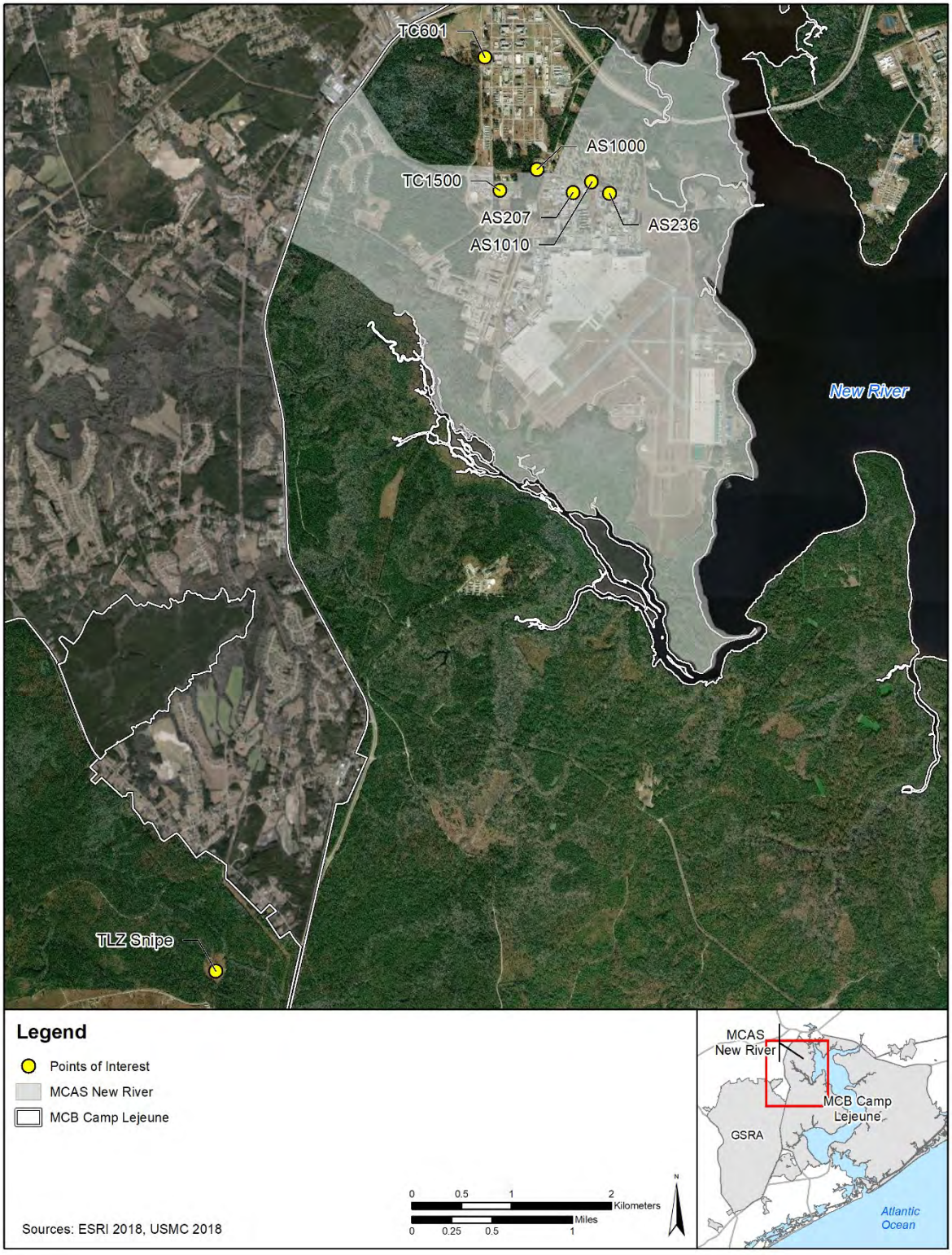

Figure 3.3-2. Points of Interest at MCAS New River

Figure 3.3-3 shows the DNL noise contours in 5-dB increments for the existing conditions at MCAS New River. Most of the noise generated from aircraft operations at MCAS New River remains on the installation, or is over the New River. Small portions of the 65 DNL contour do extend off MCAS New River, but they remain within the boundaries of MCB Camp Lejeune. **Table 3.3-3** shows the acreage breakdown (excluding water bodies) for MCAS New River. A total of 517 acres of land are exposed to 65 DNL or greater noise levels at MCAS New River. No areas of 65 DNL or greater extend off of USMC owned property.

Table 3.3-3. Noise Exposure (Acres) under Exisitng Conditions

	USMC Property			
DNL Level (dBA)	*On MCAS New River*	*On MCB Camp Lejeune*	*Off-Base*	*Total*
65+	464	53	--	517
70+	113	--	--	113
75+	4	--	--	4

Table 3.3-4 shows the DNL values at each of the seven Points of interest under the existing conditions. Values range from 49 to 56 dBA. These values are all well below the DoD threshold of 65 dB DNL for land use recommendations for noise sensitive land uses.

Table 3.3-4. Noise Exposure at Selected Points of Interest at MCAS New River

POI Description	*Facility Number*	*Existing Conditions DNL (dBA)*
Child Development Center	AS1000	54
Child Development Center	AS207	55
New River Community Center	AS1010	55
TLZ Snipe	N/A	50
Chapel	TC601	49
Chapel	AS236	50
DeLalio Elementary School	TC1500	53

Notes: TLZ = tactical landing zone

Figure 3.3-3. Noise Contours at MCAS New River under Existing Conditions

3.3.6.2 Installation Noise Environment

MCAS New River experiences noise from sources other than aircraft. Major contributors aside from aircraft to the noise environment would be general construction from building refurbishment and new construction and vehicular traffic, as well as general industrial noise from operation of an airfield. MCAS New River is adjacent to MCB Camp Lejeune which has a number of military ranges and impact areas that receive artillery fire. The noise generated form military training in these ranges extends well outside of those ranges and would be experienced at MCAS New River.

3.3.7 Environmental Consequences

Noise from the proposed construction and demolition would be temporary and short-term in nature. The noise associated with these activities would be imperceptible over aircraft generated noise at the busy airfield. Therefore, the noise analysis focuses on the noise associated with the proposed change in aircraft.

Noise Potential Impacts:

- Under No Action, noise levels would remain unchanged
- Minor increase in noise from CH-53K introduction
- No impacts off-installation from noise levels above 65 DNL

3.3.7.1 No Action Alternative

Under the No Action Alternative, the CH-53K would not replace the CH-53E. The CH-53E would continue to operate as it currently does. As such, there would be no additional impacts from aircraft noise under the No Action Alternative. Existing conditions would continue.

3.3.7.2 Proposed Action (Preferred Alternative) Potential Impacts

Under the Proposed Action, the CH-53K would replace the CH-53E, in a one for one replacement for authorized aircraft at MCAS New River. There would be no increase in operations for the new aircraft. Total airfield operations at MCAS New River would remain the same as those under the No Action Alternative (see **Table 3.3-2**), except the CH-53K would replace the CH-53E.

Figure 3.3-4 shows the predicted noise contours under the Proposed Action as compared to the No Action Alternative. As the figure shows, there are only very small differences in the two sets of contours. **Table 3.3-5** shows the noise exposure for areas under the noise contours. Transition to the CH-53K would cause an additional 39 acres to be exposed to noise levels greater than 65 DNL (dBA). No areas of noise greater than 65 DNL would extend off of USMC owned property. No cantonment or residential areas would be exposed to noise above 65 DNL as a result of the Proposed Action.

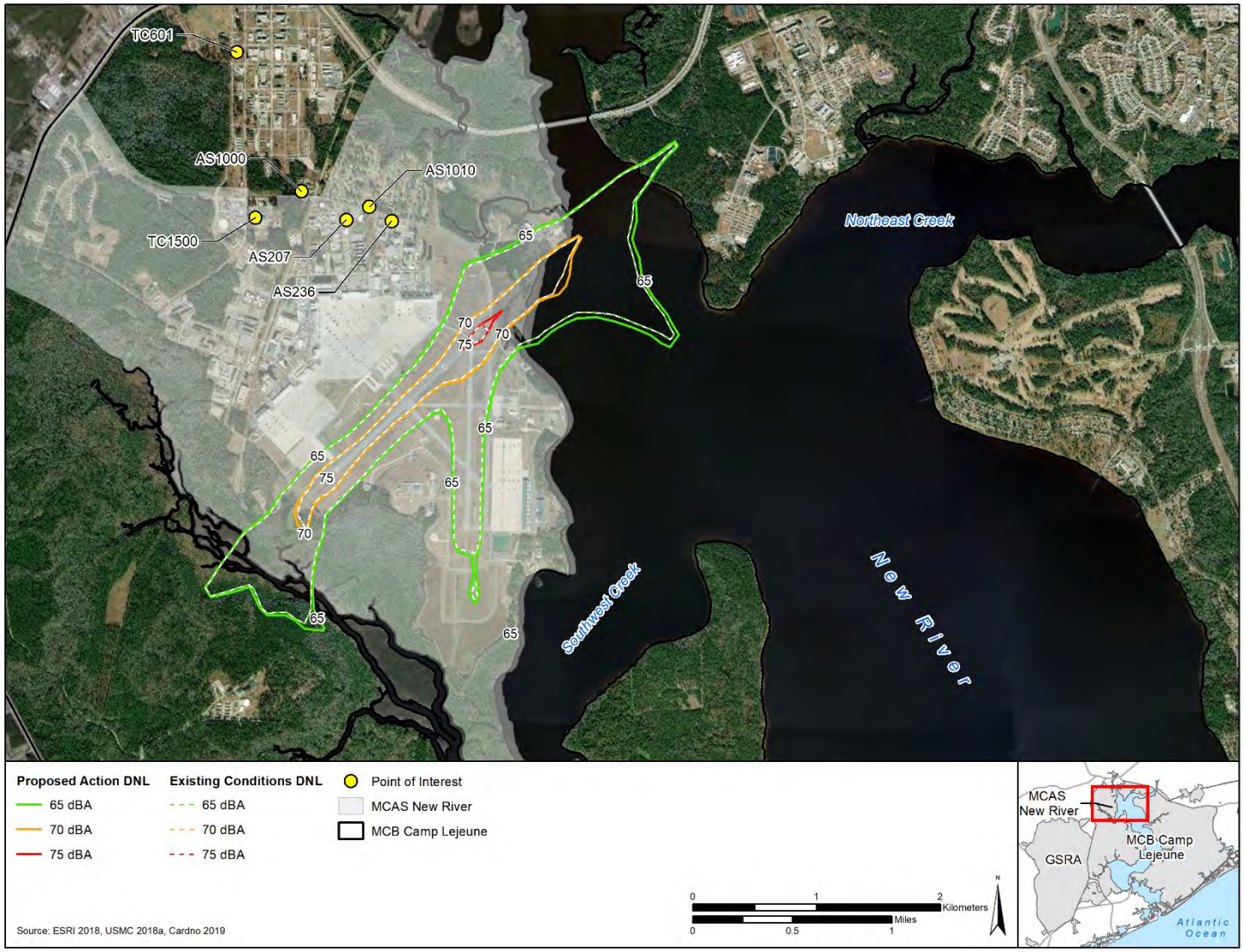

Figure 3.3-4. Noise Contours under Proposed Action Compared to No Action Alternative

Table 3.3-5. Noise Exposure (Acres) under Proposed Action and Net Change from No Action Alternative						
	USMC Property					
Level	*On MCAS New River*	*On MCB Camp Lejeune*	*Off Base Acreage*	*Proposed Action Total*	*No Action Total*	*Change from No Action*
65+	491	65	--	556	517	+39
70+	125	--	--	125	113	+12
75+	6	--	--	6	4	+2

Table 3.3-6 shows the estimated DNL values at each of the seven POIs and the net change from the No Action Alternative. The values range from 49 to 57. The greatest increase in noise exposure is 1 dB, and occurs at four of the seven locations. The CH-53K is a heavier aircraft and therefore slightly louder than the CH-53E. However, it is unlikely that these minor changes in the noise environment from the Proposed Action would be noticeable. Additionally, noise exposure does not exceed 65 DNL at any of the selected POIs.

Table 3.3-6. Noise Exposure at Selected Points of Interest at MCAS New River			
POI Description	*Facility Number*	*Proposed Action DNL (dBA)*	*DNL (dBA) Change from No Action*
Child Development Center	AS1000	54	0
Child Development Center	AS207	56	+1
New River Community Center	AS1010	56	+1
TLZ Snipe	N/A	51	+1
Chapel	TC601	49	0
Chapel	AS236	57	+1
DeLalio Elementary School	TC1500	53	0

Therefore, implementation of the Preferred Alternative would not result in significant impacts to the noise at MCAS New River

3.4 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 supports a plant or animal.

Within this EA, biological resources are divided into two major categories: (1) terrestrial vegetation, and (2) terrestrial wildlife. Threatened, endangered, and other special status species are discussed in a separate section.

3.4.1 Regulatory Setting

Special-status species, for the purposes of this assessment, are those terrestrial species listed as threatened or endangered under the ESA and species afforded federal protection under the MBTA or the BGEPA.

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to

consult with the U.S. Fish and Wildlife Service (USFWS) or National Oceanic and Atmospheric Administration (NOAA) Fisheries to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered species, or result in the destruction or adverse modification of designated critical habitat. Critical habitat cannot be designated on any areas owned, controlled, or designated for use by the DoD where an Integrated Natural Resources Management Plan has been developed that, as determined by the Department of Interior or Department of Commerce Secretary, provides a benefit to the species subject to critical habitat designation.

Birds, both migratory and most native-resident bird species, are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186 (Migratory Bird Conservation). Under the MBTA it is unlawful by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, [or] possess migratory birds or their nests or eggs at any time, unless permitted by regulation. The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of 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 to develop and implement appropriate conservation measures to minimize or mitigate adverse effects of the proposed action if the action will have a significant negative effect on the sustainability of a population of a migratory bird species.

Bald and golden eagles are protected by the BGEPA. This act prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald 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."

3.4.2 Affected Environment

The following discussions provide a description of the existing conditions for each of the categories under biological resources at MCAS New River and nearby Camp Lejeune. Threatened and endangered species are discussed in a separate section below.

3.4.2.1 Terrestrial Vegetation

MCAS New River is part of the Atlantic Coastal Plain. More specifically, the MCAS New River falls into a landscape classified broadly as the New River Dissected Terraces. This area is characterized by upland terraces that are dissected by networks of numerous small streams, their associated wetlands, and the New River. **Table 3.4-1** shows the ecological classifications at MCAS New River (MCB Camp Lejeune 2015).

Table 3.4-1. Ecological Classifications at MCAS New River.	
Ecological Classification	***Acres***
Broad Pocosins	72
Drainage Slopes	211
Inland Tidal Marshes and Tidal Swamps	686
Interstream Flats	151
Mesic Pine Savannas	418
Other Altered Lands	24
Pocosin Fringes	12
Small Stream Swamps and Streamhead Pocosins	53
Urban Areas	367
Urban-Woodland Complex	813
Water	66
Wet-Mesic and Wet Pine Savannas	57
Xeric and Dry-Mesic Pine Savannas	687

Source: USMC 2018a

Of these 13 classifications, only five are in the vicinity of the Proposed Action. These are Drainage Slopes, Inland Tidal Marshes and Tidal Swamps, Urban Areas, Urban-Woodland Complex, and Xeric and Dry-Mesic Pine Savannas. Most of the area in the vicinity of the Proposed Action is composed of Urban Areas, Urban-Woodland Complex, and Xeric and Dry-Mesic Pine Savannas.

3.4.2.2 Terrestrial Wildlife

Wildlife includes all animal species (i.e. insects and other invertebrates, freshwater fish, amphibians, reptiles, birds, and mammals) focusing on the species and habitat features of greatest importance or interest.

The extensive diversity of habitat and open land ranges at MCB Camp Lejeune and on natural portions of MCAS New River provide excellent habitat for wildlife. Wildlife found at MCAS New River are typical of that found in the Atlantic Coastal Plain. White-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), and black bear (*Ursus americana*) are the large, indigenous mammals known to occur. Medium size mammals that are present include red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), and bobcat (*Lynx rufus*). Common small mammals include raccoon (*Procyon lotor*), beaver (*Castor canadensis*), Virginia opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*), fox squirrel (*Sciurus niger*), Eastern cottontail (*Sylvilagus floridanus*), marsh rabbit (*Sylvilagus palustris*), otter (*Lontra canadensis*), mink (*Mustela vison*), and numerous species of ground-dwelling rodents (MCB Camp Lejeune 2015).

3.4.2.3 Threatened and Endangered Species

MCB Camp Lejeune and MCAS New River are home to nine species that are federally listed as threatened or endangered, or a candidate for listing. The species are:

- Red-cockaded woodpecker (*Picoides borealis*) (Endangered),
- Green sea turtle (*Chelonia mydas*) (Threatened),
- Loggerhead sea turtle (*Caretta caretta*) (Threatened),
- Rough-leaved loosestrife (*Lysimachia asperulaefolia*) (Endangered),

- Seabeach amaranth (*Amaranthsu pumilus*) (Threatened),
- Piping Plover (*Charadrius melodus*) (Threatened),
- Red knot (*Calidris canutus*) (Threatened),
- Hirst's panic grass (*Dichanthelium hirstii*) (Candidate Species), and
- American alligator (*Alligator mississippiensis*) [Threatened due to similarity in appearance]

The American alligatoris listed by the USFWS as threatened due to similarity of appearance to the threatened American crocodile (*Crocodylus acutus*). Federal agencies are not responsible for fulfilling the requirements of Section 7 with respect to actions that may affect species protected due to similarity of appearance. Therefore, this species is not analyzed in this EA.

The bald eagle (*Haliaeetus leucocephalus*) has been removed from the endangered species list, but it remains protected under the BGEPA. Protective measures and monitoring requirements for bald eagles, described in this chapter, are requirements of MCB Camp Lejeune's permit under this law (MCB Camp Lejeune 2015).

No designated critical habitat exists at MCAS New River.

3.4.3 Environmental Consequences

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:

- Temporary impacts to wildlife from construction related activities.
- Permanent loss of forested habitat for construction of Regional Stormwater Infiltration Feature.
- Noise related impacts to wildlife from operation of CH-53K would be negligible.

3.4.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur. No construction or demolition would occur and the CH-53K would not replace the CH-53E. There would be no impacts to vegetation, wildlife, or threatened and endangered species as a result of the No Action Alternative.

3.4.3.2 Proposed Action (Preferred Alternative) Potential Impacts

The study area for the analysis of effects to biological resources associated with the Preferred Alternative includes the areas associated with construction and demolition, as outlined in Chapter 2.

Under the Proposed Action, construction and demolition would impact native vegetation at MCAS New River. The construction of the new hangar, aircraft parking apron, parking structure, and CH-53K Crew Trainer would all occur within highly urbanized, previously disturbed areas. The expanded parking apron would cover approximately 12 acres of mowed grass infield, as well as maintained ditches. The Regional Stormwater Infiltration System would require the cutting of approximately 19 acres of vegetated area. This area is predominately forested, and classified as a mixture of Drainage Slopes, Inland Tidal Marshes and Tidal Swamps, and Xeric and Dry-Mesic Pine Savannas. The forested area would transition to an infiltration basin, with wetland features and functions.

All aspects of construction, other than the Regional Stormwater Infiltration System would occur in areas relatively devoid of quality wildlife habitat. Construction and demolition of the hangar, parking

structure, and CH-53K Aircrew Trainer Facility would all be along the flightline areas, or very near the airfield. Any wildlife in the vicinity of the construction areas would experience disturbance from construction activities. Mobile species would likely flee the area. Due to temporary nature of construction, and construction and operation of facilities in already developed areas, these facilities would not have any long term impacts to any population of wildlife at MCAS New River.

The Regional Stormwater Infiltration System would remove approximately 19 acres of forested habitat. This area would be converted from forest to a stormwater infiltration feature with wetland characteristics. Land clearing would occur outside of migratory bird breeding season, to the maximum extent feasible. Mobile species would likely flee the area during construction, with less mobile species possibly impacted by construction activities. Long-term, the area would experience habitat conversion, and species assemblages would likely transition from species common to forested areas to species common in wetland habitats. Given the relatively small amount of acreage of conversion, and compared to the vast areas of managed forest that are adjacent at MCAS New River and MCB Camp Lejeune, no long-term population level impacts to native wildlife would occur from the Proposed Action. Additionally, the new habitat may provide beneficial habitat to species that colonize emergent wetlands.

No threatened and endangered species are known to occur within the study area of the Preferred Alternative. No suitable habitat exists within the Preferred Alternative area for any of the nine listed species that occur on MCAS New River or MCB Camp Lejeune. The Proposed Action would generally occur in previously developed, highly urbanized areas of MCAS New River. While the Regional Stormwater Feature does have forested habitat, it is not critical or regulated habitat, and there are no occurrences of any of the nine listed species noted within that area, nor is the forest area managed for red-cockaded woodpecker foraging or nesting habitat (MCB Camp Lejeune 2015).

North Carolina's Natural Heritage Program commented that there was a documented occurrence of the American alligator within the project area in their comments received January 7, 2020. However, presence of the American alligator does not trigger federal consultation. It is unlikely that any of the Proposed Action would adversely impact any protected species, whether listed by the federal government or the State of North Carolina.

Noise from aircraft operations under the Preferred Alternative would increase by a minimal amount (See **Section 3.2**). Threatened and endangered terrestrial species on MCAS New River are already exposed to the ongoing air operations. As indicated in **Section 3.2** Noise*,* there would be no significant change in noise contours associated with the proposed increase in airfield operations as compared with baseline conditions and ambient noise levels would not significantly increase.

There would be no significant impact on threatened and endangered species and no formal consultation between the USMC and USFWS or NOAA Fisheries would be required.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to biological resources.

3.5 Coastal Zone

The coastal zone is the interface between land and water and is vital to the well-being of our county. It supports half of the nation's population and supports ecologically important habitat and natural resources.

3.5.1 Regulatory Setting

Through the CZMA of 1972, Congress established national policy to preserve, protect, develop, restore, or enhance resources in the coastal zone. This Act encourages coastal states to properly manage use of their coasts and coastal resources, prepare and implement coastal management programs, and provide for public and governmental participation in decisions affecting the coastal zone. To this end, CZMA imparts an obligation upon federal agencies whose actions or activities affect any land or water use or natural resource of the coastal zone to be carried out in a manner consistent to the maximum extent practicable with the enforceable policies of federally approved state coastal management programs. As a federal agency, the Marine Corps is required to determine whether its proposed activities would affect the coastal zone. This takes the form of a consistency determination, a negative determination, or a determination that no further action is necessary.

MCAS New River is located in Onslow County, North Carolina, which is located in North Carolina's coastal zone. The North Carolina Coastal Area Management Act of 1974 was passed in accordance with the federal CZMA. It establishes a cooperative program of coastal area management between local and state governments. The Coastal Area Management Act establishes the North Carolina Coastal Resources Commission, required local land use planning in the coastal counties, and provides for a program for regulating development. The North Carolina Coastal Management Program was federally approved in 1978. North Carolina's coastal zone includes the 20 counties that are adjacent to, adjoining, intersected by, or bounded by the Atlantic Ocean or any coastal sound, including Onslow County. The coastal zone extends seaward to the 3 nautical mile territorial sea limit.

The Onslow County Comprehensive Plan (CAMA Core Land Use Plan), adopted by the Onslow County Board of Commissioners on October 19, 2009 and certified by the Coastal Resource Commission on January 13, 2010, addresses land use planning in relation to CAMA. According to this Comprehensive Land Use Plan, Camp Lejeune is zoned as a Military Reservation and is limited to activities determined to be appropriate by the military. As the proposed project has been requested by authorities at Camp Lejeune, the Proposed Action on Base will be consistent with the operation of the Camp Lejeune Military Reservation, the applicable policies of the North Carolina Coastal Management Program, and Onslow County's comprehensive plan policies, for the reasons described throughout the Coastal Consistency Determination.

3.5.2 Affected Environment

There are two tiers of regulatory review for projects within the coastal zone. The first tier includes projects that are located in Areas of Environmental Concern, which are designated by the state. The second tier includes land uses with the potential to affect coastal waters, even though they are not defined as Areas of Environmental Concern. These proposed projects are reviewed under the Coastal Area Management Act General Policy Guidelines. Both of these are explained in more detail below.

The North Carolina Coastal Resources Commission designated Areas of Environmental Concern within the 20 coastal counties and set rules for managing development within these areas. An Area of Environmental Concern is an area of natural importance. These areas may be easily destroyed by erosion or flooding, or may have environmental, social, economic, or aesthetic values that make them valuable. The classification protects the area from uncontrolled development. Projects located within an Area of Environmental Concern undergo a more thorough level of regulatory review.

Areas of Environmental Concern include almost all coastal waters and about three percent of the land in the 20 coastal counties. The four categories of Areas of Environmental Concern are:

- The Estuarine and Ocean System, which includes public trust areas, estuarine coastal waters, coastal shorelines, and coastal wetlands;
- The Ocean Hazard System, which includes components of barrier island systems;
- Public Water Supplies, which include certain small surface water supply watersheds and public water supply well fields; and
- Natural and Cultural Resource Areas, which include coastal complex natural areas; areas providing habitat for federal or state designated rare, threatened or endangered species; unique coastal geologic formations; or significant coastal archaeological or historic resources.

General Policy Guidelines

Projects that are located outside of an Area of Environmental Concern are reviewed under the General Policy Guidelines. The North Carolina Coastal Area Management Act sets forth 11 General Policy Guidelines addressing:

- Coastal energy policies;
- Coastal water quality policies;
- Floating structure policies;
- Mitigation policies;
- Policies on beneficial use and availability of materials resulting from the excavation or maintenance of navigational channels;
- Policies on use of coastal airspace;
- Policies on ocean mining;
- Policies on water- and wetland-based target areas for military training areas;
- Post-disaster policies;
- Shorefront access policies; and
- Shoreline erosion policies.

The purpose of these rules is to establish generally applicable objectives and policies to be followed in the public and private use of land and water areas within the coastal area of North Carolina.

3.5.3 Environmental Consequences

The location and extent of a proposed action needs to be evaluated for its potential effects on a project site and adjacent land uses. Factors affecting a proposed action in terms of land use include its compatibility with on-site and adjacent land uses, restrictions on public access to land, or change in an existing land use that is valued by the community.

Coastal Zone Potential Impacts:

- No change to land use designations under the Proposed Action
- The Proposed Action would be consistent with the CZMA and with Onslow County's Land Use Plan and North Carolina's Coastal Area Management Act

3.5.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the existing land use within the coastal zone of North Carolina. Therefore, no significant impacts to the coastal zone would occur with implementation of the No Action Alternative.

3.5.3.2 Proposed Action (Preferred Alternative) Potential Impacts

The Proposed Action would occur within the coastal zone of the State of North Carolina. No element of the Proposed Action affects any of the AEC's outlined by North Carolina's CAMA. MCAS New River submitted a Federal Consistency Determination on November 15, 2019 that finds the Proposed Action to be consistent with the enforceable policies of North Carolina's Coastal Area Management Act. Concurrence was received on January 9, 2020. See **Appendix A**.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to land use within the coastal zone.

3.6 Hazardous Materials and Wastes

This section discusses hazardous materials, hazardous waste, toxic substances, and contaminated sites.

3.6.1 Regulatory Setting

Hazardous materials are defined by 49 CFR section 171.8 as "hazardous substances, hazardous wastes, marine pollutants, elevated temperature materials, materials designated as hazardous in the Hazardous Materials Table, and materials that meet the defining criteria for hazard classes and divisions in 49 CFR part 173." Transportation of hazardous materials is regulated by the U.S. Department of Transportation regulations.

Hazardous wastes are defined by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments, as: "a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may (A) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (B) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed." Certain types of hazardous wastes are subject to special management provisions intended to ease the management burden and facilitate the recycling of such materials. These are called universal wastes and their associated regulatory requirements are specified in 40 CFR part 273. Four types of waste are currently covered under the universal wastes regulations: hazardous waste batteries,

hazardous waste pesticides that are either recalled or collected in waste pesticide collection programs, hazardous waste thermostats, and hazardous waste lamps, such as fluorescent light bulbs.

Special hazards are those substances that might pose a risk to human health and are addressed separately from other hazardous substances. Special hazards include asbestos-containing material (ACM), polychlorinated biphenyls (PCBs), and lead-based paint (LBP). USEPA is given authority to regulate special hazard substances by the Toxic Substances Control Act. Asbestos is also regulated by USEPA under the CAA, and the Comprehensive Environmental Response, Compensation, and Liability Act.

The DoD established the Defense Environmental Restoration Program (DERP) to facilitate thorough investigation and cleanup of contaminated sites on military installations (active installations, installations subject to Base Realignment and Closure, and formerly used defense sites). The Installation Restoration Program and the Military Munitions Response Program are components of the DERP. The Installation Restoration Program requires each DoD installation to identify, investigate, and clean up hazardous waste disposal or release sites. The Military Munitions Response Program addresses nonoperational rangelands that are suspected or known to contain unexploded ordnance, discarded military munitions, or munitions constituent contamination. The Environmental Restoration Program is the USMC's initiative to address DERP.

OPNAVINST 5090.1C and MCO 5090.2B establish policy and responsibilities for compliance with statutory requirements for hazardous waste management. OPNAVINST 5100.23G establishes requirements and assigns responsibilities to incorporate facility asbestos management principles and practices.

3.6.2 Affected Environment

The USMC adheres to the Navy's policies with regard to hazardous wastes and materials. The Navy has implemented a strict Hazardous Material Control and Management Program and a Hazardous Waste Minimization Program for all activities. These programs are governed Navy-wide by applicable OPNAVINSTs and at the installation by specific instructions issued by the Base Commander. The Navy continuously monitors its operations to find ways to minimize the use of hazardous materials and to reduce the generation of hazardous wastes.

3.6.2.1 Hazardous Materials

Hazardous materials are used at MCAS New River for the maintenance of aircraft, ground vehicles, and facilities, as well as for the maintenance of the built infrastructure, which includes roads, buildings, stormwater management structures, overhead steam lines, and subsurface utilities. Typical materials include a variety of fuels, lubricants, sealants, adhesives, paints and paint removers, rust prevention and corrosion control products, coolants, and boiler water treatment chemicals.

Hazardous materials aboard MCAS New River are managed through the Hazardous Materials Management System, and the procurement, storage, distribution, and disposition of packaged hazardous materials are tracked through the program's database.

3.6.2.2 Hazardous Waste

Hazardous waste at MCAS New River is managed under the Installation's Hazardous Waste Management Plan, which is outlined in Chapter 9 of Air Station Order 5090.2B. The USEPA and North Carolina have specific regulatory requirements for the treatment, disposal, and storage of hazardous waste. The MCAS New River Environmental Management System ensures that generators of solid and hazardous waste comply with these regulations. MCAS New River operates as a Large Quantity Generator under RCRA. The Installation utilizes a less than 90 day Hazardous Material/Hazardous Waste Consolidation Site for Installation-wide consolidation of hazardous waste.

3.6.2.3 Special Hazards

Toxic substances considered in this EA are limited to ACMs, LBP, and PCBs. MCAS New River manages existing ACMs in accordance with the MCB Camp Lejeune Asbestos Management Plan (MCB Camp Lejeune Order 5090.62A).

3.6.2.4 Defense Environmental Restoration Program

The DERP at MCAS New River is managed through the Installation Restoration Program/Hazardous Waste Site Cleanup Implementation for MCB Camp Lejeune (MCB Camp Lejeune Order 5090.10A). The footprint of the Proposed Action overlies four sites that are managed under this program (**Figure 3.7-1**).

The proposed Regional Stormwater Infiltration System and CH-53K Aircrew Trainer Facility would partially overlap site UXO 30. This site is currently active in the Military Munitions Response Program and encompasses the former B-12 Baffled Pistol Range. The proposed site for the CH-53K Hangar overlies site IR-86. This is an active Installation Restoration Program site associated with Tank Area AS419-AS421. The site proposed for the CH-53K Hangar overlies SWMU 689, which is an active Solid Waste Management Unit associated with the Wash Racks at AS-4101.

3.6.3 Environmental Consequences

The hazardous materials and wastes analysis contained in the respective sections addresses issues related to the use and management of hazardous materials and wastes as well as the presence and management of specific cleanup sites at MCAS New River.

3.6.3.1 No Action Alternative

Under the No Action Alternative, the Proposed Action would not occur and there would be no change to the existing hazardous materials and wastes, nor management of the same at MCAS New River. Therefore, no significant impacts to hazardous materials and wastes would occur with implementation of the No Action Alternative.

Hazardous Material and Waste Potential Impacts:

- Small increase in hazardous wastes.
- No new hazardous wastes or materials anticipated
- Contractors performing construction and demolition activities would be required to comply with installation orders, federal and state laws regarding hazardous materials and wastes
- ACM, LBP, PCBs, and PFAS would be handled in accordance with installation orders, and federal, state, and local laws.

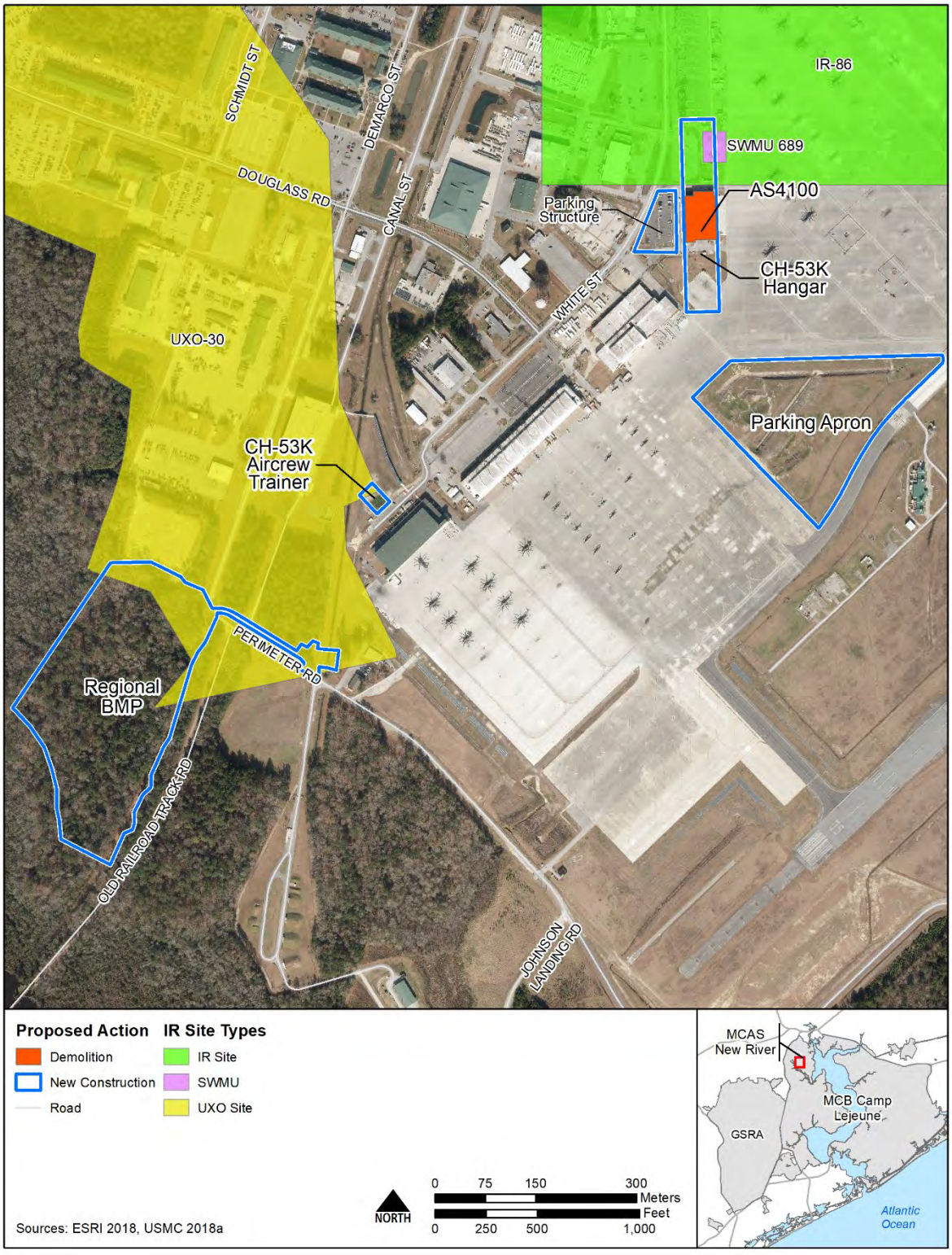

Figure 3.7-1. Installation Restoration Sites in Vicinity of Proposed Action at MCAS New River

3.6.3.2 Proposed Action (Preferred Alternative) Potential Impacts

The study area for hazardous materials and waste for the Preferred Alternative is MCAS New River. During demolition and construction activities, contractors would be required to follow all federal, state, and local regulations for the use and disposal of hazardous materials and wastes. At this time, it is not anticipated that there would be any changes to personnel loading, operations, or training activities associated with the CH-53K. Training and operations would mirror that of the existing CH-53E. The use of hazardous materials and creation of hazardous waste would be anticipated to be similar to current conditions aboard MCAS New River. It is not anticipated that new hazardous waste streams would be created with the operation of the CH-53K at MCAS New River. During research, development, testing, and evaluation of the CH-53K, no hazardous materials or wastes used required special handling, and all major components, minus the engine and gearboxes, had similar capacities for fluids as the CH-53E. There would be a slight increase in the use of hazardous materials and creation of hazardous waste (i.e., petroleum, oils, and lubricants) due to the larger engine size of the CH-53K compared to the CH-53E (personal communication, Winstead 2019). These materials would be managed under the Installation's Hazardous Waste Management Plan as they are currently. Therefore, impacts to hazardous materials and wastes would be minimal.

