ENVIRONMENTAL ASSESSMENT

Joint Directed Energy Test Center (JDETC) White Sands Missile Range, New Mexico

December 2021

Approved for Public Release - Distribution is Unlimited. OPSEC review conducted by WSMR on 22-Jul-2021. [This page intentionally left blank]

FINDING OF NO SIGNIFICANT IMPACT

Name of the Proposed Action: Environmental Assessment Joint Directed Energy Test Center (JDETC), White Sands Missile Range, New Mexico.

Description of the Proposed Action: White Sands Test Center (WSTC) proposes to construct facilities and operate directed energy (DE) and counter-DE test capabilities, as well as comprehensive Integrated Air and Missile Defense (IAMD) test and evaluation capabilities at two sites [Salinas and JDETC Central] entirely within WSMR boundaries. Specifically, the construction and operational phases of the JDETC Program will provide a persistent testbed and prototype-like capability to support the analysis of the synergies among weapon systems (DE, kinetic energy [KE], cyber, and electronic weapons). These evaluations would include joint suites of operational-quality sensors (including ground, air, sea, and space), full kill chain evaluations, and simultaneous evaluations of joint/integrated command and control nodes as required by several U.S. Department of Defense (DoD) strategy and planning documents.

Purpose and Need:

The need for the Proposed Action is to execute the 2018 National Defense Strategy. The purpose is to provide DE weapon systems such as high energy laser (HEL) and high-power microwave (HPM) and counter-DE test capabilities as part of the U.S. warfighting capabilities. Key beneficial attributes of DE weapon systems include:

- Low-cost per-shot expense;
- Deep magazine (i.e., potential for a large number of firings in one engagement);
- Scalability;
- Immediate initiation of target effects;
- Low collateral damage; and
- Low visibility firing signature.

These attributes make DE weapons suitable for use by each of the Joint Services and Agencies. Because of differing missions and operational environments, the priorities and interests of the Services and Agencies vary considerably. All require greater lethality and capability than is currently available.

Environmental Consequences: The Environmental Assessment (EA) contains the results of an impact analysis of the No-Action Alternative, Alternative I, and two action alternatives on the affected environment. Valued Environmental Components were analyzed in the EA. No significant impacts on the environment have been identified. The potential effects to cultural resources will require further analysis. The consultation process for Section 106 of the National Preservation Act will be used to determine which mitigations are needed to avoid any adverse effects to historic properties.

Conclusion: Preparation of an Environmental Impact Statement is unwarranted. Based on the information and analysis present in this EA, the guidelines for determining the significance of proposed federal actions in the 40 Code of Federal Regulations 1508.27 and Army guidelines under 32 CFR 651, and public and agency comments from the 30-day public review period, WSTC will implement Alternative I. The quality of human and natural environment will not be significantly impacts by construction upgrades at Salinas Peak and JDETC Central Sites or directed energy operations. The action would occur entirely within the administrative boundaries of WSMR, therefore there are no anticipated impacts on the general population

to including minority populations, low-income populations and children. WSTC will follow all federal, state, local laws and regulations, and best management practices listed in Table 3-12. To minimize potential impacts on wildlife, the following mitigations would be followed:

- Vegetation removed during nesting season will be surveyed for nesting birds within seven days prior to construction activities. Methods will be approved by the WSMR Garrison Environmental Division;
- WSMR Garrison Environmental Division will be consulted when a bird nest is discovered in construction areas;
- Raptor protection measures described in the WSMR Avian Protection Plan will be incorporated.
- Human and vehicle activities will remain outside of the 0.5 mi (800-m) buffer area of any active eagle nests through the nesting season (mid-January through July); and
- Test personnel would immediately provide the locations to the WSMR Garrison Environmental Division of any munitions landing near eagle nests (active or inactive), and would immediately report any injured or dead birds (including eagles) discovered in an impact area or through recovery effort.

A

ERIC D. LITTLÉ BRIGADIER GENERAL, U.S. ARMY COMMANDING

UI /28/2022 Date

U.S. ARMY WHITE SANDS MISSILE RANGE WHITE SANDS MISSILE RANGE, NEW MEXICO ENVIRONMENTAL ASSESSMENT

TITLE: Environmental Assessment Joint Directed Energy Test Center (JDETC), White Sands Missile Range (WSMR), New Mexico.

PROPONENT:

SMART.SHAWANT Digitally signed by A.DEPREE.111326 SMART.SHAWANTA.DEPREE.1 113268430 Date: 2021.12.22.09:38:07-07:00'

SHAWANTA D. SMART COLONEL, AC COMMANDING 12/22/21

Date

REVIEWED:

KNIGHT.BRIAN.DA | Digitally signed by KNIGHT.BRIAN.DA | KNIGHT.BRIAN.DANIEL.127128 NIEL.1271283330 | Date: 2021.12.28 13:10:43 -0700'

BRIAN KNIGHT CHIEF, ENVIRONMENTAL DIVISION DIRECTORATE OF PUBLIC WORKS 12/28/21

Date

CONCURRENCE:

M. RYAN HOWELL COLONEL, U.S. ARMY COMMANDING

APPROVED:

A

ERIC D. LITTLE BRIGADIER GENERAL, U.S. ARMY COMMANDING

<u>Ø1/11/</u>22 Date

01/28/2022

Date

[This page intentionally left blank]

REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188	
The public reporting burden for this collection of inf maintaining the data needed, and completing and r suggestions for reducing the burden, to the Departr shall be subject to any penalty for failing to comply of PLEASE DO NOT RETURN YOUR FO	formation is es reviewing the contents of Defense with a collection DRM TO TH	timated to average 1 hour per re collection of information. Send cor e, Executive Service Directorate (i n of information if it does not displ HE ABOVE ORGANIZAT	sponse, including the time for nments regarding this burden o 0704-0188). Respondents shou ay a currently valid OMB contro ION.	reviewing instructions, searching existing data sources, gathering and estimate or any other aspect of this collection of information, including I/d be aware that notwithstanding any other provision of law, no person of number.	
1. REPORT DATE (DD-MM-YYYY) 2. REPORT TYPE 07-12-2021 Environmental Assessment			3. DATES COVERED (From - To) 13 January 2020 – 07 December 2021		
4. TITLE AND SUBTITLE Environmental Assessment				5a. CONTRACT NUMBER	
White Sands Missile Range, New	Mexico			5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Dimsha, Mark A. (contractor)				5d. PROJECT NUMBER	
Epsilon Systems Solutions, Inc.				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION N	Ame(s) an	ID ADDRESS(ES)		8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGE		E(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY ST	TATEMEN	Т			
13. SUPPLEMENTARY NOTES					
14. ABSTRACT This Environmental Assessment (EA) additional action alternatives. Resource and human health and safety. No sign JDETC Program facilities and its supp) contains t ce areas an ificant imp port activit	he results of an impact an alyzed in the EA include pacts on the environment ies. No significant cumul	nalysis of the No-Actic : air quality, cultural re have been identified fo lative impacts are expe	on Alternative, the Proposed Action, and two esources, soil erosion effects, biological resources, or proposed construction and operation of the cted.	
TO. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF a. REPORT b. ABSTRACT c. TH	: HIS PAGE	17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON Cathy Giblin	
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$				19b. TELEPHONE NUMBER (Include area code) (575) 678-3541	

[This page intentionally left blank]

Acronyms and Abbreviations

A-A	air to air	Expn	Experimental
A-G	air to ground	FR	Federal Register
AAQS	Ambient Air Quality Standards	ft	feet
ac	acre	FTS	flight termination system
ACHP	Advisory Council on Historic Preservation	G-A	ground to air
AICUZ	Air Installations Compatible Use Zones	Н	High
ANSI	American National Standards Institute	ha	hectare
ARPA	Archaeological Resources Protection Act	H_2S	hydrogen sulfide
asl	above sea level	HEL	high energy laser
ATEC	Army Test and Evaluation Command	HERF	hazards of electromagnetic radiation to fuel
ATP/FC	acquisition, tracking, pointing, and fire control	HERO	hazards of electromagnetic radiation to ordnance
BMP	best management practice	HERP	hazards of electromagnetic radiation to personnel
С	candidate	HELSTF	High Energy Laser System Test Center
C4ISR	command, control, communications, computers, intelligence, surveillance, and reconnaissance	HPD	Historic Preservation Division
CEQ	Council on Environmental Quality	HPM	high-power microwave
CFR	Code of Federal Regulations	IAMD	Integrated Air and Missile Defense
CH ₄	methane	IEEE	Institute of Electrical and Electronic Engineers
CO	carbon monoxide	INCRMP	Integrated Natural and Cultural Management Plan
CO ₂	carbon dioxide	IPT	Integrated Product Team
CO _{2e}	carbon dioxide equivalent	ISR	intelligence, surveillance, and reconnaissance
CONEMP	Concepts of Employment	JDETC	Joint Directed Energy Test Center
CONEX	Container Express	JDETS	Joint Directed Energy Test Site
CONOPS	Concept of Operations	JIAMD	Joint Integrated Air and Missile Defense
CRM	Cultural Resources Manager	KE	kinetic energy
DA PAM	Department of the Army Pamphlet	km	kilometer
DE	directed energy	КТМ	kineto tracking mounts
DoD	Department of Defense	KW	kilowatt
DODI	Department of Defense Instruction	L	low
DPW	Directorate of Public Works	m	meter
DT	developmental testing	m ²	square meter
E	endangered	M	medium
E3	Electromagnetic Environmental Effects	MAR	Multifunction Array Radar
EA	environmental assessment	MBTA	Migratory Bird Treaty Act
EIS	environmental impact statement	MRTFB	Major Range and Test Facility Base
ΕΟ	Executive Order	NAAQS	National Ambient Air Quality Standards
FEIS	final environmental impact statement	NEPA	National Environmental Policy Act
FLIR	forward-looking infrared	NHPA	National Historic Preservation
FONSI	finding of no significant impact	NMAC	New Mexico Administrative Code

ESA	Endangered Species Act	NO ₂	nitrogen dioxide
NOAA	National Oceanic and Atmospheric	SO2	sulfur dioxide
	Administration		
NRCS	Natural Resources Conservation Service	SOC	species of concern
NRHP	National Register of Historic Places	SOP	standard operating procedure
O ₃	ozone	SSL	solid-state laser
ОТ	operational testing	SWaP	size, weight, and power
Pb	lead	SWAS	swarming autonomous system
PHETS	Permanent High Explosive Test Site	SWPPP	stormwater pollution prevention plan
PM2.5	particulate matter with an aerodynamic	SY	square vards
	diameter of 2.5 microns or less		1 5
PM10	particulate matter with an aerodynamic	Т	threatened
	diameter of 10 microns or less		
ppt	parts per thousand	UAS	unmanned aerial system
OD	quantity distance	USACE	U.S. Army Corps of Engineers
RAM	rockets, artillery, and mortars	USC	United States Code
RCRA	Resource Conservation and Recovery Act	USDA	United States Department of Agriculture
RDT&E	research, development, testing, and	USFWS	United States Fish and Wildlife Service
	evaluation		
ROI	region of influence	UXO	unexploded ordnance
S-A	surface to air	VEC	valued environmental component
SARA	Superfund Amendments and	VH	verv high
	Reauthorization Act		5 8
SF	square feet	VL	verv low
SGCN	species of greatest conservation need	WSMR	White Sands Missile Range
SHPO	State Historic Preservation Officer		6

Acronyms and Abbreviations, Continued

TABLE OF CONTENTS

Finding of No Significant Impactiii
Acronyms and Abbreviationsix
Acronyms and Abbreviations, Continuedx
Table of Contentsxi
List of Figuresxiv
List of Tablesxiv
Chapter 1 Introduction
1.1 Background
1.1.1 Salinas Peak
1.1.2 JDETC Central Site1-1
1.2 Purpose and Need for the Proposed Action
1.2.1 Purpose of the Proposed Action1-4
1.2.2 Need for the Proposed Action
1.3 Decisions to be Made
1.4 Related Environmental Documentation1-5
Chapter 2 Proposed Action and Alternatives
2.1 Description of the Proposed Action
2.1.1 Construction Activities
2.1.1.1 Salinas Peak
2.1.1.2 JDETC Central
2.1.2 Operations
2.1.2.1 Weapon Systems
2.1.2.2 Engagement Types2-9
2.1.2.3 Targets
2.1.2.4 Staffing
2.1.2.5 Operations Tempo
2.2 Alternatives Considered in this Environmental Assessment
2.2.1 The No-Action Alternative
2.2.2 Alternative 1 – JDETC Central and Salinas Peak Upgrades and Operations
2.2.3 Alternative 2 – Salinas Peak Location Only
2.2.4 Alternative 3 - JDETC Central Location Only