During demolition of AS4100 the contractor could encounter ACMs, LBP, PCBs, and aqueous film forming foam (AFFF) potentially containing per- and polyfluoroakyl substances (PFAS)used in the original construction and operation of the building. MCAS New River would utilize contractors already approved by MCB Camp Lejeune to carry out any required sampling, abatement, and permitting that may be required. The contractors would be required to manage these toxic substances and the associated actions in accordance with the base orders, Department of Defense, Department of the Navy, USMC guidance, and relevant federal, state, and local regulations. Although the removal of ACMs, LBP, PCBs, or AFFF PFAS during demolition activities would potentially increase the risk of short-term exposure, specifically for the contractor personnel managing the renovation and demolition operations, the removal of any of these hazardous substances would have a long-term beneficial impact by slightly reducing the overall quantity of ACMs, LBP, PCBs and/or PFAS aboard MCAS New River.

The construction of the CH-53K hangar is proposed in an area underlain by known PFAS in groundwater. It is anticipated that excavation and drilling activities proposed as part of the installation of building footers and foundation could generate contaminated media, primarily soil that would meet the definition of a hazardous waste. If contaminated media are encountered, they would be identified, characterized, managed, and disposed in accordance with MCB Camp Lejeune's Hazardous Waste Management Plan and Permit.

Munitions clearance would need to be conducted before construction of the Regional Stormwater Infiltration System. With implementation of best management practices (BMPs) for dealing with contamination and munition clearance, impacts to the DERP at MCAS New River would not be significant.

Therefore, implementation of the Preferred Alternative would not result in significant impacts to hazardous materials and wastes.

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4 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.

4.1 Definition of Cumulative Impacts

The approach taken in the analysis of cumulative impacts follows the objectives of NEPA, CEQ regulations, and CEQ guidance. Cumulative impacts are defined in 40 CFR section 1508.7 as "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 analyses, 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 analysis document.

In addition, CEQ and 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 EPA 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?

4.2 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 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 3 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 EISs and EAs, management plans, land use plans, and other planning related studies.

4.3 Past, Present, and Reasonably Foreseeable Actions

This section will focus on past, present, and reasonably foreseeable future projects at and near the Proposed Action locale. In determining which projects to include in the cumulative impacts analysis, a preliminary determination was made regarding the past, present, or reasonably foreseeable action. Specifically, using the first fundamental question included in **Section 4.1**, it was determined if a relationship exists such that the affected resource areas of the Proposed Action 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 informed decision-making. Projects included in this cumulative impacts analysis are listed in **Table 4.1-1** and briefly described in the following subsections.

Table 4.1-1. Cumulative Action Evaluation

Action	*Level of NEPA Analysis Completed*
Past Actions	
Introduction of the V-22 to the Second Marine Aircraft Wing in Eastern North Carolina	EIS
Grow the Force	EIS
Establishing Integrated Maintenance Program Capability at MCAS New River	EA
MILCON P-615 Aircraft Parking Apron Addition	CATEX
MILCON P-526 Aircraft Maintenance Hangar Construction Phases I and II	CATEX
Present and Reasonably Foreseeable Future Actions	
MILCON P-695 Center for Naval Aviation Technical Training (CNATT) Classroom Building	CATEX
MILCON P-380 MV-22 Replacement Hangar	CATEX

Notes: CATEX = Categorical Exclusion

4.3.1 Past Actions

Introduction of the V-22 to the Second Marine Aircraft Wing in Eastern North Carolina. The Record of Decision for the East Coast Basing of the MV-22B was signed in December of 1999 (USMC 1999). This document included analysis for the transition of the existing CH-46E helicopters with the new V-22 tilt-rotor aircraft that would later be called the MV-22B. This document analyzed the impacts from the aircraft transition and the associated construction required to house and maintain the new aircraft.

Grow the Force. An EIS was prepared for the proposed permanent incremental increase of Marine Corps personnel at MCB Camp Lejeune, MCAS Cherry Point, and MCAS New River. A Record of Decision was signed in January 2010 (USMC 2009). This action included the analysis for several projects totaling over 100 acres of construction within the airfield environment at MCAS New River.

Integrated Maintenance Program Capability at MCAS New River. An EA was prepared to evaluate the potential environmental impacts associated with the establishment of Integrated Maintenance Program capability for H-1, H-53, and MV-22 aircraft at MCAS New River. The purpose of the Proposed Action was to establish on-site Depot-level direct support for Fleet squadrons, reduce duplication of effort by consolidating maintenance tasks, and allow Fleet squadrons to retain local control of assigned aircraft. The need for the Proposed Action was to reduce an aircraft's out-of-service period for scheduled maintenance. A FONSI was signed in 2014.

MILCON P-615 Aircraft Parking Apron Addition. This project constructed 342,120 square feet of additional aircraft parking apron and associated perimeter lighting. The new apron is located adjacent to the existing apron and accommodates 15 MV-22 aircraft. A CATEX Decision Memorandum was signed on May 2007.

MILCON P-526 Aircraft Maintenance Hangar Construction Phases I and II. This project constructed a multi-story aircraft maintenance hangar to provide hangar bay, shop space, flight-line operations, and maintenance functions in support of MV-22 aircraft squadrons. This project also included demolition of substandard hangar AS-504. A CATEX Decision Memorandum was signed on July 2004.

4.3.2 Present and Reasonably Foreseeable Actions

P-695 CNATT Classroom Building. This project is to construct a multi-story classroom with approximately 120,000 square feet of classroom space. The structure would be located to the north of the airfield but near the flight line. This classroom will provide education space for training aircraft maintenance personnel. As part of the project, buildings AS222, AS312, and AS510 will be demolished to make space for the proposed CNATT classroom. A CATEX decision memorandum was signed in March of 2019.

P-380 MV-22 Replacement Hangar. This project would construct one additional USMC Standard Type II Aircraft Maintenance Hangar module to the south end of building AS890, and two additional modules to the north end of AS890. The proposed hangars would provide an additional 297,000 square feet of hangar space. Additionally, approximately 15 acres of new parking apron would be constructed. A CATEX decision memorandum was signed in June of 2019.

4.4 Cumulative Impact Analysis

4.4.1 Air Quality

The ROI is Onslow County, North Carolina, which includes the city of Jacksonville. This area is in attainment for all criteria pollutants. Air quality is generally good in this moderately populated coastal region.

Cumulative air quality impacts from past, present, and future actions within the ROI would be less than significant because anticipated emissions would not result in a violation of any NAAQS or otherwise result in long-term degradation of local air quality. It is more likely that the overall level of criteria pollutant emissions and GHGs from mobile source operations in construction activities and military

operations would increase, but at a level that would generate few discernable impacts. 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.

4.4.2 Water Resources

The ROI for water resources would be MCAS New River and its adjacent waterways and wetlands.

Cumulative water resources impacts from past, present, and future actions within the ROI would be less than significant because all construction activities would be done in accordance with all applicable laws, permits, and plans to prevent erosion and sedimentation of adjacent waterways and wetlands. Any wetland or stream impacts from past and future actions would require permitting through USACE and NCDEQ, and would ensure that wetland impacts are minimized and mitigated per regulations and permit requirements. 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.

4.4.3 Noise

The ROI for Noise would be the general area around the airfield at MCAS New River, and all areas within the 65 dB DNL noise contours, as they extend from the airfield. As shown in Chapter 3, almost all of this area resides on MCAS New River or MCB Camp Lejeune.

All of the past, present, and future actions listed in **Table 4.1-1** would contribute to the overall noise environment at MCAS New River. All actions listed would have construction elements that would have temporary impacts to noise. The introduction of the V-22 to MCAS New River would have long-term impacts to noise from continued operation of that aircraft.

Cumulative impacts from past, present, and future actions within the ROI would be less than significant because many would be short-term, temporary disturbances from construction activities within MCAS New River boundary. Construction activities would likely be unnoticed due to the fact that most are occurring at an active military airfield. Long-term, cumulative impacts would occur from the implementation of the Proposed Action. However, these impacts would remain well within the noise levels used for DoD land use planning guidelines (65 DNL). The replacement of the CH-53E with the CH-53K showed less than significant impacts when compared to No Action conditions at MCAS New River. These modeled noise results also take into account the operation of the MV-22 at MCAS New River. Therefore, there would be no significant cumulative impacts to noise from the implementation of the Proposed Action.

4.4.4 Biological Resources

The ROI for biological resources would be the general location of construction, and the general area around the airfield at MCAS New River that would be impacted by noise from aircraft operations.

Cumulative biological resource impacts from past, present, and future actions within the ROI would be less than significant because disturbance to wildlife from construction activities would be temporary and would generally occur in already developed areas of MCAS New River. Noise impacts to wildlife from aircraft would continue as it currently does, and existing wildlife is already likely habituated to the noise of a military airfield. An additional approximately 19 acres of forested area would be permanently converted into the Regional Stormwater Infiltration System. This conversion of habitat type would

present a permanent loss of forested area at MCAS New River. However, there would remain large areas of similar habitat nearby at MCB Camp Lejeune, and outside of MCAS New River. Similarly, future projects P-695 and P380 would occur in developed areas or along the flightline. Areas of suitable habitat for any threatened or endangered species would not occur in these proposed project areas. 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.

4.4.5 Coastal Zone

Cumulative land use impacts from past, present, and future actions within the coastal zone would be less than significant because land use at MCAS New River and the surrounding area would not be negatively impacted by the Proposed Action. All past, present, and future actions within the ROI would be consistent with the enforceable policies of North Carolina's Coastal Area Management Act. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant cumulative impacts within the ROI.

4.4.6 Hazardous Materials and Wastes

All of the past, present, and future actions listed in **Table 4.1-1** would require the use of hazardous materials and generate hazardous waste. All actions listed would have construction elements that would have temporary impacts to hazardous materials and wastes.

The Proposed Action and the cumulative projects have resulted or would result in short-term increases in the use and generation of hazardous materials and wastes during construction and demolition activities. The majority of hazardous materials are anticipated to be fully consumed during these activities. Any unused hazardous materials would be managed in accordance with federal and state regulations and Marine Corps procedures for working with hazardous materials. Hazardous wastes generated by these projects may include special hazards such as ACMs, LBP, and PCBs and mercury-containing equipment, as well as contaminated soil and groundwater from Installation Restoration Program sites. The removal and proper disposal of these substances would be managed in accordance with federal and state requirements and would have a beneficial cumulative impact. As a result, adverse cumulative impacts associated with hazardous materials and wastes from past, present, and future actions within the ROI would not occur. Therefore, implementation of the Proposed Action combined with the past, present, and reasonably foreseeable future projects, would not result in significant cumulative impacts within the ROI.

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5 Other Considerations Required by NEPA

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

In accordance with 40 Code of Federal Regulations (CFR) section 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. **Table 5.1-1** identifies the principal federal and state laws and regulations that are applicable to the Proposed Action, and describes briefly how compliance with these laws and regulations would be accomplished.

Table 5.1-1. Principal Federal and State Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
National Environmental Policy Act; CEQ NEPA implementing regulations; Navy procedures for Implementing NEPA	This EA has been prepared in accordance with NEPA and Marine Corps NEPA procedures.
Clean Air Act	The Proposed Action would be implemented in accordance with the CAA. The General Conformity Rule does not apply to the Proposed Action because the area is in attainment for all NAAQS pollutants. MCAS New River would continue to operate in adherence to the existing Title V permit.
Clean Water Act	The Proposed Action would be implemented in accordance with the CWA and all applicable permits would be obtained prior to the start of the project.
Coastal Zone Management Act	The Proposed Action would be consistent, to the maximum extent practicable, with the enforceable policies of the North Carolina Coastal Resources Program. A Coastal Consistency Determination is included in **Appendix A.**
National Historic Preservation Act	There are no historic properties located within the area of potential effects of the Proposed Action; therefore, there are no historic properties affected.
Endangered Species Act	The Proposed Action would have no effect on species listed under the ESA or designated critical habitat.
Migratory Bird Treaty Act	Land clearing activities would be scheduled to occur, to the extent feasible, outside the breeding season for migratory birds, under guidance from the Natural Resources Manager.
Bald and Golden Eagle Protection Act	The Proposed Action would not affect bald or golden eagles.
Comprehensive Environmental Response and Liability Act	The Proposed Action would comply with this Act.
Emergency Planning and Community Right-to-Know Act	The Proposed Action would comply with this Act.
Federal Insecticide, Fungicide, and Rodenticide Act	The Proposed Action would comply with this Act.
Resource Conservation and Recovery Act	The Proposed Action would comply with this Act.
Toxic Substances Control Act	The Proposed Action would comply with this Act.
Farmland Protection Policy Act	The Proposed Action would comply with this Act.

Table 5.1-1. Principal Federal and State Laws Applicable to the Proposed Action	
Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	***Status of Compliance***
EO 11988, Floodplain Management	The Proposed Action would not occur within the 100-year floodplain. Low-impact development techniques would be applied where practicable due to the amount of ground disturbance required. The Proposed Action would comply with this EO.
EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	The Proposed Action would comply with this EO.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	The Proposed Action would comply with this EO.
EO 13834, Efficient Federal Operations	The Proposed Action would comply with this EO

5.2 Irreversible or Irretrievable Commitments of Resources

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

Implementation of the Proposed Action would involve human labor; the consumption of fuel, oil, and lubricants for construction vehicles; and loss of natural resources (forest vegetation). Implementing the Proposed Action would not result in significant irreversible or irretrievable commitment of resources.

5.3 Unavoidable Adverse Impacts

This EA has determined that the Proposed Action would not result in any significant impacts. The existing forested area at the site proposed for the Regional Stormwater Infiltration System would be removed. While this adverse impact would be unavoidable, it is not significant given the expansive areas of forest surrounding the site and through the larger installation. The Regional Stormwater Infiltration System would be replanted with vegetation and would have wetland-like characteristics that would be beneficial to the environment. Additionally, there would be unavoidable impacts to streams and wetlands due to aircraft apron expansion. Through incorporation and implementation of the appropriate permit required mitigations, and BMPs, no significant impacts would result from the Proposed Action; therefore, there would be no unavoidable adverse effects.

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

NEPA requires an analysis of the relationship between a project's short-term impacts on the environment and the effects that these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. Impacts that narrow the range of beneficial uses of

the environment are of particular concern. This refers to the possibility that choosing one development site reduces future flexibility in pursuing other options, or that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short-term, effects to the human environment with implementation of the Proposed Action would primarily relate to the construction activity itself. Air quality and noise would be impacted in the short-term. In the long-term, operation of the CH-53K would be very similar to existing conditions at MCAS New River. The construction of the facilities and operation would not significantly impact the long-term natural resource productivity of the area. The Proposed Action would not result in any impacts that would significantly reduce environmental productivity or permanently narrow the range of beneficial uses of the environment.

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Winstead, Todd. 2019. Personal Communication between Todd Winstead of PMA-261 Heavy Lift Helicopter Program and Michael Harrison of Cardno regarding the hazardous waste stream of the CH-53K on 1 October 2019.

Woodall, Brian. 2019. Personal Communication between Brian Woodall of MCB Camp Lejeune and Kirk Kropinack of MCB Camp Lejeune regarding construction debris and solid waste on 21 May 2019.

7 List of Preparers

This EA was prepared collaboratively between the Navy and contractor preparers.

U.S. Department of the Navy

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Appendix A
Federal Consistency Determination

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ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
BRAXTON C. DAVIS
Director

NORTH CAROLINA
Environmental Quality

January 9, 2020

Mr. John R. Townson
Director, Environmental Management
U.S. Marine Corps
East-Marine Base Camp Lejeune
PSC Box 20005
Camp Lejeune NC 28542-0005

SUBJECT: **CD20-003** Consistency Concurrence Concerning the U.S. Marine Corps (USMC) Proposed Replacement of the Existing CH-53E Super Stallion Aircraft with the New CH-53K King Stallion Aircraft, Marine Corps Installations East-Marine Corps Base Camp Lejeune, Onslow County, North Carolina (DCM#20200003)

Dear Mr. Townson:

We received your consistency submission on November 15, 2019, concerning the USMC proposal to replace the heavy lift helicopter CH-53E with the heavy lift helicopter CH-53K. The proposal includes construction of a new hangar and support facilities to allow for maintenance and training.

North Carolina's coastal zone management program consists of, but is not limited to, the Coastal Area Management Act, the State's Dredge and Fill Law, Chapter 7 of Title 15A of North Carolina's Administrative Code, and the land use plan of the County and/or local municipality in which the proposed project is located. It is the objective of the Division of Coastal Management (DCM) to manage the State's coastal resources to ensure that proposed federal activities would be compatible with safeguarding and perpetuating the biological, social, economic, and aesthetic values of the State's coastal waters.

DCM has reviewed the submitted information pursuant to the management objectives and enforceable policies of Subchapters 7H and 7M of Chapter 7 in Title 15A of the North Carolina Administrative Code and concurs that the proposed activity is consistent with North Carolina's approved coastal management program. However, the North Carolina Wildlife Resources Commission requests that stormwater treatment systems be designed to current North Carolina standards that best minimize impacts to wildlife resources.

Prior to the initiation of the activities described, the applicant should obtain any required State approvals or authorizations, including any authorizations required by the N.C. Division of Water Resources. Should the proposed action be modified further, a revised consistency determination could be necessary. This might take the form of either a supplemental consistency determination pursuant to 15 CFR 930.46, or a new consistency determination pursuant to 15 CFR 930.36. Likewise, if further project assessments reveal environmental effects not previously considered by the proposed development, a supplemental consistency certification may be required.

If you have any questions, please contact me at (252) 808-2808. Thank you for your consideration of the North Carolina Coastal Management Program.

Sincerely,

Daniel Govoni
Federal Consistency Coordinator

North Carolina Department of Environmental Quality | Division of Coastal Management
Morehead City Office | 400 Commerce Avenue | Morehead City, North Carolina 28557
252.808.2808

UNITED STATES MARINE CORPS
MARINE CORPS INSTALLATIONS EAST-MARINE CORPS BASE
PSC BOX 20005
CAMP LEJEUNE NC 28542-0005

5090.12
G-F/BEMD
NOV 15 2019

Mr. Daniel Govoni
Federal Consistency Coordinator
North Carolina Department of Environmental Quality
Division of Coastal Management
400 Commerce Avenue
Morehead City, NC 28557-3421

Dear Mr. Govoni:

Marine Corps Installations East-Marine Corps Base Camp Lejeune (MCIEAST MCB CAMLEJ) proposes to replace the existing CH-53E Super Stallion aircraft located at MCAS New River with the new CH-53K King Stallion aircraft, as directed by the 2018 USMC Aviation Plan. The Proposed Action would include construction of a new hangar and support facilities to allow for maintenance and training, which would mirror that of the existing CH-53E.

Enclosed is our consistency determination for the proposed project. In accordance with Section 307(c)(1) of the Federal Coastal Zone Management Act of 1972 as amended, MCIEAST-MCB CAMLEJ has determined that these activities are consistent with North Carolina's Coastal Management Program. This determination is based on the review of the enforceable policies of the State's coastal program, found in Chapter 7 of Title 15A of the North Carolina Administrative Code. MCIEAST-MCB CAMLEJ requests that the Division of Coastal Management concur with this consistency determination.

The point of contact for this project is Ms. Jessi Baker, Environmental Conservation Branch, G-F, at (910)451-4542 or email jessi.baker@usmc.mil.

Sincerely,

JOHN R. TOWNSON
Director, Environmental Management
By direction of the
Commanding General

Enclosure: FEDERAL CONSISTENCY DETERMINATION FOR REPLACEMENT OF HEAVY LIFT HELICOPTER CH-53E WITH HEAVY LIFT HELICOPTER CH-53K AT MARINE CORPS AIR STATION NEW RIVER, ONSLOW COUNTY NORTH CAROLINA

FEDERAL CONSISTENCY DETERMINATION FOR REPLACEMENT OF HEAVY LIFT HELICOPTER CH-53E WITH HEAVY LIFT HELICOPTER CH-53K AT MARINE CORPS AIR STATION NEW RIVER, ONSLOW COUNTY NORTH CAROLINA

November 2019

The United States (U.S.) Marine Corps has determined that the proposed activity is consistent with the enforceable policies of North Carolina's approved Coastal Management Program. Marine Corps Air Station (MCAS) New River is located in Onslow County, North Carolina.

1.0 FEDERAL AGENCY PURPOSE AND ACTION

The Marine Corps proposes the replacement of existing CH-53E Super Stallion aircraft located at MCAS New River with the new CH-53K King Stallion aircraft, as directed by the 2018 USMC Aviation Plan. The CH-53E Super Stallion is at the end of its anticipated operational life span, and cannot meet present and future heavy lift requirements. The Proposed Action would also include construction of a new hangar and support facilities to allow for maintenance and training for the CH-53K aircraft.

Under the Proposed Action, the CH-53E at MCAS New River would be replaced with the CH-53K. This would represent a one-for-one replacement of all the CH-53E aircraft authorized at MCAS New River. In addition, construction and/or renovation to the facilities at MCAS New River would be necessary to maintain, support, or train pilots and maintainers on the CH-53K and would be included in the Proposed Action. At this time, it is not anticipated that there would be any changes to personnel loading, operations, or training activities associated with the CH-53K. Training and operations would mirror that of the existing CH-53E. Details on the construction projects to support the CH-53K are provided below.

Construction and Demolition Projects

In order to achieve the transition from CH-53E to CH-53K at MCAS New River, several construction and demolitions projects would be included (**Table 1** and **Figure 1**)

Table 1. Construction and Demolition Projects Associated with the Proposed Action

Facility	Approximate Size (Square Feet)	Description/Usage
Construction Projects		
Three-Module Type II Hangar	297,000	CH-53K Maintenance.
Aircraft Parking Apron	530,000	Paved area to expand aircraft parking capacity.
Parking Structure	230,000	Multi-level parking structure for CH-53K personnel.
CH-53K Cargo Loading Trainer Facility	10,000	Training facility for loading crews for CH-53K.
Regional Stormwater Infiltration System	530,000	Single infiltration system to treat stormwater from existing and future impervious surface at MCAS New River. Would include a pump station at south end of airfield to feed into infiltration basin.
Demolition Projects		
AS4100	31,000	Existing CH-53E Maintenance Hangar; would be demolished to make way for new CH-53K hangar.

MCAS New River would construct a three-module Type II aircraft hangar (approximately 297,000 square feet) to replace the outdated existing CH-53E hangar. As part of the CH-53K transition effort, a 230,000-square foot parking structure would be constructed adjacent to the proposed hangar. This parking structure would provide much needed parking spaces for personnel reporting to the new CH-53K hangar. Also included would be the paving of approximately 530,000 square feet (12 acres) of grass infield for an

expanded parking apron for aircraft. Demolition of building AS4100 would also occur as part of this effort to make way for newer structures.

The Proposed Action also includes the construction of a Regional Stormwater Infiltration System to the west of the airfield on undeveloped land. The Infiltration System is necessary due to the large amount of impervious surface at MCAS New River. The installation is predominately built out, with little natural area left within its boundary. The Regional Stormwater Infiltration System would be used to treat stormwater from existing and future impervious surfaces at MCAS New River. The single, large feature would allow for improved future treatment capacity and prevent MCAS New River from needing to construct many, smaller stormwater features that would occupy valuable space within the air station boundary. The new single system would provide stormwater storage capacity and be designed to allow infiltration and discharge into an adjacent wetland area. MCB Camp Lejeune received a letter (June 19, 2014) from North Carolina Division of Energy, Mineral, and Land Resources confirming the design plan for the infiltration basin, and stating that the design met the intent of the agreement made between the base and North Carolina Division of Energy, Mineral, and Land Resources with regard to the overall state stormwater permitting approach for MCAS New River (see Attachment 1).

Also included in the Proposed Action is the construction of a CH-53K Air Crew Training Facility (MILCON P-680). These facilities are approximately 9,800-square feet. Both of these facilities are required to keep Marines trained in loading the new CH-53K.

Figure 1. Construction and Demolition for CH-53K Transition at MCAS New River

2.0 NORTH CAROLINA COASTAL AREA MANAGEMENT ACT

In 1972, Congress passed the Coastal Zone Management Act, which encouraged states to keep the coasts healthy by establishing programs to manage, protect, and promote the country's fragile coastal resources. Two years later, the North Carolina General Assembly passed the landmark Coastal Area Management Act (CAMA). CAMA established the Coastal Resources Commission, required local land use planning in 20 coastal counties, and provided for a program for regulating development. The North Carolina Coastal Management Program was federally approved in 1978 by the National Oceanic and Atmospheric Administration.

2.1 AREAS OF ENVIRONMENTAL CONCERN

North Carolina's coastal zone includes the 20 counties that are adjacent to, adjoining, intersected by, or bounded by the Atlantic Ocean or any coastal sound, including Onslow County. There are two tiers within this boundary. The first tier is comprised of Areas of Environmental Concern (AEC) designated by the state. The second tier includes land uses with the potential to affect coastal waters, even though they are not defined as AECs. The coastal zone extends seaward to the three nautical mile territorial sea.

An AEC is an area of natural importance and its classification protects the area from uncontrolled development. The four categories of AECs are:

1. The Estuarine and Ocean System, which includes public trust areas, estuarine coastal waters, coastal shorelines, and coastal wetlands;
2. The Ocean Hazard System, which includes components of barrier island systems;
3. Public Water Supplies, which include certain small surface water supply watersheds and public water supply well fields; and
4. Natural and Cultural Resource Areas, which include coastal complex natural areas; areas providing habitat for federal or state designated rare, threatened, or endangered species; unique coastal geologic formations; or significant coastal archaeological or historic resources.

The Proposed Action would occur along the flight line area at MCAS New River (**Figure 2**). Most construction and demolition would occur in previously disturbed areas. The regional stormwater feature would be the only element that requires any vegetation clearance. The following is a brief analysis of only the policies of the CAMA AEC applicable to the Proposed Action.

Figure 2. Areas of Environmental Concern

15A North Carolina Administrative Code (NCAC) 07H.0200 (Estuarine and Ocean Systems)

Estuarine and ocean systems include coastal wetlands, estuarine waters, and public trust areas.

15A NCAC 07H .0205 (Coastal Wetlands) defines and establishes management objectives for coastal wetlands. The management objective of this policy is to conserve and manage these resources as an interrelated group so as to safeguard and perpetuate their biological, social, economic, and aesthetic values and to make certain that development occurring within AECs is compatible with natural characteristics so as to minimize the likelihood of substantial loss of private property and public resources. An additional objective is to protect present common-law and statutory public rights of access to the lands and waters of the coastal area.

None of the Proposed Action elements would impact or overlap coastal wetlands, or the designated coastal wetland AEC. Therefore, the Proposed Action would be consistent with this policy.

15A NCAC 07H .0206 (Estuarine Waters) defines and establishes management objectives for estuarine waters in order "to conserve and manage the important features of estuarine waters so as to safeguard and perpetuate their biological, social, aesthetic, and economic values; to coordinate and establish a management system capable of conserving and utilizing estuarine waters so as to maximize their benefits to man and the estuarine and ocean system."

The Proposed Action would not impact any estuarine waters. Construction and demolition activities associated with the Proposed Action would adhere to MCAS New River's stormwater pollution prevention procedures, as well as all required erosion and sedimentation control procedures. Therefore, the Proposed Action would be consistent with this policy.

15A NCAC 07H .0207 (Public Trust Areas) defines and establishes management objectives for public trust areas, in order "to protect public rights for navigation, recreation, and to conserve and manage public trust areas in a manner that safeguards and perpetuates their biological, economic, and aesthetic values."

The Proposed Action would occur within the MCAS New River boundary. As such, the Proposed Action would have no impact on public rights for navigation or recreation. Therefore, the Proposed Action would be consistent with this policy.

15A NCAC 07H.0300 (Ocean Hazard Areas)

Ocean hazard areas are those areas along the Atlantic Ocean shoreline where, because of their special vulnerability to erosion or other adverse effects of sand, wind, and water, uncontrolled or incompatible development could unreasonably endanger life or property. Ocean hazard areas include beaches, frontal dunes, inlet lands, and other areas in which geologic, vegetative, and soil conditions indicate a substantial possibility of excessive erosion or flood damage. No aspect of the Proposed Action would impact Ocean Hazard Areas. No activities would occur on dunes or ocean coastlines. Therefore, the Proposed Action would be consistent with this policy.

15A NCAC 07H.0400 (Public Water Supplies)

This policy addresses valuable small surface water supply watersheds and public water supply well fields. These vulnerable, critical water supplies, if degraded, could adversely affect public health or require substantial monetary outlays by affected communities for alternative water source development. The management objective for this policy is to regulate development within critical water supply areas to protect and preserve public water supply well fields and surface water sources.

The Proposed Action does not include any development within critical water supply areas and would have no impact to public water supplies. Therefore, the Proposed Action would be consistent with this policy.

15A NCAC 07H.0500 (Natural and Cultural Resource Areas)

15A NCAC 07H .0501 (General) defines fragile coastal natural and cultural resource areas as "areas containing environmental, natural, or cultural resources of more than local significance in which uncontrolled or incompatible development could result in major or irreversible damage to natural systems or cultural resources, scientific, educational, or associative values, or aesthetic qualities." The AECs within this category are coastal complex natural areas, coastal areas that sustain remnant species, unique coastal geologic formations, significant coastal architectural resources, and significant coastal historic architectural resources.

There are no significant natural resource areas in the vicinity of the Proposed Action. Three archaeological sites are located within the area of the proposed Regional Stormwater Feature; however, these have been deemed ineligible for listing on the National Register of Historic Places. Therefore, the Proposed Action would be consistent with this policy.

2.2 GENERAL POLICY GUIDELINES

The North Carolina CAMA sets forth 11 General Policy Guidelines, addressing:

Shoreline erosion policies;
Shorefront access policies;
Coastal energy policies;
Post-disaster policies;
Floating structure policies;
Mitigation policies;
Coastal water quality policies;
Policies on use of coastal airspace;
Policies on water- and wetland-based target areas for military training areas;
Policies on beneficial use and availability of materials resulting from the excavation or maintenance of navigational channels; and
Policies on ocean mining.

The purpose of these rules is to establish generally applicable objectives and policies to be followed in the public and private use of land and water areas within the coastal area of North Carolina.

None of the general policies are applicable for the activities associated with the Proposed Action. The CH-53K will operated as the existing CH-53E currently does. There would be no change in activity, and therefore no impact to any of the above polices.

3.0 ONSLOW COUNTY COASTAL MANAGEMENT POLICIES

The CAMA requires local governments in each of the 20 coastal counties in the state to prepare, implement, and enforce a land use plan and ordinances consistent with established state and federal policies. Specifically, local policy statements are required on resource protection; resource production and management; economic and community development; continuing public participation; and storm hazard mitigation, post-disaster recovery, and evacuation plans. Upon approval by the North Carolina Coastal Resources Commission, each plan becomes part of the North Carolina Coastal Management Plan.

Onslow County adopted its Land Use Plan in 2009, and most recently amended the plan in 2014. In accordance with the Onslow County Land Use Plan, the activities associated with the Proposed Action are consistent with the policies of Onslow County, to the greatest extent practicable, as shown in **Table 2**.

Table 2. Onslow County Land Use Plan Policies

Policy	Applicability
Public Access	Not Applicable
Land Use Compatibility	Not Applicable
Agricultural and Forestry Preservation	Not Applicable
Conservation	Consistent
Stormwater control	Consistent
Water and Sewer; Solid Waste; Transportation	Consistent
Natural Hazard Areas	Consistent
Water Quality	Consistent
Local Areas of Concern (Cultural and Historic Sites)	Consistent

4.0 CONCLUSION

In conclusion, after careful consideration of the investigation and transition of the CH-53E to the CH-53K heavy lift helicopter and necessary facility upgrades to support the transition under the Proposed Action, the Marine Corps has determined that this action would not adversely affect North Carolina's coastal zone.

NCDENR

North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

June 19, 2014

Mr. John Townson
Director EMD
BLDG 12 Post Ln
Camp Lejeune, NC 28542

Subject: Marine Corps Air Station (MCAS) New River – Regional Stormwater BMP Design Agreement with NCDENR

Dear Mr. Townson,

On May 13, 2014 the Division of Energy, Mineral and Land Resources (DEMLR) received the, "Technical Memorandum of Understanding for a Regional BMP Design for MCAS New River", from AMEC, who is the consultant representing Camp Lejeune on this matter.

DEMLR has reviewed this document and found that it meets the intent of the agreement made between Camp Lejeune and DEMLR for the design and overall state stormwater permitting approach for MCAS New River. DEMLR encourages Camp Lejeune to continue with the implementation of this agreement which will lead to improved water quality and the integration of existing and future stormwater requirements into a single Master Stormwater Permit and Watershed Plan.

We have attached a list of State Stormwater permits that we have identified as being a part of the permit consolidation to date. This document will be a "Living Document" that will be updated as needed as we work together to meet the goals outlined in this MCAS New River Technical MOU.

If you have any further questions or requirements concerning this agreement please contact Kelly Johnson at (910) 796-7331, Christine Nelson at (910) 796- 7345 or Georgette Scott at (910) 796-7339.