2.2.5	Comparison of Alternatives	
2.3 Alte	rnatives Considered but not Carried Forward	
2.3.1	Conducting JDETC Program and Another Range Complex	
2.3.2	Limited Testing at WSMR	
Chapter 3 Aff	ected Environment and Environmental Consequences	
3.0 Val	aed Environmental Components	
3.1 Air	Quality	
3.1.1	Affected Environment	
3.1.1.	1 Attainment Status	
3.1.1.	1 Area Meteorology	
3.1.1.	2 Greenhouse Gases	
3.1.2	Environmental Consequences	
3.1.2.	1 No-Action Alternative	
3.1.2.	2 Alternative 1 – JDETC Central and Salinas Peak	
3.1.2.	3 Alternative 2 – Salinas Peak Only	
3.1.2.	4 Alternative 3 – JDETC Central Only	
3.1.3	Best Management Practices	
3.2 Cult	ural Resources	
3.2.1	Affected Environment	
3.2.1.	1 Salinas Peak	
3.2.1.	2 JDETC Central	
3.2.2	Environmental Consequences	
3.2.2.	1 No-Action Alternative	
3.2.2.	2 Alternative 1 – JDETC Central and Salinas Peak	
3.2.2.	3 Alternative 2 – Salinas Peak Only	
3.2.2.	4 Alternative 3 – JDETC Central Only	
3.2.3	Best Management Practices and Mitigations	
3.3 Soil	Erosion Effects	
3.3.1	Affected Environment	
3.3.1.	1 Geology	
3.3.1.	2 Soils	
3.3.1.	3 Topography	
3.3.1.	4 Soil Erodibility	

3.3	3.2	Environmental Consequences	3-17
	3.3.2.	No-Action Alternative	3-17
	3.3.2.	2 Alternative 1 – JDETC Central and Salinas Peak	3-17
	3.3.2.	3 Alternative 2 – Salinas Peak Only	3-18
	3.3.2.4	4 Alternative 3 – JDETC Central Only	3-18
3.3	3.3	Best Management Practices and Mitigations	3-18
3.4	Biol	ogical Resources	3-19
3.4	l.1	Affected Environment	3-19
	3.4.1.	l Vegetation Communities	3-19
	3.4.1.	2 Wildlife Communities	3-20
	3.4.1.	3 Protected Species	3-22
	3.4.1.4	4 Invasive Species	3-24
3.4	.2	Environmental Consequences	3-26
	3.4.2.	No-Action Alternative	3-26
	3.4.2.2	2 Alternative 1 – JDETC Central and Salinas Peak Upgrades and Operations	3-26
	3.4.2.	3 Alternative 2 – Salinas Peak Location Only	3-29
	3.4.2.4	Alternative 3 – JDETC Central Location Only	3-29
3.4	1.3	Best Management Practices and Mitigations	3-29
3.5	Hun	nan Health and Safety	3-31
3.5	5.1	Affected Environment	3-31
	3.5.1.	l Regulatory Environment	3-31
	3.5.1.2	2 Existing Conditions	3-32
3.5	5.2	Environmental Consequences	3-32
	3.5.2.	No-Action Alternative	3-32
	3.5.2.2	2 Alternative 1 – JDETC Central and Salinas Peak	3-32
	3.5.2.	3 Alternative 2 – Salinas Peak Only	3-36
	3.5.2.4	4 Alternative 3 – JDETC Central Only	3-37
3.5	5.3	Best Management Practices and Mitigations	3-37
3.6	Sum	mary of Potential Impacts and Mitigations	3-37
Chapter	4 Cur	nulative Impacts	4-1
4.1	Air	Quality	4-3
4.2	Cult	ural Resources	4-3
4.3	Soil	Erosion Effects	4-3

Environi Joint Dii	nental Assessment rected Energy Test Center	Final December 2021		
<u>voin Di</u>		2021		
4.4	Biological Resources	4-3		
4.5	Human Health and Safety	4-3		
Chapter	5 References	5-1		
Chapter	6 List of Preparers	6-1		
Chapter 7 Agencies and Consultations				
APPENDIX A Air Pollutant Emission Calculations				
APPENI	DIX B Public Participation	B-1		

LIST OF FIGURES

Figure 1-1 WSMR Location within New Mexico	1-2
Figure 1-2 Salinas Peak and JDETC Central Sites	1-3
Figure 2-1 Salinas Peak Site Overview	2-2
Figure 2-2 Salinas Road	2-4
Figure 2-3 JDETC Central Overview	2-6

LIST OF TABLES

Table 2-1 Comparison of Alternatives	2-12
Table 3-1 Valued Environmental Components Review Summary	
Table 3-2 National and State of New Mexico Ambient Air Quality Standards	
Table 3-3 WSMR Climate Summary	
Table 3-4 Total Emissions (tons/year) - Alternative 1	
Table 3-5 GHG Emissions for Alternative 1	
Table 3-6 Total Emissions (tons/year) - Alternative 2	
Table 3-7 GHG Emissions for Alternative 2	
Table 3-8 Total Emissions (tons/year) - Alternative 3	
Table 3-9 GHG Emissions for Alternative 3	
Table 3-10 Soil Erodibility by Type	
Table 3-11 Protected Species Potentially Occurring at WSMR	
Table 3-12 Environmental Effects Summary	
Table 4-1 Reasonably Foreseeable Actions within the Region of Influence	4-2

CHAPTER 1 INTRODUCTION

This environmental assessment (EA) evaluates possible environmental effects associated with the construction and operation activities of Joint Directed Energy Test Center (JDETC) Program at White Sands Missile Range (WSMR), a Major Range and Test Facility Base (MRTFB). JDETC would consist of two locations on WSMR and includes construction, maintenance and repair, and test operations.

1.1 BACKGROUND

WSMR is located in south-central New Mexico, encompassing over 2,000,000 acres (809,000 hectares) in the five counties of Doña Ana, Socorro, Lincoln, Otero, and Sierra. The Main Post area is approximately 45 miles (72 kilometers [km]) north of El Paso, Texas, and 20 miles east-northeast of Las Cruces, New Mexico. U.S. Highway 70 crosses WSMR from east to west and serves as the main access route to the Main Post area (Figure 1-1).

The Proposed Action would involve construction and research, development, testing, and evaluation (RDT&E) and training activities at two sites at WSMR: the JDETC Central site and Salinas Peak (Figure 1-2).

1.1.1 Salinas Peak

Salinas Peak is located roughly 62 miles (100 km) north of the JDETC Central site. The location is approximately 9,000 feet (ft) (2,740 meters [m]) high on a ridgeline overlooking the Tularosa Basin, making it an ideal site for testing airborne systems to engage air and ground targets. Salinas Peak is accessible by ground vehicles and helicopters.

There is existing WSMR RDT&E infrastructure in place at Salinas Peak, including a metal High Bay building used by the Air Force. The building was damaged by high winds, but could be repaired and used for storage or other purposes as part of JDETC operations at Salinas Peak. There are also limited bunking facilities, a radar site, and communications.

1.1.2 JDETC Central Site

The proposed JDETC Central site would be located near the existing High Energy Laser System Test Facility (HELSTF). It would serve as the communications hub for the program, with command-and-control capabilities and the ability to tie in customer remote users and assets into simple and campaign-level exercises. The site will also include office space to support briefings, planning and operations, operator and maintainer training, support facilities such as a clean room, and a runway with limited aircraft support equipment and communications capabilities to support routine testing and large-scale exercises.





1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.2.1 Purpose of the Proposed Action

The purpose of the Proposed Action is to provide directed energy (DE) and counter-DE test capabilities, as well as comprehensive Integrated Air and Missile Defense (IAMD) test and evaluation capabilities. Specifically, the construction and operational phases of the JDETC Program will provide a persistent testbed and prototype-like capability to support the analysis of the synergies among weapon systems (DE, kinetic energy [KE], cyber, and electronic weapons). These evaluations would include joint suites of operational-quality sensors (including ground, air, sea, and space), full kill chain evaluations, and simultaneous evaluations of joint/integrated command and control nodes as required by several U.S. Department of Defense (DoD) strategy and planning documents.

1.2.2 Need for the Proposed Action

The 2018 National Defense Strategy emphasizes the need to include DE weapon systems such as highenergy laser (HEL) and high-power microwave (HPM) as part of the U.S. warfighting capabilities. Key beneficial attributes of DE weapon systems include:

- Low-cost per-shot expense;
- Deep magazine (i.e., potential for a large number of firings in one engagement);
- Scalability;
- Immediate initiation of target effects;
- Low collateral damage; and
- Low visibility firing signature.

These attributes make DE weapons suitable for use by each of the Joint Services and Agencies. Because of differing missions and operational environments, the priorities and interests of the Services and Agencies vary considerably. Still, each requires DE weapon systems with greater lethality and capability than is currently available.

The need to directly involve operational personnel in the development of the systems and for them to be properly trained in the operation and support of DE weapon systems is now widely recognized, as the systems are gaining operational acceptance, even at relatively low power levels. The Joint Services are actively pursuing rapid prototyping and experimentation to accelerate the fielding of DE weapons. Due to the threats from near-peer adversaries, it is also recognized that DE systems effectiveness must increase through proper integration of multi-domain capable DE, KE, cyber, and electronic weapon systems. Construction of facilities at the Salinas Peak and/or JDETC Central sites will meet the need for the Proposed Action.

1.3 DECISIONS TO BE MADE

The White Sands Test Center is the project proponent for the Proposed Action, which reports to the U.S. Army Test and Evaluation Command (ATEC). This EA has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [USC] §§ 4321-4370d), and the Department of the Army Environmental Analysis of Army Actions: Final Rule (32 Code of Federal Regulations [CFR] Part 651 [2002]).

The decision to be made by WSMR, based on analysis within this EA, is whether the proposed facilities can be constructed and operated at the JDETC Central and Salinas Peak sites without significant environmental impact.

This EA provides data for analysis and consideration of potential environmental impacts associated with the proposed construction and RDT&E and training activities. Based on an examination of the data generated and an assessment of the magnitude of the potential impacts, a determination would be made indicating if further study is required, via an Environmental Impact Statement (EIS), or if a Finding of No Significant Impact (FONSI) is applicable.

1.4 RELATED ENVIRONMENTAL DOCUMENTATION

To keep environmental documents brief, Army policy allows the tiering or incorporation of existing EAs or completed analyses into other NEPA documents. Tiering permits analysis of actions at a programmatic level for those programs that are similar in nature or broad in scope (40 CFR 1502.4[c], 1502.20, and 1508.23 [2020]) to be used in other analysis efforts. This level of analysis eliminates repetitive discussions of the same issues and focuses on the key issues at each appropriate level of project review. Existing documents that have been reviewed and incorporated by references include:

- Final Environmental Impact Statement for Development and Implementation of Range-Wide Mission and Major Capabilities at White Sands Missile Range, New Mexico (WSMR FEIS; WSMR 2009);
- Environmental Assessment High Energy Laser Systems Test Facility (HELSTF) Enhanced Laser and Range Operations (WSMR 2005);
- Programmatic Environmental Assessment for Directed Energy Test Sites and Operations on White Sands Missile Range, New Mexico (WSMR 2007);
- Supplemental Environmental Assessment for Joint Directed Energy Test Site (JDETS) on White Sands Missile Range (WSMR 2008); and
- White Sands Missile Range Integrated Natural and Cultural Resources Management Plan and Environmental Assessment 2015-2019 (INCRMP, WSMR 2015).

CHAPTER 2 PROPOSED ACTION AND ALTERNATIVES

2.1 DESCRIPTION OF THE PROPOSED ACTION

As JDETC is a Joint Service capability, Use Case inputs were solicited from each of the stakeholder services and agencies to determine mission requirements. Use Cases are descriptions from the user/customer point of view of the kinds of test and training scenarios that may be executed at JDETC and were developed to describe basic RDT&E scenarios that JDETC would be able to host. The associated RDT&E and training activities range from DE subsystem testing to full kill chain engagements involving both DE and KE weapon systems (WSMR 2019).

The JDETC Program would bring DE weapon systems through developmental testing (DT) to operational testing (OT) and experimental regimes. DT would evaluate and determine the DE weapons' operating and engineering characteristics, such as beam quality, thermal loads, and cycle time. Robust OT is essential in determining whether warfighters can use the systems effectively. The sections below describe the construction and operations needed to meet the Use Case requirements.

2.1.1 Construction Activities

The JDETC Program would include primary facilities at the Salinas Peak and JDETC Central sites, with support services provided by other existing WSMR sites and facilities. This section summarizes proposed construction activities at these locations. Please note that specific details regarding construction have not been finalized and some facility locations and dimensions could change in the final design charrette. The information provided below is the best available at the time of the writing of this EA and is used for analysis purposes.

2.1.1.1 Salinas Peak

The Salinas Peak site is located on a mountaintop approximately 9,000 ft (2,740 m) above sea level (asl). It represents a unique environment in that it allows multiple degrees of freedom to engage aerial targets, as well as ground targets on the desert floor below. Figure 2-1 provides an overview of the existing and proposed future facilities at the Salinas Peak site, including a helicopter landing area that would not require new construction or improvements.

To meet the JDETC mission requirements, the construction of two new facilities and restoration of at least one building would occur. The first new facility would be a clamshell enclosure to house the HEL systems. The high-wind-resistant, high-aperture-opening clamshell enclosure would be built at the east end of the Salinas Peak complex and would require the removal of existing portable structures. The HEL systems would mount on a "shaker table" to simulate airborne disturbances (e.g., wind gusts, aerodynamic loading, etc.), as well as aircraft attitude changes in pitch, roll, and yaw, as needed. The shaker table would need to be able to be pointed in a range of directions required to provide a robust engagement geometry, considering terrain masking of air and ground



targets at the site. The clamshell facility would be installed on a new concrete pad 60 ft in diameter with reinforced tie-downs on 8-ft centers.

The gravel access road to the Salinas pinnacle would need to be extended approximately 900 ft. A second concrete pad, measuring 25 ft x 100 ft (7.6 m x 30.5 m), would be constructed located along the access road to the pinnacle for equipment storage and utilities.

A reinforced concrete shelter-in-place facility would be built to house personnel present during RDT&E operations. Some scenarios would require missiles, drones, and manned aircraft engaging the site, presenting a danger to personnel in the vicinity. A suitable shelter would be required to provide safety for test personnel, as well as command and control capabilities needed to run the tests from the shelter. The shelter will accommodate 12 people at 100 gross square feet (SF) (9.3 square meters [m²]) per person.

Given the remote location of Salinas Peak, test personnel would be required to lodge at the site for days at a time. An existing 800-SF (74 m²) facility would be renovated to meet these needs. An existing high bay facility may be renovated for the storage of JDETC Program equipment.

Electrical power would be provided through installation of two enhanced 500-kVA generators with corresponding switchgear, concrete generator pads, two 500-gallon (1,890-liter) double-walled diesel fuel tanks, and a 240-SF (22 m²) switch building with corresponding utility connections to utility stubs at the pinnacle of Salinas Peak.

Additionally, improvements would need to be made at the base camp located at the foot of Salinas Peak, near Salinas Road (WSMR S Route 327) (Figure 2-2). The base camp improvements would include equipment storage facilities, tactical communications, potable water (brought in by delivery), a Container Express (CONEX) box with latrine and shower, a septic system, and an equipment staging area. The staging area would be large enough to host a cement batch plant, should it be deemed necessary. The base camp would include parking with security fencing and lighting. A helicopter pad would be installed near the base camp to accommodate deliveries.



2.1.1.2 JDETC Central

JDETC Central, located a short distance south of HELSTF, would serve as the administrative and communications hub for the JDETC Program. The site would involve the construction of a new facility with a high bay, subgrade laboratories, and administrative space. The high bay will include DE weapon systems designed to operate from multiple platforms. To accommodate higher electricity demands, a new electrical substation would be constructed near the existing Multifunction Array Radar (MAR) substation.

The JDETC Central facility would provide protection and secure equipment from blowing sand and inclement weather. Shaker table capabilities would be installed in the enclosure to emulate platform disturbances (e.g., ocean vessel movements in waves) to examine line of sight stabilization and other key engineering parameters. JDETC Central is designed to house resident HEL and HPM systems that can be made quickly available for operator training and Concept of Operations and Concepts of Employment (CONOPS/CONEMP) development, as well as hosting customer systems (e.g., shipboard HEL systems) that may need extensive diagnostics and opportunities to engage live targets. One or more towers would be constructed on the JDETC Central roof to provide additional weapon elevation, enhancing the target engagement envelope. These towers will be standalone structures, not requiring guy wires. JDETC Central will also include office space to support RDT&E briefings, planning and operations, DE operator and maintainer training, and support facilities, such as a clean room.

The JDETC Central facility would provide approximately 30,000 SF (2,790 m²) of usable space, with 14,100 SF (1,310 m²) of full-service laboratory and 15,990 SF (1,486 m²) to be used as an administration area. The facility would be surrounded by a concrete apron with an area of approximately 5,420 square yards (SY) (4,530 m²). It is estimated that approximately 7,600 SY (6,350 m²) of parking would be needed for the JDETC organizational and non-organizational users.

Four CONEX boxes would be installed near JDETC Central, along Range Road 21. These four enclosures would act as instrumented targets to assess aimpoint maintenance and damage levels. A runway with flight apron would also be constructed at the JDETC Central site in future phases of the program, with limited aircraft support equipment and communications capabilities to support routine testing and large-scale Air and Missile Defense System full kill chain exercises.

Additionally, the JDETC Central facility would require a fire suppression water line, connection to propane gas tanks at HELSTF, conduit enclosed fiber optic and 3-phase electric lines, and connections to the existing sanitary sewer and domestic water systems. Each of the CONEX boxes would be connected to fiber optic communications and single-phase electric lines by tying into the nearest existing nodes. All utilities listed would be subgrade, requiring trenching. New roads would be graded to connect the new facilities to existing roads. Figure 2-3 provides an overview of the JDETC Central site.



Ancillary buildings may be needed to support the JDETC Central complex. These would include four structures: a target preparation building, North Target Transition Site, South Transition Site, and HPM Target Building. At this date, the exact locations and sizes for these facilities is not known, but the buildings would be near the JDETC Central complex.

2.1.2 Operations

This section provides a summary of the weapon systems, engagement scenarios, targets, impact areas, and staffing requirements that would be utilized in support of the Proposed Action.

2.1.2.1 Weapon Systems

The JDETC Program would conduct RDT&E and training scenarios for a full spectrum and a combination of operational and developmental weapon systems. The emphases would include providing capabilities to accelerate the development and fielding of DE weapon systems, supporting key activities such as experimentation and prototyping by the Services. The weapon systems used at JDETC would include actual DE weapons, KE weapons, and intelligence, surveillance, and reconnaissance (ISR) threat systems, when feasible. Customers would be able to bring their weapons and subsystems for RDT&E and training or use resident JDETC equipment, such as HEL and HPM devices and acquisition, tracking, pointing, and fire control (ATP/FC) subsystems.

Directed Energy Weapons

The Proposed Action involves testing and evaluation of DE systems, including HEL and HPM systems, as well as the synergy of DE weapons with KE, cyber, and electronic weapons.

High Energy Lasers

Low-power laser applications for sensing, tracking, illumination, and ranging have been around for decades. The challenge has been to develop HEL systems with the power, packaging, and reliability needed for military use. Currently, sub-100-kilowatt (KW) HELs are available and being fielded to perform missions that are a fit for systems capable of delivering tens of KW of energy.

As DE systems mature, the size, weight, and power (SWaP) characteristics will be reduced, making them compatible with smaller platforms for offensive and self-protect applications. SWaP characteristics of current generation laser weapon systems are suitable for large aircraft such as the C-130 for defending against airborne threats and for some air to ground missions. HELs can damage the optics of electro-optical guided missiles in addition to damaging flight control surfaces (i.e., fins or other controls). Ultra-precision, low collateral damage air to ground (A-G) applications can also be performed at limited ranges against relatively soft targets. Maturation of the HEL systems will enable engagements at longer ranges with reduced dwell times as HEL power and beam quality are increased.

Current ground-based and sea-based systems are capable of engaging and defeating small unmanned aerial systems (UAS) and swarming autonomous systems (SWAS) threats, as well as providing defense against rockets, artillery, and mortars (RAM). New systems being developed will have higher power levels and may have shorter dwell times on targets.

In addition to damaging targets, HEL systems can provide exceptional ISR capabilities due to their high resolution, large-aperture optics, and associated tracking systems. Other ancillary missions could include high bandwidth, jam-resistant optical (laser) communications in contested environments.

The Proposed Action would include multiple types of solid-state lasers (SSLs), including fiber lasers. JDETC will be designed to accommodate as many SSL variants as possible, based on customer inputs and assessments of scalability to useful power and beam quality levels.

High Power Microwave Weapons

High Power Microwave Weapon systems generate short, intense energy pulses producing a transient surge of thousands of volts that overload the circuits of semiconductor devices, causing catastrophic failure. HPM can disable non-shielded electronic devices (including most modern electronic devices) within the effective range of the weapon. Average power levels are similar to many conventional military radar systems, although peak power levels can be higher. HPM typically operate with up to 200 pulses per second for a maximum of 30 seconds every five minutes. HPM offers the potential to deny, disrupt, disable, or destroy target electronics by disabling the internal semiconductors that run them.

There are HPM systems being developed for airbase defense, where power and antenna size are not as critical as they are for mobile systems. HPM is well-suited for counter-UAS and SWAS due to the capability to propagate effects into a relatively wide area, instead of having to deliver the energy to a single target at a time, as is the case with HEL systems.

A wide spectrum of HPM systems would be used at JDETC Central. The infrastructure within the complex would be designed so that both HEL and HPM would be used independently or in a combination during target engagements.

Associated subsystems (e.g., target acquisition and tracking subsystems, damage assessment, communications, operator control, and situational awareness interfaces) would be tested along with the weapons themselves. Mobile platforms such as kineto tracking mounts (KTM) would be provided to host customer subsystems, as well as co-locating/integrating them directly with the DE weapon systems. The use of KTM is described and analyzed in the WSMR FEIS (2009).

Kinetic Energy Weapons

The Proposed Action would involve use of KE weapons both as simulated threats and as defensive weapons used in countermeasures testing. KE weapons would include A-G missiles and munitions including cruise missiles, ground-to-air (G-A) missiles, air-to-air (A-A) missiles, RAM, and others.

Electronic Warfare and Cyber-Systems and Subsystems

Electronic warfare systems would be used for simulated electronic attack scenarios or defensive/support tests. Electronic attack systems act to disrupt, deny, destroy, or deceive target electronic/computer systems. Electronic protection systems prevent a receiver from being jammed or deceived. Electronic support systems sense electromagnetic encroachment and can identify potential electronic attacks.

Cyberwarfare is defined as the use of computer technology to disrupt a state or organization's activities, especially the deliberate attacking of information systems for strategic or military purposes. Cyberwarfare

includes a multitude of potential attack scenarios, including espionage, sabotage, denial-of-service attack, electrical power grid disruption, propaganda, or economic disruption. The Proposed Action would include counter-cyber warfare RDT&E and training activities.

Integrated Weapon Systems

Integrated weapon systems would represent combinations of more than one of the types described above. For the Proposed Action, integrated weapon systems would include:

- HEL with HPM systems;
- HEL with KE weapons;
- HPM with KE weapons; and
- HEL, HPM, KE weapons, electronic warfare, and cyber systems.

The final combination reflects the System of Systems Use Case.

2.1.2.2 Engagement Types

JDETC will employ actual weapons platforms, surrogate platforms, and simulations to provide a full spectrum of engagements for T&E, training, and to develop CONOPS and CONEMP for DE weapon systems. Infrastructure will be provided to enable the following types of engagements.

Air to Ground

Surrogate HEL and HPM aircraft infrastructure will be available at Salinas Peak with the DE weapons and selected subsystems. Salinas Peak will be able to function as a surrogate aircraft equipped with DE weapons capable of engaging tactical targets on the desert floor or target boards to measure target acquisition, aimpoint, and atmospheric propagation characteristics.

Air to Air

Airborne DE weapon systems at Salinas Peak will be able to engage incoming aircraft threats, including cruise missiles, manned aircraft with A-A missiles, and full-size or small drones, individually or in swarms. The engagements may involve threats "attacking" the Salinas Peak system or other scenarios such as non-head on engagements of cruise missiles. JDETC will also support A-A engagements that include a DE weapon or limited capability DE weapon surrogate on an actual aircraft rather than using Salinas Peak as the DE weapon surrogate platform.

Ground to Air

Using the HEL and/or HPM systems hosted in the high bay at JDETC Central, ground-based engagements of a wide variety of airborne threats such as cruise missiles, drone swarms, and aggressor airborne DE systems would be possible. A robust capability would be provided for G-A scenarios such as IAMD, ranging from simple engagements to large campaign level scenarios. The engagements could also be performed using DE weapon systems on tactical ground vehicles positioned at JDETC Central or at one of the distributed sites.

Simulated Sea Surface to Air

This engagement type (with acronym "S-A") is very similar to the G-A engagement, except that the DE weapon would be mounted on a shaker table system that is programmed to provide sea wave and wind disturbances in pitch, roll, yaw, and heave. JDETC would closely coordinate the development of the ship motion generator with Navy stakeholders, using existing solutions to the maximum extent possible to conserve funds and minimize development time. The naval engagements could include live or simulated targeting platforms such as ship-launched drones, as well as ship-based multi-mission helicopters equipped with radar and electro-optical surveillance and targeting sensors and communications links.

Ground to Ground

These engagements could utilize stationary ground-based DE weapon systems at JDETC Central, as well as mobile DE and KE weapon systems for applications such as airbase defense. Towers would be used to extend the engagement envelope of the stationary DE weapons to enhance testing and to be representative of weapons placements on hills.

Simulated Sea Surface to Sea Surface

This engagement scenario would include simulated swarming boats (or ground vehicle surrogates), as well as simulated enemy surface combatants. Command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) capabilities would also be exercised in these engagements. As with sea S-A engagements, drones and MH-60R Seahawk helicopters typically deployed on surface ships could be used to provide realistic targeting scenarios. The aircraft would be equipped with radar and forward-looking infrared (FLIR) cameras. Other missions supported by the H-60 include electronic warfare and command, control, and communications. Navy RDT&E scenarios at JDETC could include the MH-60R, as well as shipboard drones, leveraging the combat system components resident at Desert Ship.