Sincerely,

Georgette D Scott

For Tracy Davis, P.E., Director
Division of Energy, Mineral and Land Resources

GDS\gds: G:\WQ\Shared\Stormwater\GDS\MCAS New River Master Plan\2014 06 Approval Ltr

Cc: Tracy Davis
Georgette Scott
WIRO Stormwater File

Division of Energy, Mineral, and Land Resources
Land Quality Section – Wilmington Regional Office
127 Cardinal Drive Extension, Wilmington, North Carolina 28405 • (910) 796-7215 / Fax: (910) 350-2004

Appendix B
Air Quality Calculation

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Construction emission assumptions for MCAS New River CH-53E Replacement

	43,560	Conversion from Acre to SF	1.4	tons/CY for Gravel	48 acres total disturbance
	0.03704	Cubic feet to Cubic Yards	80,000	lbs/Truck Load for Delivery	
	0.1111	Square Feet to Square Yards	2000	pounds per ton	
	453.59	grams per pound	145	lb/ft^3 density of Hot Mix Asphalt	

2020-2021

Three-Module Type II Hangar	297,000	sf bldg	22	months construction duration	
	891,000	cf excavation	440	Material Deliveries	
	67,704	cy excavation	6,023	trucks of dirt hauled in/out	
	49,898	cy concrete	5,544	concrete trucks	
	16,819	cy gravel	1,402	trucks of gravel hauled in	
	23,000	ft trenching			
	19	AC land clearing			
	4,578	CY fill			
	21,322	ft piling			
	91,960	SY grading			

	Total Truck Trips
Dirt	8,733
Concrete	19,260
Gravel	5,533
Asphalt	63
Demo Debris	565
Materials Delivery	1,520
Grand Total Truck Trips	35,674
Ave # Truck Trip/Day	143

Apron Maintenance	530,000	sf concrete apron	6	months construction duration	CY material brought in	CY material taken out	
	19,630	CY new concrete	2,181	concrete trucks	239,533	223,886	
	9,815	CY new gravel	818	trucks of gravel hauled in			1,533,000
	58,889	SY grading			Trenching area SF	44640	
					Material removed	1240	CY
Parking Structure	230,000	sf bldg	12	months construction duration	Total new Bldg SF	657,000	
Assume 2-story	115000	sf footprint	240	Material Deliveries	Total bldg SF (const + ren	657,000	
	345,000	cf excavation			area to be graded SF	165,293	
	25,556	cy excavation	2,130	trucks of dirt hauled out	excavation	218,236	cy
	49,898	cy concrete	5,544	concrete trucks	asphalt/concrete & grave	234,955	cy
	6,543	cy gravel	545	trucks of gravel hauled in	bldg demo CY	5,650	
	27,821	ft piling			bldg demo SF	113,000	
	154	CY asphalt	13	trucks of asphalt hauled in	Other demo CY	0	
					Other demo SF	243	
					Total demo SF	113,243	
					Paving area SF	41,128	
CH-53K Cargo Loading	10,000	sf bldg	18	months construction duration			
Trainer Facility	2,747	cy excavation	360	Material Deliveries			
	445	ft trenching	229	trucks of dirt hauled out			
	49,702	cy concrete	5,522	concrete trucks			
	24,851	cy gravel	2,485	trucks of gravel hauled in			
	3,280	ft piling					
	1,111	SY grading					

CNATT Class Bldg	120,000	sf bldg	24	months construction duration
	113,637	cf excavation	480	Material Deliveries
	4,209	cy excavation	351	trucks of dirt hauled out
	4,209	cy concrete	468	concrete trucks
	2,830	cy gravel	283	trucks of gravel hauled in
	4,675	ft trenching		
	8,202	ft piling		
	607	CY asphalt	51	trucks of asphalt hauled in
	13,333	SY grading		
SW System	530,000	sf		
	118,021	CY excavation	9,835	trucks of dirt hauled out
	1,640	ft trenching		
	533,330	sf land clearing	12.2	acres
Demolition				
AS515 & AS4100	113,000	sf of buildings	2	month demolition
Assume 1 CY construction debris per 20 SF of building				
	5,650	CY demolition debris	565	Truck loads demolition debris

Clearing 12.2 Acres

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Dozer	142	145	0.58	0.38	1.41	4.17	0.12	0.30	0.29	536
Loader/Backhoe	142	87	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692
Small Backhoe	142	55	0.21	1.43	7.35	6.35	0.15	1.06	1.03	692

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Dozer	9.88	37.11	109.51	3.02	7.77	7.53	14,056
Loader w/ integral Backhoe	8.16	41.90	36.19	0.85	6.06	5.88	3,943
Small backhoe	5.16	26.49	22.88	0.54	3.83	3.72	2,492

On-road Equipment	Hours of Operation	Engine HP	Speed (mph)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck	65	230	16	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Dump Truck	1.58	8.36	37.51	0.02	1.56	1.52	3,576
Subtotal in lbs	25	114	206	4	19	19	24067
Clearing Grand Total in Tons	**0.01**	**0.06**	**0.10**	**0.00**	**0.01**	**0.01**	**12**

Site Prep - Excavate/Fill - Trenching - Grading

Site Prep - Excavate/Fill (CY)	222,814 CY		
Trenching (LF)	29,760 LF	Assume 2' deep,1 ' wide	2204 CY
Grading (SY)	1,487,640 SY	Assume compact 0.5 feet (0.166 yards)	246,948 CY compacted

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Excavator	743	243	0.59	0.34	1.21	4.03	0.12	0.22	0.22	536
Skid Steer Loader	891	160	0.23	0.38	1.47	4.34	0.12	0.31	0.30	536
Dozer (Rubber Tired)	807	145	0.59	0.38	1.41	4.17	0.12	0.30	0.29	536
Compactor	1,143	103	0.58	0.40	1.57	4.57	0.12	0.32	0.31	536
Grader	528	285	0.58	0.34	1.21	4.07	0.12	0.23	0.22	536
Backhoe/Loader	31	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Excavator	80.74	283.87	945.95	27.06	52.30	50.74	125,780
Skid Steer Loader	27.71	106.29	313.70	8.33	22.08	21.42	38,733
Dozer (Rubber Tired)	57.35	215.35	635.46	17.55	45.07	43.72	81,565
Compactor	59.49	236.45	687.50	17.35	48.05	46.61	80,653
Grader	66.19	232.54	783.57	22.19	43.42	42.12	103,150
Backhoe/loader	1.24	4.45	15.09	0.41	0.85	0.83	1,909

On-road Equipment	Hours	MPH	Engine HP	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM10 lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Dump Truck (12 CY)	743	5	230	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Dump Truck (12 CY)	5.65	29.86	133.95	0.07	5.59	5.41	12,769
Subtotal in lb:	**298**	**1,109**	**3,515**	**93**	**217**	**211**	**444,560**
Site Prep Grand Total in Tons	**0.15**	**0.55**	**1.76**	**0.05**	**0.11**	**0.11**	**222**

Gravel Work

60,858 CY 4,347 trips 382,536 total miles

Off-road Equipment	Hours	Engine HP	Load Factor	VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM_{10} g/hp-hr	$PM_{2.5}$ g/hp-hr	CO_2 g/hp-hr
Dozer	609	185	0.59	0.34	1.21	4.08	0.12	0.23	0.22	536
Wheel Loader for Spreading	761	87	0.59	0.35	1.25	4.23	0.12	0.24	0.23	536
Compactor	1,678	103	0.43	0.36	1.34	4.45	0.12	0.26	0.25	536

	VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
Dozer	50.34	176.81	597.53	16.88	33.11	32.12	78,464
Wheel Loader for Spreading	30.02	107.46	364.43	9.92	20.55	19.93	46,123
Compactor	58.93	219.40	729.57	18.89	42.13	40.87	87,801

On-road Equipment	Miles	Engine HP	VOC lb/mile	CO lb/mile	NOx lb/mile	SO_2 lb/mile	PM_{10} lb/mile	$PM_{2.5}$ lb/mile	CO_2 lb/mile
Dump Truck	382,536	230	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
			VOC lb	CO lb	NOx lb	SO2 lb	PM10 lb	PM2.5 lb	CO_2 lb
		Dump Truck	581.96	3076.34	13798.09	6.90	575.51	557.64	1,315,366
		Subtotal (lbs):	721	3,580	15,490	53	671	651	1,527,754
		Gravel Work Grand Total in Tons	0.36	1.79	7.74	0.03	0.34	0.33	764

Building Construction- **Trainer and Classroom Building**
130,000 SF Foundation
130,000 SF Total

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	Emission Factors VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Crane	650	330	0.58	0.25	1.22	5.26	0.11	0.21	0.20	530
Concrete Truck	650	300	0.43	0.19	1.45	4.32	0.12	0.21	0.20	536
Diesel Generator	520	40	0.43	0.26	1.41	3.51	0.11	0.23	0.22	536
Telehandler	1,300	99	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
Scissors Lift	1,040	83	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
Skid Steer Loader	650	67	0.59	1.69	7.97	6.70	0.15	1.19	1.15	691
Pile Driver	6,703	260	0.43	0.46	1.55	5.90	0.11	0.31	0.30	530
All Terrain Forklift	26	84	0.59	0.51	3.94	4.93	0.13	0.52	0.51	595
				Annual Emissions VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Crane	67.39	334.48	1442.65	31.29	56.97	55.26	145,450
			Concrete Truck	34.68	268.89	798.72	21.32	38.83	37.67	99,133
			Diesel Generator	5.18	27.78	69.18	2.13	4.57	4.44	10,573
			Telehandler	85.30	659.53	825.13	21.41	87.24	84.62	99,541
			Scissors Lift	57.21	442.35	553.42	14.36	58.51	56.76	66,763
			Skid Steer Loader	95.87	451.35	379.42	8.42	67.36	65.34	39,136
			Pile Driver	766.71	2564.00	9751.55	188.24	518.58	503.03	875,095
			All Terrain Forklift	1.45	11.19	14.00	0.36	1.48	1.44	1,689

On-road Equipment	Hours of Operation	Engine HP	Speed (mph)	VOC lb/mile	CO lb/mile	NOx lb/mile	SO2 lb/mile	PM lb/mile	PM2.5 lb/mile	CO_2 lb/mile
Delivery Truck	3,120	265	45	0.0015	0.0080	0.0361	0.0000	0.0015	0.0015	3.4385
				VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
			Delivery Truck	213.59	1129.09	5064.24	2.53	211.23	204.67	482,771
			Subtotal (lbs):	1327	5889	18898	290	1045	1013	1820150
			Building Construction Grand Total in Tons	0.66	2.94	9.45	0.15	0.52	0.51	910

Building Construction- Hangar & Parking Garage

517,000 SF

Off-road Equipment	Cumulative Hours of Operation	Engine HP	Load Factor	VOC[1] g/hp-hr	CO[1] g/hp-hr	NOx[1] g/hp-hr	SO_2[1] g/hp-hr	PM10[1] g/hp-hr	PM2.5[1] g/hp-hr	CO_2[1] g/hp-hr
Crane	3,102	330	0.58	0.25	1.22	5.26	0.11	0.21	0.20	530.30
tools and office support (Assume 5 generators at 40 HP each)	16,607	40	0.43	0.43	1.94	4.94	0.13	0.46	0.45	589.07
Telehandler	5,170	99	0.59	0.51	3.94	4.93	0.13	0.52	0.51	594.61
Scissors Lift	4,136	83	0.59	0.51	3.94	4.93	0.13	0.52	0.51	594.61
Skid steer loader	2,585	67	0.59	1.69	7.97	6.70	0.15	1.19	1.15	690.87
pile driver	2,553	260	0.43	0.46	1.55	5.90	0.11	0.31	0.30	529.64
all terrain forklift	2,553	84	0.59	0.51	3.94	4.93	0.13	0.52	0.51	594.61

On-road Equipment	Cumulative Hours of Operation	Engine HP	Speed (miles/hour)	VOC[2] lb/mile	CO[2] lb/mile	NOx[2] lb/mile	SO_2[2] lb/mile	PM10[2] lb/mile	PM2.5[2] lb/mile	CO_2[2] lb/mile
Concrete truck	2,418	300	0.43	1.66E-03	8.58E-03	3.92E-02	0	1.69E-03	1.64E-03	3
Delivery Truck	15,013	365	30	1.66E-03	8.58E-03	3.92E-02	0	1.69E-03	1.64E-03	3

	VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
	321.6	1596.3	6884.8	149.3	271.9	263.7	694130.0
	269.9	1221.1	3111.0	79.8	290.2	281.5	370959.4
	339.2	2622.9	3281.5	85.2	346.9	336.5	395866.8
	227.5	1759.2	2200.9	57.1	232.7	225.7	265510.7
	381.3	1795.0	1508.9	33.5	267.9	259.9	155640.1
	292.0	976.5	3714.0	71.7	197.5	191.6	333290.1
	142.1	1099.0	1375.0	35.7	145.4	141.0	165870.1
	VOC lb	**CO lb**	**NOx lb**	**SO2 lb**	**PM lb**	**PM2.5 lb**	**CO_2 lb**
	1.14	5.90	26.97	0.01	1.16	1.13	2326.18
	747.44	3864.14	17664.83	8.20	761.64	739.62	1,523,444
Subtotal (lbs):	**2722.26**	**14940.00**	**39767.81**	**520.44**	**2515.32**	**2440.70**	**3,907,038**
Building Construction Grand Total in Tons	**1.36**	**7.47**	**19.88**	**0.26**	**1.26**	**1.22**	**1954**

Concrete Work

Total 153,706 CY Note: Assume all excavated soil is accounted for in Excavate/Fill and Trenching

Off-road Equipment	Hours of Operation	Engine HP	Load Factor	Emission Factors VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Concrete Mixer	8,094	3.5	0.43	0.69	3.04	6.17	0.13	0.54	0.52	588
Concrete Truck	7,319	300	0.43	0.38	1.75	6.18	0.11	0.27	0.26	530

	Annual Emissions VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Concrete Mixer	18.46	81.75	165.74	3.40	14.51	14.08	15,799
Concrete Truck	790.07	3,633.80	12,868.75	237.26	559.30	542.52	1,102,977
Subtotal (lbs):	**809**	**3,716**	**13,034**	**241**	**574**	**557**	**1,118,776**
Concrete Work Grand Total in Tons	**0.40**	**1.86**	**6.52**	**0.12**	**0.29**	**0.28**	**559**

Concrete Runway

Concrete Surface 505,904 SF 11.6 acres

Off-road Equipment	Cumulative Hours of Operation	Engine HP	Load Factor	Emission Factors VOC g/hp-hr	CO g/hp-hr	NOx g/hp-hr	SO_2 g/hp-hr	PM10 g/hp-hr	PM2.5 g/hp-hr	CO_2 g/hp-hr
Grader (CAT 120M2 or similar)	82	150	0.61	1.06	3.52	8.24	0.06	0.47	0.47	568
Steel drum roller/soil compactor	819	401	0.56	0.70	3.18	7.20	0.05	0.28	0.28	568
Paving/Concrete Machine	819	164	0.53	1.14	3.71	8.87	0.49	0.49	0.49	568
Curbing Machine	41	130	0.59	1.14	3.71	8.87	0.49	0.49	0.49	568
Cement and Motar Mixer 1	819	9	0.56	0.92	2.64	5.41	0.07	0.35	0.35	568
Cement and Motar Mixer 2	819	9	0.56	0.92	2.64	5.41	0.07	0.35	0.35	568
Cement and Motar Mixer 3	819	9	0.56	0.92	2.64	5.41	0.07	0.35	0.35	568
Tractor/Loader/Backhoe	819	75	0.55	1.50	4.22	8.33	0.06	0.80	0.80	568
On-road Equipment	**Cumulative Hours of Operation**	**Engine HP**	**Speed (miles/hour)**	**VOC lb/mile**	**CO lb/mile**	**NOx lb/mile**	**SO2 lb/mile**	**PM10 lb/mile**	**PM2.5 lb/mile**	**CO2 lb/mile**
Cement Truck	819	230	20	0.00152	0.00804	0.03607	0.00002	0.00150	0.00146	3.43854
Water Truck	82	230	10	0.00152	0.00804	0.03607	0.00002	0.00150	0.00146	3.43854

	Annual Emissions VOC lb	CO lb	NOx lb	SO2 lb	PM lb	PM2.5 lb	CO_2 lb
Grader (CAT 120M2 or similar)	17.54	58.18	136.09	0.94	7.75	7.75	9,388
Steel drum roller/soil compactor	282.59	1,290.51	2,917.53	20.27	114.33	114.33	230,410
Paving/Concrete Machine	178.12	581.43	1,392.46	77.52	77.52	77.52	89,184
Curbing Machine	7.86	25.65	61.44	3.42	3.42	3.42	3,935
Cement and Motar Mixer 1	8.36	24.04	49.25	0.59	3.16	3.16	5,171
Cement and Motar Mixer 2	8.36	24.04	49.25	0.59	3.16	3.16	5,171
Cement and Motar Mixer 3	8.36	24.04	49.25	0.59	3.16	3.16	5,171
Tractor/Loader/Backhoe	111.64	314.29	620.01	4.47	59.73	59.73	42,325
	VOC lb	**CO lb**	**NOx lb**	**SO2 lb**	**PM lb**	**PM2.5 lb**	**CO_2 lb**
Cement Truck	24.92	131.72	590.79	0.30	24.64	23.88	56,320
Water Truck/Oil truck	1.25	6.59	29.54	0.01	1.23	1.19	2,816
Tons/year:	**0.32**	**1.24**	**2.95**	**0.05**	**0.15**	**0.15**	**225**

Fugitive Dust Per Year

PM_{10} tons/acre/mo	acres	days of disturbance	PM_{10} Total	$PM_{2.5}/PM_{10}$ Ratio	$PM_{2.5}$ Total
0.42	12	250	63.6	0.1	6.4

CY 2020 Construction Worker POVs 15 miles one way estimated average

Vehicles	# vehicles	# days	mi/day	VOCs lb/mi	CO lb/mi	NOx lb/mi	SO_2 lb/mi	PM_{10} lb/mi	$PM_{2.5}$ lb/mi	N_2O g/mi	CH_4 g/mi	CO_2 g/mi
passenger vehicles	42	240	30	0.00129	0.03681	0.00510	0.00001	0.00021	0.00019	364.00	0.031	0.032
				VOCs lb	**CO lb**	**NOx lb**	**SO_2 lb**	**PM_{10} lb**	**$PM_{2.5}$ lb**	**CO_2 kg**	**CH_4 kg**	**N_2O kg**
				388.86	11131.57	1541.86	4.05	63.03	58.12	110,074	9	10
			Tons per Year	**0.19**	**5.57**	**0.77**	**0.00**	**0.03**	**0.03**	**121.34**	**0.01**	**0.01**
											CO2e in tons/year	**125**

Total Annual Emissions

	VOC	CO	NOx	SO2	PM	PM2.5	CO_2
Estimated Emissions	1.74	10.74	24.59	0.33	64.99	7.68	2,384
Comparative Threshold	250	250	250	250	250	250	NA
Exceed? Yes/No	No	No	No	No	No	No	NA

Aircraft Emissions

Section 1. Baseline Operation Emissions

CH-53E Flight Operation	Total Number of Operations	Fuel used lb	Emissions (lb) from single operation						Total Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Departure:	3923	805	4.35	9.30	4.67	1.79	1.71	2,572	9.81	18.24	9.16	3.51	3.36	5,044
Arrival:	3,923	941	6.89	13.55	4.19	2.09	2.05	3,004	15.54	26.58	8.22	4.10	4.02	5,892
								LTO Total:	**25.35**	**44.82**	**17.39**	**7.60**	**7.38**	**10,937**
Patterns:														
VFR	3,218	274	0.13	0.77	2.11	0.61	0.61	882	0.24	1.24	3.39	0.98	0.98	1,419
GCA Box	810	565	0.19	1.44	4.44	1.25	1.25	1,821	0.09	0.58	1.80	0.51	0.51	737
								Patterns Total:	**0.33**	**1.82**	**5.19**	**1.49**	**1.49**	**2,156**
								Total Annual Flight Emissions for CH-53E:	**25.68**	**46.65**	**22.58**	**9.09**	**8.86**	**13,093**

MV-22 Flight Operation	Total Number of Operations	Fuel used lb	Emissions (lb) from single operation						Total Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Departure: Vertical	737	801	0.03	2.45	6.79	1.78	1.12	2,579	0.01	0.90	2.50	0.66	0.41	951
Departure: Short	4,179	688	0.03	2.37	5.38	1.53	0.94	2,216	0.07	4.95	11.24	3.19	1.96	4,630
Arrivals	4,916	601	0.04	2.96	3.87	1.33	0.78	1,935	0.11	7.28	9.51	3.28	1.92	4,756
								LTO Total:	**0.20**	**13.13**	**23.26**	**7.13**	**4.29**	**10,337**
Patterns:														
VFR	3,218	280	0.003	0.19	3.57	0.62	0.44	899	0.01	0.31	5.74	1.00	0.71	1,446
GCA Box	810	400	0.004	0.26	5.20	0.89	0.63	1,283	0.00	0.11	2.11	0.36	0.26	520
								Patterns Total:	**0.01**	**0.41**	**7.85**	**1.36**	**0.96**	**1,966**
								Total Annual Flight Emissions for MV-22:	**0.21**	**13.54**	**31.11**	**8.49**	**5.26**	**12,303**

H-53E Static Operations Engine Testing	# aircraft	Fuel used lb/ac	lb per year/aircraft						Annual Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Maintenance Testing	48	49,973	195.9	402.6	258.4	109.9	78.0	159,485	**5.41**	**9.66**	**6.20**	**2.64**	**1.87**	**3,828**

MV-22 Static Operations Engine Testing	# of Aircraft	Fuel used lb/ac	lb per year/aircraft						Annual Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Maintenance Testing	92	163,640	18.44	742.12	1,089.72	360.01	111.21	528,300	**0.98**	**34.14**	**50.13**	**16.56**	**5.12**	**24,302**

Section 2. No Action Operation Emissions

CH-53E Flight Operation	Total Number of Operations	Fuel used lb	Emissions (lb) from single operation						Total Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Departure:	3923	805	4.348	9.300	4.672	1.787	1.713	2,572	9.81	18.24	9.16	3.51	3.36	5,044

Arrival:	3,923	941	6.891	13.552	4.193	2.089	2.05	3,004	15.54	26.58	8.22	4.10	4.02	5,892
								LTO Total:	**25.35**	**44.82**	**17.39**	**7.60**	**7.38**	**10,937**
Patterns:														
VFR	3,218	274	0.13	0.77	2.11	0.11	0.61	882	0.24	1.24	3.39	0.18	0.98	1,419
GCA Box	810	565	0.19	1.44	4.44	0.23	1.25	1,821	0.09	0.58	1.80	0.09	0.51	737
								Patterns Total:	**0.33**	**1.82**	**5.19**	**0.27**	**1.49**	**2,156**
								Total Annual Flight Emissions for CH-53E:	**25.68**	**46.65**	**22.58**	**7.87**	**8.86**	**13,093**

MV-22 Flight Operation	Total Number of Operations	Fuel used lb	Emissions (lb) from single operation						Total Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Departure: Vertical	857	801	0.03	2.45	6.79	1.78	1.12	2,579	0.01	1.05	2.91	0.76	0.48	1,105
Departure: Short	4,855	688	0.03	2.37	5.38	1.53	0.94	2,216	0.08	5.75	13.06	3.71	2.28	5,380
Arrivals	5,712	601	0.04	2.96	3.87	1.33	0.78	1,935	0.13	8.45	11.05	3.81	2.23	5,526
								LTO Total:	**0.23**	**15.26**	**27.02**	**8.28**	**4.99**	**12,011**
Patterns:														
VFR	2,890	280	0.003	0.19	3.57	0.62	0.44	899	0.00	0.27	5.16	0.90	0.64	1,299
GCA Box	925	400	0.004	0.26	5.20	0.89	0.63	1,283	0.00	0.12	2.41	0.41	0.29	593
								Patterns Total:	**0.01**	**0.39**	**7.56**	**1.31**	**0.93**	**1,892**
								Total Annual Flight Emissions for MV-22:	**0.24**	**15.65**	**34.59**	**9.59**	**5.92**	**13,903**

H-53E Static Operations Engine Testing	# aircraft	Fuel used lb/ac	lb per year/aircraft						Annual Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Maintenance Testing	48	49,973	195.90	402.60	258.40	109.94	78	159,485	**4.70**	**9.66**	**6.20**	**2.64**	**1.87**	**3,828**

MV-22 Static Operations Engine Testing	# of Aircraft	Fuel used lb/ac	lb per year/aircraft						Annual Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Maintenance Testing	108	163,640	18.44	742.12	1,089.72	360.01	111.21	528,300	**1.15**	**40.07**	**58.84**	**19.44**	**6.01**	**28,528**

Section 3. Preferred Action Operation Emissions

CH-53K Flight Operation	Total Number of Operations	Fuel used lb	Emissions (lb) from single operation						Total Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
LTO:	3923	2,488	0.89	8.39	27.26	5.52	0.22	7,718	2.008	16.457	53.470	10.836	0.432	15,139
Patterns:														
VFR	3,218	274	0.13	0.77	2.11	0.11	0.61	882	0.24	1.24	3.39	0.18	0.98	1,419
GCA Box	810	565	0.19	1.44	4.44	0.23	1.25	1,821	0.09	0.58	1.80	0.09	0.51	737

							Patterns Total:	0.33	1.82	5.19	0.27	1.49	2,156
							Total Annual Flight Emissions for CH-53K:	2.34	18.28	58.66	11.11	1.92	17,295

MV-22 Flight Operation	Total Number of Operations	Fuel used lb	Emissions (lb) from single operation						Total Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Departure: Vertical	857	801	0.03	2.45	6.79	1.78	1.12	2,579	0.01	1.05	2.91	0.76	0.48	1,105
Departure: Short	4,855	688	0.03	2.37	5.38	1.53	0.94	2,216	0.08	5.75	13.06	3.71	2.28	5,380
Arrivals	5,712	601	0.04	2.96	3.87	1.33	0.78	1,935	0.13	8.45	11.05	3.81	2.23	5,526
								LTO Total:	0.23	15.26	27.02	8.28	4.99	12,011
Patterns:														
VFR	2,890	280	0.003	0.19	3.57	0.62	0.44	899	0.00	0.27	5.16	0.90	0.64	1,299
GCA Box	925	400	0.004	0.26	5.2	0.89	0.63	1,283	0.00	0.12	2.41	0.41	0.29	593
								Patterns Total:	0.01	0.39	7.56	1.31	0.93	1,892
								Total Annual Flight Emissions for MV-22:	0.24	15.65	34.59	9.59	5.92	13,903

H-53K Static Operations Engine Testing	# aircraft	Fuel used lb/ac	lb/1000 lb of fuel						Annual Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Maintenance Testing	60	64,868	12.23	130.1	612.06	142.71	7.54	204,747	**0.37**	**3.90**	**18.36**	**4.28**	**0.23**	**6,142**

MV-22 Static Operations Engine Testing	# of Aircraft	Fuel used lb/ac	lb per year/aircraft						Annual Tons per Year					
			HC	CO	NOx	SO2	$PM_{10/2.5}$	CO2	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Maintenance Testing	108	163,640	18.44	742.12	1,089.72	360.01	111.21	528,300	**1.15**	**40.07**	**58.84**	**19.44**	**6.01**	**28,528**

Section 4. Aircraft Summary - Baseline and No Action

Aircraft Operation	Annual Tons per Year					
	VOC	CO	NOx	SO2	$PM_{10/2.5}$	CO2e
Baseline Operations						
CH-53E Flight	25.68	46.65	22.58	9.09	8.86	13,093
CH-53E Engine Testing	5.41	9.66	6.20	2.64	1.87	3,828
MV-22 Flight	0.21	13.54	31.11	8.49	5.26	12,303
MV-22 Engine Testing	0.98	34.14	50.13	16.56	5.12	24,302
Total Baseline	**32.27**	**103.99**	**110.02**	**36.77**	**21.11**	**53,526**
No Action Operations						
CH-53E Flight	25.68	46.65	22.58	7.87	8.86	13,093
CH-53E Engine Testing	4.70	9.66	6.20	2.64	1.87	3,828

MV-22 Flight	0.24	15.65	34.59	9.59	5.92	13,903
MV-22 Engine Testing	1.15	40.07	58.84	19.44	6.01	28,528
Total No Action	**31.76**	**112.03**	**122.21**	**39.54**	**22.66**	**59,352**
Net Change	**-0.50**	**8.05**	**12.20**	**2.77**	**1.55**	**5,826**
Comparative Threshold	250	250	250	250	250	NA
Exceed? Yes/No	**No**	**No**	**No**	**No**	**No**	NA

Section 5. Aircraft Summary - No Action and Preferred Action

	Annual Tons per Year					
Aircraft Operation	**VOC**	**CO**	**NOx**	**SO2**	**$PM_{10/2.5}$**	**CO2e**
No Action Operations						
CH-53E Flight	25.68	46.65	22.58	7.87	8.86	13,093
CH-53E Engine Testing	4.70	9.66	6.20	2.64	1.87	3,828
MV-22 Flight	0.24	15.65	34.59	9.59	5.92	13,903
MV-22 Engine Testing	1.15	40.07	58.84	19.44	6.01	28,528
Total No Action	**27.13**	**65.05**	**59.01**	**18.23**	**15.37**	**28,122**
Preferred Action Operations						
CH-53K Flight	2.34	18.28	58.66	11.11	1.92	17,295
CH-53K Engine Testing	0.37	3.90	18.36	4.28	0.23	6,142
MV-22 Flight	0.24	15.65	34.59	9.59	5.92	13,903
MV-22 Engine Testing	1.15	40.07	58.84	19.44	6.01	28,528
Total Preferred Action	**4.09**	**77.91**	**170.46**	**44.42**	**14.07**	**65,869**
Net Change	**-23.04**	**12.85**	**111.45**	**26.18**	**-1.30**	**37,747**
Comparative Threshold	250	250	250	250	250	NA
Exceed? Yes/No	**No**	**No**	**No**	**No**	**No**	NA

GHG Emissions from airfield operations

0.89 pounds GHG/mile traveled
Average car in US driven 11,500 miles per year

Airfield Ops	37,747 tons	75,494,000 lbs
	@ 0.89 lb per mi	84,824,719 miles
	@ 11,500 mile/yr	7,376 extra cars

1

Appendix C
Noise Study

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NOISE ANALYSIS

In Support of

CH-53E to CH-53K Transition Environmental Assessment at

Marine Corps Air Station New River North Carolina

FINAL

Naval Facilities Engineering Command, Mid-Atlantic
9324 Virginia Avenue
Bldg. Z-144
Norfolk, VA 23511-3095

Marine Corps Installations Command
300 Marine Corps Pentagon
Washington, DC 20350

OCTOBER 2019

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LIST OF ACRONYMS

%	percent
%QQBPA	power unit for CH-53
°F	degrees Fahrenheit
AAD	Annual Average Daily
AICUZ	Air Installations Compatible Use Zones
ATAA	Air Traffic Activity Analyzer
ATAR	Air Traffic Activity Report
dB	Decibel
dBA	A-weighted Decibel
DLG	Digital Line Graph
DNL	Day-Night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
FAR	Federal Aviation Regulations
ft	feet
GCA	Ground Controlled Approach
in Hg	inches mercury
kPa-s/m^2	kilopascal-seconds per square meter
MAG	Marine Aircraft Group
MAW	Marine Aircraft Wing
MCAS	Marine Corps Air Station
MCB	Marine Corps Base
NASA	National Aeronautics and Space Administration
NED	National Elevation Dataset
NMAP	Noise Map
POI	Points of Interest
RNM	Rotorcraft Noise Model
RPM	Revolutions Per Minute
TLZ	Tactical Landing Zones
U.S.	United States
USGS	United States Geological Survey
USMC	United States Marine Corps
VFR	Visual Flight Rules
VMM	Marine Medium Tilt-Rotor Squadron

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1.0 INTRODUCTION

1.1 BACKGROUND

This noise study is in support of the Environmental Assessment (EA) for the replacement of the CH-53E with the CH-53K aircraft at Marine Corps Air Station (MCAS) New River, North Carolina. MCAS New River is located on the west bank of the New River, in eastern North Carolina. It is approximately three miles south of downtown Jacksonville, the county seat of Onslow County. The Air Station is approximately 3,700 acres within the northwest portion of the larger 130,000-acre Marine Corps Base (MCB) Camp Lejeune (**Figure 1-1**).

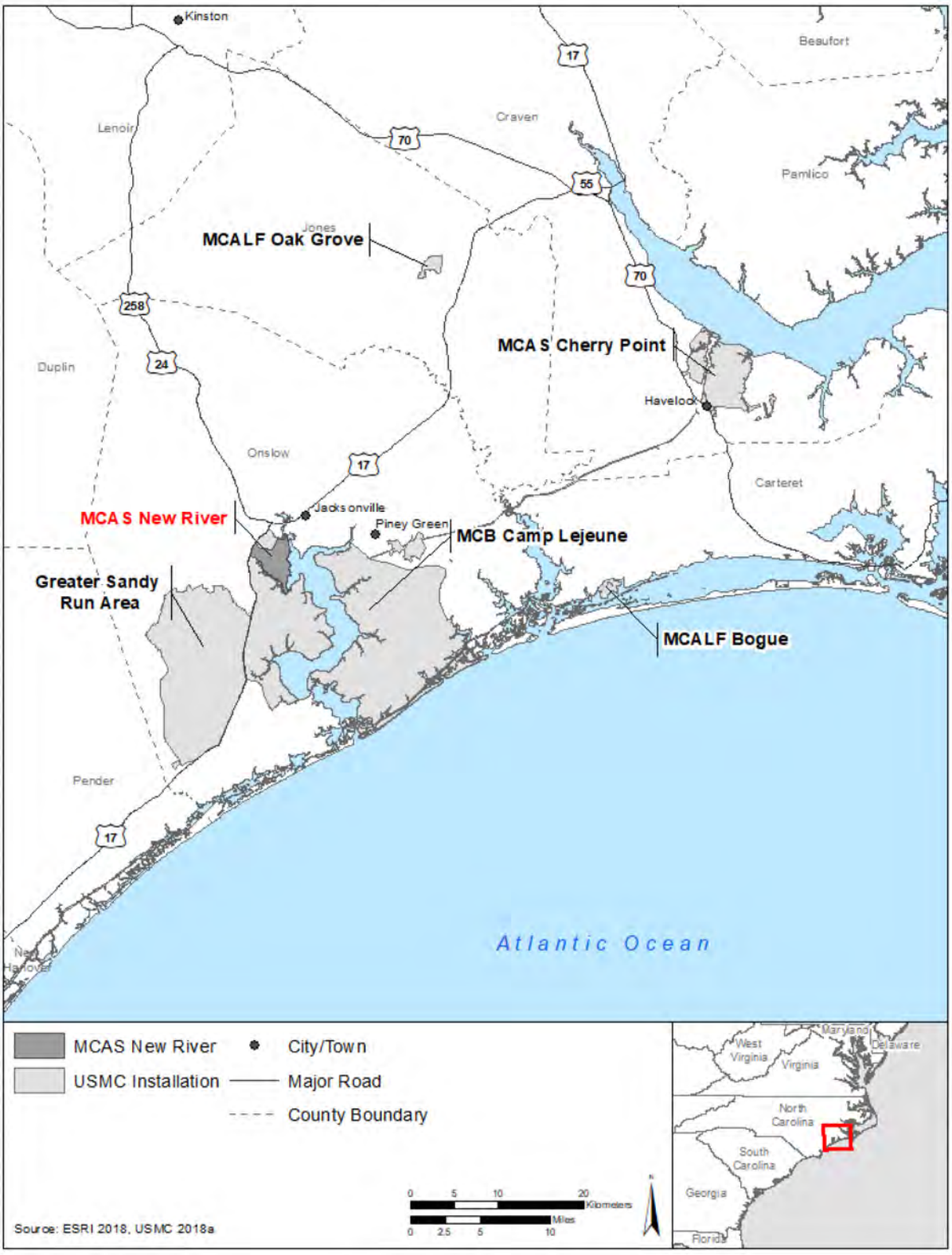
MCAS New River's mission is to "maintain and operate facilities and provide services and materiel to ground combat forces located at MCB Camp Lejeune and perform such other air operations as requested." The Air Station is the premier Marine Corps rotor/tilt-rotor operating facility on the East Coast. Several major tenants of the Air Station conduct predominately rotary wing and tilt-rotor operations, including units of the 2nd Marine Aircraft Wing (MAW): Marine Aircraft Group (MAG) 26 and MAG 29, and their subordinate aircraft squadrons.

1.2 AIRFIELD AND RUNWAY ORIENTATION

MCAS New River has two, bi-directional runways in the 01/19 direction and the 05/23 direction. Being predominately a tilt-rotor/rotary wing installation, there are a number of alternative landing pads that the aircraft can use. **Figure 1-2** shows the main airfield, runway orientation, and alternate landing pads modeled at MCAS New River. These pads reflect the common locations for aircraft departures and arrivals when not using the runway ends – usually the intersections of runway and taxiways leading to parking areas, fuel pits, and the like. Also shown, are the areas where aircraft maintenance run-ups are performed.