Joint Integrated Air and Missile Defense

The siting of JDETC on the extremely large expanse of WSMR provides the opportunity for DE weapon systems RDT&E and training in a robust, realistic air and missile defense environment. The layered notional engagements with KE, DE, electronic attack, and cyber capabilities would be allowed under this engagement type. The WSMR Joint Integrated Air and Missile Defense (JIAMD) Prototype/Persistent Test Bed is intended to test a complete JIAMD layered defense, as well as individual systems or subsystems, support experimentation, train/certify warfighters, and demonstrate full kill chain including command/control and ISR elements. The WSMR JIAMD/range control software infrastructure should allow all JDETC sites to join in large-scale testing and experimentation. Additionally, it should permit a smaller-scale System of Systems testing for DE purposes with real and virtual weapons and targets. Large-scale operations such as JIAMD events would be conducted in accordance with the WSMR FEIS.

2.1.2.3 Targets

The Proposed Action would require the use of a variety of aerial and ground targets. Targets for DE weapon engagements generally require specialized instrumentation and security measures prior to and after testing. Aerial targets would include:

- A-A missiles;
- Cruise missiles; and

• Drones (full scale, single UAS, and SWAS).

Ground targets would be located on the desert floor east of Salinas Peak. The ground targets would include static target boards and target boards mounted on vehicles, each equipped for high-speed infrared cameras. The cameras would be used to measure system or atmospheric jitter and aim-point maintenance. Targets would be recovered after testing, in accordance with existing standard operating procedures (SOPs).

2.1.2.4 Staffing

It is estimated that a total of 21 full-time personnel would be needed to support the Proposed Action. During times of increased RDT&E or training activity, this number could temporarily increase.

Large operations, such as JIAMD scenarios, would require short-term increases in test personnel and support teams on WSMR. These operations could last for up to three weeks and could require hundreds of temporary personnel. Such operations are described and analyzed in the WSMR FEIS (2009).

2.1.2.5 Operations Tempo

Once operational, the JDETC program is expected to conduct RDT&E activities between two to three weeks per quarter.

2.2 ALTERNATIVES CONSIDERED IN THIS ENVIRONMENTAL ASSESSMENT

2.2.1 The No-Action Alternative

Under the No-Action Alternative, the construction activities described in Section 2.1.1 would not occur, and RDT&E and training activities associated with the nine Use Cases would not be conducted under the JDETC Program at WSMR.

2.2.2 Alternative 1 – JDETC Central and Salinas Peak Upgrades and Operations

This alternative includes construction and facility improvements at the Salinas Peak and JDETC Central sites, as provided in Section 2.1.1. The JDETC Central site would house 21 permanent personnel, Salinas Peak would be staffed as required, and operations would occur as described in 2.1.2 and its subsections.

2.2.3 Alternative 2 – Salinas Peak Location Only

Alternative 2 would include construction and upgrade of facilities only at Salinas Peak and Salinas Base Camp as provided in Section 2.1.1.1. The JDETC Central facility would not be constructed near HELSTF. RDT&E activities involving HEL and HPM systems would commence at the Salinas Peak site and would continue at existing facilities such as HELSTF. There would be 21 permanent personnel based at existing facilities across WSMR. Some personnel would be temporarily located at the Salinas Peak site during operations.

2.2.4 Alternative 3 - JDETC Central Location Only

Under Alternative 3, the JDETC Central facilities would be constructed as provided in Section 2.1.1.2. No construction or improvements would occur at Salinas Peak or Salinas Base Camp. All JDETC program operations would be conducted at the JDETC Central location, with 21 permanent personnel. The Salinas Peak operations, including A-G tests to the desert floor, would not be conducted under this alternative.

2.2.5 Comparison of Alternatives

Table 2-1 provides summaries of the three alternatives for comparison purposes. Much of the information provided in the table is based upon estimates generated by JDETC Program engineers and is provided solely for planning purposes. The volumes of construction materials and the associated number of required deliveries are subject to change.

[This page intentionally left blank]

2

1

Table 2-1Comparison of Alternatives							
Project Doteil	Alternative						
r roject Detail	No-Action	Alternative 1	Alternative 2	Alternative 3			
Construction							
New Facility Construction	None	Salinas Clamshell structure Shelter-in-place JDETC Central JDETC Central Facility Four CONEX sites Five ancillary facilities 	Salinas • Clamshell structure • Shelter-in-place	JDETC CentralJDETC Central FacilityFour CONEX sitesFive ancillary facilities			
Facility Renovation	None	SalinasLodging facilityHigh bay for storageBase camp	Salinas • Lodging facility • High bay for storage • Base camp	None			
Concrete pads and new parking requirements	None	Salinas • 60-ft circular pad • 25 x 100 ft JDETC Central • 5,420 SY apron • Four, 30 ft x 30 ft pads for CONEX boxes • 7,600 SY parking	Salinas • 60-ft circular pad • 25 x 100 ft	 JDETC Central 5,420 SY apron Four, 30 ft x 30 ft pads for CONEX boxes 7,600 SY parking 			
New Electrical Infrastructure	None	 Salinas Two enhanced 500-kVA generators Two double-walled diesel tanks JDETC Central New substation Backup generator/uninterrupted power supply 	Salinas • Two enhanced 500-kVA generators • Two double-walled diesel tanks	JDETC Central • New substation			

1

Final December 2021

Ducient Detail	Alternative				
Project Detail	No-Action	Alternative 1	Alternative 2	Alternative 3	
Road Construction	None	 Salinas 900-ft gravel access road to pinnacle JDETC Central Gravel access roads to each of four CONEX box facilities Paved access road to JDETC Central and non-organizational parking lot 	Salinas • 900-ft gravel access road to pinnacle	 JDETC Central Gravel access roads to each of four CONEX box facilities Paved access road to JDETC Central and non-organizational parking lot 	
Material Deliveries	None	 Salinas 35 concrete deliveries 20 building material deliveries JDETC Central 187 concrete deliveries 300 building material deliveries 	Salinas35 concrete deliveries20 building material deliveries	JDETC Central187 concrete deliveries300 building material deliveries	
Runway Construction	None	 JDETC Central Class B runway, 10,270 ft (3,130 m) long and 350 ft (107 m) wide including shoulders Flight apron to connect to JDETC Central Building 1,875 concrete deliveries 1,000 deliveries for other construction materials 	None	 JDETC Central Class B runway, 10,270 ft (3,130 m) long and 350 ft (107 m) wide including shoulders Flight apron to connect to JDETC Central Building 1,875 concrete deliveries 1,000 deliveries for other construction materials 	
		JDETC Program 0	perations		
JDETC RDT&E Events	None	 2 weeks per quarter during DT 3 weeks per quarter during OT	 2 weeks per quarter during DT 3 weeks per quarter during OT	 2 weeks per quarter during DT 3 weeks per quarter during OT	
Permanent JDETC Personnel	None	21 full-time personnel	21 full-time personnel	21 full-time personnel	
Ground Deliveries in Support of JDETC Program	None	 Salinas 3 to 5 fuel and water deliveries per year during off-cycle times One fuel and one water delivery per week during RDT&E events JDETC Central None 	 Salinas 3 to 5 fuel and water deliveries per year during off-cycle times One fuel and one water delivery per week during RDT&E events 	None	

2.3 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

2.3.1 Conducting JDETC Program and Another Range Complex

The JDETC Integrated Product Team (IPT) considered other Range complexes as homes for the program, including implementation of the full System of Systems Use Case with DE weapons, KE weapons, electronic warfare, and C4ISR units. However, no other Range complex was found to possess the unique operational environment provided by the JDETC Central and Salinas Peak sites.

2.3.2 Limited Testing at WSMR

The JDETC IPT considered continuing with the current DE weapons RDT&E capabilities at WSMR and remain limited to science and technology testing rather than pursuing OT and evaluation, experimentation, and prototyping. However, this would not support national priorities for rapidly deploying DE weapon systems and trained operational personnel.

CHAPTER 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter provides a summary of the valued environmental components (VECs), a description of the environmental conditions potentially affected by the Proposed Action, and an analysis of potential impacts associated with the Proposed Action. Additionally, potential mitigation measures are identified to minimize potential impacts identified.

3.0 VALUED ENVIRONMENTAL COMPONENTS

Army NEPA Analysis Guidance (Army 2007) provides an approach to screen valued environmental components based on information from tiered NEPA analysis and Proposed Action. A VEC analysis was conducted to identify environmental resource areas potentially impacted by the Proposed Action. This analysis considered natural and human environmental resources which are applicable to WSMR and could be impacted by combinations of past, present, and reasonably foreseeable future actions. Potentially useful federal EISs and EAs prepared for WSMR were identified and analyzed to establish regional issues, impacts, and their sources. If the screening approach determines that the cumulative impacts of this action were no greater than anticipated from previously completed analysis, then no further analysis for that VEC was captured in this document. In addition to actions and impacts, useful references and potential mitigation measures were identified for possible inclusion.

Based on this approach, regionally important VECs were identified and ranked as to the likelihood of impact from the Proposed Action. Regionally important VECs at WSMR, as characterized by incorporated EAs, were ranked based on the likelihood of potential impacts caused by the Proposed Action. Each of the VEC categories to include air quality, cultural resources, the Migratory Bird Treaty Act ([MBTA], 16 USC §§ 703-712), and the Bald and Golden Eagle Protection Act (16 USC § 668, [the Eagle Act]), human health, etc. are described in the Army NEPA Guidance Manual (Army 2007) will be assigned to one of five impact potential categories:

- Very Low (VL) No impact or minor impacts are anticipated;
- Low (L) Minor impact anticipated;
- Medium (M) Moderate impact anticipated (less than significant);
- High (H) Significant impact potential anticipated (likely to be mitigated to less than significant); and
- Very High (VH) Significant adverse impact anticipated (mitigation would be applied to minimize adverse effects).

In support of this EA, a VEC analysis was conducted in accordance with The U.S. Army Environmental Command NEPA Analysis Guidance Manual (Army 2007). Components rated moderate to high for the Proposed Action include:

- Cultural resources (includes the topics of historic properties, archaeological resources, and Native American resources);
- Soil erosion effects;
- Biological resources (includes the topics of threatened and endangered species, MBTA, Bald and Golden Eagle Protection Act, and general biological resources); and
- Human health and safety.

Table 3-1 provides a review of a VEC analysis conducted by WSMR ATEC and Garrison personnel.

VEC	Impact Potential	Rationale/Special Considerations
Air Quality	М	The Proposed Action would take place in an area that is in attainment of all National Ambient Air Quality Standards. There would be increased emissions during construction phases of the Proposed Action, especially during runway construction, but these emissions would be low in comparison to the region as a whole and temporary in nature. Two diesel generators would be installed at the Salinas Peak site. Operations would be consistent with existing WSMR activities. Emissions from operations and diesel-powered generators would not represent a significant increase in pollutant emissions.
Airspace Resources	L	Range scheduling through the Test Center Range Operations would ensure that JDETC airspace use would be included on the range schedule. The Proposed Action activities are consistent with current and future operations and would lead to negligible impacts on airspace resources.
Historic Properties	M/H	Portions of the project sites have not been surveyed or evaluated for National Register of Historic Places eligibility. Surveys will be conducted in support of this EA to determine whether eligible properties would be affected by the Proposed Action.
Archaeological Resources	M/H	Portions of the project sites have not been surveyed or evaluated for National Register of Historic Places eligibility. Surveys will be conducted in support of this EA to determine whether eligible sites would be affected by the Proposed Action.
Native American Resources	M/H	Salinas Peak is a sacred site. The Proposed Action would not alter Native Americans access to the sacred site. Portions of the project areas have not been surveyed for funerary objects, sacred sites, or objects of cultural patrimony. Surveys will be conducted in support of this EA, and consultation with State Historic Preservation Officer (SHPO) and Tribal Historic Preservation Officers (THPOs) consultation will be required.
Noise Effects	L	The Proposed Action would not increase the level or intensity of military activity and would not include the use of noisier equipment or munitions than historically used at the project sites. No sensitive human or animal species would be affected by the Proposed Action.
Soil Erosion Effects	М	The Proposed Action would include new disturbance and enlargement of existing facilities at WSMR and would increase the intensity of activity at Salinas Peak. Implementation of the Proposed Action will contribute to cumulative erosion effects when considered with current and foreseeable future operations.
Threatened and Endangered Species	L	There may be listed plant species within the vicinity of the Salinas Peak site. Avoidance measures would be taken to reduce the potential impact on this population. The Proposed Action would not affect the critical habitat of any threatened or endangered wildlife species.
Migratory Bird Treaty Act	М	The project sites may be utilized by migratory bird species.