1.3 NOISE STUDY REPORT STRUCTURE

Section 2 describes the methodology of this study. **Section 3** includes the modeling data used and the noise exposure for Baseline (Existing) Conditions. **Section 4** includes the modeling data and noise exposure for the No Action Scenario and compares the No Action to Baseline Conditions. **Section 5** includes the modeling data and noise exposure for the Proposed Action Scenario and provides comparison between the Proposed Action and the No Action Scenario.



Legend: MCALF = Marine Corps Auxiliary Landing Field

Figure 1-1. MCAS New River General Location

Figure 1-2. Runways and Pads at MCAS New River

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2.0 METHODOLOGY

Table 2-1 summarizes the noise model parameters used in this analysis. This analysis utilizes the Department of Defense (DoD) NOISEMAP suite of computer programs (Czech and Plotkin 1998; Wasmer Consulting 2006a; Wasmer Consulting 2006b) containing the core computational programs called "Noise Map (NMAP)", version 7.3, and Rotorcraft Noise Model (RNM) version 7.2.2.

Table 2-1. Noise Modeling Parameters

Software	Analysis	Version
NMAP	Fixed wing aircraft	7.3
RNM	Rotorcraft	7.2.2
Parameter	**Description**	
Receiver Grid Spacing	500 ft in x and y	
Metric	DNL (dBA)	
Basis	Annual Average Daily Operations	
Topography		
Elevation Data Source	USGS 30 meters NED	
Elevation Grid Spacing	500 ft in x and y	
Impedance Data Source	USGS Hydrography DLG	
Impedance Grid spacing	500 ft in x and y	
Flow Resistivity of Ground (soft/hard)	225 kPa-s/m^2 (grass) 100,000 kPA-s/m^2 (water)	
Modeled Weather		
Temperature	63.3 °F	
Relative Humidity	57.8 %	
Barometric Pressure	30.06 in Hg	

Source: Cardno 2019.

Legend: NMAP=Noise Map; RNM = Rotorcraft Noise Model; ft = feet; DNL = Day-Night Average Sound Level; dBA = A-weighted decibel; USGS = U.S. Geological Survey; NED = National Elevation Dataset; DLG = Digital Line Graph; kPa-s/m^2 = kilopascal-seconds per square meter; °F = degrees Fahrenheit; % = percent; in Hg = inches of mercury

2.1 PRIMARY NOISE METRIC AND MODELING

Day-Night Average Sound Level (DNL) is the relevant noise metric for this study and is based on annual average daily aircraft operations. DNL is the United States (U.S.) Government standard for modeling cumulative noise exposure and assessing community noise impacts. DNL has two time periods of interest: daytime and nighttime. Daytime hours are from 7:00 a.m. to 10:00 p.m. local time. Nighttime hours are from 10:00 p.m. to 7:00 a.m. local time. DNL weights operations occurring during the nighttime period by adding 10 decibels (dB) to the single-event sound level. Note that "daytime" and "nighttime" in calculation of DNL are sometimes referred to as "acoustic day" and "acoustic night" and always correspond to the times given above. This is often different than the "day" and "night" used commonly in military aviation, which are directly related to the times of sunrise and sunset, and vary throughout the year with the seasonal changes.

Modeling of noise, using the NOISEMAP software suite, is accomplished by determining and building each aircraft's flight tracks (paths over the ground) and

profiles (which include data such as altitude, airspeed, power settings, and other flight conditions).

This is combined with information about the numbers of each type of operation by aircraft/track/profile, local climate, ground surrounding the airfield, and similar data related to ground run-up of aircraft engines to sum the total noise energy experienced annually at a grid of points on the ground. In this case, as indicated in **Table 2-1**, that grid spacing was 500 feet. Noise exposure is presented in terms of contours, i.e., lines of equal value, of DNL. DNL contours of 60 to 90 dB, presented in 5-dB increments, provide a graphical depiction of the aircraft noise environment. NOISEMAP's ability to account for the effects of sound propagation includes consideration of terrain elevation, taken from United States Geological Survey (USGS) National Elevation Dataset (NED), and ground impedance conditions, also derived from USGS data. In this case, "soft ground" is modeled with a flow resistivity of 225 kilopascal-seconds per square meter (kPa-s/m^2). Water bodies are modeled as "hard ground" at 100,000 kPa-s/m^2. This noise modeling does not include the effect of shielding of on-base buildings.

For ambient weather, each month was assigned an average temperature, relative humidity, and barometric pressure from historical weather data. **Table 2-2** shows average weather at MCAS New River over the last three full calendar years. NOISEMAP then determined and used the month with the weather values that produced the median results in terms of noise propagation effect. In this case, the month of March produced the median effect, and so was used (with the values noted in **Table 2-1**). This modeling process, using the NOISEMAP software suite, is the DoD-accepted method for representing the overall community noise exposure over time.

Table 2-2. Average Monthly Weather Conditions at MCAS New River from 2016 to 2018

Climatological Factor	Monthly Average											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Temp (°F)	44.7	53.7	54.7	63.3	71.7	78	81.3	80.3	77.3	67.7	55	49.0
Relative Humidity (%)	59.6	59.7	54.7	57.8	70.1	70.3	72.8	75.8	73.1	68.4	68.6	69.8
Pressure (in Hg)	30.1	30.1	30.1	30.1	30.0	30.0	30.0	30.1	30.0	30.1	30.1	30.1

Source: Weather Underground 2018

Inputs for NOISEMAP was developed by through interviews with squadron representatives, air traffic control personnel, and aircraft maintainers. Air Traffic Activity Reports (ATARs) for the last 12 years and Air Traffic Activity Analyzer (ATAA) data was also used to refine operations numbers, types, and to develop breakdowns of runway usage, and day versus night operations by each aircraft type at MCAS New River. This information was then complied into a Data Validation Package (DVP) and was submitted to MCAS New River for review and comment. Revisions were made and Version 2 of the DVP was submitted for approval on June 4, 2019. No more comments were received for model inputs.

2.1.1 RNM AIRCRAFT

Three aircraft were modeled using RNM. AH-1Y/Z and UH-1Y were both modeled using NCFiles (hemispheres) labeled "AH1W-". The CH-53E was modeled using NCFiles labeled "CH53E". The MV-22B used the NCFiles labeled "MV22-". Transient heavy helicopters are modeled using the NCFiles labeled "CH53E", while the transient light helicopters were modeled as AH-1Y/Z, using the NCFiles (hemispheres) labeled "AH1W-". NCFiles consist of measured aircraft noise data and are used by the model to calculate noise exposure based on operation input.

2.1.2 NMAP AIRCRAFT

A number of transient aircraft were modeled with NMap. ATAA data shows 23 different types of transient aircraft, with numbers of operations varying from single digits to a few dozen per year. Modeling an array of types of operations for so many aircraft types is impractical. Because of low numbers of transients relative to the based aircraft, the transients were grouped by type (fighter, transport, etc.) and in some cases, size (light, heavy). A representative aircraft was then chosen for each resulting group for modeling. Surrogate/representative aircraft were chosen conservatively, using either the most common type of aircraft in the group (if there is a dominant example), or the largest/loudest type of aircraft in the group. For example, the number of transient operations for C-21, Cessna C560, Gulfstream G5, and Lear LR35 total about 3 operations per month. Modeling all the arrivals and departures for each runway with such small numbers is unnecessary due to the small contribution to noise. Instead, these aircraft are grouped together as "Transient Light Jet" and modeled using the Cessna C500 in the model, which is representative of all of them added together. **Table 2-3** shows the surrogates used for transient operations in NMap.

Table 2-3. Transient Aircraft Surrogates

Transient Category	Surrogate Aircraft
Transient Fighter	F-35B
Transient Heavy Turbo Prop	C-130J
Transient Light Turbo Prop	C-12
Transient Light Jet	CESSNA-500
Transient Transport	C-17

2.2 CH-53K NOISE MODELING METHODOLOGY

Most aircraft in the DoD inventory have been measured for noise in various conditions so that the results can be used in subsequent modeling. Depending on aircraft type, this data will be either "noisefile" or "NC file" data. Because the CH-53K is new variant, it has not been measured for "noisefile" or NC file representation in the modeling software. Therefore an alternate method of estimation was used to represent the CH-53K variant in the noise model calculations. Consultation with National Aeronautical and Space Administration (NASA) Langley Research Center indicated that the standard used in Federal Aviation Regulations (FAR) part 36, subpart H, dealing with helicopter noise is that the noise difference between two helicopters is logarithmically proportional to the weight ratio of the two, or roughly:

$$\Delta \sim 10 * \log 10(\text{Weight ratio})$$

Using information from CH-53E subject matter experts about typical takeoff and landing weights in regular use at MCAS New River, and determining CH-53K values for equivalent aircraft conditions (fuel, crew, loading, etc.), an adjustment from CH-53E to CH-53K was developed. This adjustment (to DNL) is about 0.64 dBA, which corresponds to an equivalent increase in operations of about 16%. Under the Proposed Action modeling scenario, this adjustment was applied to the portion of the noise contribution from CH-53E in the Baseline/No Action to estimate the noise produced from the CH-53K in the Proposed Action. Application of this dB adjustment based on the increased weight of the CH-53K variant was applied to the CH-53E operations in the Proposed Action to develop an estimation of noise contributed from the CH-53K. When added to the rest of the modeled noise from other aircraft at the Air Station, it represented the total noise represented in the Proposed Action (Stephenson 2018).

2.3 POINTS OF INTEREST

The noise modeling software has the ability to provide noise level estimations at specific points on the ground, known as Points of Interest (POIs). These points are typically noise sensitive locations, such as schools, child development centers, hospitals, or churches. Through communication with MCAS New River, it was determined that many of the noise complaints or problem areas for noise are well outside of the noise contour footprint for MCAS New River's airfield. These complaints are generally due to a specific training activity, from artillery fire at adjacent MCB Camp Lejeune, or from the use of specific Tactical Landing Zones (TLZ). As such, seven POIs were chosen using MCAS New River/MCB Camp Lejeune GIS Data to search for buildings with noise sensitive uses, with the addition of specific locations given to Cardno from MCAS New River. The seven POIs are listed in **Table 2-4** and shown on **Figure 2-1**.

Table 2-4. Point of Interest Description and Facility Number at MCAS New River

POI Description	Facility Number
Child Development Center	AS1000
Child Development Center	AS207
New River Community Center	AS1010
TLZ Snipe	N/A
Chapel	TC601
Chapel	AS236
DeLalio Elementary School	TC1500

Legend: POI=Points of Interest; TLZ=Tactical Landing Zone.

2.4 MODELED SCENARIOS

Three scenarios were modeled in support of the CH-53K Transition EA. The Baseline Scenario is based on the average aircraft activity over the past 12 years (2007 – 2018). The Baseline Scenario shows the average aircraft activity of the currently based aircraft at MCAS New River. The No Action Scenario is based on the addition of one Marine Medium Tilt-Rotor Squadron (VMM) that will stand up at MCAS New River in 2020, as part of the MV-22B Record of Decision (Navy 1999) as well as an anticipated increase in throughput of the MV-22B Fleet Readiness Squadron (VMMT-204) to train U.S. Navy aircrews in the future. The Proposed Action Scenario assumes the same amount of flight operations as the No Action Scenario, but replaces the CH-53E with the CH-53K.

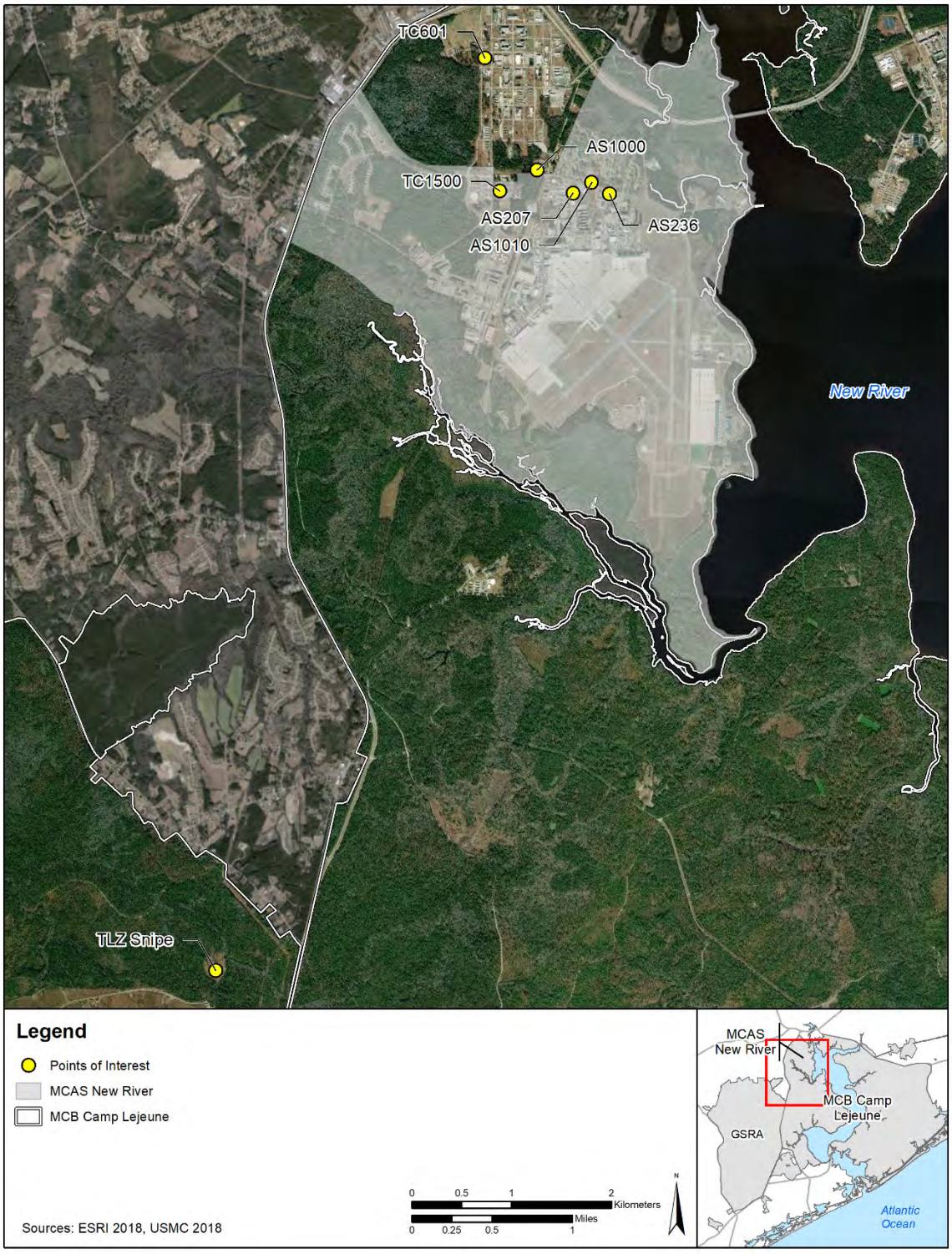

Figure 2-1. Points of Interest at MCAS New River

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3.0 BASELINE SCENARIO

The following two subsections detail the modeling data and the resultant noise exposure for the Baseline Scenario. This represents annual average daily aircraft operations based on the air traffic activity reports (ATARs) for the past 12 years (2007 – 2018). Data was also taken from ATAA data that allowed for a more precise description of runway splits and specific aircraft operations.

Transient aircraft have been "combined" into representative categories. This allows for the model to conservatively capture a wide range of aircraft types without having to model many different airframes, for which there would be little to no actual measured noise reference data.

3.1 MODELING DATA

Table 3-1 details the modeled annual flight operations at MCAS New River for the Baseline Scenario.

Table 3-2 lists the static profiles for the modeled ground operations (maintenance-related) for the aircraft based at MCAS New River. These modeled static operations provide a proxy for taxi time and functional checks, as well as refueling operations, and provide the input to capture the noise produced from these procedures into the resulting noise contour output. This table shows the type aircraft, and the location, heading, duration of the event, and number of times per day and night that the modeled event takes place. Please refer back to Figure 1-2 for static locations.

Detailed tables and figures showing modeling assumptions, specific operations, representative flight profiles, runway usage, and day/night operation breakdowns are provided in Appendix A and Appendix B.

Table 3-1. Modeled Aircraft Operations under Baseline Scenario

Aircraft	Arrivals									Departures		
	Course Rules		Straight In/ Instrument		Overhead		Total Arrivals			Total Departures		
	Day	Night	Day	Night	Day	Night	Day	Night	Total	Day	Night	Total
AH-1W/Z	1,324	260	260	51	--	--	1,584	311	1,895	1,799	97	1,895
UH-1N/Y	1,059	208	208	41	--	--	1,267	249	1,516	1,439	78	1,517
CH-53E	2,557	543	679	144	--	--	3,236	687	3,923	3,615	308	3,923
MV-22B	951	216	2,438	554	618	140	4,006	910	4,916	4,516	401	4,917
Transient	--	--	752	30	--	--	752	30	782	752	30	782

Aircraft	Closed Patterns							Total Operations		
	VFR Patterns		GCA Box		Total Pattern Operations					
	Day	Night	Day	Night	Day	Night	Total	Day	Night	Total
AH-1W/Z	1,150	206	396	46	1,546	252	1,798	4,929	660	5,589
UH-1N/Y	920	164	316	38	1,236	202	1,438	3,942	529	4,471
CH-53E	2,998	220	706	104	3,704	324	4,028	10,555	1,319	11,874
MV-22B	2,230	258	671	1,125	2,900	384	3,284	11,423	1,694	13,117
Transient	--	--	--	--	--	--	--	1,504	60	1,564
						TOTAL Annual Operations		**32,353**	**4,262**	**36,616**

Legend: VFR=Visual Flight Rules; GCA=Ground Controlled Approach; Course Rules = standard departures and arrivals procedures at MCAS New River.

Table 3-2. Modeled Static Profiles for MCAS New River under Basline Scenario

Aircraft	Engine	Profile Name	Pad	Heading	Power/Units	Number Day	Number Night	Duration (seconds)	Number Engines
AH-1G	T53-L-13	Low Work AH1W "D"	Pad D	50	1 POWER Fixed	1.506849	0	200	1
AH-1G	T53-L-13	Low Work AH1W "D"	Pad D	230	1 POWER Fixed	1.506849	0	200	1
AH-1G	T53-L-13	Low Work AH1W "F"	Pad F	50	1 POWER Fixed	0.502283	0	200	1
AH-1G	T53-L-13	Low Work AH1W "F"	Pad F	230	1 POWER Fixed	0.502283	0	200	1
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "B"	Pad B	50	7% QQBPA Fixed	1.410153	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "B"	Pad B	230	7% QQBPA Fixed	1.410153	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "G"	Pad G	180	7% QQBPA Fixed	3.384367	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "G"	Pad G	360	7% QQBPA Fixed	3.384367	0	245	2
CH-53E	T64-GE-416A	CH-53E Collective Bias at "D"	Pad D	50	7% QQBPA Fixed	0.3424658	0	1800	3
CH-53E	T64-GE-416A	CH-53E Collective Bias at "D"	Pad D	230	7% QQBPA Fixed	0.3424658	0	1800	3
CH-53E	T64-GE-416A	CH-53E Track and Balance at "D"	Pad D	50	7% QQBPA Fixed	0.890411	0	150	3
CH-53E	T64-GE-416A	CH-53E Track and Balance at "D"	Pad D	230	7% QQBPA Fixed	0.890411	0	150	3
TEST CELL	TEST CELL	Maintenance Idle	Test Cell	230	70% RPM Variable	1.228493	0.064657	12600	1
TEST CELL	TEST CELL	Maintenance Idle	Test Cell	230	70% RPM Variable	1.228493	0.064657	10800	1

Legend: RPM=Revolutions per Minute; %QQBPA = power setting for CH-53E

3.2 NOISE EXPOSURE

Figure 3-1 shows the resultant 60 dB to 80 dB DNL contours in 5 dB increments for the daily aircraft events under the Baseline Scenario at MCAS New River. Similarly, **Figure 3-2** shows the contours but also a colored noise gradient shading that illustrates that noise doesn't stop at a contour line. As shown, most of the noise produced from aircraft flight operations at MCAS New River remains on the installation (approximately 1,301 acres), or extends out over MCB Camp Lejeune (approximately 992 acres). Under the Baseline Scenario, no part of the aircraft generated noise greater than 60 dB DNL extends outside of U.S. Marine Corps (USMC) property boundaries. **Table 3-3** shows the acreage breakdown for the different levels of DNL and if they fall on base and off-base.

Table 3-4 shows the estimate DNL values for the seven POIs, or noise sensitive locations that were developed in communication with MCAS New River. POIs are also shown on **Figure 3-1**, with the exception of TLZ Snipe. This POI is located far to the south, well outside of the noise contour area. As such, it is reported here, but not shown on figures. Please refer to **Figure 2-1** for the location of all the modeled POIs. Under Baseline Conditions, DNL values range from 56 A-weighted Decibel (dBA) to 49 dBA, with the greatest being located at the New River Community Center.

Table 3-3. Acreage Breakdowns for Levels of DNL under the Baseline Scenario at MCAS New River

DNL Level (dBA)	USMC Property		Off-Base	Total
	On MCAS New River	On MCB Camp Lejeune		
60+	1,301	992	--	2,293
65+	455	47	--	502
70+	108	--	--	108
75+	1	--	--	1

Legend: DNL=Day-Night Average Sound Level; dBA=A-weighted decibels; MCAS=Marine Corps Air Station; MCB=Marine Corps Base.

Table 3-4. DNL Values at Points of Interest under the Baseline Scenario

POI Description	Facility Number	DNL (dBA)
Child Development Center	AS1000	54
Child Development Center	AS207	55
New River Community Center	AS1010	55
TLZ Snipe	N/A	50
Chapel	TC601	49
Chapel	AS236	56
DeLalio Elementary School	TC1500	53

Legend: POI = Points of Interest; DNL=Day-Night Average Sound Level; dBA=A-weighted decibels; TLZ=Tactical Landing Zone.

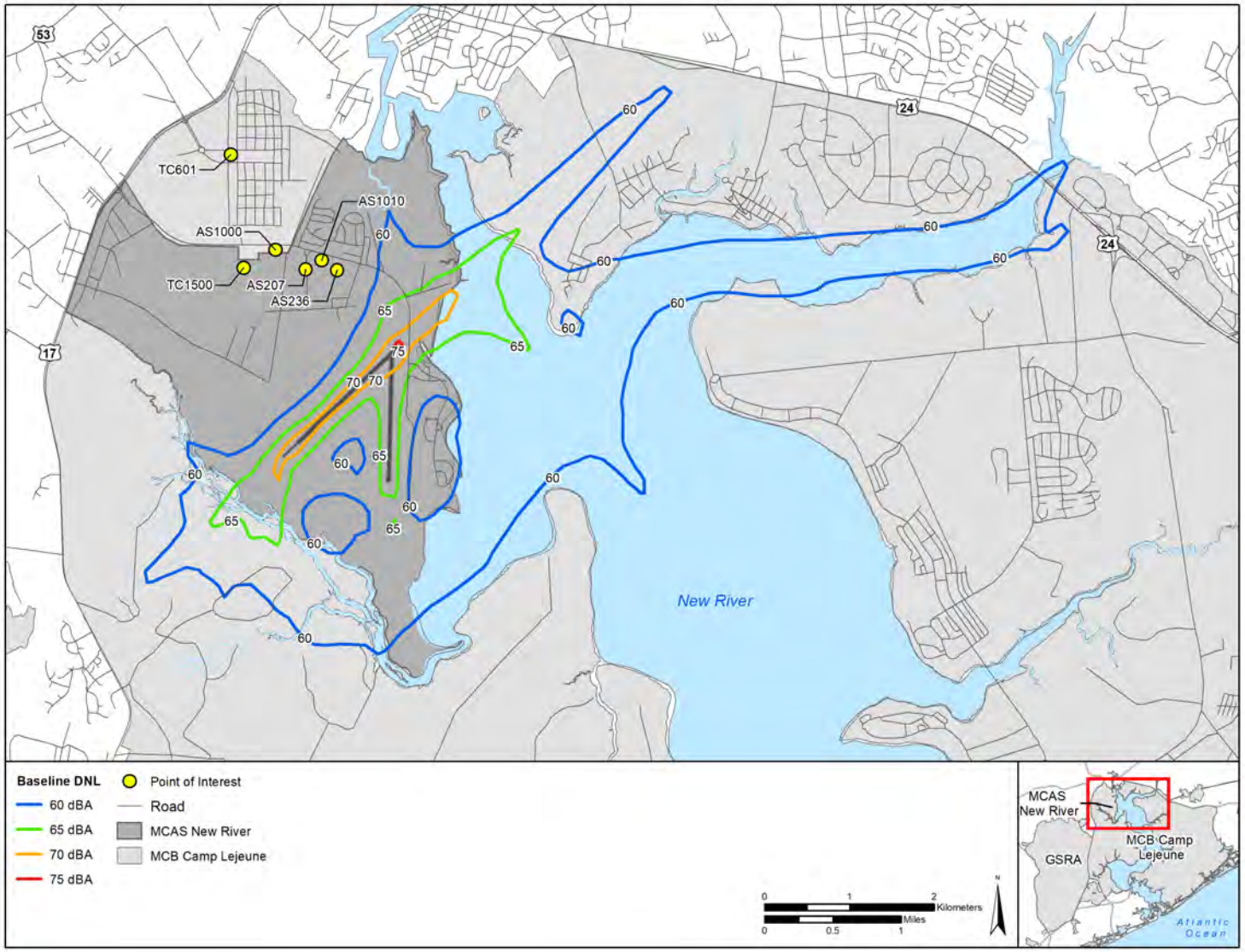

Figure 3-1. Noise Contours (DNL) under Baseline Scenario at MCAS New River

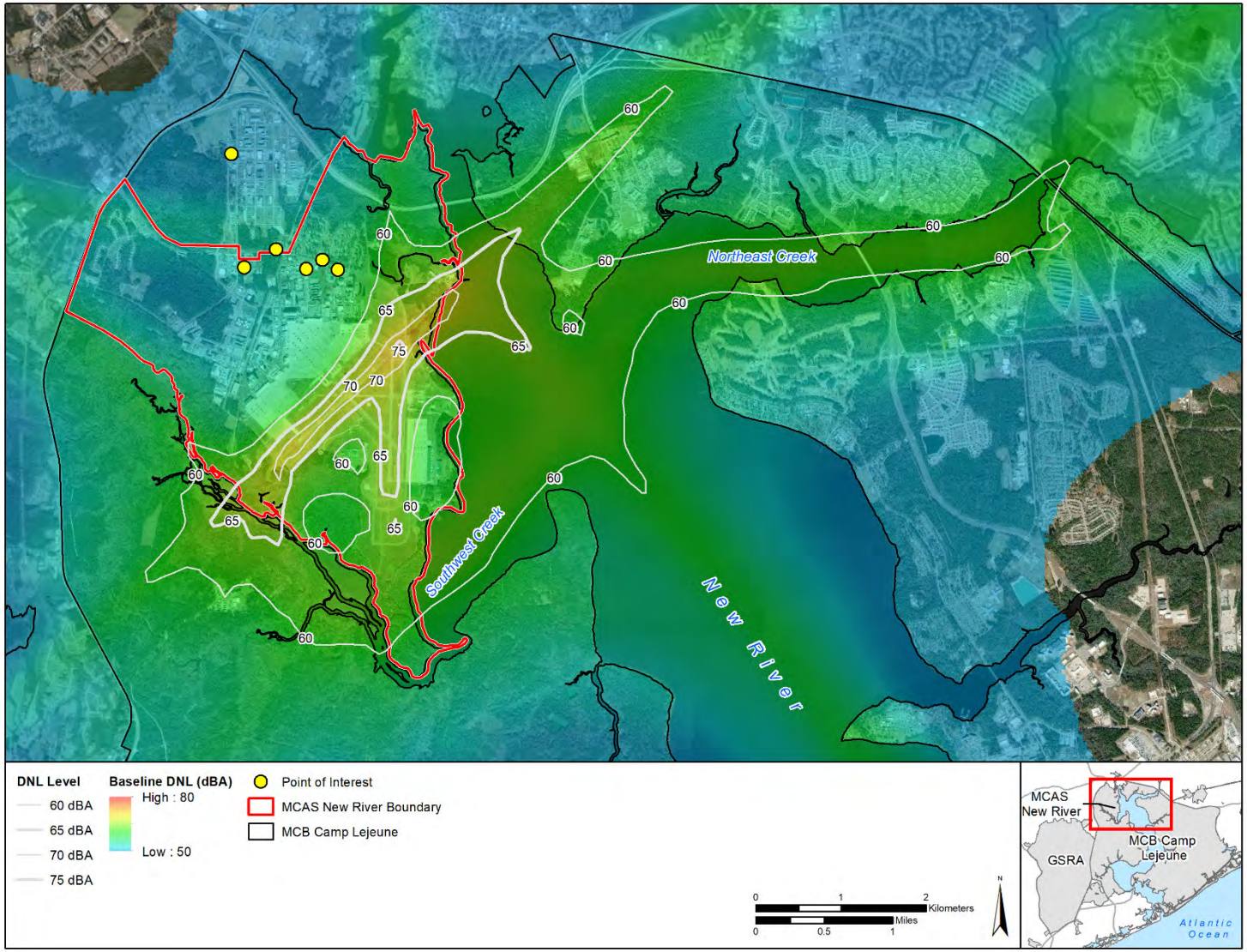

Figure 3-2. Noise Gradient and DNL Contours under Baseline Scenario at MCAS New River

4.0 NO ACTION SCENARIO

The No Action Scenario represents an estimation of what aircraft operations will be taking place at MCAS New River in the near future. This scenario adds the last VMM squadron of MV-22B aircraft to MCAS New River, as outlined in the 1999 ROD for MV-22B homebasing, as well as the 2018 USMC AVPLAN. It also includes the future increased throughput in the MV-22B FRS (VMMT-204) due to training U.S. Navy aircrews. This scenario takes into account the additional MV-22B aircraft activity that will occur in the future at MCAS New River, regardless of whether the CH-53E transitions to the CH-53K.

4.1 MODELING DATA

The annual aircraft operations modeled for the No Action Scenario are shown below in **Table 4-1**. **Table 4-2** shows the modeled static profiles under the No Action Scenario.

Detailed tables and figures showing modeling assumptions, specific operations, representative flight profiles, runway usage, and day/night operation breakdowns are provided in Appendix A and Appendix B.

Table 4-1. Annual Aircraft Operations under No Action Scenario

Aircraft	Arrivals									Departures		
	Course Rules		Straight In/ Instrument		Overhead		Total Arrivals			Total Departures		
	Day	Night	Day	Night	Day	Night	Day	Night	Total	Day	Night	Total
AH-1W/Z	1,324	260	260	51	--	--	1,584	311	1,895	1,799	97	1,895
UH-1N/Y	1,059	208	208	41	--	--	1,267	249	1,516	1,439	78	1,517
CH-53E	2,557	543	679	144	--	--	3,236	687	3,923	3,615	308	3,923
MV-22B	1,105	251	2,832	644	718	163	4,654	1,058	5,712	5,247	466	5,712
Transient	--	--	752	30	--	--	752	30	782	752	30	782

Aircraft	Closed Patterns							Total Operations		
	VFR Patterns		GCA Box		Total Pattern Operations					
	Day	Night	Day	Night	Day	Night	Total	Day	Night	Total
AH-1W/Z	1,150	206	396	46	1,546	252	1,798	4,929	660	5,589
UH-1N/Y	920	164	316	38	1,236	202	1,438	3,942	529	4,471
CH-53E	2,998	220	706	104	3,704	324	4,028	10,555	1,319	11,874
MV-22B	2,590	300	779	146	3,369	446	3,815	13,270	1,969	15,239
Transient	--	--	--	--	--	--	--	1,504	60	1,564
							TOTAL Annual Operations	**34,201**	**4,537**	**38,738**

Legend: VFR=Visual Flight Rules; GCA=Ground Controlled Approach; Course Rules = standard arrivals per MCAS New River procedures.

Table 4-2. Modeled Static Profiles for MCAS New River under No Action Scenario

Aircraft	Engine	Profile Name	Pad	Heading	Power/Units	Number Day	Number Night	Duration (seconds)	Number Engines
AH-1G	T53-L-13	Low Work AH1W "D"	Pad D	50	1 POWER Fixed	1.506849	0	200	1
AH-1G	T53-L-13	Low Work AH1W "D"	Pad D	230	1 POWER Fixed	1.506849	0	200	1
AH-1G	T53-L-13	Low Work AH1W "F"	Pad F	50	1 POWER Fixed	0.502283	0	200	1
AH-1G	T53-L-13	Low Work AH1W "F"	Pad F	230	1 POWER Fixed	0.502283	0	200	1
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "B"	Pad B	50	7% QQBPA Fixed	1.6382367	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "B"	Pad B	230	7% QQBPA Fixed	1.6382367	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "G"	Pad G	180	7% QQBPA Fixed	3.9317681	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "G"	Pad G	360	7% QQBPA Fixed	3.9317681	0	245	2
CH-53E	T64-GE-416A	CH-53E Collective Bias at "D"	Pad D	50	7% QQBPA Fixed	0.3424658	0	1800	3
CH-53E	T64-GE-416A	CH-53E Collective Bias at "D"	Pad D	230	7% QQBPA Fixed	0.3424658	0	1800	3
CH-53E	T64-GE-416A	CH-53E Track and Balance at "D"	Pad D	50	7% QQBPA Fixed	0.890411	0	150	3
CH-53E	T64-GE-416A	CH-53E Track and Balance at "D"	Pad D	230	7% QQBPA Fixed	0.890411	0	150	3
TEST CELL	TEST CELL	Maintenance Idle	Test Cell	230	70% RPM Variable	1.228493	0.064657	12600	1
TEST CELL	TEST CELL	Maintenance Idle	Test Cell	230	70% RPM Variable	1.228493	0.064657	10800	1

Legend: RPM=Revolutions per Minute; %QQBPA = power setting for CH-53E

4.2 NOISE EXPOSURE

Figure 4-1 shows the resultant 60 dB to 75 dB DNL contours in 5 dB increments for the daily aircraft events under the No Action Scenario at MCAS New River. Similarly, **Figure 4-2** shows the contours but also a colored noise gradient shading that illustrates that noise doesn't stop at a contour line. The noise contours increase only slightly under the No Action Scenario, as is expected with the small increase in operations. **Table 4-3** shows the acreage breakdowns under the No Action Scenario at MCAS New River.

Overall, the area exposed to 60 dB DNL or greater is 2,364 acres (an increase of 70 acres from the Baseline Scenario). All of the area exposed to 60 dB DNL or greater is located on USMC property. The DoD threshold for land use recommendations for noise sensitive uses is 65 dB DNL (Navy 2008). As shown in **Table 4-3** an additional 15 acres would be exposed to noise levels above 65 DNL when compared to the Baseline Scenario, all of which is on USMC property. Areas exposed to 75 dB DNL or greater would increase by 3 acres, but are located along the runway area at MCAS New River.

Table 4-4 shows the estimated DNL for each of the seven POIs. As with Baseline, the values range from 56 to 49 dBA. All of these values are below the 65 DNL threshold for land use recommendations. **Table 4-4** also shows the net change in noise from the Baseline. There is no change in DNL between the No Action and Baseline Scenarios. **Figure 4-3** shows both the Baseline and No Action Scenarios for comparison. As shown, the changes in noise contours would be relatively unobservable.

Table 4-3. Acreage Breakdowns for Levels of DNL under No Action Scenario at MCAS New River

Level	USMC Property		Off-Base	No Action Total	Baseline Total	Change from Baseline Total
	On MCAS New River	On MCB Camp Lejeune				
60+	1,330	1,033	--	2,363	2,293	+70
65+	464	53	--	517	502	+15
70+	113	--	--	113	108	+5
75+	4	--	--	4	1	+3

Legend: USMC=U.S. Marine Corps; MCAS=Marine Corps Air Station; MCB=Marine Corps Base.