 Table 3-1
 Valued Environmental Components Review Summary

VEC	Impact Potential	Rationale/Special Considerations
Bald and Golden Eagle Protection Act	М	The Salinas Peak site is within a golden eagle breeding territory occupied by an adult breeding pair, with several nests in close proximity to the site.
Biological Resources	М	Proposed construction activities have the potential to introduce invasive weed species. Construction of the runway could lead to the impact of individual "nuisance animals" such as bobcats, coyotes, or rodents. These effects would be temporary in nature and would not represent significant impacts on local populations.
Wetlands/Surface Water Resources	L	There are no wetlands in the vicinity of the project sites. The Proposed Action would not cause losses in size or decrease the functionality of local wetland resources.
Water Resources Management	L	The proposed construction activities would be conducted in accordance with all applicable state and federal regulations. Construction general permits will be acquired through the Army Corps of Engineers (USACE), with the required stormwater pollution prevention plans (SWPPP) developed and applied. There are no sensitive receptors of water pollutants associated with the Proposed Action. Available ground and surface water supplies will not be stressed due to excessive usage or drought conditions.
Facilities	L	The Proposed Action would not lead to strain on existing WSMR facilities or infrastructure. No changes to community lands or services infrastructure would result through the implementation of the Proposed Action.
Socioeconomics & Environmental Justice	L	The Proposed Action would not affect local community growth trends. No additional cumulative socioeconomic effects analysis would be needed. The Proposed Action would occur entirely within administrative boundaries of WSMR, isolated from the general population and not anticipated to go beyond the administrative boundaries; thus, there would be no impact to any populations, including minority populations, low-income populations, and children. Therefore, the Proposed Action would not disproportionately affect minority or low-income populations or children.
Energy Demand & Generation/ Transmission Use	L	The Proposed Action would not expand Installation demands on regional energy resources. Required electricity at the Salinas Peak site would be provided by diesel generators installed as part of the Proposed Action.
Land Use Conflicts/ Compatibilities	L	The project areas are identified as RDT&E ranges in the WSMR FEIS (2009). The Proposed Action would be consistent with existing WSMR land management and sustainability plans and would not create conflicts due to scheduling or differing mission requirements. The Proposed Action would not require land acquisitions or disposal of excess lands.
Hazardous Materials/ Hazardous Wastes	L	Hazardous materials and wastes associated with the Proposed Action would be managed, handled, and disposed of in accordance with existing SOPs. Construction debris, including asphalt and concrete waste, would be disposed of in coordination with the WSMR Garrison Environmental Division, Compliance Branch. Where possible, waste would be diverted from landfills and recycled. Double-walled fuel tanks would be installed at the Salinas Peak site, providing secondary containment. Maintenance activities would be conducted in existing facilities equipped for such activities.
Traffic and Transportation Systems	L	The Proposed Action would contribute negligible increases in regional and on- Installation traffic. Some deliveries to the Salinas Peak site would require one-way traffic to and from the site, creating temporary transportation impacts on the low volume traffic road

VEC	Impact Potential	Rationale/Special Considerations
Human Health and Safety	М	Deliveries on Salinas Road pose safety hazards. The Proposed Action would generate electromagnetic radiation hazards, including hazards of electromagnetic radiation to personnel (HERP), hazards of electromagnetic radiation to ordnance (HERO), and hazards of electromagnetic radiation to fuel (HERF).

3.1 AIR QUALITY

The principal framework of national, state, and local efforts to protect air quality in the United States is the Clean Air Act (42 USC § 7401 et seq., [CAA]). Under the CAA, the U.S. Environmental Protection Agency (EPA) has set health-based standards known as National Ambient Air Quality Standards (NAAQS) for six criteria pollutants considered to be key indicators of air quality: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), lead (Pb), and two categories of particulate matter—namely particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀) and particulate matter with an aerodynamic diameter of 2.5 microns or less (PM_{2.5}) (40 CFR Part 50).

The EPA is responsible for ensuring that all air quality standards are met or attained in cooperation with state, tribal, and local governments through national strategies to control air pollutant emissions. Under the CAA, state and local agencies may establish state Ambient Air Quality Standards (AAQS) of their own, provided these are at least as stringent as the federal requirements. Pertinent State regulations are found in Title 20, Chapter 2, Part 3 of the New Mexico Administrative Code (NMAC) 20.2.3.1 to 20.2.3.11 issued by the Environmental Improvement Board on September 6, 2006. Federal NAAQS and the State of New Mexico AAQS are shown in Table 3-2.

Army Regulation (AR) 200-1, part 1-24, *Environmental Protection and Enhancement*, states (in part) that Garrison Commanders will: "Comply with applicable federal, state, and local environmental laws, regulations, internal directives and goals, EOs, and overseas Foreign Governing Standards." To that end, the Environmental Asset section of AR 200-1 lists the following air quality policies and program goals:

- Comply with applicable federal, state, and local air quality regulations, permit requirements, and overseas Final Governing Standards;
- Identify and implement cost-effective pollution prevention measures that will reduce toxic or criteria air emissions;
- Eliminate dependency on ozone-depleting substances; and
- Achieve and maintain air quality standards to protect human health and the environment while minimizing mission impacts.

3.1.1 Affected Environment

3.1.1.1 Attainment Status

The lands within WSMR's boundaries are in attainment for all criteria pollutants. The nearest nonattainment area to WSMR lies 17 miles south of the southernmost boundary of WSMR at Anthony in Doña Ana County, classified as moderate nonattainment for PM_{10} . Sunland Park, New Mexico, is located approximately 39 mi (63 km) south of WSMR and is in nonattainment for ozone.

Type1 Primary Primary Primary & Secondary None	AAQS 8.7 ppm 13.1 ppm 0.05 ppm 0.10 ppm
Primary Primary Primary & Secondary None	8.7 ppm 13.1 ppm 0.05 ppm 0.10 ppm
Primary Primary Primary & Secondary None	8.7 ppm 13.1 ppm 0.05 ppm 0.10 ppm
Primary Primary & Secondary None	13.1 ppm 0.05 ppm 0.10 ppm
Primary & Secondary None	0.05 ppm 0.10 ppm
Primary & Secondary None	0.05 ppm 0.10 ppm
None	0.10 ppm
Primary & Secondary	None ⁴
Primary & Secondary	None ⁴
Primary & Secondary	None ⁴
Primary & Secondary	None ⁴
Primary & Secondary	None ⁴
Primary	0.02 ppm ⁸
Primary	0.10 ppm ⁸
Secondary	None ⁴
None	0.10 ppm
None	0.003 ppm
	Primary & Secondary Primary Secondary None None

Table 3-2 National and State of New Mexico Ambient Air Ouality Standards

s are "health-based," and Secondary Standards are "welfare-based.

2. Not to be exceeded more than once per year.

3. To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.

4. When no state AAOS exists, the NAAOS applies.

5. To attain this standard, the 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed $15.0 \,\mu\text{g/m}^3$.

To attain this standard, the 3-hour average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within 6. an area must not exceed 35 µg/m^3 .

7. Not to be exceeded more than once per year on average over three years.

For the entire State of New Mexico except for the area within 3.5 miles of the Chino Mines Company smelter furnace stack near Hurley 8. where higher levels (same as NAAQS) apply.

1-hour average not to be exceeded more than once a year. For the entire State of New Mexico, except for those parts of the Pecos-9. Permian Basin Intrastate Air Quality Control Region where higher levels apply.

10. Total reduced sulfur does not include H2S. Applies to the entire State of New Mexico except for those parts of the Pecos- Permian Basin Intrastate Air Quality Control Region where higher levels are in effect. Sources: 40 CFR Part 50, NMAC 20.2.3.1 to 20.2.3.11

3.1.1.1 Area Meteorology

Air quality is closely intertwined with day-to-day meteorological weather conditions and the influences of longer-term climate. Concentrations of atmospheric air pollutant gases/species can be influenced by meteorological variables (e.g., wind speed), which affect the dispersion of particulates from soils; wind direction and speed which affects transportation; mixing depths and stability, which affect dispersion; and temperature, humidity, sunlight, and cloud water, which can play a role in the chemical formation of certain air pollutants.

WSMR encompasses the Tularosa Basin in southern New Mexico, which lies between the Sacramento Mountains to the east, the San Andres and Oscura mountains to the west, and the Jornada del Muerto Basin in the northwestern portion of the range. The climate of the Tularosa and Jornada del Muerto basins is typical of the arid regions of the state at lower altitudes. Table 3-3 provides a summary of climate conditions at WSMR.

Wind speeds are usually moderate, although relatively strong winds often accompany occasional frontal activity during late winter and spring months and sometimes occur just in advance of thunderstorms. Frontal winds may exceed 30 knots (55.6 km per hour) for several hours and reach peak speeds of more than 50 knots (92 km per hour). Spring is the windy season. Blowing dust and soil erosion can occur during dry spells. Winds generally predominate from the southeast in summer and from the west in winter.

Avoragos	Month									Annual			
Averages	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Max Temp ¹	57.3	62.9	70.3	79.3	88.2	96.8	97.2	94.5	89.0	78.8	65.9	56.8	78.1
Min Temp ¹	22.3	25.7	31.5	39.5	48.6	58.4	64.0	61.6	54.1	41.1	28.1	21.6	41.4
Precipitation ²	0.50	0.38	0.29	0.30	0.37	0.76	1.34	1.67	1.29	0.90	0.44	0.67	8.89

Table 3-3	WSMR	Climate	Summary
		Chinace	Summary

1. In degrees Fahrenheit

2. In inches

Source: WRCC 2020

3.1.1.2 Greenhouse Gases

Greenhouse gases (GHGs) are pollutants of concern for air quality and climate change. GHGs include water vapor, carbon dioxide (CO₂), methane (CH₄), NO₂, O₃, and several chlorofluorocarbons. Water vapor is a naturally occurring GHG and accounts for the largest percentage of the greenhouse effect. Next to water vapor, CO₂ is the second-most abundant GHG and is typically produced from human-related activities. The largest source of CO₂ emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. Additionally, a number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO₂ emissions.

GHG emissions for an action can be inventoried based on methods prescribed by state and federal agencies. However, the specific contributions of a particular project to global or regional climate change generally cannot be identified based on existing scientific knowledge because individual projects typically have a negligible effect. Also, climate processes are understood only at a general level.

3.1.2 Environmental Consequences

Criteria pollutant emissions resulting from proposed construction and RDT&E activities have been evaluated for the Proposed Action. Air quality impacts would be significant if emissions associated with the Proposed Action would: 1) increase ambient air pollution concentrations above the NAAQS; 2) contribute to an existing violation of the NAAQS; 3) interfere with or delay timely attainment of the NAAQS; or 4) impair visibility within federally mandated Prevention of Significant Deterioration Class I areas. Additionally, a conformity analysis would be required before initiating any action that may lead to

nonconformance with a State Implementation Plan, an exceedance of *de minimis* criteria pollutant thresholds, or contribution to a violation of the NAAQS.

Since WSMR is considered in attainment/unclassified for the NAAQS, the provisions of the General Conformity Rule do not apply. However, emission estimates for the Proposed Action have been compared to *de minimis* thresholds of a basic nonattainment area for planning purposes. At WSMR, dust generation and control are of principal concern. In the sections below, fugitive dust is the largest contributor to PM_{10} emissions.

3.1.2.1 No-Action Alternative

Under the No-Action Alternative, there would be no construction at the Salinas Peak or JDETC Central locations, and no new operations would be introduced to WSMR. Therefore, there would be no increase in criteria pollutant or GHG emissions. Therefore, the No-Action Alternative would have no effect on regional air quality.

3.1.2.2 Alternative 1 – JDETC Central and Salinas Peak

Criteria Air Pollutant Emissions

Estimated annual criteria air pollutant emissions were calculated for the actions associated with Alternative 1. These include the construction activities at Salinas Peak and JDETC Central, as well as material deliveries for construction and operations. Grading and gravel application to Salinas Road were also included. The analysis also considered roundtrip personnel transport from Las Cruces to the project sites. Table 3-4 provides a summary of the criteria pollutant emissions associated with Alternative 1.

Total emissions resulting from project activities have been estimated using data presented in Chapter 2, and the general air quality assumptions and emission factors are listed in Appendix A. Emission calculations for all project activities are provided in Appendix A. As the WSMR area is in attainment for all criteria pollutants and estimated emissions are below *de minimis* thresholds, implementation of Alternative 1 would have no significant impact on regional air quality.

Emission Source	Pollutant (tons/year)							
Emission Source	VOC	NOx	CO	SOx	PM ₁₀	CO_2^1	CH4 ¹	
Vehicle Emissions ²	0.033	0.241	0.484	0.00171	0.00729	175	0.00296	
Construction Emissions ³	0.0877	0.612	0.524	0.00137	0.924	120	0.00792	
Runway Construction Emissions ⁴	2.34	7.43	8.43	0.0477	3.13	7,314	0.173	
Total	2.46	8.28	9.44	0.0508	4.06	7,609	0.184	
<i>de minimis</i> threshold ⁵	100	100	100	100	100	NA	NA	

Table 3-4Total Emissions (tons/year) – Alternative 1

Notes: ¹ CO₂ and CH₄ emission estimates provided for GHG analysis.

²Vehicle emissions include personnel transport and equipment delivery for construction and operations.

³ Construction emissions include construction equipment and fugitive dust emissions, not including runway construction.

⁴ Runway construction emissions include fugitive dust emissions, emissions due to construction equipment, and vehicles used during the construction of the runway at JDETC Central. It should be noted that the runway construction would not be in the same year as facility construction.

⁵ *de minimis* thresholds do not apply to actions taken on WSMR as it is in attainment/unclassified for the NAAQS. However, emissions estimates for the Proposed Action have been compared to *de minimis* thresholds of a basic nonattainment area for planning purposes.

NA = Not Applicable.

Greenhouse Gas Emissions

In the absence of formally adopted thresholds of significance, this EA compares GHG emissions that would occur with Alternative 1 actions to the 25,000 metric ton level, as well as comparing the net GHG emissions associated with the Proposed Action to the U.S. GHG baseline inventory of 2018 of 5.90×10^9 metric tons (tonnes) (EPA 2020) to determine the relative increase in proposed GHG emissions. Table 3-5 summarizes the annual GHG emissions associated with the implementation of the Proposed Action. Appendix A presents estimates of GHG emissions generated by the Proposed Action. These data show that the CO_{2e} emissions associated with the Proposed Action would amount to approximately 0.000117% of the total CO_{2e} emissions generated by the U.S. Emissions under the Proposed Action are also below the 25,000 metric tons of CO_{2e} level proposed in the draft NEPA guidance by the Council on Environmental Quality (CEQ) (see Table 3-5).

Table 3-5	GHG Emissions for Alternative 1					
Pollutant	Actual emissions (tonnes/year)	CO2e emissions (tonnes/year)				
CO ₂	6,903	6,903				
CH ₄	0.167	3.50				
Total		6,907				
% U.S. emissions		0.000117				

3.1.2.3 Alternative 2 – Salinas Peak Only

Criteria Air Pollutant Emissions

Estimated annual criteria air pollutant emissions were calculated for the actions associated with Alternative 2. These include the construction activities at Salinas Peak as well as material deliveries for construction and operations. Grading and gravel application to Salinas Road were also included. The analysis also considered roundtrip personnel transport from Las Cruces to the project site.

Table 3-6 provides a summary of the criteria pollutant emissions associated with Alternative 2. As the WSMR area is in attainment for all criteria pollutants and estimated emissions are below *de minimis* thresholds, implementation of Alternative 2 would have no significant impact on regional air quality.

Greenhouse Gas Emissions

Table 3-7 summarizes the annual GHG emissions associated with the implementation of the Proposed Action. Appendix A presents estimates of GHG emissions generated by the Proposed Action. These data show that the CO_{2e} emissions associated with the Proposed Action would amount to approximately 0.0000018% of the total CO_{2e} emissions generated by the U.S. Emissions under the Proposed Action are also below the 25,000 metric tons of CO_{2e} level proposed in the draft NEPA guidance by the CEQ (Table 3-7).

Table 3-0	Total Emissions (tons/year) – After hative 2								
Emission Source		Pollutant (tons/year)							
Emission Source	VOC	NOx	CO	SOx	PM ₁₀	CO_2^1	CH4 ¹		
Vehicle Emissions ²	0.0165	0.12	0.242	0.00086	0.00364	87.7	0.00148		
Construction Emissions ³	0.0207	0.154	0.101	0.00031	0.0486	27.4	0.00187		
Total	0.0372	0.274	0.343	0.00117	0.0522	115	0.00335		
<i>de minimis</i> threshold ⁴	100	100	100	100	100	NA	NA		

Table 3-6	Total Emissions (tons/year) – Alternative 2
-----------	---

Notes: ¹ CO₂ and CH₄ emission estimates provided for GHG analysis.

² Facility construction emissions include fugitive dust emissions, emissions due to construction equipment and vehicles used during the construction of JDETC Program facilities, not including the runway.

³ Operational phase emissions include emissions from personal and mission support vehicle usage and associated fugitive dust generation.

⁴ *de minimis* thresholds do not apply to actions taken on WSMR as it is in attainment/unclassified for the NAAQS. However, emissions estimates for the Proposed Action have been compared to *de minimis* thresholds of a basic nonattainment area for planning purposes.

NA = Not Applicable.

Table 5-7	Ono Emissions for Anternative 2					
Pollutant	Actual emissions	CO2e emissions				
Tonutant	(tonnes/year)	(tonnes/year)				
CO ₂	104	104				
CH ₄	0.00303	0.0638				
Total		104				
% U.S. emissions		1.76 x 10 ⁻⁶				

Table 3-7GHG Emissions for Alternative 2

3.1.2.4 Alternative 3 – JDETC Central Only

Estimated annual criteria air pollutant emissions were calculated for the actions associated with Alternative 3. These include the construction activities at JDETC Central as well as material deliveries for construction and operations. The analysis also considered roundtrip personnel transport from Las Cruces to the project site.

Table 3-8 provides a summary of the criteria pollutant emissions associated with Alternative 3. As the WSMR area is in attainment for all criteria pollutants and estimated emissions are below *de minimis* thresholds, implementation of Alternative 3 would have no significant impact on regional air quality.

Greenhouse Gas Emissions

Table 3-9 summarizes the annual GHG emissions associated with the implementation of the Proposed Action. Appendix A presents estimates of GHG emissions generated by the Proposed Action. These data show that the CO_{2e} emissions associated with the Proposed Action would amount to approximately 0.000115% of the total CO_{2e} emissions generated by the U.S. Emissions under the Proposed Action are also below the 25,000 metric tons of CO_{2e} level proposed in the draft NEPA guidance by the CEQ (Table 3-9).

Table 5-8 Total Emissions (tons/year) – Alternative 5								
Emission Source	Pollutant (tons/year)							
Emission Source	VOC	NOx	CO	SOx	PM10	CO_2^1	CH4 ¹	
Vehicle Emissions ²	0.0165	0.120	0.242	0.00085	0.00364	87.7	0.00148	
Construction Emissions ³	0.0670	0.458	0.423	0.00106	0.879	92.4	0.00605	
Runway Construction Emissions ⁴	2.34	7.43	8.43	0.0477	3.13	7,314	0.173	
Total	2.34	8.01	9.10	0.0496	4.01	7,494	0.181	
<i>de minimis</i> threshold ⁵	100	100	100	100	100	NA	NA	

Table 3-8	Total Emissions ((tons/year)) – Alternative 3
-----------	-------------------	-------------	-------------------

¹ CO₂ and CH₄ emission estimates provided for GHG analysis. Notes:

² Vehicle emissions include personnel transport and equipment delivery for construction and operations.

3 Construction emissions include construction equipment and fugitive dust emissions, not including runway construction.

⁴ Runway construction emissions include fugitive dust emissions, emissions due to construction equipment and vehicles used during the construction of the runway at JDETC Central. It should be noted that the runway construction would not be in the same year as facility construction.

NA = Not Applicable.

1 ubic 0)				
Pollutant	Actual emissions (tonnes/year)	CO2e emissions (tonnes/year)		
CO ₂	6,798	6,798		
CH ₄	0.164	3.45		
Total		6,801		
% U.S. emissions		0.000115		

Table 3-9 **GHG Emissions for Alternative 3**

3.1.3 **Best Management Practices**

As specified in 32 CFR 651 (2002), the project proponent has the responsibility of ensuring that all best management practices (BMPs) and mitigation measures are implemented. BMPs are practices taken by an agency to prevent disturbance. Mitigations are measures implemented to reduce the impact of an action to insignificant and would be included in a FONSI. The following BMPs would be applied to reduce impacts to regional air quality:

- To the fullest extent possible, unpaved roads and other cleared areas would be wetted to minimize • fugitive dust emissions during heavy usage;
- During construction or other earth-moving activities, truckloads of dirt would be covered with tarps to reduce windborne dust; and
- Acquisition of any generators will be coordinated with WSMR Garrison Environmental Compliance to ensure EPA or other standards are met.

⁵ de minimis thresholds do not apply to actions taken on WSMR as it is in attainment/unclassified for the NAAQS. However, emissions estimates for the Proposed Action have been compared to de minimis thresholds of a basic nonattainment area for planning purposes.

3.2 CULTURAL RESOURCES

Cultural resources include prehistoric and historic archaeological sites; as well as historic buildings, structures, objects, and districts that depict evidence of human activity considered important to any culture, subculture, or community. Cultural resources consist of archaeological resources, architectural resources, and traditional cultural properties.

Archaeological resources consist of the material remains of prehistoric and/or historic human activity. The Archaeological Resources Protection Act of 1979 (ARPA) defines archaeological resources as "pottery, basketry, bottles, weapons, weapon projectiles, tools, structures or portions of structures, pit houses, rock paintings, rock carvings, intaglios, graves, human skeletal materials, or any portion or piece of any of the foregoing items" (16 USC 470bb [1988]).

Architectural resources include manmade structures including, but not limited to, standing buildings, dams, bridges, and canals. Under the National Historic Preservation Act of 1966 (NHPA) (Public Law [PL] 89-665, as amended by PL 96-515; 16 USC 470 et seq.), only architectural resources older than 50 years are considered for protection; however, younger structures can be afforded the same protection under special circumstances (e.g., Criteria Consideration G).

Traditional cultural properties may include archaeological resources, architectural resources, topographic features, plant and animal habitat, and any other inanimate object deemed essential to the continuance of a traditional culture by Native Americans and other groups.

The NHPA provides for the establishment of the National Register of Historic Places (NRHP), an official list of districts, archaeological sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture. Section 106 of the NHPA requires federal agencies with jurisdiction over a proposed federal project to consider the undertaking's effect on cultural resources listed or eligible for listing in the NRHP and affords the SHPO and the Advisory Council on Historic Preservation (ACHP) opportunity to comment regarding the undertaking.

NRHP eligibility criteria have been defined by the Secretary of the Interior's Standards for Evaluation (36 CFR 60 [1981]). To be considered eligible for listing in the NRHP, cultural resources must covey the quality of significance in American history, architecture, archaeology, engineering, and culture present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and meet at least one of the following criteria:

- Criterion A: The resources are associated with the events that have made a significant contribution to the broad patterns of American history;
- Criterion B: The resources are associated with the lives of persons significant in our past;
- Criterion C: The resources embody the distinctive characteristic of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant or distinguishable entity whose components may lack individual distinction; and
- Criterion D: The resources have yielded or may likely yield information important in prehistory or history.

The process of agency review and assessment of the effect of an undertaking on cultural resources is set forth in the implementing regulations formulated by the ACHP (36 CFR 800, Protection of Historic Properties [2000]). Other applicable laws and guidelines include:

- Executive Order (EO) 11593, Protection and Enhancement of Cultural Environment (16 USC 470 [Supp. 1, 1971]);
- Native American Graves Protection and Repatriation Act (PL 101 601 [1990], USC 3001 3013);
- Determination of Eligibility for Inclusion in the NRHP (36 CFR 63 [1981]);
- Curation of Federally Owned and Federally Administered Archaeological Collections (36 CFR 79 [1990]); and
- DoD Directive 4710.1, Archeological and Historic Resources Management (1984).

Section 101(d)(6)(B) of the NHPA requires federal agencies to consult with Indian tribes that attach religious or cultural significance to historic properties. Compliance with 36 CFR 800.2 (2004), which implements consultations with Native Americans, may be conducted by federal agencies as part of a government-to-government undertaking.

In accordance with Section 101(b)(3) of the Act, SHPOs advise and assist federal agencies in carrying out their Section 106 responsibilities and assist agencies, organizations, and individuals to ensure that historic properties are taken into consideration at all levels of planning and development. In New Mexico, the SHPO is the director of the New Mexico Historic Preservation Division (HPD) of the Department of Cultural Affairs. Consultation between WSMR and SHPO is an ongoing process regarding actions taken at WSMR, and SHPO will be consulted whenever a new ground disturbance is planned in support of the Proposed Action.

3.2.1 Affected Environment

3.2.1.1 Salinas Peak

There are no current archaeological surveys for the Salinas Peak site, the Salinas Base Camp, or the road connecting the two sites. Surveys will be conducted prior to any ground-disturbing activity, including road improvement or maintenance. Consultation with SHPO will be conducted following these surveys.

3.2.1.2 JDETC Central

There have been limited archaeological surveys of the JDETC Central area, including all existing roads and the proposed CONEX 2 location, with no historic or prehistoric resources recorded during these surveys.

Surveys will be conducted prior to any ground-disturbing activities for all other locations at the JDETC Central Site. Consultation with SHPO will be conducted following these surveys.

3.2.2 Environmental Consequences

The definition of effect is contained within 36 CFR Part 800 (2000): "Effect means alteration to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." As per this regulation, an adverse effect occurs:

"...when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would

diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.... Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative."