Table 4-4. Estimated Noise Levels at POIs under No Action Scenario Compared to Baseline Conditions

POI Description	Facility Number	No Action DNL (dBA)	Change from Baseline
Child Development Center	AS1000	54	0
Child Development Center	AS207	55	0
New River Community Center	AS1010	55	0
TLZ Snipe	N/A	50	0
Chapel	TC601	49	0
Chapel	AS236	56	0
DeLalio Elementary School	TC1500	53	0

Legend: POI=Point of Interest; DNL=Day-Night Average Sound Level; dBA=A-weighted decibels; TLZ=Tactical Landing Zone.

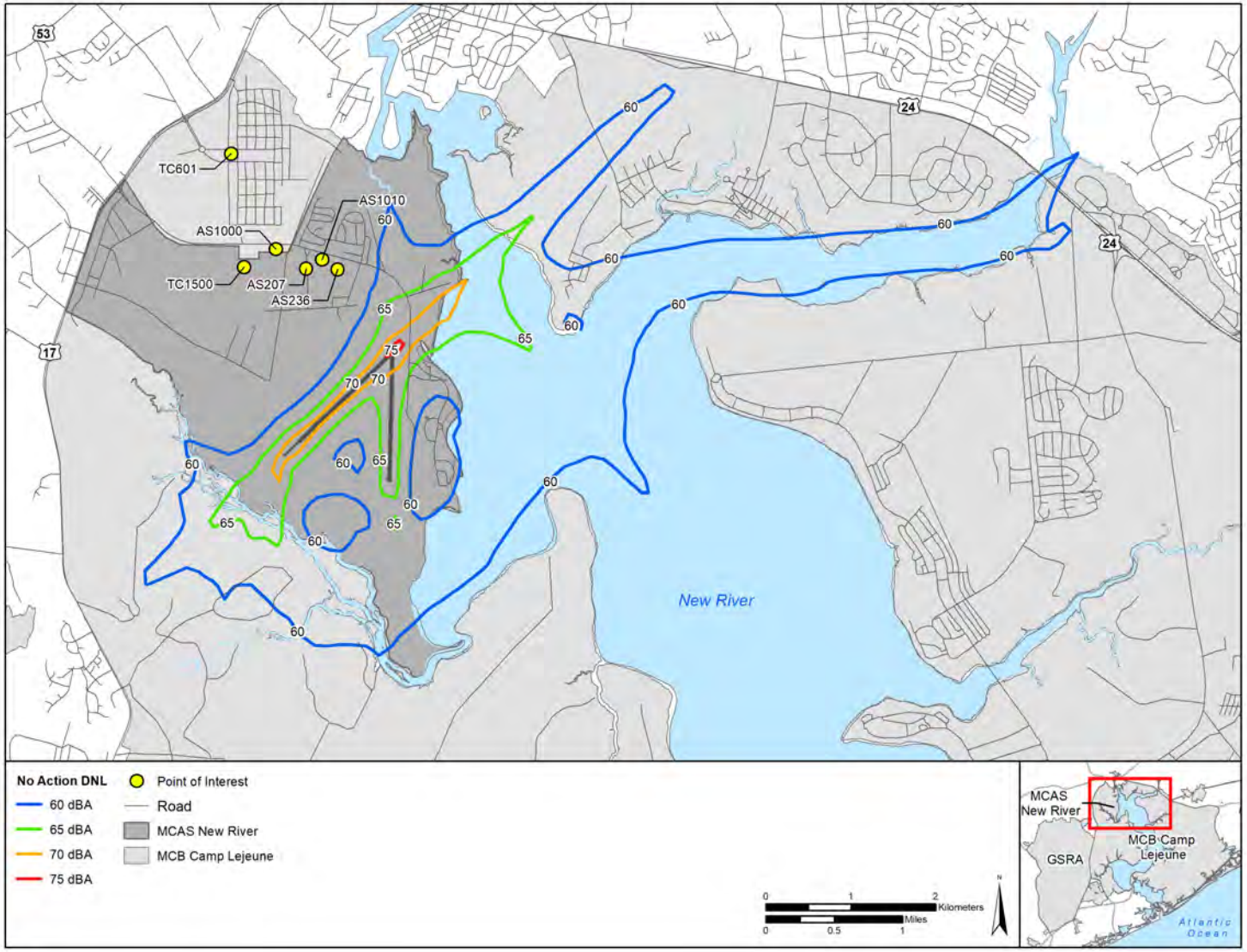

Figure 4-1. Noise Contours (DNL) under the No Action Scenario at MCAS New River

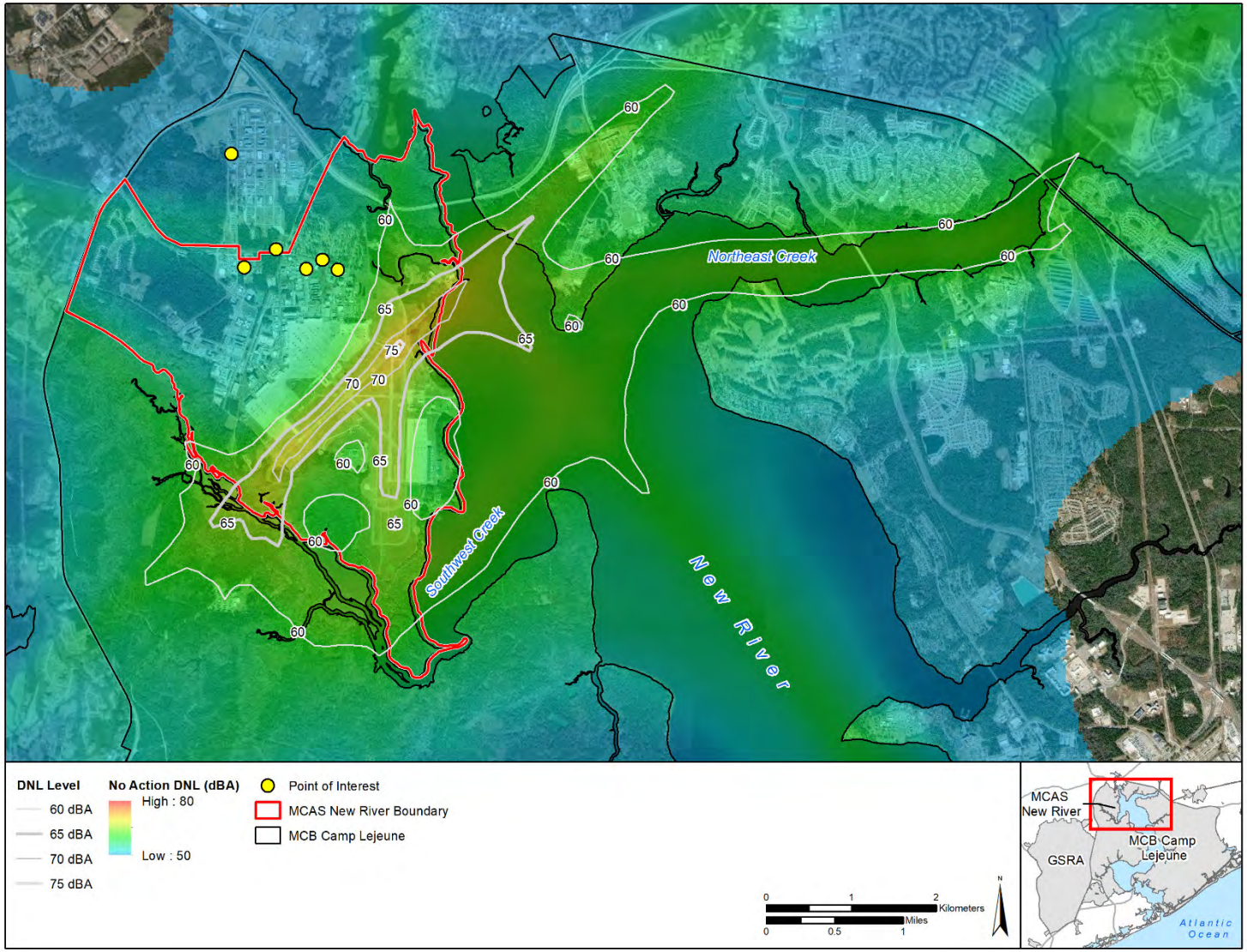

Figure 4-2. Noise Gradient and DNL Contours under the No Action Scenario at MCAS New River

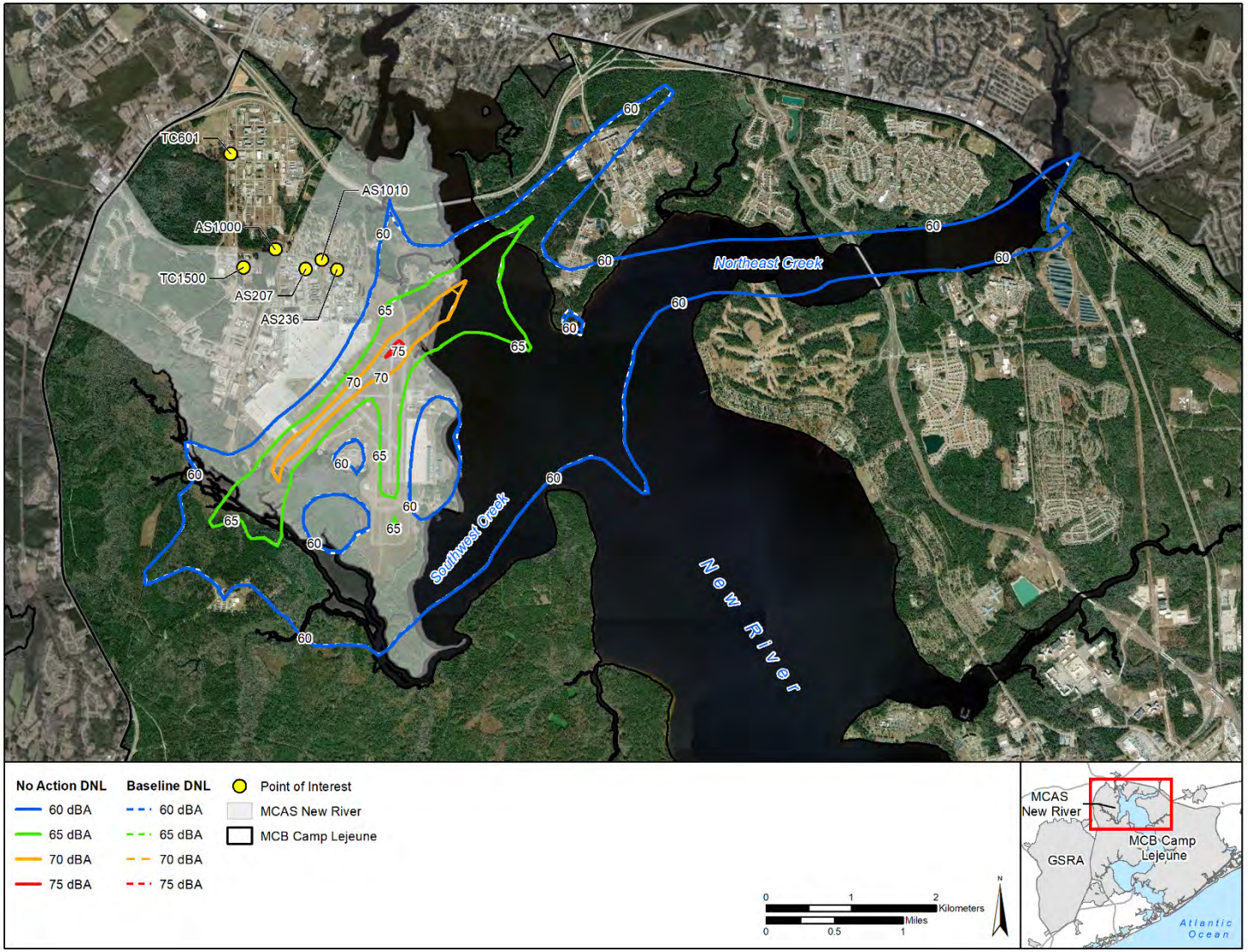

Figure 4-3. Comparison of Baseline and No Action Scenarios at MCAS New River

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5.0 PROPOSED ACTION SCENARIO

The Proposed Action Scenario represents the one-for-one replacement of the CH-53E with the CH-53K. All other aircraft operations remain the same as those shown in the No Action Scenario. It is assumed that the CH-53K would operate exactly the same as the CH-53E that it would replace.

5.1 MODELING DATA

The annual aircraft operations modeled for the Proposed Action Scenario are shown below in **Table 5-1**. **Table 5-2** shows the modeled static profiles for the Proposed Action Scenario.

Detailed tables and figures showing modeling assumptions, specific operations, representative flight profiles, runway usage, and day/night operation breakdowns are provided in Appendix A and Appendix B.

Table 5-1. Annual Aircraft Operations under Proposed Action Scenario

Aircraft	Arrivals									Departures		
	Course Rules		Straight In/ Instrument		Overhead		Total Arrivals			Total Departures		
	Day	Night	Day	Night	Day	Night	Day	Night	Total	Day	Night	Total
AH-1W/Z	1,324	260	260	51	--	--	1,584	311	1,895	1,799	97	1,895
UH-1N/Y	1,059	208	208	41	--	--	1,267	249	1,516	1,439	78	1,517
CH-53K	2,557	543	679	144	--	--	3,236	687	3,923	3,615	308	3,923
MV-22B	1,105	251	2,832	644	718	163	4,654	1,058	5,712	5,247	466	5,712
Transient	--	--	752	30	--	--	752	30	782	752	30	782

Aircraft	Closed Patterns							Total Operations		
	VFR Patterns		GCA Box		Total Pattern Operations					
	Day	Night	Day	Night	Day	Night	Total	Day	Night	Total
AH-1W/Z	1,150	206	396	46	1,546	252	1,798	4,929	660	5,589
UH-1N/Y	920	164	316	38	1,236	202	1,438	3,942	529	4,471
CH-53K	2,998	220	706	104	3,704	324	4,028	10,555	1,319	11,874
MV-22B	2,590	300	779	146	3,369	446	3,815	13,270	1,969	15,239
Transient	--	--	--	--	--	--	--	1,504	60	1,564
							TOTAL Annual Operations	**34,201**	**4,537**	**38,738**

Legend: VFR = Visual Flight Rules; GCA=Ground Controlled Approach; Course Rules = standard arrivals per MCAS New River procedures..

Table 5-2. Modeled Static Profiles for MCAS New River under the Proposed Action Scenario

Aircraft	Engine	Profile Name	Pad	Heading	Power/Units	Number Day	Number Night	Duration (sec)	Number Engines
AH-1G	T53-L-13	Low Work AH1W "D"	Pad D	50	1 POWER Fixed	1.506849	0	200	1
AH-1G	T53-L-13	Low Work AH1W "D"	Pad D	230	1 POWER Fixed	1.506849	0	200	1
AH-1G	T53-L-13	Low Work AH1W "F"	Pad F	50	1 POWER Fixed	0.502283	0	200	1
AH-1G	T53-L-13	Low Work AH1W "F"	Pad F	230	1 POWER Fixed	0.502283	0	200	1
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "B"	Pad B	50	7% QQBPA Fixed	1.6382367	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "B"	Pad B	230	7% QQBPA Fixed	1.6382367	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "G"	Pad G	180	7% QQBPA Fixed	3.9317681	0	245	2
MV-22B (modeled as CH-53E)	T64-GE-416A	MV-22B Low Work at "G"	Pad G	360	7% QQBPA Fixed	3.9317681	0	245	2
CH-53E	T64-GE-416A	CH-53E Collective Bias at "D"	Pad D	50	7% QQBPA Fixed	0.3424658	0	1800	3
CH-53E	T64-GE-416A	CH-53E Collective Bias at "D"	Pad D	230	7% QQBPA Fixed	0.3424658	0	1800	3
CH-53E	T64-GE-416A	CH-53E Track and Balance at "D"	Pad D	50	7% QQBPA Fixed	0.890411	0	150	3
CH-53E	T64-GE-416A	CH-53E Track and Balance at "D"	Pad D	230	7% QQBPA Fixed	0.890411	0	150	3
TEST CELL	TEST CELL	Maintenance Idle	Test Cell	230	70% RPM Variable	1.228493	0.064657	12600	1
TEST CELL	TEST CELL	Maintenance Idle	Test Cell	230	70% RPM Variable	1.228493	0.064657	10800	1

Legend: RPM=Revolutions per Minute; %QQBPA = power setting for CH-53E

5.2 NOISE EXPOSURE

Figure 5-1 shows the resultant 60 dB to 75 dB DNL contours in 5 dB increments for the daily aircraft events under the Proposed Action Scenario at MCAS New River. Similarly, **Figure 5-2** shows the contours but also a colored noise gradient shading that illustrates that noise doesn't stop at a contour line. The noise contours increase under the Proposed Action Scenario, when compared to the No Action Scenario, due to the greater weight of the CH-53K over the CH-53E. **Table 5-3** shows the acreage breakdowns under the different noise contours at MCAS New River under the Proposed Action Scenario.

Overall, the area exposed to 60 dB DNL or greater is 2,584 acres, an increase of 221 acres when compared to the No Action Scenario. Of the 2,584 acres, only 5 acres are not within USMC owned property. The small portion of the 60 dB DNL or greater that extends off-base is at the east end of Northeast Creek. The Proposed Action Scenario results in an increase of 39 acres of land exposed to 65 DNL or greater, the DoD threshold for land use recommendations for noise sensitive land uses. No areas off base would be exposed to noise levels greater than 65 DNL.

Table 5-4 shows the estimated DNL for each of the seven POIs. Under the Proposed Action Scenario, estimated DNLs range from 57 to 49 dBA; very similar to the values estimated under the No Action Scenario. The greatest change in DNL is an increase of 1 dBA at four of the seven POIs. All of these values are well below the 65 DNL threshold for noise sensitive land uses.

Table 5-3. Acreage Breakdowns for Levels of DNL under Proposed Action Scenario and Comparison to the No Action at MCAS New River

Level	USMC Property		Off Base Acreage	Proposed Action Total	No Action Total	Change from No Action Total
	On MCAS New River	On MCB Camp Lejeune				
60+	1,423	1,156	5	2,584	2,364	+221
65+	491	65	--	556	517	+39
70+	125	--	--	125	113	+12
75+	6	--	--	6	4	+2

Legend: USMC=U.S. Marine Corps; MCAS=Marine Corps Air Station; MCB=Marine Corps Base/

Table 5-4. Estimated Noise Levels at POIs under Proposed Action Scenario Compared to No Action Scenario

POI Description	Facility Number	Proposed Action DNL (dBA)	Change from No Action
Child Development Center	AS1000	54	0
Child Development Center	AS207	56	+1
New River Community Center	AS1010	56	+1
TLZ Snipe	N/A	51	+1
Chapel	TC601	49	0
Chapel	AS236	57	+1
DeLalio Elementary School	TC1500	53	0

Legend: POI=Points of Interest; DNL=Day-Night Average Sound Level; dBA=A-weighted Decibels.

Figure 5-3 shows both the No Action and Proposed Action Scenarios for comparison. The difference between the contours are almost unnoticeable.

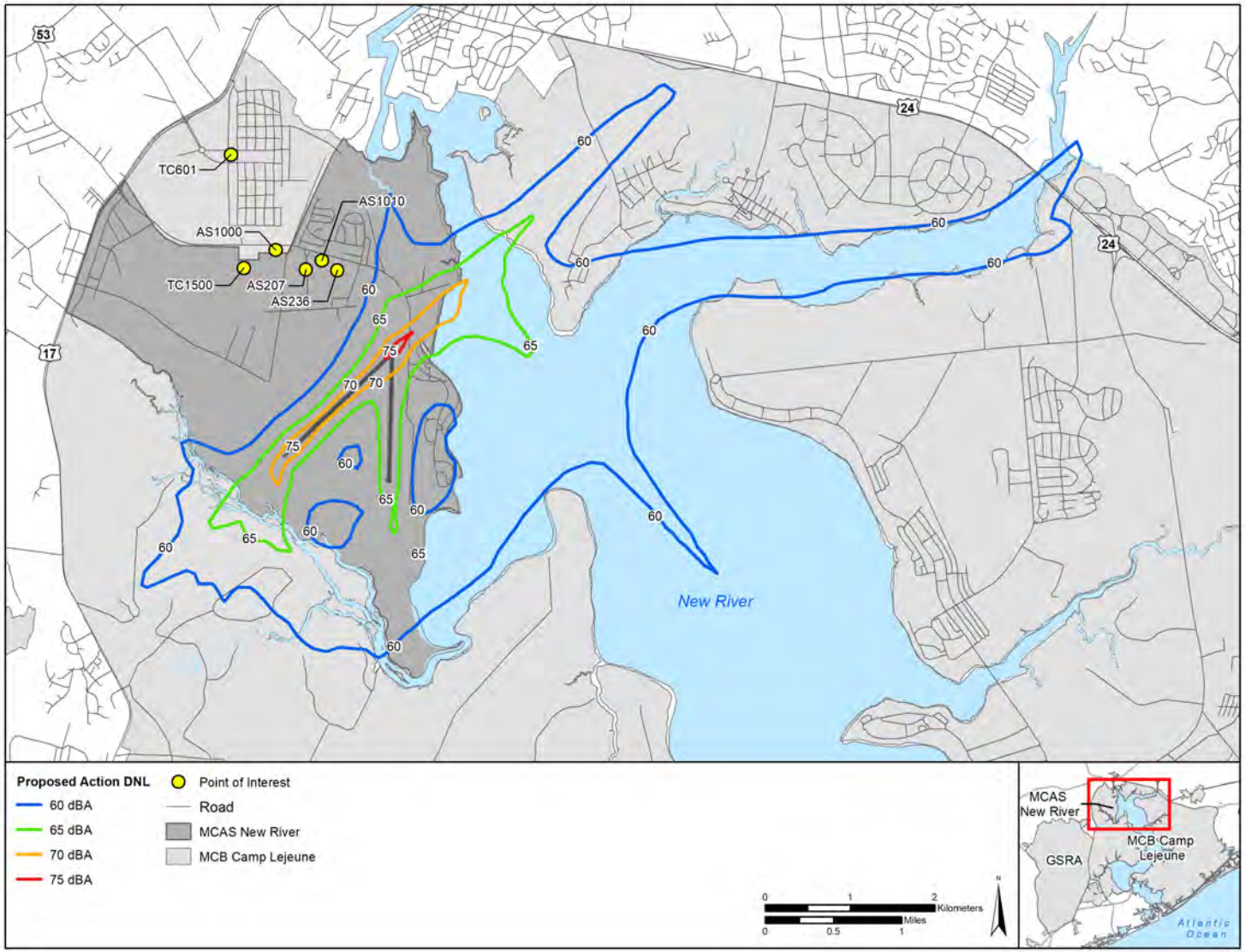

Figure 5-1. Noise Contours (DNL) under Proposed Action Scenario at MCAS New River

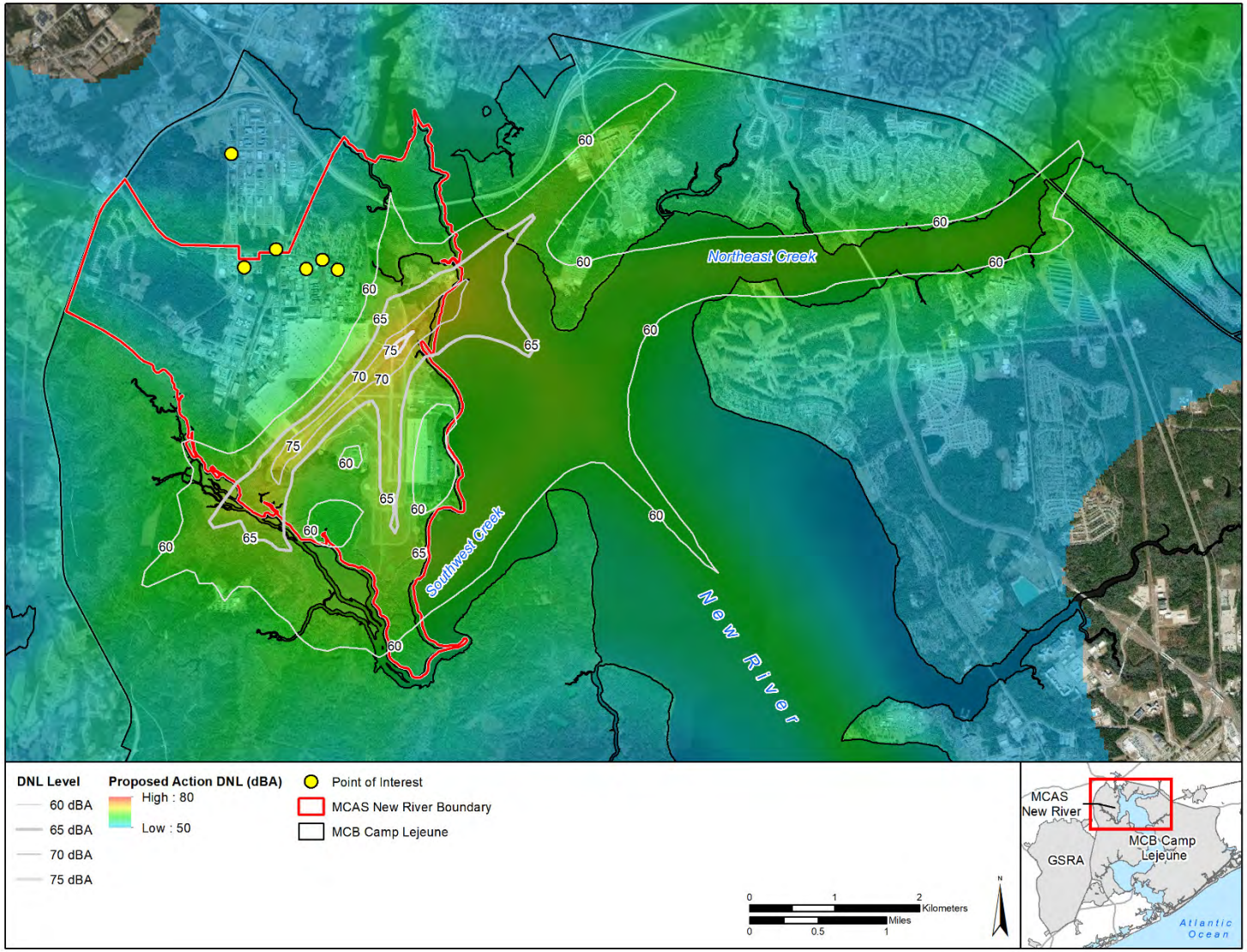

Figure 5-2. Noise Gradient and DNL Contours under Proposed Action Scenario at New River

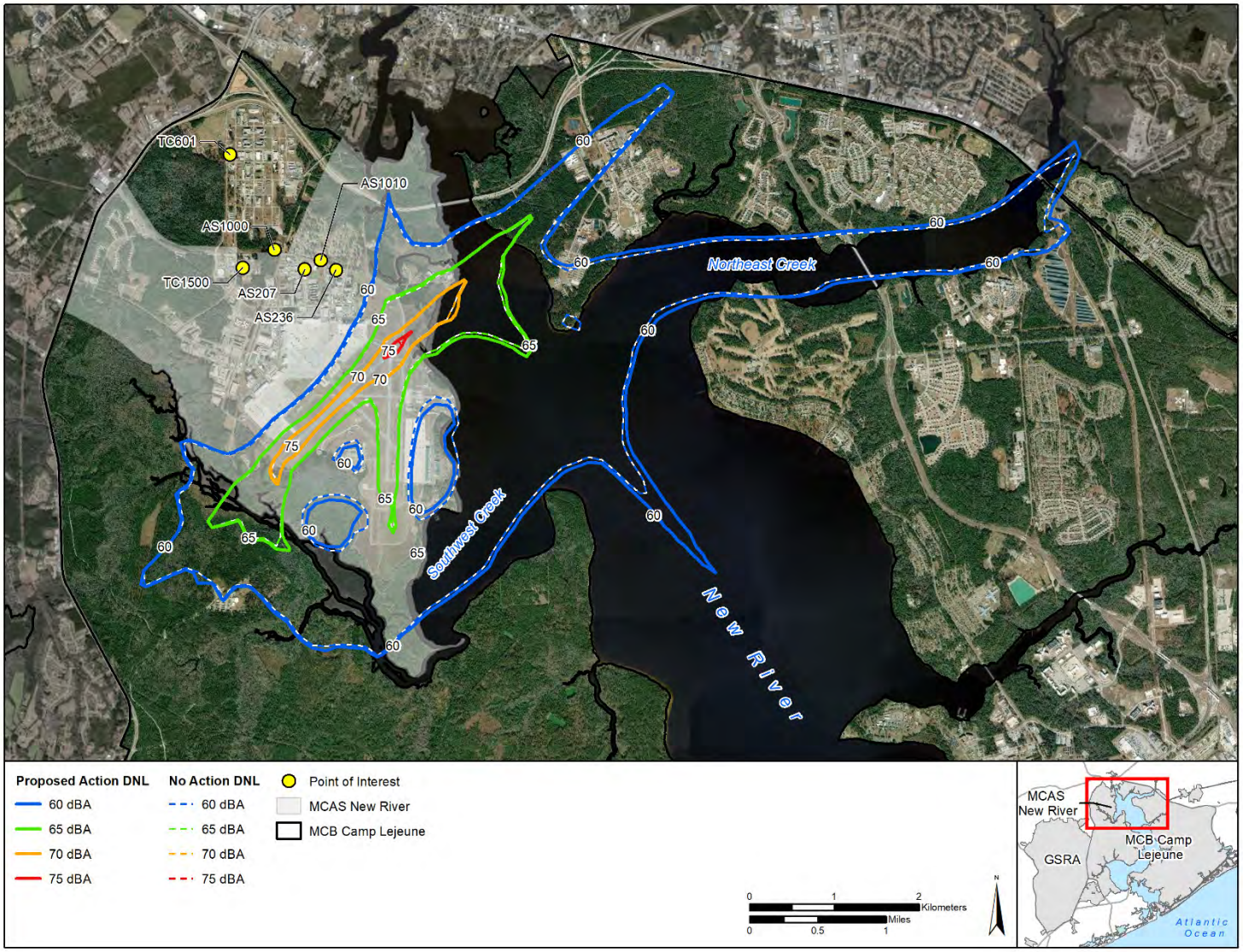

Figure 5-3. Comparison of No Action and Proposed Action Scenarios at MCAS New River

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Appendix A
DETAILED FLIGHT OPERATIONS AT MCAS NEW RIVER

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Table A-1. H-1 Assumptions for Arrival Operations

H-1 ARRIVALS			
Topic	**Values**		**Source**
Arrivals by Course Rules	Runway 01	2%	ATAA
	Runway 05	23%	
	Runway 19	6%	
	Runway 23	69%	
Course Rules Arrival to Rwy 01 - Landing point	#s	70%	Interview
	Intersection twy A	30%	
Course Rules Arrival to Rwy 05 - Landing point	#s	50%	Interview
	Intersection twy D	50%	
Course Rules Arrival to Rwy 19 - Landing point	#s	10%	Interview
	Intersection twy A	40%	
	Intersection twy D	50%	
Course Rules Arrival to Rwy 23 - Landing point	#s	50%	Interview
	Intersection twy D	50%	
Runway 01 Arrivals FROM:	NE Creek	39%	ATAA
	Hospital Point	27%	
	Dixon Fire Tower	24%	
	SW Water Tower	10%	
Runway 05 Arrivals FROM:	NE Creek	50%	ATAA
	Hospital Point	20%	
	Dixon Fire Tower	9%	
	SW Water Tower	21%	
Runway 19 Arrivals FROM:	NE Creek	57%	ATAA
	Hospital Point	25%	
	Dixon Fire Tower	8%	
	SW Water Tower	11%	
Runway 23 Arrivals FROM:	NE Creek	52%	ATAA
	Hospital Point	22%	
	Dixon Fire Tower	7%	
	SW Water Tower	18%	
NE Creek Arrivals COME FROM:	East	50%	Interview
	Northeast	50%	
NE Creek Arrivals to 05, 19, and 23 GO:	AROUND Mumford Point	10%	Interview
	OVER Mumford Point	90%	
Hospital Point Arrivals GO:	AROUND Ragged Point	20%	Interview
	OVER Ragged Point	80%	
SI and Instrument Approaches	Runway 01	2%	ATAA
	Runway 05	12%	
	Runway 19	13%	
	Runway 23	73%	

Table A-2. H-1 Assumptions for Departure Operations

H-1 DEPARTURES			
Topic	**Values**		**Source**
Departures by Runway	Runway 01	2%	ATAA
	Runway 05	25%	
	Runway 19	5%	
	Runway 23	68%	
Depart Rwy 01 - FROM:	#s	80%	Interview
	Intersection twy A	20%	
Depart Rwy 05 - FROM:	#s	80%	Interview
	Intersection twy D	20%	
Depart Rwy 19 - FROM:	#s	10%	Interview
	Intersection twy A	30%	
	Intersection twy D	60%	
Depart Rwy 23 - FROM:	#s	5%	Interview
	Intersection twy D	15%	
	Intersection twy F	80%	
Runway 01 Departures TO:	NE Creek	46%	ATAA
	Hospital Point	29%	
	Dixon Fire Tower	6%	
	SW Water Tower	20%	
Runway 05 Departures TO:	NE Creek	62%	ATAA
	Hospital Point	19%	
	Dixon Fire Tower	6%	
	SW Water Tower	14%	
	Straight	1%	
Runway 19 Departures TO:	NE Creek	58%	ATAA
	Hospital Point	25%	
	Dixon Fire Tower	6%	
	SW Water Tower	10%	
	Right Turn to 300	1%	
Runway 19 Departures TO:	NE Creek	52%	ATAA
	Hospital Point	19%	
	Dixon Fire Tower	10%	
	SW Water Tower	18%	
	Right Turn to 300	<1%	
	Straight	<1%	
NE Creek Arrivals GO TO:	East	50%	Interview
	Northeast	50%	

Table A-3. H-1 Assumptions for Closed Pattern Operations

H-1 CLOSED PATTERNS			
Topic	**Values**		**Source**
Visual Patterns	Runway 01	8%	ATAA
	Runway 05	17%	
	Runway 19	29%	
	Runway 23	46%	
Vis Patterns Rwy 01 - TO:	#s	70%	Interview
	Intersection twy A	30%	
Vis Patterns Rwy 05 - TO:	#s	50%	Interview
	Intersection twy D	50%	
Vis Patterns Rwy 19 - TO:	#s	10%	Interview
	Intersection twy A	70%	
	Intersection twy D	20%	
Vis Patterns Rwy 23 - TO:	#s	10%	Interview
	Intersection twy D	90%	
Type pattern Runway 01	Outer	80%	Interview
	Close-In	20%	
Type pattern Runway 05	Outer	80%	Interview
	Close-In	20%	
Type pattern Runway 19	Outer	80%	Interview
	Close-In	20%	
Type pattern Runway 23	Outer	80%	Interview
	Close-In	20%	
GCA Box Patterns TO	Runway 01	2%	ATAA
	Runway 05	7%	
	Runway 19	21%	
	Runway 23	70%	

Table A-4. H-1 Assumptios for Day/Night Operations

	Day (0700-2200L)	Night (2200-0700L)
Departure	95%	5%
Arrival	84%	16%
Closed Visual Pattern	85%	15%
GCA Box	89%	11%