Examples of adverse effects may include, but are not limited to, the following:

- I. Physical destruction of or damage to all or part of the property;
- II. Alteration of a property, including restoration, renovation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR 68 [1995]) and applicable guidelines;
- III. Removal of property from its historic location;
- IV. Change of the character of the property's use or of physical features within the property's setting that contributes to its historic significance;
- V. Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- VI. Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and
- VII. Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure the long-term preservation of the property's historic significance.

Effects can be direct, indirect, and cumulative. Direct effects include physical destruction or damage. Indirect effects include the introduction of visual, auditory, or vibration impacts as well as neglect to a historic property. Cumulative effects are the impacts of a project taken into account with known past or present projects as well as foreseeable future projects.

3.2.2.1 No-Action Alternative

Under the No-Action Alternative, there would be no construction activities at the Salinas Peak and JDETC Central sites and no new RDT&E activities at WSMR. Therefore, there would be *no effect* on cultural resources associated with the No-Action Alternative.

3.2.2.2 Alternative 1 – JDETC Central and Salinas Peak

Some construction and RDT&E activities associated with Alternative 1 would occur in areas that have been previously surveyed and determined to contain no historic properties through NHPA Section 106 consultation, with SHPO concurrence (CONEX 2 location and existing roads near JDETC Central). These activities would not impact cultural resources and would have no potential for cumulative impacts to cultural resources. The potential would exist for the inadvertent discovery of cultural resources in these areas. In the event of inadvertent discovery, program personnel would report to the WSMR Garrison Environmental Division, as specified in Cultural Resources Management SOP #9, *Accidental Discovery of Historic Properties*, of the WSMR INCRMP (WSMR 2015). Areas containing known significant cultural resources would be avoided through site selection during the planning process.

In accordance with Section 9 of the 1985 Programmatic Memorandum of Agreement with SHPO, WSMR will consult on any findings of adverse effect, to include unevaluated sites. Proposed RDT&E activities that would occur in areas where cultural resource surveys have not been completed or where surveys have been conducted but NHPA Section 106 consultation is not complete would be subject to site-specific cultural resource survey and evaluation as needed. Consultation with THPOs will also be conducted. The WSMR Cultural Resources Manager (CRM) would determine whether site-specific cultural resource studies or consultation would be required prior to the implementation of proposed activities in these areas. Any cultural resource identification and consultation requirements would be completed prior to the implementation of these activities.

The analysis of potential effects will remain incomplete until the necessary surveys and consultation with SHPO are conducted. Therefore, no determination of effect for this alternative can be made at this time.

3.2.2.3 Alternative 2 - Salinas Peak Only

Under this alternative, proposed construction and RDT&E activities at Salinas Peak, Salinas Base Camp, and the road connecting the two sites would be identical to those associated with Alternative 1.

As with Alternative 1, the analysis of potential effects will remain incomplete until the necessary surveys and consultation with SHPO and THPOs are conducted. Therefore, no determination of effect for Alternative 2 can be made at this time.

3.2.2.4 Alternative 3 – JDETC Central Only

Proposed construction and RDT&E activities at the JDETC Central Site under Alternative 3 would be identical to those associated with Alternative 1.

As with Alternative 1, the analysis of potential effects will remain incomplete until the necessary surveys and consultation with SHPO and THPOs are conducted. Therefore, no determination of effect for Alternative 3 can be made at this time.

3.2.3 Best Management Practices and Mitigations

As specified in 32 CFR 651 (2002), the project proponent has the responsibility of ensuring that all BMPs and mitigation measures are implemented. BMPs are practices taken by an agency to prevent disturbance. Mitigations are measures implemented to reduce the impact of an action to insignificant and would be included in a FONSI. The following BMPs would be applied to reduce impacts to cultural resources:

- Recovery of targets will be conducted in accordance with the WSMR SOP for Environmental Protection During Recovery Actions; and
- In the event of inadvertent discovery, program personnel would report to the WSMR Garrison Environmental Division, as specified in Cultural Resources Management SOP #9 of the WSMR INCRMP.

3.3 SOIL EROSION EFFECTS

Soil erosion effects are generally dependent upon a variety of factors, including soil structure and composition, climate, topography, and vegetative cover. The structure and composition refer to the physical features of soil, such as compaction, moisture, and composition, based on the bedrock material and mineral deposits. Climactic soil erosion effects primarily revolve around the abundance and intensity of precipitation in each environment. Topographic descriptions are typically in respect to the elevation, slope, aspect, and surface features (e.g., surface roughness) found within a given area. Vegetative cover is an interface between the atmosphere and soil surface, therefore, influencing the overall permeability and potential runoff. When considered together, these factors determine a soil's potential for wind and water erosion. This analysis of soil erosion effects focuses on the two project areas of Salinas Peak and JDETC Central.

Descriptions of the WSMR geology and topography, seismicity and geologic hazards, geologic resources, and soils can be found in the WSMR FEIS, Section 3.6 *Earth Sciences*.

3.3.1 Affected Environment

3.3.1.1 Geology

The geologic history of WSMR is described in detail in the WSMR EIS, Section 3.6, and the INCRMP, Section 6.3. The 2003 Geologic Map of New Mexico (NMBGMR 2003) was utilized to determine the geographic regions for each of the proposed features.

Salinas Peak

Salinas Peak geology is categorized as -Ti – Tertiary intrusive rocks of intermediate to silicic composition (Pliocene to Eocene). This unit is comprised of manzanitic to graniteic plutons, stocks locoliths, and prophyitic dikes in deeply eroded magmatic centers; and andesitic, dacitic, or rhyolitic plugs and dikes near cauldrons or stratovolcanoes.

JDETC Central

JDETC Central falls within the Qeg unit. This unit is comprised of gypsiferous eolian deposits (Holocene to Middle Pleistocene). The four associated CONEX boxes of JDETC Central are within the Qa unit, made up of Alluvium ranging from the Holocene to Upper Pleistocene.

3.3.1.2 Soils

The United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) soil data for WSMR were downloaded and queried for Salinas Peak and JDETC Central.

Salinas Peak

The primary soil type on Salinas Peak is Rubble land-Rock Outcrop-Far complex, 3 to 90 percent slopes. The Rubble land and Rock Outcrop components are miscellaneous areas and largely undefined. The Far component soils are well-drained with parent material of colluvium derived from rhyolite and/or residium weathered from rhyolite (NRCS 2014).

JDETC Central

JDETC Central and CONEX 2 are represented by Globe-Jato-Peligro complex, 0 to 20 percent slopes. This complex ranges from Globe soils that are poorly drained and derived from a parent material of clayey alluvium to Jato soils that are well-drained with fine-silty alluvium over gypsiferous lacustrine deposit parent material, and Peligro soils that are excessively drained with a parent material of gypsiferous sandy eolian deposits. CONEX 1, 3, and 4 locations are represented by Hermes loam, 0 to 4 percent slopes soils (NRCS 2014). Hermes loam is well-drained, with a parent material of alluvium over gypsiferous lacustrine deposits.

3.3.1.3 Topography

Salinas Peak

Salinas Peak ranges from approximately 6,800 ft (2,070 m) asl at the Salinas Base Camp to 8,965 ft (2,732 m) asl at the peak. Salinas Road has multiple switchbacks and will require widening in some portions for materials to reach the peak. Salinas Peak represents one of the greatest areas of topographic relief at WSMR.

JDETC Central

At JDETC Central, the main site is at approximately 3,955 ft (1,205 m) asl, and the four associated CONEX are at 3,930 ft (1,198 m) asl. This region of WSMR has little to no topographic relief.

3.3.1.4 Soil Erodibility

Soil erosion from wind, water, and road use is a concern due to its impacts on the surrounding plant communities and the resulting cost of road maintenance. The NRCS uses several factors to evaluate soil erodibility (NRCS 2020):

- The erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.
- A wind erodibility group consists of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.
- Road and trail erosion hazard ratings are based on soil erosion factor K, slope, and content of rock fragments.

A rating of "slight" indicates that little or no erosion is likely. "Moderate" indicates that some erosion is likely, that the roads or trails may require periodic maintenance. "Severe" indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Table 3-10 provides a summary of the soil erodibility for the predominant soil types present on Salinas Peak and at JDETC Central.

Location	Map Unit Name	Erosion Hazard(Road, Trail)	Wind Erodibility Group	K factor, Whole Soil
Salinas Peak	Rubble land-Rock Outcrop- Far complex, 3 to 90 percent slopes	Severe or Not Rated Poorly suited or not rated for roads	6 or Not Rated	0.20 or not rated
JDETC Central and CONEX 2	Globe-Jato-Pelgiro complex, 0 to 20 percent slopes	Slight to Severe Moderately to Poorly suited for roads	3-4	0.17-0.49
CONEX 1, 3, & 4	Hermes loam, 0 to 4 percent slopes	Slight Moderately suited for roads	4L	0.32

Table 3-10 Soil Erodibility by Type

Source: NRCS 2018.

The highest potential for erosion is at Salinas Peak within the Far soils. At JDETC Central and CONEX 2 have the highest potential for erosion in Pelgiro soils. While grouped in similar complexes, the remaining soil types at Salinas Peak and JDETC Central pose either a slight risk for erosion or are not currently rated by NRCS.

3.3.2 Environmental Consequences

3.3.2.1 No-Action Alternative

Under the No-Action Alternative, the construction activities described in Section 2.1.1 would not occur, and RDT&E and training activities provided in Section 2.1.2 would not be conducted under the JDETC Program at WSMR. Therefore, there would be no soil erosion effects associated with this alternative.

3.3.2.2 Alternative 1 – JDETC Central and Salinas Peak

Deliveries and personal vehicle traffic on Salinas Road would be a major source of soil erosion effects associated with Alternative 1. Considering this, Salinas Road would be monitored for erosion and maintained or improved as needed. Road maintenance and improvements would be designed to prevent water from running down or off the road in a concentrated flow that would create ruts and erosion. The runoff would be managed using techniques such as those described in Zeedyk (2006) or other methods to minimize erosion by properly directing, slowing, and infiltrating water. Such measures include:

- Prioritize treatments that accomplish both road maintenance and water harvesting (i.e., directing water to buffered sites where filtration can occur);
- Set aside maintenance funds to improve problem segments incrementally;
- Avoid using Salinas Road during wet weather or when too soft to travel on;
- Always maintain drainage features to a functional condition and remove blockages as they occur;
- Do not grade or disturb an established surface if the road is draining properly and is smooth enough for travel;
- Keep the grade of drainage features as steep or steeper than the roadway; and
- Fix the easiest road segments first to keep them functioning properly at the least expense.

With regards to Salinas Road maintenance, the Directorate of Public Works (DPW) would need to request funds for monitoring road conditions and also maintenance funds in yearly work plans. JDETC project staff can assist by placing work orders for road maintenance when it is time. The project may be required to

reimburse DPW for sustainment of the road, if the action exceeds what can be funded in an annual work plan.

Construction at the JDETC Central location would include parking, a concrete apron around the facility, a runway, and taxiways to connect the JDETC Central facility to the runway. These would introduce large impervious surfaces, altering the area of stormwater runoff. At the time of this writing, specific stormwater design plans have not been developed. However, the final JDETC Central construction would include stormwater control, collection, and infiltration systems that will minimize erosion potential while not attracting wildlife to the facility or runway.

Under Alternative 1, there would be new construction and RDT&E activities at Salinas Peak and at the JDETC Central Site. All WSMR activities, including test preparation and recovery actions would follow existing SOPs and BMPs, as described in Section 3.3.3, to minimize soil erosion effects. These actions would be consistent with those analyzed in the WSMR FEIS. Therefore, no significant impact would result through the implementation of Alternative 1.

3.3.2.3 Alternative 2 – Salinas Peak Only

Under Alternative 2, there would be new construction and RDT&E activities at Salinas Peak and the Base Camp. All WSMR activities, including test preparation and recovery actions would follow existing SOPs and BMPs, as described in Section 3.3.3, to minimize soil erosion effects. These actions would be consistent with those analyzed in the WSMR FEIS. Therefore, no significant impact would result through the implementation of Alternative 2.

3.3.2.4 Alternative 3 – JDETC Central Only

Under Alternative 3, there would be new construction and RDT&E activities at the JDETC Central site. All WSMR activities, including test preparation and recovery actions would follow existing SOPs and BMPs, as described in Section 3.3.3, to minimize soil erosion effects. These actions would be consistent with those analyzed in the WSMR FEIS. Therefore, no significant impact would result through the implementation of Alternative 3.

3.3.3 Best Management Practices and Mitigations

As specified in 32 CFR 651 (2002), the project proponent has the responsibility of ensuring that all BMPs and mitigation measures are implemented. BMPs are practices taken by an agency to prevent disturbance. Mitigations are measures implemented to reduce the impact of an action to insignificant and would be included in a FONSI. The following BMPs would be implemented to minimize soil erosion effects:

- Salinas Road would be monitored and maintained or improved as needed;
- Following target recovery, the excavation areas would be re-contoured to match the existing drainage condition; and
- Erosion control measures will be implemented in accordance with a USACE-approved SWPPP.