Source: ATAA

Table A-5. Detailed H-1 Operations in Noise Model

Track Type	Runway Group	Location			Long Name		Profile	Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Arrival	01	01 #s	NE Creek	39%	Northeast Creek - E	50%	1101	01A1	8.266	84%	16%	0.01893	0.00372
Course Rules	2%	70%			Northeast Creek - NE	50%	1102	01A2	8.266	84%	16%	0.01893	0.00372
2852			Hosp Point	27%	Hospital Point - Around Ragged point	20%	1103	01A3	2.318	84%	16%	0.00531	0.00104
					Hospital Point - Over Ragged point	80%	1104	01A4	9.270	84%	16%	0.02123	0.00417
			Dixon Fire Tower	24%	Dixon Fire Tower		1105	01A5	10.352	84%	16%	0.02370	0.00466
			SW Water tower	10%	SW Water Tower		1106	01A6	4.172	84%	16%	0.00955	0.00188
		01A	NE Creek	39%	Northeast Creek - E	50%	1129	01AA1	3.543	84%	16%	0.00811	0.00159
		30%			Northeast Creek - NE	50%	1130	01AA2	3.543	84%	16%	0.00811	0.00159
			Hosp Point	27%	Hospital Point - Around Ragged point	20%	1131	01AA3	0.993	84%	16%	0.00227	0.00045
					Hospital Point - Over Ragged point	80%	1132	01AA4	3.973	84%	16%	0.00910	0.00179
			Dixon Fire Tower	24%	Dixon Fire Tower		1133	01AA5	4.436	84%	16%	0.01016	0.00200
			SW Water tower	10%	SW Water Tower		1134	01AA6	1.788	84%	16%	0.00409	0.00080
	05	05 #s	Northeast Creek	50%	Northeast Creek		1108	05A1	161.988	84%	16%	0.37091	0.07289
	23%	50%	Hospital Point	20%	Hospital Point		1109	05A2	64.350	84%	16%	0.14734	0.02896
			Dixon Fire Tower	9%	Dixon Fire Tower		1110	05A3	29.948	84%	16%	0.06857	0.01348
			SW Water Tower	21%	SW Water Tower		1111	05A4	68.246	84%	16%	0.15627	0.03071
		05D	Northeast Creek	50%	Northeast Creek		1143	05DA1	161.988	84%	16%	0.37091	0.07289
		50%	Hospital Point	20%	Hospital Point		1144	05DA2	64.350	84%	16%	0.14734	0.02896
			Dixon Fire Tower	9%	Dixon Fire Tower		1145	05DA3	29.948	84%	16%	0.06857	0.01348
			SW Water Tower	21%	SW Water Tower		1146	05DA4	68.246	84%	16%	0.15627	0.03071
	19	19 #s	NE Creek	57%	Northeast Creek - E	5%	1113	19A1	0.468	84%	16%	0.00107	0.00021
	6%	10%			Northeast Creek - NE	5%	1114	19A2	0.468	84%	16%	0.00107	0.00021
					Northeast Creek - E - Over Mumford Point	45%	1115	19A3	4.215	84%	16%	0.00965	0.00190
					Northeast Creek - NE - Over Mumford Point	45%	1116	19A4	4.215	84%	16%	0.00965	0.00190
			Hosp Point	25%	Hospital Point		1117	19A5	4.104	84%	16%	0.00940	0.00185
			Dixon	8%	Dixon Fire Tower		1118	19A6	1.246	84%	16%	0.00285	0.00056
			SW Water tower	11%	SW Water Tower		1119	19A7	1.805	84%	16%	0.00413	0.00081
		19A	NE Creek	57%	Northeast Creek - E	5%	1153	19AA1	1.874	84%	16%	0.00429	0.00084
		40%			Northeast Creek - NE	5%	1154	19AA2	1.874	84%	16%	0.00429	0.00084
					Northeast Creek - E - Over Mumford Point	45%	1155	19AA3	16.862	84%	16%	0.03861	0.00759
					Northeast Creek - NE - Over Mumford Point	45%	1156	19AA4	16.862	84%	16%	0.03861	0.00759
			Hosp Point	25%	Hospital Point		1157	19AA5	16.415	84%	16%	0.03759	0.00739
			Dixon	8%	Dixon Fire Tower		1158	19AA6	4.985	84%	16%	0.01141	0.00224
			SW Water tower	11%	SW Water Tower		1159	19AA7	7.219	84%	16%	0.01653	0.00325
		19D	NE Creek	57%	Northeast Creek - E	5%	1161	19DA1	2.342	84%	16%	0.00536	0.00105
		50%			Northeast Creek - NE	5%	1162	19DA2	2.342	84%	16%	0.00536	0.00105
					Northeast Creek - E - Over Mumford Point	45%	1163	19DA3	21.077	84%	16%	0.04826	0.00948
					Northeast Creek - NE - Over Mumford Point	45%	1164	19DA4	21.077	84%	16%	0.04826	0.00948
			Hosp Point	25%	Hospital Point		1165	19DA5	20.519	84%	16%	0.04698	0.00923
			Dixon	8%	Dixon Fire Tower		1166	19DA6	6.231	84%	16%	0.01427	0.00280
			SW Water tower	11%	SW Water Tower		1167	19DA7	9.024	84%	16%	0.02066	0.00406
	23	23 #s	NE Creek	52%	Northeast Creek - E	25%	1121	23A1	129.591	84%	16%	0.29673	0.05831
	69%	50%			Northeast Creek - NE	25%	1122	23A2	129.591	84%	16%	0.29673	0.05831
					Northeast Creek - E - Over Mumford Point	25%	1123	23A3	129.591	84%	16%	0.29673	0.05831
					Northeast Creek - NE - Over Mumford Point	25%	1124	23A4	129.591	84%	16%	0.29673	0.05831
			Hosp Point	22%	Hospital Point		1125	23A5	217.912	84%	16%	0.49896	0.09805
			Dixon	7%	Dixon Fire Tower		1126	23A6	69.934	84%	16%	0.16013	0.03147
			SW Water tower	18%	SW Water Tower		1127	23A7	182.068	84%	16%	0.41689	0.08193
		23D	NE Creek	52%	Northeast Creek - E	25%	1177	23DA1	129.591	84%	16%	0.29673	0.05831
		50%			Northeast Creek - NE	25%	1178	23DA2	129.591	84%	16%	0.29673	0.05831
					Northeast Creek - E - Over Mumford Point	25%	1179	23DA3	129.591	84%	16%	0.29673	0.05831
					Northeast Creek - NE - Over Mumford Point	25%	1180	23DA4	129.591	84%	16%	0.29673	0.05831
			Hosp Point	22%	Hospital Point		1181	23DA5	217.912	84%	16%	0.49896	0.09805
			Dixon	7%	Dixon Fire Tower		1182	23DA6	69.934	84%	16%	0.16013	0.03147
			SW Water tower	18%	SW Water Tower		1183	23DA7	182.068	84%	16%	0.41689	0.08193
S/I - Vis and Inst	01						1107	01A7	10.073	84%	16%	0.02306	0.00453
	2%												
	05						1112	05A5	68.757	84%	16%	0.15744	0.03094
560	12%												
	19						1120	19A8	73.574	84%	16%	0.16847	0.03311
	13%												
	23						1128	23A8	407.724	84%	16%	0.93359	0.18346
	73%												

Table A-5. Detailed H-1 Operations used in Noise Model (cont.)

Track Type	Runway Group	Location			Long Name				TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Departure	01	01 #s	Northeast Creek	46%	Northeast Creek - E	50%	1201	01D1	12.993	95%	5%	0.03378	0.00182
	2%	80%			Northeast Creek - NE	50%	1202	01D2	12.993	95%	5%	0.03378	0.00182
3412			Hospital Point	29%	Hospital Point		1203	01D3	16.220	95%	5%	0.04217	0.00227
			Dixon Fire Tower	6%	Dixon Fire Tower		1204	01D4	3.145	95%	5%	0.00817	0.00044
			SW Water Tower	20%	SW Water Tower		1205	01D5	11.255	95%	5%	0.02926	0.00158
		01A	Northeast Creek	46%	Northeast Creek - E	50%	1225	01AD1	3.248	95%	5%	0.00844	0.00046
		20%			Northeast Creek - NE	50%	1226	01AD2	3.248	95%	5%	0.00844	0.00046
			Hospital Point	29%	Hospital Point		1227	01AD3	4.055	95%	5%	0.01054	0.00057
			Dixon Fire Tower	6%	Dixon Fire Tower		1228	01AD4	0.786	95%	5%	0.00204	0.00011
			SW Water Tower	20%	SW Water Tower		1229	01AD5	2.814	95%	5%	0.00731	0.00039
	05	05 #s	Northeast Creek	62%	Northeast Creek - E	50%	1206	05D1	211.050	95%	5%	0.54864	0.02958
	25%	80%			Northeast Creek - NE	50%	1207	05D2	211.050	95%	5%	0.54864	0.02958
			Hospital Point	19%	Hospital Point		1208	05D3	126.904	95%	5%	0.32989	0.01779
			Dixon Fire Tower	6%	Dixon Fire Tower		1209	05D4	39.295	95%	5%	0.10215	0.00551
			SW Water Tower	14%	SW Water Tower		1210	05D5	93.084	95%	5%	0.24198	0.01305
			Straight	1%	Straight Out		1211	05D6	3.865	95%	5%	0.01005	0.00054
		05D	Northeast Creek	62%	Northeast Creek - E	50%	1235	05DD1	52.763	95%	5%	0.13716	0.00740
		20%			Northeast Creek - NE	50%	1236	05DD2	52.763	95%	5%	0.13716	0.00740
			Hospital Point	19%	Hospital Point		1237	05DD3	31.726	95%	5%	0.08247	0.00445
			Dixon Fire Tower	6%	Dixon Fire Tower		1238	05DD4	9.824	95%	5%	0.02554	0.00138
			SW Water Tower	14%	SW Water Tower		1239	05DD5	23.271	95%	5%	0.06049	0.00326
			Straight	1%	Straight Out		1240	05DD6	0.966	95%	5%	0.00251	0.00014
	19	19 #s	Northeast Creek	58%	Northeast Creek - E	50%	1212	19D1	4.977	95%	5%	0.01294	0.00070
	5%	10%			Northeast Creek - NE	50%	1213	19D2	4.977	95%	5%	0.01294	0.00070
			Hospital Point	25%	Hospital Point		1214	19D3	4.259	95%	5%	0.01107	0.00060
			Dixon Fire Tower	6%	Dixon Fire Tower		1215	19D4	1.085	95%	5%	0.00282	0.00015
			SW Water Tower	10%	SW Water Tower		1216	19D5	1.790	95%	5%	0.00465	0.00025
			Rt 300 deg	1%	RT 300 Degrees		1217	19D8	0.095	95%	5%	0.00025	0.00001
		19A	Northeast Creek	58%	Northeast Creek - E	50%	1247	19AD1	14.932	95%	5%	0.03882	0.00209
		30%			Northeast Creek - NE	50%	1248	19AD2	14.932	95%	5%	0.03882	0.00209
			Hospital Point	25%	Hospital Point		1249	19AD3	12.776	95%	5%	0.03321	0.00179
			Dixon Fire Tower	6%	Dixon Fire Tower		1250	19AD4	3.255	95%	5%	0.00846	0.00046
			SW Water Tower	10%	SW Water Tower		1251	19AD5	5.371	95%	5%	0.01396	0.00075
			Rt 300 deg	1%	RT 300 Degrees		1252	19AD8	0.285	95%	5%	0.00074	0.00004
		19D	Northeast Creek	58%	Northeast Creek - E	50%	1253	19DD1	29.865	95%	5%	0.07764	0.00419
		60%			Northeast Creek - NE	50%	1254	19DD2	29.865	95%	5%	0.07764	0.00419
			Hospital Point	25%	Hospital Point		1255	19DD3	25.552	95%	5%	0.06642	0.00358
			Dixon Fire Tower	6%	Dixon Fire Tower		1256	19DD4	6.510	95%	5%	0.01692	0.00091
			SW Water Tower	10%	SW Water Tower		1257	19DD5	10.742	95%	5%	0.02792	0.00151
			Rt 300 deg	1%	RT 300 Degrees		1258	19DD8	0.570	95%	5%	0.00148	0.00008
	23	23 #s	Northeast Creek	52%	Northeast Creek - E	50%	1218	23D1	29.993	95%	5%	0.07797	0.00420
	68%	5%			Northeast Creek - NE	50%	1219	23D2	29.993	95%	5%	0.07797	0.00420
			Hospital Point	19%	Hosptial Point		1220	23D3	22.172	95%	5%	0.05764	0.00311
			Dixon Fire Tower	10%	Dixon Fire Tower		1221	23D4	11.815	95%	5%	0.03071	0.00166
			SW Water Tower	18%	SW Water Tower		1222	23D5	21.050	95%	5%	0.05472	0.00295
			Straight Out	0%	Straight Out		1223	23D6	0.067	95%	5%	0.00017	0.00001
			RT 300 Degrees	0%	RT 300 Degrees		1224	23D8	0.547	95%	5%	0.00142	0.00008
		23D	Northeast Creek	52%	Northeast Creek - E	50%	1265	23DD1	89.979	95%	5%	0.23391	0.01261
		15%			Northeast Creek - NE	50%	1266	23DD2	89.979	95%	5%	0.23391	0.01261
			Hospital Point	19%	Hosptial Point		1267	23DD3	66.516	95%	5%	0.17291	0.00932
			Dixon Fire Tower	10%	Dixon Fire Tower		1268	23DD4	35.445	95%	5%	0.09214	0.00497
			SW Water Tower	18%	SW Water Tower		1269	23DD5	63.150	95%	5%	0.16416	0.00885
			Straight Out	0%	Straight Out		1270	23DD6	0.201	95%	5%	0.00052	0.00003
			RT 300 Degrees	0%	RT 300 Degrees		1271	23DD8	1.640	95%	5%	0.00426	0.00023
		23F	Northeast Creek	52%	Northeast Creek - E	50%	1272	23FD1	479.885	95%	5%	1.24749	0.06726
		80%			Northeast Creek - NE	50%	1273	23FD2	479.885	95%	5%	1.24749	0.06726
			Hospital Point	19%	Hosptial Point		1274	23FD3	354.755	95%	5%	0.92221	0.04972
			Dixon Fire Tower	10%	Dixon Fire Tower		1275	23FD4	189.039	95%	5%	0.49142	0.02650
			SW Water Tower	18%	SW Water Tower		1276	23FD5	336.802	95%	5%	0.87554	0.04721
			Straight Out	0%	Straight Out		1277	23FD6	1.074	95%	5%	0.00279	0.00015
			RT 300 Degrees	0%	RT 300 Degrees		1278	23FD8	8.746	95%	5%	0.02274	0.00123

Table A-5. Detailed H-1 Operations used in Noise Model (cont.)

Track Type	Runway Group	Location		Long Name				TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Closed Pat	01	01	visual/tower pattern	Outer Pattern	80%	1301	01T1	55.071	85%	15%	0.12804	0.02283
Visual	8%	70%		Close-In Pattern	20%	1302	01T2	13.768	85%	15%	0.03201	0.00571
1219		01A	visual/tower pattern	Outer Pattern	80%	1313	01AT1	23.602	85%	15%	0.05488	0.00979
(events)		30%		Close-In Pattern	20%	1314	01AT2	5.900	85%	15%	0.01372	0.00245
	05	05	visual/tower pattern	Outer Pattern	80%	1304	05T1	81.339	85%	15%	0.18912	0.03373
	17%	50%		Close-In Pattern	20%	1305	05T2	20.335	85%	15%	0.04728	0.00843
		05D	visual/tower pattern	Outer Pattern	80%	1319	05DT1	81.339	85%	15%	0.18912	0.03373
		50%		Close-In Pattern	20%	1320	05DT2	20.335	85%	15%	0.04728	0.00843
	19	19	visual/tower pattern	Outer Pattern	80%	1307	19T1	28.239	85%	15%	0.06566	0.01171
	29%	10%		Close-In Pattern	20%	1308	19T2	7.060	85%	15%	0.01641	0.00293
		19A	visual/tower pattern	Outer Pattern	80%	1325	19AT1	197.674	85%	15%	0.45961	0.08196
		70%		Close-In Pattern	20%	1326	19AT2	49.419	85%	15%	0.11490	0.02049
		19D	visual/tower pattern	Outer Pattern	80%	1328	19DT1	56.478	85%	15%	0.13132	0.02342
		20%		Close-In Pattern	20%	1329	19DT2	14.120	85%	15%	0.03283	0.00585
	23	23	visual/tower pattern	Outer Pattern	80%	1310	23T1	45.159	85%	15%	0.10500	0.01872
	46%	10%		Close-In Pattern	20%	1311	23T2	11.290	85%	15%	0.02625	0.00468
		23D	visual/tower pattern	Outer Pattern	80%	1334	23DT1	406.431	85%	15%	0.94498	0.16852
		90%		Close-In Pattern	20%	1335	23DT2	101.608	85%	15%	0.23625	0.04213
	01		GCA Box Pattern			1303	01G1	6.115	89%	11%	0.01497	0.00178
GCA Box	2%											
	05		GCA Box Pattern			1306	05G1	29.835	89%	11%	0.07304	0.00870
398	7%											
	19		GCA Box Pattern			1309	19G1	83.947	89%	11%	0.20551	0.02449
	21%											
	23		GCA Box Pattern			1312	23G1	277.970	89%	11%	0.68049	0.08108
	70%											

Table A-6. CH-53E/K Assumptions for Arrival Operations

CH-53 ARRIVALS			
Topic	**Values**		**Source**
Arrivals by Course Rules	Runway 01	2%	ATAA
	Runway 05	23%	
	Runway 19	4%	
	Runway 23	71%	
Course Rules Arrival to Rwy 01 - Landing point	#s	34%	Interview
	Intersection twy A	10%	
	Intersection twy D	56%	
Course Rules Arrival to Rwy 05 - Landing point	#s	50%	Interview
	Intersection twy D	50%	
Course Rules Arrival to Rwy 19 - Landing point	#s	20%	Interview
	Intersection twy A	40%	
	Intersection twy D	40%	
Course Rules Arrival to Rwy 23 - Landing point	#s	50%	Interview
	Intersection twy D	50%	
Runway 01 Arrivals FROM:	NE Creek	32%	ATAA
	Hospital Point	34%	
	Dixon Fire Tower	27%	
	SW Water Tower	7%	
Runway 05 Arrivals FROM:	NE Creek	35%	ATAA
	Hospital Point	28%	
	Dixon Fire Tower	28%	
	SW Water Tower	9%	
Runway 19 Arrivals FROM:	NE Creek	41%	ATAA
	Hospital Point	29%	
	Dixon Fire Tower	17%	
	SW Water Tower	13%	
Runway 23 Arrivals FROM:	NE Creek	43%	ATAA
	Hospital Point	33%	
	Dixon Fire Tower	17%	
	SW Water Tower	8%	
NE Creek Arrivals COME FROM:	East	50%	Interview
	Northeast	50%	
NE Creek Arrivals to 05, 19, and 23 GO:	AROUND Mumford Point	10%	Interview
	OVER Mumford Point	90%	
Hospital Point Arrivals GO:	AROUND Ragged Point	20%	Interview
	OVER Ragged Point	80%	
SI and Instrument Approaches	Runway 01	2%	ATAA
	Runway 05	15%	
	Runway 19	15%	
	Runway 23	68%	

Table A-7. CH-53E/K Assumptions for Departure Operations

CH-53 DEPARTURES			
Topic	**Values**		**Source**
Departures by Runway	Runway 01	55%	ATAA
	Runway 05	5%	
	Runway 19	33%	
	Runway 23	7%	
Depart Rwy 01 - FROM:	#s	80%	Interview
	Intersection twy A	20%	
Depart Rwy 05 - FROM:	#s	45%	Interview
	Intersection twy D	55%	
Depart Rwy 19 - FROM:	#s	10%	Interview
	Intersection twy A	30%	
	Intersection twy D	60%	
Depart Rwy 23 - FROM:	#s	5%	Interview
	Intersection twy D	15%	
	Intersection twy F	80%	
Runway 01 Departures TO:	NE Creek	52%	ATAA
	Hospital Point	26%	
	Dixon Fire Tower	16%	
	SW Water Tower	6%	
Runway 05 Departures TO:	NE Creek	49%	ATAA
	Hospital Point	25%	
	Dixon Fire Tower	16%	
	SW Water Tower	8%	
	Straight	2%	
Runway 19 Departures TO:	NE Creek	52%	ATAA
	Hospital Point	25%	
	Dixon Fire Tower	19%	
	SW Water Tower	4%	
	Right Turn to 300	1%	
Runway 23 Departures TO:	NE Creek	40%	ATAA
	Hospital Point	20%	
	Dixon Fire Tower	28%	
	SW Water Tower	9%	
	Straight	1%	
	Sandy One	<1%	
	Right Turn to 300	<1%	
NE Creek Arrivals GO TO:	East	50%	Interview
	Northeast	50%	

Table A-8. CH-53E/K Assumptions for Closed Pattern Operations

CH-53 CLOSED PATTERNS			
Topic	**Values**		**Source**
Visual Patterns	Runway 01	5%	ATAA
	Runway 05	18%	
	Runway 19	24%	
	Runway 23	53%	
Vis Patterns Rwy 01 - TO:	#s	45%	Interview
	Intersection twy A	25%	
	Intersection twy D	30%	
Vis Patterns Rwy 05 - TO:	#s	20%	Interview
	Intersection twy D	20%	
	Intersection twy F	60%	
Vis Patterns Rwy 19 - TO:	#s	10%	Interview
	Intersection twy A	70%	
	Intersection twy D	20%	
Vis Patterns Rwy 23 - TO:	#s	30%	Interview
	Intersection twy D	10%	
	Intersection twy F	60%	
GCA Box Patterns TO	Runway 01	<1%	ATAA
	Runway 05	9%	
	Runway 19	18%	
	Runway 23	73%	

Table A-9. CH-53E/K Assumptions for Day/Night Operations

	Day (0700-2200L)	Night (2200-0700L)
Departure	92%	8%
Arrival	82%	18%
Closed Visual Pattern	93%	7%
GCA Box	87%	13%

Source: ATAA

Table A-10. Detailed CH-53E/K Operations used in Noise Model

Track Type	Runway Group	Location			Long Name		Profile	Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Arrival	01	01 #s	NE Creek	32%	Northeast Creek - E	50%	3101	01A1	3.854	82%	18%	0.00871	0.00185
	2%	34%			Northeast Creek - NE	50%	3102	01A2	3.854	82%	18%	0.00871	0.00185
Course Rules			Hosp Point	34%	Hospital Point - Around Ragged point	20%	3103	01A3	1.667	82%	18%	0.00377	0.00080
3100					Hospital Point - Over Ragged point	80%	3104	01A4	6.670	82%	18%	0.01507	0.00320
			Dixon Fire Tower	27%	Dixon Fire Tower		3105	01A5	6.607	82%	18%	0.01493	0.00317
			SW Water tower	7%	SW Water Tower		3106	01A6	1.652	82%	18%	0.00373	0.00079
		01A	NE Creek	32%	Northeast Creek - E	50%	3129	01AA1	1.134	82%	18%	0.00256	0.00054
		10%			Northeast Creek - NE	50%	3130	01AA2	1.134	82%	18%	0.00256	0.00054
			Hosp Point	34%	Hospital Point - Around Ragged point	20%	3131	01AA3	0.490	82%	18%	0.00111	0.00024
					Hospital Point - Over Ragged point	80%	3132	01AA4	1.962	82%	18%	0.00443	0.00094
			Dixon Fire Tower	27%	Dixon Fire Tower		3133	01AA5	1.943	82%	18%	0.00439	0.00093
			SW Water tower	7%	SW Water Tower		3134	01AA6	0.486	82%	18%	0.00110	0.00023
		01D	NE Creek	32%	Northeast Creek - E	50%	3136	01DA1	6.348	82%	18%	0.01434	0.00305
		56%			Northeast Creek - NE	50%	3137	01DA2	6.348	82%	18%	0.01434	0.00305
			Hosp Point	34%	Hospital Point - Around Ragged point	20%	3138	01DA3	2.746	82%	18%	0.00621	0.00132
					Hospital Point - Over Ragged point	80%	3139	01DA4	10.986	82%	18%	0.02482	0.00527
			Dixon Fire Tower	27%	Dixon Fire Tower		3140	01DA5	10.882	82%	18%	0.02459	0.00522
			SW Water tower	7%	SW Water Tower		3141	01DA6	2.720	82%	18%	0.00615	0.00131
	05	05 #s	Northeast Creek	35%	Northeast Creek		3108	05A1	124.514	82%	18%	0.28137	0.05976
	23%	50%	Hospital Point	28%	Hospital Point		3109	05A2	97.005	82%	18%	0.21921	0.04656
			Dixon Fire Tower	28%	Dixon Fire Tower		3110	05A3	99.567	82%	18%	0.22500	0.04779
			SW Water Tower	9%	SW Water Tower		3111	05A4	30.293	82%	18%	0.06846	0.01454
		05D	Northeast Creek	35%	Northeast Creek		3150	05DA1	124.514	82%	18%	0.28137	0.05976
		50%	Hospital Point	28%	Hospital Point		3151	05DA2	97.005	82%	18%	0.21921	0.04656
			Dixon Fire Tower	28%	Dixon Fire Tower		3152	05DA3	99.567	82%	18%	0.22500	0.04779
			SW Water Tower	9%	SW Water Tower		3153	05DA4	30.293	82%	18%	0.06846	0.01454
	19	19 #s	NE Creek	41%	Northeast Creek - E	5%	3113	19A1	0.546	82%	18%	0.00123	0.00026
	4%	20%			Northeast Creek - NE	5%	3114	19A2	0.546	82%	18%	0.00123	0.00026
					Northeast Creek - E - Over Mumford Point	45%	3115	19A3	4.910	82%	18%	0.01110	0.00236
					Northeast Creek - NE - Over Mumford Point	45%	3116	19A4	4.910	82%	18%	0.01110	0.00236
			Hosp Point	29%	Hospital Point		3117	19A5	7.612	82%	18%	0.01720	0.00365
			Dixon	17%	Dixon Fire Tower		3118	19A6	4.488	82%	18%	0.01014	0.00215
			SW Water tower	13%	SW Water Tower		3119	19A7	3.344	82%	18%	0.00756	0.00161
		19A	NE Creek	41%	Northeast Creek - E	5%	3160	19AA1	1.091	82%	18%	0.00247	0.00052
		40%			Northeast Creek - NE	5%	3161	19AA2	1.091	82%	18%	0.00247	0.00052
					Northeast Creek - E - Over Mumford Point	45%	3162	19AA3	9.821	82%	18%	0.02219	0.00471
					Northeast Creek - NE - Over Mumford Point	45%	3163	19AA4	9.821	82%	18%	0.02219	0.00471
			Hosp Point	29%	Hospital Point		3164	19AA5	15.224	82%	18%	0.03440	0.00731
			Dixon	17%	Dixon Fire Tower		3165	19AA6	8.976	82%	18%	0.02028	0.00431
			SW Water tower	13%	SW Water Tower		3166	19AA7	6.688	82%	18%	0.01511	0.00321
		19D	NE Creek	41%	Northeast Creek - E	5%	3168	19DA1	1.091	82%	18%	0.00247	0.00052
		40%			Northeast Creek - NE	5%	3169	19DA2	1.091	82%	18%	0.00247	0.00052
					Northeast Creek - E - Over Mumford Point	45%	3170	19DA3	9.821	82%	18%	0.02219	0.00471
					Northeast Creek - NE - Over Mumford Point	45%	3171	19DA4	9.821	82%	18%	0.02219	0.00471
			Hosp Point	29%	Hospital Point		3172	19DA5	15.224	82%	18%	0.03440	0.00731
			Dixon	17%	Dixon Fire Tower		3173	19DA6	8.976	82%	18%	0.02028	0.00431
			SW Water tower	13%	SW Water Tower		3174	19DA7	6.688	82%	18%	0.01511	0.00321
	23	23 #s	NE Creek	43%	Northeast Creek - E	5%	3121	23A1	23.460	82%	18%	0.05301	0.01126
	71%	50%			Northeast Creek - NE	5%	3122	23A2	23.460	82%	18%	0.05301	0.01126
					Northeast Creek - E - Over Mumford Point	45%	3123	23A3	211.140	82%	18%	0.47713	0.10134
					Northeast Creek - NE - Over Mumford Point	45%	3124	23A4	211.140	82%	18%	0.47713	0.10134
			Hosp Point	33%	Hospital Point		3125	23A5	356.919	82%	18%	0.80655	0.17131
			Dixon	17%	Dixon Fire Tower		3126	23A6	186.842	82%	18%	0.42222	0.08968
			SW Water tower	8%	SW Water Tower		3127	23A7	83.825	82%	18%	0.18942	0.04023
		23D	NE Creek	43%	Northeast Creek - E	5%	3184	23DA1	23.460	82%	18%	0.05301	0.01126
		50%			Northeast Creek - NE	5%	3185	23DA2	23.460	82%	18%	0.05301	0.01126
					Northeast Creek - E - Over Mumford Point	45%	3186	23DA3	211.140	82%	18%	0.47713	0.10134
					Northeast Creek - NE - Over Mumford Point	45%	3187	23DA4	211.140	82%	18%	0.47713	0.10134
			Hosp Point	33%	Hospital Point		3188	23DA5	356.919	82%	18%	0.80655	0.17131
			Dixon	17%	Dixon Fire Tower		3189	23DA6	186.842	82%	18%	0.42222	0.08968
			SW Water tower	8%	SW Water Tower		3190	23DA7	83.825	82%	18%	0.18942	0.04023
	01						3107	01A7	16.014	82%	18%	0.03619	0.00769
S/I - Vis and Inst	2%												
824	05						3112	05A5	121.971	82%	18%	0.27562	0.05854
	15%												
	19						3120	19A8	122.190	82%	18%	0.27612	0.05865
	15%												
	23						3128	23A8	563.346	82%	18%	1.27302	0.27039
	68%												

Table A-10. Detailed CH-53E/K Operations used in Noise Model (cont.)

Track Type	Runway Group	Location			Long Name			Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Departure	01	01 #s	Northeast Creek	52%	Northeast Creek - E	50%	3201	01D1	447.225	92%	8%	1.12919	0.09608
	55%	80%			Northeast Creek - NE	50%	3202	01D2	447.225	92%	8%	1.12919	0.09608
3923			Hospital Point	26%	Hospital Point		3203	01D3	444.578	92%	8%	1.12251	0.09551
			Dixon Fire Tower	16%	Dixon Fire Tower		3204	01D4	280.508	92%	8%	0.70825	0.06026
			SW Water Tower	6%	SW Water Tower		3205	01D5	100.559	92%	8%	0.25390	0.02160
		01A	Northeast Creek	52%	Northeast Creek - E	50%	3226	01AD1	111.806	92%	8%	0.28230	0.02402
		20%			Northeast Creek - NE	50%	3227	01AD2	111.806	92%	8%	0.28230	0.02402
			Hospital Point	26%	Hospital Point		3228	01AD3	111.145	92%	8%	0.28063	0.02388
			Dixon Fire Tower	16%	Dixon Fire Tower		3229	01AD4	70.127	92%	8%	0.17706	0.01507
			SW Water Tower	6%	SW Water Tower		3230	01AD5	25.140	92%	8%	0.06348	0.00540
		01G			Northeast Creek - E			01GD1					
					Northeast Creek - NE			01GD2					
					Hospital Point			01GD3					
					Dixon Fire Tower			01GD4					
					SW Water Tower			01GD5					
	05	05 #s	Northeast Creek	49%	Northeast Creek - E	50%	3206	05D1	22.389	92%	8%	0.05653	0.00481
	5%	45%			Northeast Creek - NE	50%	3207	05D2	22.389	92%	8%	0.05653	0.00481
			Hospital Point	25%	Hospital Point		3208	05D3	22.911	92%	8%	0.05785	0.00492
			Dixon Fire Tower	16%	Dixon Fire Tower		3209	05D4	14.218	92%	8%	0.03590	0.00305
			SW Water Tower	8%	SW Water Tower		3210	05D5	7.325	92%	8%	0.01850	0.00157
			Straight	2%	Straight Out		3211	05D6	1.512	92%	8%	0.00382	0.00032
		05D	Northeast Creek	49%	Northeast Creek - E	50%	3241	05DD1	27.365	92%	8%	0.06909	0.00588
		55%			Northeast Creek - NE	50%	3242	05DD2	27.365	92%	8%	0.06909	0.00588
			Hospital Point	25%	Hospital Point		3243	05DD3	28.003	92%	8%	0.07070	0.00602
			Dixon Fire Tower	16%	Dixon Fire Tower		3244	05DD4	17.378	92%	8%	0.04388	0.00373
			SW Water Tower	8%	SW Water Tower		3245	05DD5	8.953	92%	8%	0.02261	0.00192
			Straight	2%	Straight Out		3246	05DD6	1.848	92%	8%	0.00467	0.00040
		05F			Northeast Creek - E			05FD1					
					Northeast Creek - NE			05FD2					
					Hospital Point			05FD3					
					Dixon Fire Tower			05FD4					
					SW Water Tower			05FD5					
					Straight Out			05FD6					
	19	19 #s	Northeast Creek	52%	Northeast Creek - E	50%	3212	19D1	33.779	92%	8%	0.08529	0.00726
	33%	10%			Northeast Creek - NE	50%	3213	19D2	33.779	92%	8%	0.08529	0.00726
			Hospital Point	25%	Hospital Point		3214	19D3	32.361	92%	8%	0.08171	0.00695
			Dixon Fire Tower	19%	Dixon Fire Tower		3215	19D4	24.271	92%	8%	0.06128	0.00521
			SW Water Tower	4%	SW Water Tower		3216	19D5	4.921	92%	8%	0.01242	0.00106
			Rt 300 deg	1%	RT 300 Degrees		3217	19D8	1.835	92%	8%	0.00463	0.00039
		19A	Northeast Creek	52%	Northeast Creek - E	50%	3253	19AD1	101.336	92%	8%	0.25586	0.02177
		30%			Northeast Creek - NE	50%	3254	19AD2	101.336	92%	8%	0.25586	0.02177
			Hospital Point	25%	Hospital Point		3255	19AD3	97.083	92%	8%	0.24512	0.02086
			Dixon Fire Tower	19%	Dixon Fire Tower		3256	19AD4	72.812	92%	8%	0.18384	0.01564
			SW Water Tower	4%	SW Water Tower		3257	19AD5	14.763	92%	8%	0.03727	0.00317
			Rt 300 deg	1%	RT 300 Degrees		3258	19AD8	5.505	92%	8%	0.01390	0.00118
		19D	Northeast Creek	52%	Northeast Creek - E	50%	3259	19DD1	202.673	92%	8%	0.51173	0.04354
		60%			Northeast Creek - NE	50%	3260	19DD2	202.673	92%	8%	0.51173	0.04354
			Hospital Point	25%	Hospital Point		3261	19DD3	194.166	92%	8%	0.49025	0.04171
			Dixon Fire Tower	19%	Dixon Fire Tower		3262	19DD4	145.624	92%	8%	0.36769	0.03129
			SW Water Tower	4%	SW Water Tower		3263	19DD5	29.525	92%	8%	0.07455	0.00634
			Rt 300 deg	1%	RT 300 Degrees		3264	19DD8	11.009	92%	8%	0.02780	0.00237
		19G			Northeast Creek - E			19GD1					
					Northeast Creek - NE			19GD2					
					Hospital Point			19GD3					
					Dixon Fire Tower			19GD4					
					SW Water Tower			19GD5					
					RT 300 Degrees			19GD8					
	23	23 #s	Northeast Creek	40%	Northeast Creek - E	50%	3218	23D1	2.644	92%	8%	0.00668	0.00057
	7%	5%			Northeast Creek - NE	50%	3219	23D2	2.644	92%	8%	0.00668	0.00057
			Hospital Point	20%	Hosptial Point		3220	23D3	2.611	92%	8%	0.00659	0.00056
			Dixon Fire Tower	28%	Dixon Fire Tower		3221	23D4	3.716	92%	8%	0.00938	0.00080
			SW Water Tower	9%	SW Water Tower		3222	23D5	1.241	92%	8%	0.00313	0.00027
			Straight Out	0%	Straight Out		3223	23D6	0.053	92%	8%	0.00014	0.00001
			Sandy One	0%	Sandy One		3224	23D7	0.000	92%	8%	0.00000	0.00000
			RT 300 Degrees	1%	RT 300 Degrees		3225	23D8	0.184	92%	8%	0.00047	0.00004
		23D	Northeast Creek	40%	Northeast Creek - E	50%	3271	23DD1	7.933	92%	8%	0.02003	0.00170
		15%			Northeast Creek - NE	50%	3272	23DD2	7.933	92%	8%	0.02003	0.00170
			Hospital Point	20%	Hosptial Point		3273	23DD3	7.834	92%	8%	0.01978	0.00168
			Dixon Fire Tower	28%	Dixon Fire Tower		3274	23DD4	11.147	92%	8%	0.02814	0.00239
			SW Water Tower	9%	SW Water Tower		3275	23DD5	3.724	92%	8%	0.00940	0.00080
			Straight Out	0%	Straight Out		3276	23DD6	0.160	92%	8%	0.00041	0.00003
			Sandy One	0%			3277	23DD7	0.000	92%	8%	0.00000	0.00000
			RT 300 Degrees	1%	RT 300 Degrees		3278	23DD8	0.553	92%	8%	0.00140	0.00012
		23F	Northeast Creek	40%	Northeast Creek - E	50%	3279	23FD1	42.310	92%	8%	0.10683	0.00909
		80%			Northeast Creek - NE	50%	3280	23FD2	42.310	92%	8%	0.10683	0.00909
			Hospital Point	20%	Hosptial Point		3281	23FD3	41.779	92%	8%	0.10549	0.00898
			Dixon Fire Tower	28%	Dixon Fire Tower		3282	23FD4	59.451	92%	8%	0.15011	0.01277
			SW Water Tower	9%	SW Water Tower		3283	23FD5	19.859	92%	8%	0.05014	0.00427
			Straight Out	0%	Straight Out		3284	23FD6	0.856	92%	8%	0.00216	0.00018
			Sandy One	0%			3285	23FD7	0.000	92%	8%	0.00000	0.00000
			RT 300 Degrees	1%	RT 300 Degrees		3286	23FD8	2.948	92%	8%	0.00744	0.00063

Table A-10. Detailed CH-53E/K Operations used in Noise Model (cont.)

Track Type	Runway Group	Location		Long Name		Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Closed Patterr	01	01	visual	Tower Pattern	3301	01T1	34.687	93%	7%	0.08856	0.00647
	5%	45%									
Visual		01A	visual	Tower Pattern	3309	01AT1	19.270	93%	7%	0.04920	0.00360
1608		25%									
(events)		01D	visual	Tower Pattern	3311	01DT1	23.124	93%	7%	0.05904	0.00431
		30%									
	05	05	visual	Tower Pattern	3303	05T1	58.478	93%	7%	0.14930	0.01091
	18%	20%									
		05D	visual	Tower Pattern	3315	05DT1	58.478	93%	7%	0.14930	0.01091
		20%									
		05F	visual	Tower Pattern	3317	05FT1	175.434	93%	7%	0.44791	0.03273
		60%									
	19	19	visual	Tower Pattern	3305	19T1	39.356	93%	7%	0.10048	0.00734
	24%	10%									
		19A	visual	Tower Pattern	3319	19AT1	236.135	93%	7%	0.60289	0.04405
		60%									
		19D	visual	Tower Pattern	3321	19DT1	118.068	93%	7%	0.30145	0.02203
		30%									
	23	23	visual	Tower Pattern	3307	23T1	253.534	93%	7%	0.64731	0.04730
	53%	30%									
		23D	visual	Tower Pattern	3325	23DT1	84.511	93%	7%	0.21577	0.01577
		10%									
		23F	visual	Tower Pattern	3327	23FT1	507.068	93%	7%	1.29463	0.09460
		60%									
	01		GCA Box Pattern		3302	01G1	1.480	87%	13%	0.00353	0.00052
GCA Box	0%										
	05		GCA Box Pattern		3304	05G1	37.752	87%	13%	0.09009	0.01334
406	9%										
(events)	19		GCA Box Pattern		3306	19G1	71.062	87%	13%	0.16958	0.02511
	18%										
	23		GCA Box Pattern		3308	23G1	295.353	87%	13%	0.70481	0.10438
	73%										

Table A-11. MV-22 Assumptions for Arrival Operations

MV-22 ARRIVALS			
Topic	**Values**		**Source**
Arrivals by Course Rules	Runway 01	5%	ATAA
	Runway 05	16%	
	Runway 19	9%	
	Runway 23	70%	
Runway 01 Arrivals FROM:	NE Creek	36%	ATAA
	Hospital Point	49%	
	Dixon Fire Tower	11%	
	SW Water Tower	3%	
Runway 05 Arrivals FROM:	NE Creek	35%	ATAA
	Hospital Point	37%	
	Dixon Fire Tower	20%	
	SW Water Tower	8%	
Runway 19 Arrivals FROM:	NE Creek	36%	ATAA
	Hospital Point	50%	
	Dixon Fire Tower	9%	
	SW Water Tower	5%	
Runway 23 Arrivals FROM:	NE Creek	49%	ATAA
	Hospital Point	34%	
	Dixon Fire Tower	12%	
	SW Water Tower	5%	
SI and Instrument Approaches	CONV Mode	20%	
	ARPLN Mode	80%	
SI and Instrument Approaches	Runway 01	5%	ATAA
	Runway 05	16%	
	Runway 19	14%	
	Runway 23	65%	
Overhead Approaches	CONV Mode	30%	
	ARPLN Mode	70%	
Overhead Approaches	Runway 01	1%	ATAA
	Runway 05	12%	
	Runway 19	11%	
	Runway 23	76%	

Table A-12. MV-22 Assumptions for Departure Operations

MV-22 DEPARTURES			
Topic	**Values**		**Source**
Departures by Runway	Runway 01	5%	ATAA
	Runway 05	22%	
	Runway 19	11%	
	Runway 23	63%	
Depart Rwy 01 - FROM:	#s	80%	Interview
	Intersection twy A	20%	
Depart Rwy 05 - FROM:	#s	80%	Interview
	Intersection twy D	20%	
Depart Rwy 19 - FROM:	#s	10%	Interview
	Intersection twy A	30%	
	Intersection twy D	60%	
Depart Rwy 23 - FROM:	#s	5%	Interview
	Intersection twy D	15%	
	Intersection twy F	80%	
Runway 01 Departures TO:	NE Creek	30%	ATAA
	Hospital Point	22%	
	Dixon Fire Tower	5%	
	SW Water Tower	17%	
	Straight	26%	
Runway 05 Departures TO:	NE Creek	60%	ATAA
	Hospital Point	20%	
	Dixon Fire Tower	6%	
	SW Water Tower	14%	
	Straight	<1%	
Runway 19 Departures TO:	NE Creek	35%	ATAA
	Hospital Point	39%	
	Dixon Fire Tower	10%	
	SW Water Tower	16%	
	Right Turn to 300	<1%	
Runway 23 Departures TO:	NE Creek	47%	ATAA
	Hospital Point	21%	
	Dixon Fire Tower	11%	
	SW Water Tower	20%	
	Straight	<1%	
	Right Turn to 300	<1%	
NE Creek Arrivals GO TO:	East	50%	Interview
	Northeast	50%	

Table A-13. MV-22 Assumptions for Closed Pattern Operations

MV-22 CLOSED PATTERNS			
Topic	**Values**		**Source**
Visual Patterns	Runway 01	9%	ATAA
	Runway 05	17%	
	Runway 19	28%	
	Runway 23	46%	
GCA Box Patterns TO	Runway 01	2%	ATAA
	Runway 05	7%	
	Runway 19	21%	
	Runway 23	70%	

Table A-14. MV-22 Assumptions for Day/Night Operations

	Day (0700-2200L)	Night (2200-0700L)
Departure	92%	8%
Arrival	81%	19%
Closed Visual Pattern	90%	10%
GCA Box	84%	16%

Source: ATAA

Table A-15. Detailed MV-22 Baseline Operations used in Noise Model

Track Type	Runway Group	Location			Long Name		Profile	Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Arrival		01	Northeast Creek	36%	Conv mode		4101	01A1	22.322	81%	19%	0.04983	0.01132
Crs Rules		5%	Hospital Point	49%	Conv mode		4102	01A3	30.474	81%	19%	0.06803	0.01546
1167			Dixon Fire Tower	11%	Conv mode		4103	01A5	6.988	81%	19%	0.01560	0.00354
			SW Water Tower	3%	Conv mode		4104	01A6	2.135	81%	19%	0.00477	0.00108
		05	Northeast Creek	35%	Conv mode		4109	05A1	64.830	81%	19%	0.14473	0.03289
		16%	Hospital Point	37%	Conv mode		4110	05A2	67.353	81%	19%	0.15036	0.03417
			Dixon Fire Tower	20%	Conv mode		4111	05A3	36.297	81%	19%	0.08103	0.01841
			SW Water Tower	8%	Conv mode		4112	05A4	15.140	81%	19%	0.03380	0.00768
		19	Northeast Creek	36%	Conv mode		4117	19A1	37.073	81%	19%	0.08276	0.01881
		9%	Hospital Point	50%	Conv mode		4118	19A5	51.825	81%	19%	0.11570	0.02629
			Dixon Fire Tower	9%	Conv mode		4119	19A6	9.317	81%	19%	0.02080	0.00473
			SW Water Tower	5%	Conv mode		4120	19A7	4.853	81%	19%	0.01083	0.00246
		23	Northeast Creek	49%	Conv mode		4125	23A1	397.712	81%	19%	0.88787	0.20175
		70%	Hospital Point	34%	Conv mode		4126	23A6	280.087	81%	19%	0.62528	0.14208
			Dixon Fire Tower	12%	Conv mode		4127	23A5	96.468	81%	19%	0.21536	0.04894
			SW Water Tower	5%	Conv mode		4128	23A7	44.061	81%	19%	0.09836	0.02235
		01	Straight-In / Inst		Conversion Mode	20%	4105	01A7	27.110	81%	19%	0.06052	0.01375
S/I - Vis and Inst		5%	Straight-In / Inst		Airplane Mode	80%	4106	01A7	108.439	81%	19%	0.24209	0.05501
		05	Straight-In / Inst		Conversion Mode	20%	4113	05A5	94.069	81%	19%	0.21000	0.04772
2992		16%	Straight-In / Inst		Airplane Mode	80%	4114	05A5	376.275	81%	19%	0.84002	0.19087
		19	Straight-In / Inst		Conversion Mode	20%	4121	19A8	86.223	81%	19%	0.19249	0.04374
		14%	Straight-In / Inst		Airplane Mode	80%	4122	19A8	344.893	81%	19%	0.76996	0.17496
		23	Straight-In / Inst		Conversion Mode	20%	4129	23A8	390.956	81%	19%	0.87279	0.19832
		65%	Straight-In / Inst		Airplane Mode	80%	4130	23A8	1563.826	81%	19%	3.49117	0.79329
		01	Overhead		Conversion Mode	30%	4107	01O1	3.086	81%	19%	0.00689	0.00157
OVHD		1%	Overhead		Airplane Mode	70%	4108	01O1	7.201	81%	19%	0.01608	0.00365
758		05	Overhead		Conversion Mode	30%	4115	05O1	27.775	81%	19%	0.06201	0.01409
		12%	Overhead		Airplane Mode	70%	4116	05O1	64.809	81%	19%	0.14468	0.03288
		19	Overhead		Conversion Mode	30%	4123	19O1	23.990	81%	19%	0.05356	0.01217
		11%	Overhead		Airplane Mode	70%	4124	19O1	55.978	81%	19%	0.12497	0.02840
		23	Overhead		Conversion Mode	30%	4131	23O1 - S	172.533	81%	19%	0.38517	0.08752
		76%	Overhead		Airplane Mode	70%	4132	23O1 - S	402.577	81%	19%	0.89873	0.20422

Table A-15. Detailed MV-22 Baseline Operations used in Noise Model (cont.)

Track Type	Runway Group	Location			Long Name				TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Departure	01	01	Northeast Creek	30%	Northeast Creek - E	50%	4201	01D1	27.230	92%	8%	0.06852	0.00608
	5%	80%			Northeast Creek - NE	50%	4202	01D2	27.230	92%	8%	0.06852	0.00608
4917			Hospital Point	22%	Hospital Point		4203	01D3	39.038	92%	8%	0.09823	0.00872
			Dixon Fire Tower	5%	Dixon Fire Tower		4204	01D4	8.675	92%	8%	0.02183	0.00194
			SW Water Tower	17%	SW Water Tower		4205	01D5	31.326	92%	8%	0.07883	0.00700
			Straight	26%	Straight Out - ARPLN		4206	01D6	47.713	92%	8%	0.12006	0.01065
		01A - VTO	Northeast Creek	30%	Northeast Creek - E	50%	4207	01AD1	6.807	92%	8%	0.01713	0.00152
		20%			Northeast Creek - NE	50%	4208	01AD2	6.807	92%	8%	0.01713	0.00152
			Hospital Point	22%	Hospital Point		4209	01AD3	9.759	92%	8%	0.02456	0.00218
			Dixon Fire Tower	5%	Dixon Fire Tower		4210	01AD4	2.169	92%	8%	0.00546	0.00048
			SW Water Tower	17%	SW Water Tower		4211	01AD5	7.832	92%	8%	0.01971	0.00175
			Straight	26%	Straight Out - ARPLN		4212	01AD6	11.928	92%	8%	0.03002	0.00266
	05	05	Northeast Creek	60%	Northeast Creek - E	50%	4213	05D1	253.315	92%	8%	0.63745	0.05657
	22%	80%			Northeast Creek - NE	50%	4214	05D2	253.315	92%	8%	0.63745	0.05657
			Hospital Point	20%	Hospital Point		4215	05D3	166.620	92%	8%	0.41929	0.03721
			Dixon Fire Tower	6%	Dixon Fire Tower		4216	05D7	50.881	92%	8%	0.12804	0.01136
			SW Water Tower	14%	SW Water Tower		4217	05D5	122.508	92%	8%	0.30828	0.02736
			Straight	0%	Straight Out - ARPLN		4218	05D6	4.149	92%	8%	0.01044	0.00093
		05D - VTO	Northeast Creek	60%	Northeast Creek - E	50%	4219	05DD1	63.329	92%	8%	0.15936	0.01414
		20%			Northeast Creek - NE	50%	4220	05DD2	63.329	92%	8%	0.15936	0.01414
			Hospital Point	20%	Hospital Point		4221	05DD3	41.655	92%	8%	0.10482	0.00930
			Dixon Fire Tower	6%	Dixon Fire Tower		4222	05DD7	12.720	92%	8%	0.03201	0.00284
			SW Water Tower	14%	SW Water Tower		4223	05DD5	30.627	92%	8%	0.07707	0.00684
			Straight	0%	Straight Out - ARPLN		4224	05DD6	1.037	92%	8%	0.00261	0.00023
	19	19	Northeast Creek	35%	Northeast Creek - E	50%	4225	19D1	9.217	92%	8%	0.02320	0.00206
	11%	10%			Northeast Creek - NE	50%	4226	19D2	9.217	92%	8%	0.02320	0.00206
			Hospital Point	39%	Hospital Point		4227	19D3	20.883	92%	8%	0.05255	0.00466
			Dixon Fire Tower	10%	Dixon Fire Tower		4228	19D4	5.049	92%	8%	0.01270	0.00113
			SW Water Tower	16%	SW Water Tower		4229	19D5	8.338	92%	8%	0.02098	0.00186
			Rt 300 deg	0%	RT 300 Degrees - ARPLN		4230	19D8	0.229	92%	8%	0.00058	0.00005
		19A - VTO	Northeast Creek	35%	Northeast Creek - E	50%	4231	19AD1	27.652	92%	8%	0.06959	0.00617
		30%			Northeast Creek - NE	50%	4232	19AD2	27.652	92%	8%	0.06959	0.00617
			Hospital Point	39%	Hospital Point		4233	19AD3	62.648	92%	8%	0.15765	0.01399
			Dixon Fire Tower	10%	Dixon Fire Tower		4234	19AD4	15.146	92%	8%	0.03811	0.00338
			SW Water Tower	16%	SW Water Tower		4235	19AD5	25.013	92%	8%	0.06294	0.00559
			Rt 300 deg	0%	RT 300 Degrees - ARPLN		4236	19AD8	0.688	92%	8%	0.00173	0.00015
		19D - VTO	Northeast Creek	35%	Northeast Creek - E	50%	4237	19DD1	55.305	92%	8%	0.13917	0.01235
		60%			Northeast Creek - NE	50%	4238	19DD2	55.305	92%	8%	0.13917	0.01235
			Hospital Point	39%	Hospital Point		4239	19DD3	125.296	92%	8%	0.31530	0.02798
			Dixon Fire Tower	10%	Dixon Fire Tower		4240	19DD4	30.291	92%	8%	0.07623	0.00676
			SW Water Tower	16%	SW Water Tower		4241	19DD5	50.027	92%	8%	0.12589	0.01117
			Rt 300 deg	0%	RT 300 Degrees - ARPLN		4242	19DD8	1.377	92%	8%	0.00346	0.00031
	23	23	Northeast Creek	47%	Northeast Creek - E	50%	4243	23D1	36.649	92%	8%	0.09222	0.00818
	63%	5%			Northeast Creek - NE	50%	4244	23D2	36.649	92%	8%	0.09222	0.00818
			Hospital Point	21%	Hosptial Point		4245	23D3	32.388	92%	8%	0.08150	0.00723
			Dixon Fire Tower	11%	Dixon Fire Tower		4246	23D4	17.497	92%	8%	0.04403	0.00391
			SW Water Tower	20%	SW Water Tower		4247	23D5	31.158	92%	8%	0.07841	0.00696
			Straight Out	0%	Straight Out - ARPLN		4248	23D6	0.102	92%	8%	0.00026	0.00002
			RT 300 Degrees	0%	RT 300 Degrees - ARPLN		4249	23D8	0.439	92%	8%	0.00111	0.00010
		23D	Northeast Creek	47%	Northeast Creek - E	50%	4250	23DD1	109.947	92%	8%	0.27667	0.02455
		15%			Northeast Creek - NE	50%	4251	23DD2	109.947	92%	8%	0.27667	0.02455
			Hospital Point	21%	Hosptial Point		4252	23DD3	97.164	92%	8%	0.24451	0.02170
			Dixon Fire Tower	11%	Dixon Fire Tower		4253	23DD4	52.492	92%	8%	0.13209	0.01172
			SW Water Tower	20%	SW Water Tower		4254	23DD5	93.475	92%	8%	0.23522	0.02087
			Straight Out	0%	Straight Out		4255	23DD6	0.307	92%	8%	0.00077	0.00007
			RT 300 Degrees	0%	RT 300 Degrees		4256	23DD8	1.318	92%	8%	0.00332	0.00029
		23F	Northeast Creek	47%	Northeast Creek - E	50%	4257	23FD1	586.384	92%	8%	1.47559	0.13094
		80%			Northeast Creek - NE	50%	4258	23FD2	586.384	92%	8%	1.47559	0.13094
			Hospital Point	21%	Hosptial Point		4259	23FD3	518.210	92%	8%	1.30404	0.11572
			Dixon Fire Tower	11%	Dixon Fire Tower		4260	23FD4	279.955	92%	8%	0.70449	0.06251
			SW Water Tower	20%	SW Water Tower		4261	23FD5	498.531	92%	8%	1.25452	0.11132
			Straight Out	0%	Straight Out		4262	23FD6	1.640	92%	8%	0.00413	0.00037
			RT 300 Degrees	0%	RT 300 Degrees		4263	23FD8	7.028	92%	8%	0.01769	0.00157

Table A-15. Detailed MV-22 Baseline Operations used in Noise Model (cont.)

Track Type	Runway Group	Location		Long Name				TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Closed Pattern	01		visual/tower pattern	CONV Pattern	40%	4301	01T1	45.028	90%	10%	0.11056	0.01281
visual	9%			ARPLN Pattern	60%	4302	01T1	67.541	90%	10%	0.16584	0.01921
			visual/tower pattern	CONV Pattern	40%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	60%			0.000	90%	10%	0.00000	0.00000
				Outer Touch and Go - Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
1244	05		visual/tower pattern	CONV Pattern	23%	4304	05T1	47.779	90%	10%	0.11731	0.01359
(events)	17%			ARPLN Pattern	77%	4305	05T1	159.956	90%	10%	0.39274	0.04549
			visual/tower pattern	CONV Pattern	23%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	77%			0.000	90%	10%	0.00000	0.00000
				Outer Touch and Go Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
	19		visual/tower pattern	CONV Pattern	55%	4307	19T1	194.089	90%	10%	0.47655	0.05520
	28%			ARPLN Pattern	45%	4308	19T1	158.800	90%	10%	0.38990	0.04516
			visual/tower pattern	CONV Pattern	55%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	45%			0.000	90%	10%	0.00000	0.00000
			visual/tower pattern	CONV Pattern	55%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	45%			0.000	90%	10%	0.00000	0.00000
				Outer Touch and Go Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
	23		visual/tower pattern	CONV Pattern	12%	4310	23T1	68.497	90%	10%	0.16818	0.01948
	46%			ARPLN Pattern	88%	4311	23T1	502.310	90%	10%	1.23333	0.14286
		23D	visual/tower pattern	Outer Pattern	12%				90%	10%	0.00000	0.00000
		100%		Close-In Pattern	88%				90%	10%	0.00000	0.00000
		23F		Outer Touch and Go Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
	01		GCA Box Pattern			4303	01G1	6.117	84%	16%	0.01412	0.00264
GCA Box	2%											
	05		GCA Box Pattern			4306	05G1	29.845	84%	16%	0.06888	0.01289
398	7%											
	19		GCA Box Pattern			4309	19G1	83.975	84%	16%	0.19381	0.03626
	21%											
	23		GCA Box Pattern			4312	23G1	278.062	84%	16%	0.64175	0.12006
	70%											

Table A-16. Detailed MV-22 No Action Operations used in Noise Model

Track Type	Runway Group	Location			Long Name		Profile	Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Arrival		01	Northeast Creek	36%	Conv mode		4101	01A1	25.932	81%	19%	0.05789	0.01315
Crs Rules		5%	Hospital Point	49%	Conv mode		4102	01A3	35.403	81%	19%	0.07903	0.01796
1356			Dixon Fire Tower	11%	Conv mode		4103	01A5	8.118	81%	19%	0.01812	0.00412
			SW Water Tower	3%	Conv mode		4104	01A6	2.480	81%	19%	0.00554	0.00126
		05	Northeast Creek	35%	Conv mode		4109	05A1	75.315	81%	19%	0.16814	0.03821
		16%	Hospital Point	37%	Conv mode		4110	05A2	78.247	81%	19%	0.17468	0.03969
			Dixon Fire Tower	20%	Conv mode		4111	05A3	42.168	81%	19%	0.09414	0.02139
			SW Water Tower	8%	Conv mode		4112	05A4	17.589	81%	19%	0.03927	0.00892
		19	Northeast Creek	36%	Conv mode		4117	19A1	43.070	81%	19%	0.09615	0.02185
		9%	Hospital Point	50%	Conv mode		4118	19A5	60.207	81%	19%	0.13441	0.03054
			Dixon Fire Tower	9%	Conv mode		4119	19A6	10.824	81%	19%	0.02416	0.00549
			SW Water Tower	5%	Conv mode		4120	19A7	5.637	81%	19%	0.01259	0.00286
		23	Northeast Creek	49%	Conv mode		4125	23A1	462.040	81%	19%	1.03148	0.23438
		70%	Hospital Point	34%	Conv mode		4126	23A6	325.389	81%	19%	0.72642	0.16506
			Dixon Fire Tower	12%	Conv mode		4127	23A5	112.071	81%	19%	0.25019	0.05685
			SW Water Tower	5%	Conv mode		4128	23A7	51.187	81%	19%	0.11427	0.02597
		01	Straight-In / Inst		Conversion Mode	20%	4105	01A7	31.495	81%	19%	0.07031	0.01598
S/I - Vis and Inst		5%	Straight-In / Inst		Airplane Mode	80%	4106	01A7	125.979	81%	19%	0.28124	0.06391
		05	Straight-In / Inst		Conversion Mode	20%	4113	05A5	109.284	81%	19%	0.24397	0.05544
3476		16%	Straight-In / Inst		Airplane Mode	80%	4114	05A5	437.136	81%	19%	0.97588	0.22175
		19	Straight-In / Inst		Conversion Mode	20%	4121	19A8	100.169	81%	19%	0.22362	0.05081
		14%	Straight-In / Inst		Airplane Mode	80%	4122	19A8	400.678	81%	19%	0.89449	0.20325
		23	Straight-In / Inst		Conversion Mode	20%	4129	23A8	454.191	81%	19%	1.01396	0.23040
		65%	Straight-In / Inst		Airplane Mode	80%	4130	23A8	1816.766	81%	19%	4.05584	0.92160
		01	Overhead		Conversion Mode	30%	4107	01O1	3.585	81%	19%	0.00800	0.00182
OVHD		1%	Overhead		Airplane Mode	70%	4108	01O1	8.366	81%	19%	0.01868	0.00424
881		05	Overhead		Conversion Mode	30%	4115	05O1	32.268	81%	19%	0.07204	0.01637
		12%	Overhead		Airplane Mode	70%	4116	05O1	75.292	81%	19%	0.16808	0.03819
		19	Overhead		Conversion Mode	30%	4123	19O1	27.871	81%	19%	0.06222	0.01414
		11%	Overhead		Airplane Mode	70%	4124	19O1	65.032	81%	19%	0.14518	0.03299
		23	Overhead		Conversion Mode	30%	4131	23O1 - S	200.439	81%	19%	0.44747	0.10168
		76%	Overhead		Airplane Mode	70%	4132	23O1 - S	467.692	81%	19%	1.04410	0.23725

Table A-16. Detailed MV-22 No Action Operations used in Noise Model (cont)

Track Type	Runway Group	Location			Long Name			Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Departure	01	01	Northeast Creek	30%	Northeast Creek - E	50%	4201	01D1	31.634	92%	8%	0.07960	0.00706
	5%	80%			Northeast Creek - NE	50%	4202	01D2	31.634	92%	8%	0.07960	0.00706
5712			Hospital Point	22%	Hospital Point		4203	01D3	45.352	92%	8%	0.11412	0.01013
			Dixon Fire Tower	5%	Dixon Fire Tower		4204	01D4	10.078	92%	8%	0.02536	0.00225
			SW Water Tower	17%	SW Water Tower		4205	01D5	36.393	92%	8%	0.09158	0.00813
			Straight	26%	Straight Out - ARPLN		4206	01D6	55.430	92%	8%	0.13948	0.01238
		01A - VTO	Northeast Creek	30%	Northeast Creek - E	50%	4207	01AD1	7.909	92%	8%	0.01990	0.00177
		20%			Northeast Creek - NE	50%	4208	01AD2	7.909	92%	8%	0.01990	0.00177
			Hospital Point	22%	Hospital Point		4209	01AD3	11.338	92%	8%	0.02853	0.00253
			Dixon Fire Tower	5%	Dixon Fire Tower		4210	01AD4	2.520	92%	8%	0.00634	0.00056
			SW Water Tower	17%	SW Water Tower		4211	01AD5	9.098	92%	8%	0.02290	0.00203
			Straight	26%	Straight Out - ARPLN		4212	01AD6	13.857	92%	8%	0.03487	0.00309
	05	05	Northeast Creek	60%	Northeast Creek - E	50%	4213	05D1	294.287	92%	8%	0.74055	0.06572
	22%	80%			Northeast Creek - NE	50%	4215	05D2	294.287	92%	8%	0.74055	0.06572
			Hospital Point	20%	Hospital Point		4217	05D3	193.570	92%	8%	0.48710	0.04322
			Dixon Fire Tower	6%	Dixon Fire Tower		4219	05D7	59.111	92%	8%	0.14875	0.01320
			SW Water Tower	14%	SW Water Tower		4221	05D5	142.323	92%	8%	0.35815	0.03178
			Straight	0%	Straight Out - ARPLN		4224	05D6	4.820	92%	8%	0.01213	0.00108
		05D - VTO	Northeast Creek	60%	Northeast Creek - E	50%	4219	05DD1	73.572	92%	8%	0.18514	0.01643
		20%			Northeast Creek - NE	50%	4220	05DD2	73.572	92%	8%	0.18514	0.01643
			Hospital Point	20%	Hospital Point		4221	05DD3	48.392	92%	8%	0.12178	0.01081
			Dixon Fire Tower	6%	Dixon Fire Tower		4222	05DD7	14.778	92%	8%	0.03719	0.00330
			SW Water Tower	14%	SW Water Tower		4223	05DD5	35.581	92%	8%	0.08954	0.00795
			Straight	0%	Straight Out - ARPLN		4224	05DD6	1.205	92%	8%	0.00303	0.00027
	19	19	Northeast Creek	35%	Northeast Creek - E	50%	4225	19D1	10.708	92%	8%	0.02695	0.00239
	11%	10%			Northeast Creek - NE	50%	4227	19D2	10.708	92%	8%	0.02695	0.00239
			Hospital Point	39%	Hospital Point		4229	19D3	24.260	92%	8%	0.06105	0.00542
			Dixon Fire Tower	10%	Dixon Fire Tower		4231	19D4	5.865	92%	8%	0.01476	0.00131
			SW Water Tower	16%	SW Water Tower		4233	19D5	9.686	92%	8%	0.02438	0.00216
			Rt 300 deg	0%	RT 300 Degrees - ARPLN		4238	19D8	0.267	92%	8%	0.00067	0.00006
		19A - VTO	Northeast Creek	35%	Northeast Creek - E	50%	4231	19AD1	32.125	92%	8%	0.08084	0.00717
		30%			Northeast Creek - NE	50%	4232	19AD2	32.125	92%	8%	0.08084	0.00717
			Hospital Point	39%	Hospital Point		4233	19AD3	72.781	92%	8%	0.18315	0.01625
			Dixon Fire Tower	10%	Dixon Fire Tower		4234	19AD4	17.595	92%	8%	0.04428	0.00393
			SW Water Tower	16%	SW Water Tower		4235	19AD5	29.059	92%	8%	0.07313	0.00649
			Rt 300 deg	0%	RT 300 Degrees - ARPLN		4236	19AD8	0.800	92%	8%	0.00201	0.00018
		19D - VTO	Northeast Creek	35%	Northeast Creek - E	50%	4237	19DD1	64.250	92%	8%	0.16168	0.01435
		60%			Northeast Creek - NE	50%	4238	19DD2	64.250	92%	8%	0.16168	0.01435
			Hospital Point	39%	Hospital Point		4239	19DD3	145.562	92%	8%	0.36630	0.03250
			Dixon Fire Tower	10%	Dixon Fire Tower		4240	19DD4	35.191	92%	8%	0.08856	0.00786
			SW Water Tower	16%	SW Water Tower		4241	19DD5	58.118	92%	8%	0.14625	0.01298
			Rt 300 deg	0%	RT 300 Degrees - ARPLN		4242	19DD8	1.600	92%	8%	0.00403	0.00036
	23	23	Northeast Creek	47%	Northeast Creek - E	50%	4239	23D1	42.577	92%	8%	0.10714	0.00951
	63%	5%			Northeast Creek - NE	50%	4241	23D2	42.577	92%	8%	0.10714	0.00951
			Hospital Point	21%	Hosptial Point		4243	23D3	37.627	92%	8%	0.09468	0.00840
			Dixon Fire Tower	11%	Dixon Fire Tower		4245	23D4	20.327	92%	8%	0.05115	0.00454
			SW Water Tower	20%	SW Water Tower		4247	23D5	36.198	92%	8%	0.09109	0.00808
			Straight Out	0%	Straight Out - ARPLN		4250	23D6	0.119	92%	8%	0.00030	0.00003
			RT 300 Degrees	0%	RT 300 Degrees - ARPLN		4252	23D8	0.510	92%	8%	0.00128	0.00011
		23D	Northeast Creek	47%	Northeast Creek - E	50%	4250	23DD1	127.730	92%	8%	0.32142	0.02852
		15%			Northeast Creek - NE	50%	4251	23DD2	127.730	92%	8%	0.32142	0.02852
			Hospital Point	21%	Hosptial Point		4252	23DD3	112.880	92%	8%	0.28405	0.02521
			Dixon Fire Tower	11%	Dixon Fire Tower		4253	23DD4	60.982	92%	8%	0.15346	0.01362
			SW Water Tower	20%	SW Water Tower		4254	23DD5	108.594	92%	8%	0.27327	0.02425
			Straight Out	0%	Straight Out		4255	23DD6	0.357	92%	8%	0.00090	0.00008
			RT 300 Degrees	0%	RT 300 Degrees		4256	23DD8	1.531	92%	8%	0.00385	0.00034
		23F	Northeast Creek	47%	Northeast Creek - E	50%	4257	23FD1	681.228	92%	8%	1.71426	0.15212
		80%			Northeast Creek - NE	50%	4258	23FD2	681.228	92%	8%	1.71426	0.15212
			Hospital Point	21%	Hosptial Point		4259	23FD3	602.028	92%	8%	1.51496	0.13443
			Dixon Fire Tower	11%	Dixon Fire Tower		4260	23FD4	325.237	92%	8%	0.81843	0.07263
			SW Water Tower	20%	SW Water Tower		4261	23FD5	579.166	92%	8%	1.45743	0.12933
			Straight Out	0%	Straight Out		4262	23FD6	1.905	92%	8%	0.00479	0.00043
			RT 300 Degrees	0%	RT 300 Degrees		4263	23FD8	8.165	92%	8%	0.02055	0.00182

Table A-16. Detailed MV-22 No Action Operations used in Noise Model (cont)

Track Type	Runway Group	Location		Long Name			Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
Closed Pattern	01		visual/tower pattern	CONV Pattern	40%	4301	01T1	52.311	90%	10%	0.12844	0.01488
visual	9%			ARPLN Pattern	60%	4302	01T1	78.466	90%	10%	0.19266	0.02232
			visual/tower pattern	CONV Pattern	40%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	60%			0.000	90%	10%	0.00000	0.00000
				Outer Touch and Go - Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
1445	05		visual/tower pattern	CONV Pattern	23%	4304	05T1	55.507	90%	10%	0.13629	0.01579
(events)	17%			ARPLN Pattern	77%	4305	05T1	185.827	90%	10%	0.45626	0.05285
			visual/tower pattern	CONV Pattern	23%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	77%			0.000	90%	10%	0.00000	0.00000
				Outer Touch and Go Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
	19		visual/tower pattern	CONV Pattern	55%	4307	19T1	225.482	90%	10%	0.55363	0.06413
	28%			ARPLN Pattern	45%	4308	19T1	184.485	90%	10%	0.45297	0.05247
			visual/tower pattern	CONV Pattern	55%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	45%			0.000	90%	10%	0.00000	0.00000
			visual/tower pattern	CONV Pattern	55%			0.000	90%	10%	0.00000	0.00000
				ARPLN Pattern	45%			0.000	90%	10%	0.00000	0.00000
				Outer Touch and Go Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
	23		visual/tower pattern	CONV Pattern	12%	4310	23T1	79.576	90%	10%	0.19538	0.02263
	46%			ARPLN Pattern	88%	4311	23T1	583.556	90%	10%	1.43281	0.16597
		23D	visual/tower pattern	Outer Pattern	12%				90%	10%	0.00000	0.00000
		100%		Close-In Pattern	88%				90%	10%	0.00000	0.00000
		23F		Outer Touch and Go Narrow								
				Close In Touch and Go								
				GCA Box Pattern								
	01		GCA Box Pattern			4303	01G1	7.107	84%	16%	0.01640	0.00307
GCA Box	2%											
	05		GCA Box Pattern			4306	05G1	34.673	84%	16%	0.08002	0.01497
462	7%											
	19		GCA Box Pattern			4309	19G1	97.557	84%	16%	0.22516	0.04212
	21%											
	23		GCA Box Pattern			4312	23G1	323.037	84%	16%	0.74555	0.13948
	70%											

Table A-17. Assumptions for Transient Operations

TRANSIENT RUNWAY USE			
Topic	**Values**		**Source**
Transport	Runway 01	11%	ATAA
	Runway 05	20%	
includes ATAA entries:	Runway 19	17%	
C17, C9, LARGE CIVIL	Runway 23	51%	
Fighter	Runway 01	5%	ATAA
	Runway 05	13%	
includes ATAA entries:	Runway 19	25%	
AV8, F18	Runway 23	56%	
Light Jet	Runway 01	9%	ATAA
	Runway 05	19%	
includes ATAA entries:	Runway 19	7%	
C21, C560, G5, LR35	Runway 23	64%	
Heavy Turbo	Runway 01	7%	ATAA
	Runway 05	16%	
includes ATAA entries:	Runway 19	13%	
C130, C27	Runway 23	64%	
Light Turbo	Runway 01	11%	ATAA
	Runway 05	17%	
includes ATAA entries:	Runway 19	14%	
C12, LIGHT CIVIL, SW4, T34	Runway 23	57%	
Heavy Helicopter	Runway 01	Same as based CH-53	ATAA
	Runway 05		
includes ATAA entries:	Runway 19		
H46, H47	Runway 23		
Light Helicopter	Runway 01	Same as based H-1	ATAA
	Runway 05		
includes ATAA entries:	Runway 19		
CIVIL HELO, H500, H58, H60, H64	Runway 23		
All Transients	Day (0700-2200L)	96%	Interview / ATAA
	Night (2200-0700L)	4%	

Table A-18. Transient Aircraft Operations

Aircraft	Runway	Type Operation	Long Name	Profile	Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
	01	Arrival	Straight-In	9101	01A7	1.010	96%	4%	0.00266	0.00011
Transport	11%									
18		Departure	Departure	9201	01D6	1.010	96%	4%	0.00266	0.00011
	05	Arrival	Straight-In	9102	05A5	1.837	96%	4%	0.00483	0.00020
	20%									
		Departure	Departure	9202	05D6	1.837	96%	4%	0.00483	0.00020
	19	Arrival	Straight-In	9103	19A8	1.561	96%	4%	0.00411	0.00017
	17%									
		Departure	Departure	9203	19D6	1.561	96%	4%	0.00411	0.00017
	23	Arrival	Straight-In	9104	23A8	4.592	96%	4%	0.01208	0.00050
	51%									
		Departure	Departure	9204	23D6	4.592	96%	4%	0.01208	0.00050
	01	Arrival	Straight-In	9105	01A7	0.327	96%	4%	0.00086	0.00004
Fighter	5%									
12		Departure	Departure	9205	01D6	0.327	96%	4%	0.00086	0.00004
	05	Arrival	Straight-In	9106	05A5	0.764	96%	4%	0.00201	0.00008
	13%									
		Departure	Departure	9206	05D6	0.764	96%	4%	0.00201	0.00008
	19	Arrival	Straight-In	9107	19A8	1.527	96%	4%	0.00402	0.00017
	25%									
		Departure	Departure	9207	19D6	1.527	96%	4%	0.00402	0.00017
	23	Arrival	Straight-In	9108	23A8	3.382	96%	4%	0.00889	0.00037
	56%									
		Departure	Departure	9208	23D6	3.382	96%	4%	0.00889	0.00037
	01	Arrival	Straight-In	9109	01A7	1.860	96%	4%	0.00489	0.00020
Lt Jet	9%									
40		Departure	Departure	9209	01D6	1.860	96%	4%	0.00489	0.00020
	05	Arrival	Straight-In	9110	05A5	3.814	96%	4%	0.01003	0.00042
	19%									
		Departure	Departure	9210	05D6	3.814	96%	4%	0.01003	0.00042
	19	Arrival	Straight-In	9111	19A8	1.488	96%	4%	0.00391	0.00016
	7%									
		Departure	Departure	9211	19D6	1.488	96%	4%	0.00391	0.00016
	23	Arrival	Straight-In	9112	23A8	12.837	96%	4%	0.03376	0.00141
	64%									
		Departure	Departure	9212	23D6	12.837	96%	4%	0.03376	0.00141

Table A-18. Transient Aircraft Operations (cont)

Aircraft	Runway	Type Operation	Long Name	Profile	Track	TOTAL EVENTS PER YEAR	Day %	Night %	Events per day	Events per night
	01	Arrival	Straight-In	9113	01A7	4.436	96%	4%	0.01167	0.00049
Hvy Turbo	7%									
122		Departure	Departure	9213	01D6	4.436	96%	4%	0.01167	0.00049
	05	Arrival	Straight-In	9114	05A5	9.982	96%	4%	0.02625	0.00109
	16%									
		Departure	Departure	9214	05D6	9.982	96%	4%	0.02625	0.00109
	19	Arrival	Straight-In	9115	19A8	7.764	96%	4%	0.02042	0.00085
	13%									
		Departure	Departure	9215	19D6	7.764	96%	4%	0.02042	0.00085
	23	Arrival	Straight-In	9116	23A8	38.818	96%	4%	0.10210	0.00425
	64%									
		Departure	Departure	9216	23D6	38.818	96%	4%	0.10210	0.00425
	01	Arrival	Straight-In	9117	01A7	48.830	96%	4%	0.12843	0.00535
Lt Turbo	11%									
852		Departure	Departure	9217	01D6	48.830	96%	4%	0.12843	0.00535
	05	Arrival	Straight-In	9118	05A5	74.213	96%	4%	0.19519	0.00813
	17%									
		Departure	Departure	9218	05D6	74.213	96%	4%	0.19519	0.00813
	19	Arrival	Straight-In	9119	19A8	61.134	96%	4%	0.16079	0.00670
	14%									
		Departure	Departure	9219	19D6	61.134	96%	4%	0.16079	0.00670
	23	Arrival	Straight-In	9120	23A8	241.823	96%	4%	0.63603	0.02650
	57%									
		Departure	Departure	9220	23D6	241.823	96%	4%	0.63603	0.02650
Heavy Helo	SCALE 53E to include 112 Transient Heavy Helo ops.									
Light Helo	SCALE H-1 to include 408 Transient Heavy Helo ops.									

Appendix B
DETAILED STATIC OPERATIONS AT MCAS NEW RIVER

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Table B-1. Static/Maintenance Operations

Aircraft	Engine	Noise Suppressor	Profile	Long Name	Pad	Heading	Power	Units	Configuration	Angle	Num Day	Num Night	Duration	Num Engines
AH-1W/UH-1Y	T53-L-13	NONE	Low Work at "D"	Low Work AH1W "D"	Pad D	50	1	IGE Lite	Fixed		1.5068	0	200	1
						230	1	IGE Lite	Fixed		1.5068	0	200	1
			Low Work at "F"	Low Work AH1W "F"	Pad F	50	1	IGE Lite	Fixed		0.5023	0	200	1
						230	1	IGE Lite	Fixed		0.5023	0	200	1

Aircraft	Engine	Noise Suppressor	Profile	Long Name	Pad	Heading	Power	Units	Configuration	Angle	Num Day	Num Night	Duration	Num Engines
CH-53E	T64-GE-416A	NONE	Coll Bias "D"	CH-53E Collecitve Bias @ "D"	Pad D	50	7% QQBPA	Grnd Idle	Fixed		0.3425	0	1800	3
						230	7% QQBPA	Grnd Idle	Fixed		0.3425	0	1800	3
			Track Balance "D"	CH-53E Track and Balance @ "D"	Pad D	50	7% QQBPA	Grnd Idle	Fixed		0.8904	0	150	3
						230	7% QQBPA	Grnd Idle	Fixed		0.8904	0	150	3

Aircraft	Engine	Noise Suppressor	Profile	Long Name	Pad	Heading	Power	Units	Configuration	Angle	Num Day	Num Night	Duration	Num Engines
CH-53E	T64-GE-416A	NONE	MV-22B Low Work "B"	MV-22B Low Work @ "B"	Pad D	50	7% QQBPA	Grnd Idle	Fixed		1.6382	0	245	2
						230	7% QQBPA	Grnd Idle	Fixed		1.6382	0	245	2
			MV-22B Low Work "G"	MV-22B Low Work @ "G"	Pad G	360	7% QQBPA	Grnd Idle	Fixed		3.9318	0	245	2
						180	7% QQBPA	Grnd Idle	Fixed		3.9318	0	245	2

Aircraft	Engine	Noise Suppressor	Profile	Long Name	Pad	Heading	Power	Units	Configuration	Angle	Num Day	Num Night	Duration	Num Engines
TEST CELL	TEST CELL	NONE	Maint_Idle	Maintenance Idle	Maint	230	70	% RPM	Variable		1.228493	0.064657	12600	1
			Maint_Mili	Maintenance Military Power	Maint	230	100	% RPM	Variable		1.228493	0.064657	10800	1

Figure B-1. Static Operation Locations at MCAS New River

Appendix D
Agency Correspondence

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STATE OF NORTH CAROLINA
DEPARTMENT OF ADMINISTRATION

ROY COOPER
GOVERNOR

MACHELLE SANDERS
SECRETARY

January 7, 2020

Ms. Jessi Baker
United States Marine Corps
Marine Corps Installations East
12 Post Lane
Camp LeJeune, North Carolina 28547

Re: SCH File # 20-E-0000-0120; Proposal would replace the CH-53E heavy lift helicopter with a CH-53K heavy lift helicopter. Project is also for the construction and/or renovation of the facilities at MCAS New River to maintain, support or train pilots and maintainers of the CH-53K.

Dear Ms. Baker:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are comments made by the agencies in the review of this document.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Crystal Best
State Environmental Review Clearinghouse

Attachments
cc: Region P

Mailing Address:
NC DEPARTMENT OF ADMINISTRATION
1301 MAIL SERVICE CENTER
RALEIGH, NC 27699-1301

Telephone: (919) 807-2425
Fax: (919) 733-9571
COURIER #51-01-00
Email: state.clearinghouse@doa.nc.gov
Website: www.ncadmin.nc.gov

Location:
116 WEST JONES STREET
RALEIGH, NORTH CAROLINA

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
JAMIE RAGAN
Director

NORTH CAROLINA
Environmental Quality

MEMORANDUM

To: Crystal Best
State Clearinghouse Coordinator
NC Department of Administration

From: Lyn Hardison
Division of Environmental Assistance and Customer Service
Environmental Assistance and Project Review Coordinator
Washington Regional Office

RE: 20-0120 Environmental Assessment - Proposal would replace the CH-53E heavy lift helicopter with a CH-53K heavy lift helicopter, construct and/or renovate facilities at MCAS New River to maintain, support or train pilots and maintainers of the CH-53K.
Onslow County

Date: January 5, 2020

The Department of Environmental Quality has reviewed the proposal for the referenced project. Based on the information provided, several of our agencies have identified permits that may be required and offered some valuable guidance. The comments are attached for the applicant's review.

The Department's agencies will continue to be available to assist the applicant through the environmental review and permitting processes.

Thank you for the opportunity to respond.

Attachments

State of North Carolina Department of Environmental Quality
INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: Wilmington
Project Number: 20-0120 Due Date: 12/30/2019
County: Onslow

After review of this project it has been determined that the DEQ permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Permit to construct & operate wastewater treatment facilities, non-standard sewer system extensions & sewer systems that do not discharge into state surface waters.	Application 90 days before begins construction or award of construction contracts. On-site inspection may be required. Post-application technical conference usual.	30 days (90 days)
☐	Permit to construct & operate, sewer extensions involving gravity sewers, pump stations and force mains discharging into a sewer collection system	Fast-Track Permitting program consists of the submittal of an application and an engineer's certification that the project meets all applicable State rules and Division Minimum Design Criteria.	30 days (N/A)
☐	NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begins activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
☐	Water Use Permit	Pre-application technical conference usually necessary.	30 days (N/A)
☐	Well Construction Permit	Complete application must be received and permit issued prior to the installation of a groundwater monitoring well located on property not owned by the applicant, and for a large capacity (>100,000 gallons per day) water supply well.	7 days (15 days)
☐	Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
☒	Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15 A NCAC (2Q.0100 thru 2Q.0300)	Application must be submitted and permit received prior to construction and operation of the source. If a permit is required in an area without local zoning, then there are additional requirements and timelines (2Q.0113).	90 days
☒	Any open burning associated with subject proposal must be in compliance with 15 A NCAC 2D.1900	N/A	60 days (90 days)
☒	Demolition or renovations of structures containing asbestos material must be in compliance with 15 A NCAC 20.1110 (a) (1) which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-707-5950	Please Note - The Health Hazards Control Unit (HHCU) of the N.C. Department of Health and Human Services, must be notified of plans to demolish a building, including residences for commercial or industrial expansion, even if no asbestos is present in the building.	60 days (90 days)
☒	The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres are to be disturbed. Plan must be filed with and approved by applicable Regional Office (Land Quality Section) at least 30 days before beginning activity. A NPDES Construction Stormwater permit (NCG010000) is also usually issued should design features meet minimum requirements. A fee of $65 for the first acre or any part of an acre. An express review option is available with additional fees.		20 days (30 days)
☐	Sedimentation and erosion control must be addressed in accordance with NCDOT's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable Stormwater conveyances and outlets.		(30 days)
☐	Sedimentation and erosion control must be addressed in accordance with _____ Local Government's approved program. Particular attention should be given to design and installation of appropriate perimeter sediment trapping devices as well as stable Stormwater conveyances and outlets.		Based on Local Program
☒	Compliance with 15A NCAC 2H .0126 - NPDES Stormwater Program which regulates three types of activities: Industrial, Municipal Separate Storm Sewer System & Construction activities that disturb ≥1 acre.		30-60 days (90 days)
☒	Compliance with 15A NCAC 2H 1000 -State Stormwater Permitting Programs regulate site development and post-construction stormwater runoff control. Areas subject to these permit programs include all 20 coastal counties, and various other counties and watersheds throughout the state.		45 days (90 days)

State of North Carolina Department of Environmental Quality
INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: Wilmington
Project Number: 20-0120 Due Date: 12/30/2019
County: Onslow

	PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
☐	Mining Permit	On-site inspection usual. Surety bond filed with DEQ Bond amount varies with type mine and number of acres of affected land. Affected area greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
☐	Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, and certify construction is according to DEQ approved plans. May also require a permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of $200.00 must accompany the application. An additional processing fee based on a percentage or the total project cost will be required upon completion.	30 days (60 days)
☐	Oil Refining Facilities	N/A	90-120 days (N/A)
☐	Permit to drill exploratory oil or gas well	File surety bond of $5,000 with DEQ running to State of NC conditional that any well opened by drill operator shall, upon abandonment, be plugged according to DEQ rules and regulations.	10 days N/A
☐	Geophysical Exploration Permit	Application filed with DEQ at least 10 days prior to issue of permit. Application by letter. No standard application form.	10 days N/A
☐	State Lakes Construction Permit	Application fee based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property	15-20 days N/A
☐	401 Water Quality Certification	Compliance with the T1SA 02H .0500 Certifications are required whenever construction or operation of facilities will result in a discharge into navigable water as described in 33 CFR part 323.	60 days (130 days)
☐	Compliance with Catawba, Goose Creek, Jordan Lake, Randleman, Tar Pamlico or Neuse Riparian Buffer Rules is required. Buffer requirements: http://deq.nc.gov/about/divisions/water-resources/water-resources-permits/wastewater-branch/401-wetlands-buffer-permits/401-riparian-buffer-protection-program		
☐	Nutrient Offset: Loading requirements for nitrogen and phosphorus in the Neuse and Tar-Pamlico River basins, and in the Jordan and Falls Lake watersheds, as part of the nutrient-management strategies in these areas. DWR nutrient offset information: http://deq.nc.gov/about/divisions/water-resources/planning/nonpoint-source-management/nutrient-offset-information		
☐	CAMA Permit for MAJOR development	$250.00 - $475.00 fee must accompany application	75 days (150 days)
☐	CAMA Permit for MINOR development	$100.00 fee must accompany application	22 days (25 days)
☒	Abandonment of any wells, if required must be in accordance with Title 15A. Subchapter 2C.0100.		
☐	Notification of the proper regional office is requested if "orphan" underground storage tanks (USTS) are discovered during any excavation operation.		
☒	Plans and specifications for the construction, expansion, or alteration of a public water system must be approved by the Division of Water Resources/Public Water Supply Section prior to the award of a contract or the initiation of construction as per 15A NCAC 18C .0300 et. seq., Plans and specifications should be submitted to 1634 Mail Service Center, Raleigh, North Carolina 27699-1634. All public water supply systems must comply with state and federal drinking water monitoring requirements. For more information, contact the Public Water Supply Section, (919) 707-9100.		30 days
☒	If existing water lines will be relocated during the construction, plans for the water line relocation must be submitted to the Division of Water Resources/Public Water Supply Section at 1634 Mail Service Center, Raleigh, North Carolina 27699-1634. For more information, contact the Public Water Supply Section, (919) 707-9100.		30 days
☐	Plans and specifications for the construction, expansion, or alteration of the _____ water system must be approved through the _____ delegated plan approval authority. Please contact them at _____ for further information.		

State of North Carolina Department of Environmental Quality
INTERGOVERNMENTAL REVIEW PROJECT COMMENTS

Reviewing Regional Office: Wilmington
Project Number: 20-0120 Due Date: 12/30/2019
County: Onslow

Other Comments (attach additional pages as necessary, being certain to comment authority)

Division	Initials	No comment	Comments	Date Review
DAQ	DAC	☒		12/19/19
DWR-WQROS (Aquifer & Surface)	&	☐	It is recommended to schedule a site visit with 401 Water quality staff to discuss the proposal and to ensure compliance will be maintained per 401 surface Water requirements, surface water standards and buffer rules. If wetland or stream impacts are proposed, this project will need to comply with/secure a CAMA Permit, 404 permit from the USACE, obtain a 401 Water Quality Certification authorization &	/ / / /
DWR-PWS	HLC	☐	see above comments	12/20/19
DEMLR (LQ & SW)		☐	If greater than one acre of disturbance (to include) domolitions) is proposed, an approved Sedimentation and Erosion Control and State Stormwater permit will be required prior to any land disturbance.	/ /
DWM – UST		☐		/ /
Other Comments		☐		/ /

REGIONAL OFFICES

Questions regarding these permits should be addressed to the Regional Office marked below.

☐ **Asheville Regional Office**
2090 U.S. 70 Highway
Swannanoa, NC 28778-8211
Phone: 828-296-4500
Fax: 828-299-7043

☐ **Fayetteville Regional Office**
225 Green Street, Suite 714,
Fayetteville, NC 28301-5043
Phone: 910-433-3300
Fax: 910-486-0707

☐ **Mooresville Regional Office**
610 East Center Avenue, Suite 301,
Mooresville, NC 28115
Phone: 704-663-1699
Fax: 704-663-6040

☐ **Raleigh Regional Office**
3800 Barrett Drive,
Raleigh, NC 27609
Phone: 919-791-4200
Fax: 919-571-4718

☐ **Washington Regional Office**
943 Washington Square Mall,
Washington, NC 27889
Phone: 252-946-6481
Fax: 2S2-975-3716

☒ **Wilmington Regional Office**
127 Cardinal Drive Ext.,
Wilmington, NC 28405
Phone: 910-796-7215
Fax: 910-350-2004

☐ **Winston-Salem Regional Office**
450 Hanes Mill Road, Suite 300,
Winston-Salem, NC 27105
Phone: 336-776-9800
Fax: 336-776-9797

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
MICHAEL SCOTT
Director

NORTH CAROLINA
Environmental Quality

Date: December 27, 2019

To: Michael Scott, Director
Division of Waste Management

Through: Janet Macdonald
Inactive Hazardous Sites Branch – Special Projects Unit

From: Bonnie S. Ware
Inactive Hazardous Sites Branch

Subject: NEPA Project #20-0120, United States Marine Corps, Onslow County, North Carolina

The Superfund Section has reviewed the proximity of sites under its jurisdiction to the United States Marine Corps project. Proposed project is for the replacement of the CH 53E heavy lift helicopter with a CH 53K heavy lift helicopter. Project is also for the construction and/or renovation of the facilities at MCAS New River to maintain, support or train pilots and maintainers of the CH 53K.

No sites were identified within one mile of the project as shown on the attached report.

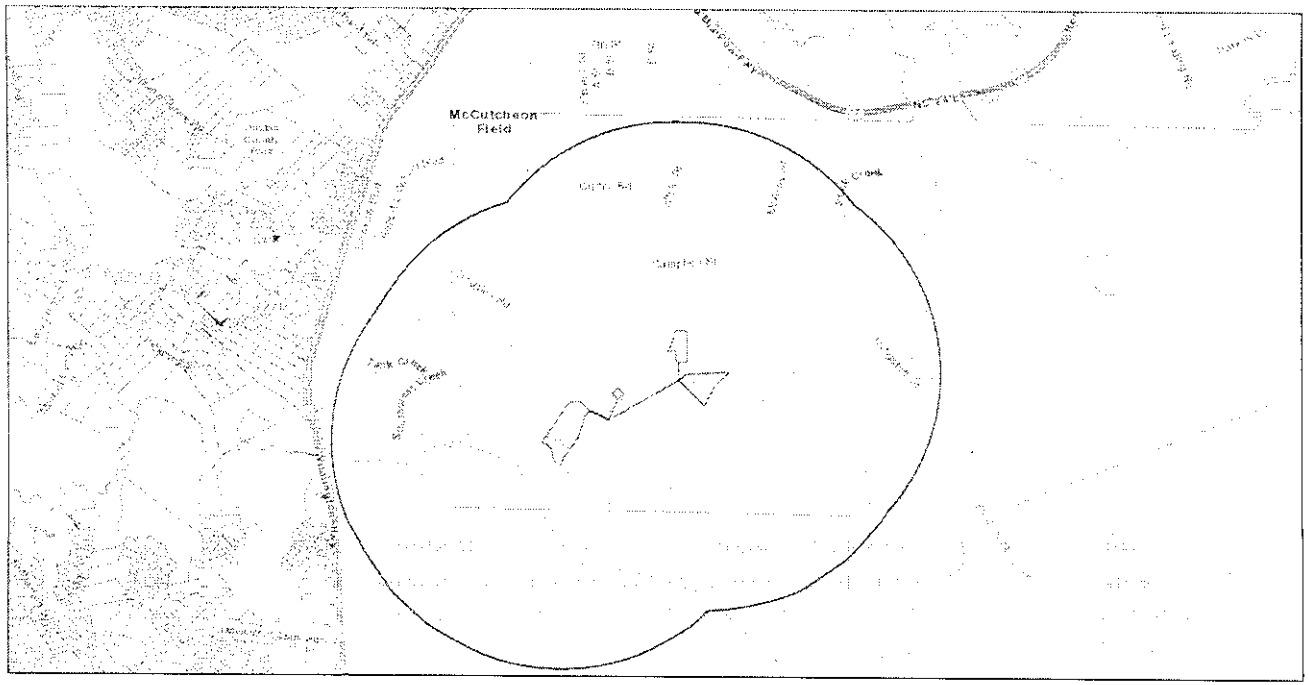
Please contact Janet Macdonald at 919.707.8349 if you have any questions.

SEPA/NEPA Review Report

Area of Interest (AOI) Information

Area : 3,610.44 acres

Dec 27 2019 16:18:24 Eastern Standard Time



* Pre-Regulatory Landfill Sites

Parcels (Polygons) - Parcels

20-0120 Onslow County

Summary

Name	Count	Area(acres)	Length(mi)
Certified DSCA Sites	0	N/A	N/A
Federal Remediation Branch Sites	0	N/A	N/A
Inactive Hazardous Sites	0	N/A	N/A
Pre-Regulatory Landfill Sites	0	N/A	N/A
Brownfields Program Sites	0	N/A	N/A

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: ONSLOW

G07: MILITARY ACTIVITES (TRAINING, FLIGHT ROUTES, BASE EXPANSIONS

STATE NUMBER: 20-E-0000-0120
DATE RECEIVED: 12/02/2019
AGENCY RESPONSE: 12/30/2019
REVIEW CLOSED: 01/02/2020

Received: 12/06/2019
State Historic Preservation Office

ER 19-5150

MS RENEE GLEDHILL-EARLEY
CLEARINGHOUSE COORDINATOR
DEPT OF NATURAL & CULTURAL RESOURCE
STATE HISTORIC PRESERVATION OFFICE
MSC 4617 - ARCHIVES BUILDING
RALEIGH NC

Previously reviewed and cleared.

REVIEW DISTRIBUTION

DEPT OF ENVIR. QUALITY - COASTAL MG
DEPT OF ENVIRONMENTAL QUALITY
DEPT OF NATURAL & CULTURAL RESOURCE
DEPT OF TRANSPORTATION
DNCR - NATURAL HERITAGE PROGRAM
DPS - DIV OF EMERGENCY MANAGEMENT
EASTERN CAROLINA COUNCIL

PROJECT INFORMATION

APPLICANT: United States Marine Corps
TYPE: National Environmental Policy Act
Environmental Assessment

DESC: Proposal would replace the CH-53E heavy lift helicopter with a CH-53K heavy lift helicopter. Project is also for the construction and/or renovation of the facilities at MCAS New River to maintain, supoort or train pilots and maintainers of the CH-53K.

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: [X] NO COMMENT [ ] COMMENTS ATTACHED

SIGNED BY: RGledhill-Earley DATE: 12·30·19

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

DEC 0 3 2019

COUNTY: ONSLOW

G07: MILITARY ACTIVITES (TRAINING, FLIGHT ROUTES, BASE EXPANSIONS

STATE NUMBER: 20-E-0000-0120
DATE RECEIVED: 12/02/2019
AGENCY RESPONSE: 12/30/2019
REVIEW CLOSED: 01/02/2020

MS CINDY WILLIAMS
CLEARINGHOUSE COORDINATOR
DPS - DIV OF EMERGENCY MANAGEMENT
FLOODPLAIN MANAGEMENT PROGRAM
4218 MAIL SERVICE CENTER
RALEIGH NC

REVIEW DISTRIBUTION

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DEPT OF NATURAL & CULTURAL RESOURCE
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If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: [✓] NO COMMENT [ ] COMMENTS ATTACHED

SIGNED BY: Edward Kelsey DATE: 12/12/19

Not in SFHA.

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

Behshad Norouzi

COUNTY: ONSLOW

G07: MILITARY ACTIVITES
(TRAINING, FLIGHT ROUTES,
BASE EXPANSIONS

STATE NUMBER: 20-E-0000-0120
DATE RECEIVED: 12/02/2019
AGENCY RESPONSE: 12/30/2019
REVIEW CLOSED: 01/02/2020

MS JEANNE STONE
CLEARINGHOUSE COORDINATOR
DEPT OF TRANSPORTATION
STATEWIDE PLANNING - MSC #1554
RALEIGH NC

Transportation Planning
Division
DEC 5 2019

REVIEW DISTRIBUTION

DEPT OF ENVIR. QUALITY - COASTAL MG
DEPT OF ENVIRONMENTAL QUALITY
DEPT OF NATURAL & CULTURAL RESOURCE
DEPT OF TRANSPORTATION
DNCR - NATURAL HERITAGE PROGRAM
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EASTERN CAROLINA COUNCIL

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If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☒ NO COMMENT ☐ COMMENTS ATTACHED

SIGNED BY: _____ DATE: 12/6/2019

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
INTERGOVERNMENTAL REVIEW

COUNTY: ONSLOW

G07: MILITARY ACTIVITES (TRAINING, FLIGHT ROUTES, BASE EXPANSIONS

STATE NUMBER: 20-E-0000-0120
DATE RECEIVED: 12/02/2019
AGENCY RESPONSE: 12/30/2019
REVIEW CLOSED: 01/02/2020

MR RODNEY BUTLER
CLEARINGHOUSE COORDINATOR
DNCR - NATURAL HERITAGE PROGRAM
1651 MAIL SERVICE CENTER
RALEIGH NC

REVIEW DISTRIBUTION

DEPT OF ENVIR. QUALITY - COASTAL MG
DEPT OF ENVIRONMENTAL QUALITY
DEPT OF NATURAL & CULTURAL RESOURCE
DEPT OF TRANSPORTATION
DNCR - NATURAL HERITAGE PROGRAM
DPS - DIV OF EMERGENCY MANAGEMENT
EASTERN CAROLINA COUNCIL

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If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☐ NO COMMENT ☒ COMMENTS ATTACHED

SIGNED BY: R. Butler DATE: 12/19/20

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**
Susi Hamilton, **Secretary**
Walter Clark, **Director, Land and Water Stewardship**

NCNHDE-10967

December 18, 2019

Clearing House
Natural Heritage Program
North Carolina Department of Natural and Cultural Resources
Raleigh, NC 27699
RE: Clearing House 20-0120

Dear Clearing House:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

A query of the NCNHP database indicates that there are records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. These results are presented in the attached 'Documented Occurrences' tables and map.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is documented within the project area or indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

Also please note that the NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Clean Water Management Trust Fund easement, or an occurrence of a Federally-listed species is documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Intersecting the Project Area
Clearing House 20-0120
December 18, 2019
NCNHDE-10967

Element Occurrences Documented Within Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Reptile	14044	Alligator mississippiensis	American Alligator	2017-12-29	E	3-Medium	Threatened Similar Appearance	Threatened	G5	S3

Natural Areas Documented Within Project Area

Site Name	Representational Rating	Collective Rating
Camp Lejeune Southwest Creek	R1 (Exceptional)	C3 (High)

Managed Areas Documented Within Project Area*

Managed Area Name	Owner	Owner Type
Camp Lejeune	US Department of Defense	Federal

*NOTE: If the proposed project intersects with a conservation/managed area, please contact the landowner directly for additional information. If the project intersects with a Dedicated Nature Preserve (DNP), Registered Natural Heritage Area (RHA), or Federally-listed species, NCNHP staff may provide additional correspondence regarding the project.

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/content/help. Data query generated on December 18, 2019; source: NCNHP, Q4 Oct 2019. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
Clearing House 20-0120
December 18, 2019
NCNHDE-10967

Element Occurrences Documented Within a One-mile Radius of the Project Area

Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Freshwater Fish	38939	Acipenser oxyrinchus oxyrinchus	Atlantic Sturgeon	2004-11-28	E	4-Low	Endangered	Endangered	G3T3	S2
Freshwater Fish	36873	Notropis chalybaeus	Ironcolor Shiner	1964-06-04	H	3-Medium	---	Significantly Rare	G4	S2S3
Mammal	9806	Trichechus manatus	West Indian Manatee	2008-06-13	E	5-Very Low	Threatened	Threatened	G2	S1N
Natural Community	14212	Tidal Red Cedar Forest	---	1999-05-14	A	4-Low	---	---	G1	S1
Natural Community	16133	Tidal Swamp (Mixed Subtype)	---	2013	A?	4-Low	---	---	G1G2	S1S2
Reptile	14044	Alligator mississippiensis	American Alligator	2017-12-29	E	3-Medium	Threatened Similar Appearance	Threatened	G5	S3
True Bug	10416	Chlorochroa dismalia	Dismal Swamp Green Stink Bug	1959-06-26	H	5-Very Low	---	Significantly Rare	G1G3	S1?
Vascular Plant	33052	Eleocharis fallax	Creeping Spikerush	1996-05-29	E	4-Low	---	Significantly Rare Throughout	G4G5	S1S2
Vascular Plant	23623	Eleocharis parvula	Little-spike Spikerush	1996-05-29	E	3-Medium	---	Significantly Rare Disjunct	G5	S1

Natural Areas Documented Within a One-mile Radius of the Project Area

Site Name	Representational Rating	Collective Rating
Camp Lejeune Southwest Creek	R1 (Exceptional)	C3 (High)

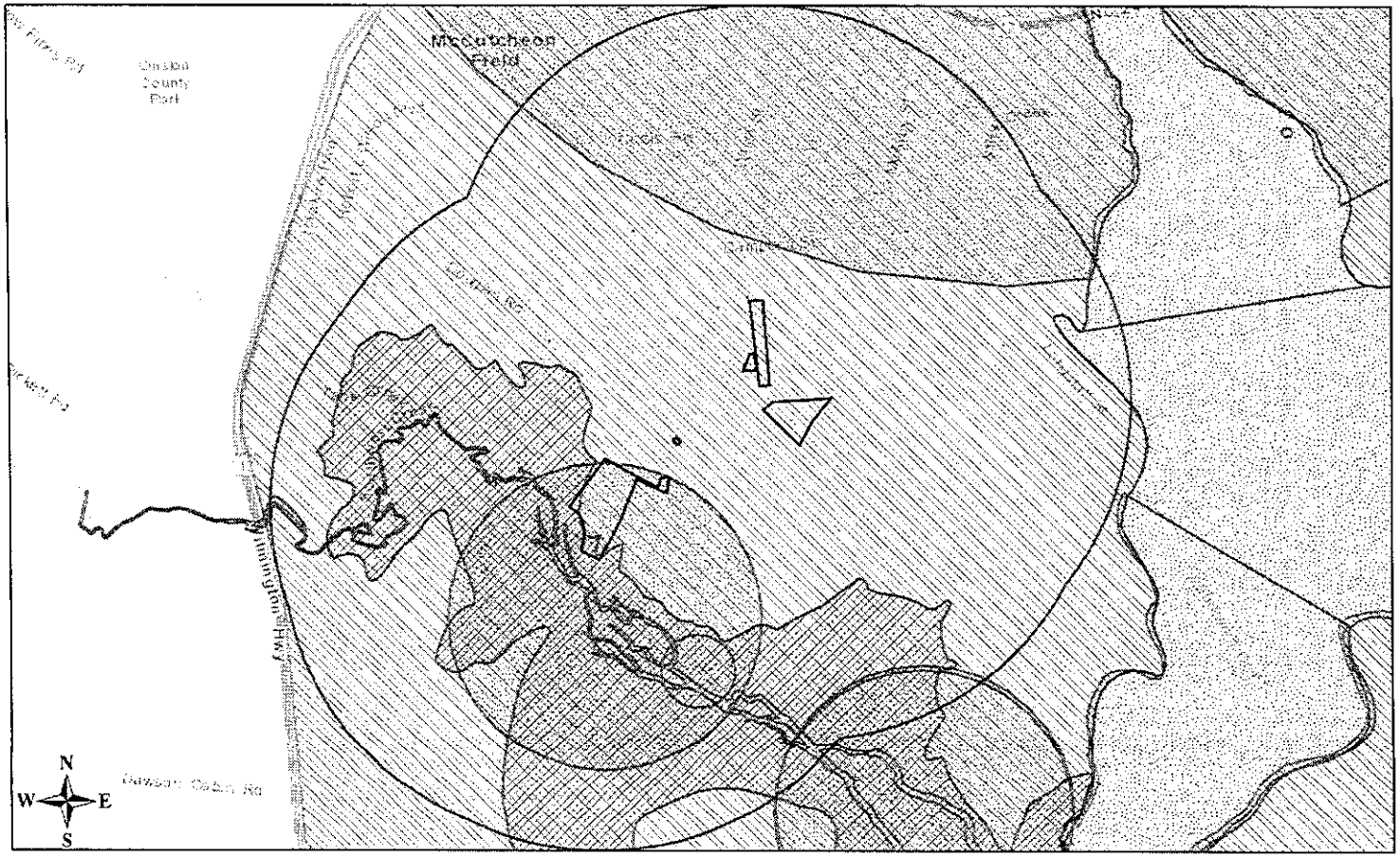
Managed Areas Documented Within a One-mile Radius of the Project Area

Managed Area Name	Owner	Owner Type
Camp Lejeune	US Department of Defense	Federal

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/content/help. Data query generated on December 18, 2019; source: NCNHP, Q4 Oct 2019.

Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-10967: Clearing House 20-0120



December 18, 2019

- Project Boundary
- Buffered Project Boundary
- Natural Heritage Element Occurrence (NHEO)
- NHP Natural Area (NHNA)
- Managed Area (MAREA)

1:29,200

0 0.25 0.5 1 mi

0 0.4 0.8 1.6 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community