3.4 BIOLOGICAL RESOURCES

Native or naturalized vegetation, wildlife, and their associated habitats are collectively referred to as biological resources. Existing information on plant and animal species and habitat types in the vicinity of the proposed sites were reviewed, with particular emphasis on the presence of any species listed as threatened or endangered by federal or state agencies to assess their sensitivity to the effects of the Proposed Action. For this EA, biological resources are divided into three areas; vegetation communities, wildlife communities, and protected species. Species with protective status are protected based on regulations such as those listed below:

- Threatened or endangered under the federal Endangered Species Act of 1973 ([ESA], 16 USC § 1531 et seq.) by the U.S. Fish and Wildlife Service (USFWS);
- Threatened or endangered wildlife species under the New Mexico Wildlife Conservation Act (17-2-40.1 New Mexico Statutes Annotated [1978]) by the New Mexico Department of Game and Fish (NMDGF);
- Rare and endangered plants species by the New Mexico State Forestry Division's Endangered Plant Program;
- Protected species under the Migratory Bird Treaty Act ([MBTA], 16 USC §§ 703-712 [2004]);
- USFWS Birds of Conservation Concern 2021 List, https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php; and
- Bald and Golden Eagles, as protected under the Bald and Golden Eagle Protection Act (16 USC § 668 [1972]).

3.4.1 Affected Environment

3.4.1.1 Vegetation Communities

The vegetation of WSMR is widely diverse, ranging from basin floors dominated by desert shrublands to mountaintops dominated by ponderosa pine (*Pinus ponderosa*) forests. Muldavin et al. (2000) developed a model for describing the vegetation communities for the range, called vegetation map units. The proposed JDETC Central locations are within the Lake Lucero-White Sands Eco-Area Landscape Unit, within Vegetated Gypsum Outcrop vegetated map unit. The four associated CONEX boxes fall within the Mixed Lowland Desert Scrub vegetated map unit. The Salinas Peak site lies within the Salinas Peak Eco-Area Landscape unit, Pinyon Pine Woodland map unit, all as defined by Muldavin et al (2000).

Vegetated Gypsum Outcrop

Vegetated Gypsum Outcrops are a unique and extensive habitat found from basin floors into foothills at elevations of 3,800-6,100 ft (1,160-1,860 m). The unique gypsum substrate may harbor a faunal community unique to WSMR, particularly reptiles and insects; birds and small mammals may also use the habitat. How fauna uses these habitats has not been extensively studied (Muldavin et al. 2000, WSMR 2015).

Mixed Lowland Desert Scrub

Mixed Lowland Desert Scrub is a complex mixture of creosotebush, tarbush, and fourwing saltbush shrublands, generally occupying low-elevation alluvial flats and playa bottoms of the northern Tularosa and Jornada basins at elevations of 3,800-5,600 ft (1,160-1,700 m) with minimal slope. Fourwing Saltbush Shrubland is found on alluvial flats and playas in the Tularosa and northern Jornada del Muerto basins.

Because Mixed Lowland Desert Scrub communities are so extensive, they are likely to be used by a variety of fauna; however, this habitat is generally uniform. There is minimal structural and plant species diversity, and, consequently, overall faunal diversity may be low (Muldavin et al. 2000, WSMR 2015).

Pinyon Pine Woodland

Pinyon Pine Woodlands are prevalent in the mountain areas of WSMR at mid to high elevations (5,800-8,500 ft [1,770-2,590 m]), where annual precipitation can exceed 18 inches (46 centimeters). Topographic physiography typically ranges from gentle mountain slopes to deep canyons and mountain escarpments. Fauna takes advantage of the colder, wetter climate and greater structural diversity compared with other habitats and the many microhabitats that result from topographic diversity. Areas of nearly continuous Pinyon Pine Woodlands contain microhabitats that are well buffered from outside influences and may support fauna endemic to WSMR, such as woodland snails (*Ashmunella* spp.). These communities may also be critical for mobile fauna during a drought when lower elevations become extremely dry and green forage scarce (Muldavin et al. 2000, WSMR 2015).

3.4.1.2 Wildlife Communities

The proposed project areas include habitats ranging from lowland desert scrub to high elevation woodlands. Complete lists of wildlife species present on WSMR can be found in the 2009 FEIS and 2015 INCRMP (WSMR, 2009; WSMR 2015).

Mammals

There are 73 documented game and non-game mammal species within WSMR. These species include large herbivores such as mule deer (*Odocoileus hemionus*), elk (*Cervis canadensis*), collared peccary (*Pecari tajacu*), pronghorn antelope (*Antilocapra americana*), bighorn sheep (*Ovis canadensis*), and nonnative species including the feral horse (*Equus caballus*), oryx (*Oryx gazella*), and Barbary sheep (*Ammotragus lervia*). Predator species commonly found on WSMR include coyote (*Canis latrans*), bobcat (*Lynx rufus*), mountain lion (*Felis concolor*), black bear (*Ursus americanus*) and badger (*Taxidea taxus*).

The Mexican wolf (*Canis lupus baileyi*) is listed as an endangered species protected by the ESA and currently does not inhabit WSMR, but has the potential to occur within the Salinas Peak project area in the future. Mexican wolves have been documented on adjacent Bureau of Land Management, National Park Service, and USFWS property. This Mexican wolf population currently holds a 10(j) designation as a non-essential experimental population (16 U.S.C. § 1539(j) (1994). Under a 10(j) designation as "nonessential, experimental," both the take prohibitions and consultation requirements of the ESA are relaxed, easing regulatory burden associated with endangered species.

Small mammals occurring on WSMR include two species of rabbits (black-tailed jackrabbit [*Lepus californicus*] and desert cottontail [*Sylvilagus audubonii*]), one species of shrew (*Notiosorex crawfordi*), 31 species of rodents, and 17 species of bats. Rodents are the most diverse order of mammals within WSMR, representing five different families: Sciuridae (squirrels), Geomyidae (gophers), Heteromyidae (kangaroo mice and pocket mice), Muridae (mice and rats), and Erethizontidae (porcupine). Bats are represented by two families: Vespertilionidae (common bats) and Molossidae (free-tail bats) families. Most bat species at WSMR roost in caves and buildings and a few are tree-roosting species (WSMR 2009).

Birds

Habitats within WSMR support approximately 290 documented avian species (WSMR 2013). WSMR has resident populations of raptors, game birds, and songbirds. Raptor species common on WSMR include redtailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), and Swainson's hawk (*Buteo swainsoni*). Game birds found on WSMR include Gambel's quail (*Callipepla gambellii*), scaled quail (*Callipepla squamata*), white-winged dove (*Zenaida asiatica*), and mourning dove (*Zenaida macroura*). Songbirds common to WSMR include black-throated sparrow (*Amphispiza bilneata*), pyrrhuloxia (*Cardinalis sinuatus*), and horned larks (*Eremophila alpestris*) (WSMR 2009).

Amphibians and Reptiles

WSMR contains habitats that support diverse herpetofauna: seven species of amphibians and 47 species of reptiles, representing three orders and 12 families, have been documented. There are six toad species (three spadefoot toads and three true toads), one salamander species, one turtle species, 27 snake species, and 19 lizard species (WSMR 2015). Five rattlesnake species occur on WSMR, and bites from all are potentially lethal. Eleven other snakes occurring on WSMR are either non-venomous or mildly venomous and are not dangerous to humans (WSMR 2009).

Fishes

The only native fish species at WSMR is the White Sands pupfish (*Cyprinodon tularosa*), which is endemic to the Tularosa Basin, natively occurring at Salt Creek and Malpais Spring and introduced to Mound Spring within WSMR and Lost River on Holloman Air Force Base. This small fish occupies a variety of microhabitats, ranging from deep spring ponds to shallow pools and calm spring runs varying in salinity from freshwater (salinity of three parts per thousand [ppt]) to saltier than seawater (salinity of 50 ppt). Within its limited habitat, populations are often dense, but their numbers can experience wide fluctuations due to natural climatic stressors such as floods or drought. The White Sands pupfish is omnivorous, feeding mainly on aquatic insects and larvae, algae, and organic detritus (WSMR 2009).

Nonnative fish species introduced to WSMR include largemouth bass (*Micropterus salmoides*), mosquitofish (*Gambusia affinis*), goldfish (*Carassius auratus*), and sunfish (*Lepomis* spp.), which have been introduced into springs and ponds and can pose a threat to native White Sands pupfish populations (WSMR 2009).

Invertebrates

Invertebrate fauna of WSMR plays a major role in the processes as pollination, soil aeration, decomposition, and seed dispersal. Invertebrates are also an important source of nutrition for many vertebrate species. A complete inventory of invertebrate species for WSMR has not yet been documented (WSMR 2015). Common orders of insects found on WSMR include Coleoptera (beetles), Hemiptera (true bugs), Hymenoptera (ants, bees, and wasps), Lepidoptera (butterflies and moths), and Diptera (flies). Other common arthropod orders include Scholopendromorpha (bark centipedes), Thelyphonida (vinegaroons), Scorpiones (scorpions), and Araneae (spiders).

One species of aquatic snail, the Tularosa springsnail (*Juturnia tularosae*), is endemic to WSMR, occurring within soft-sediment areas of Salt Creek. This species also is presumed to act as an intermediate host to a trematode that parasitizes the White Sands pupfish (*Cyprinodon Tularosa*). This species overlaps with

pupfish habitat; however, it has a more restricted range than the pupfish occurring in locations of Salt Creek with moderate to lower salinity levels (WSMR 2009). The current known locations of the Tularosa springsnail are outside the proposed project and action areas.

3.4.1.3 Protected Species

Regulatory Setting

The ESA mandates that all federal agencies consider the potential effects of their actions on species listed as federally threatened or endangered. Section 7 of the ESA requires federal agencies that fund, authorize, or carry out an action to ensure that their action is not likely to jeopardize the continued existence of any federally listed threatened or endangered species (including plant species) or result in the destruction or adverse modification of designated critical habitats. The lead federal agencies for implementing the ESA are the USFWS and the U.S. National Oceanic and Atmospheric Administration (NOAA) Fisheries Service. The USFWS maintains a worldwide list of endangered species. Species include birds, insects, fish, reptiles, mammals, crustaceans, flowers, grasses, and trees.

The ESA requires federal agencies, in consultation with the USFWS and/or the NOAA Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife. Likewise, import, export, interstate, and foreign commerce of listed species are all generally prohibited.

The Eagle Act makes it illegal to import, export, take (which includes molest or disturb), sell, purchase, or barter any Bald Eagle or Golden Eagle or parts thereof. Under the Eagle Act (72 Federal Register [FR] 31132, June 5, 2007), "take" is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest or disturb." "Disturb" is defined as "to agitate or bother a Bald or Golden Eagle to the degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (72 FR 31132, June 5, 2007).

Bald and Golden Eagles

There are 22 nesting locations of Golden Eagles within the vicinity of Salinas Peak, attributed to three or four breeding pairs. The nesting locations were observed and plotted using latitude and longitude coordinates into ArcGIS. Management guidelines for the Golden Eagle from the USFWS recommend a minimum buffer for construction activities of 0.5 mile (800 m) if the construction is visible from the nest. Buffers were places on each of the nesting locations, and it was determined that the closest nesting location is a minimum of half a mile from the Salinas Peak proposed construction location.

Golden Eagles are the largest bird of prey in North America and use a wide variety of habitats for foraging and breeding. Golden Eagles may either be permanent residents or migrants throughout New Mexico. They often nest on cliffs in this area. Nests are built out of sticks shaped to create a flat or bowl-shaped platform. A breeding pair can lay two to four eggs a year. WSMR has 31 golden eagle breeding territories with most occupied by adult breeding pairs (Trish Cutler, personal communication). Golden Eagles are protected under several federal statutes, which include the Eagle Act, the MBTA, EO 13186 – *Responsibilities of Federal Agencies to Protect Migratory Birds*, and Tribal Trust Coordination.

Migratory Birds

The MBTA protects migratory birds and prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except with a federal permit (16 USC 703 [2009]; 50 CFR 21 [1974]; 50 CFR 10 [1973]). Under the MBTA, "take" is defined as "to pursue, hunt, shoot, shoot at, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture or collect." Most actions that result in taking or the permanent or temporary possession of a protected species or nests containing eggs or young constitute violations of the MBTA, and the MBTA has no specific provision for authorizing incidental take.

EO 13186 directs federal departments and agencies to take certain actions to further implement the MBTA. Federal agencies must ensure that EAs of federal actions required by NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on bird species of concern. In addition, federal agencies must minimize the intentional take of species of concern by (i) delineating standards and procedures for such take; and (ii) developing procedures for the review and evaluation of take actions. This EO specifies the need to avoid or minimize adverse impacts on migratory birds and bird habitat when conducting agency actions, as well as the need to restore and enhance the habitat of migratory birds.

In pursuit of EO 13186 compliance, DoD has developed agreements with the USFWS for three classes of operations: military readiness activities, non-readiness activities, and airfield operations. 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.

In a 2014 Memorandum of Understanding (MOU), the USFWS and DoD identified specific activities where cooperation will contribute substantially to the conservation of migratory birds and their habitats. These non-readiness activities fall into five categories:

- Natural resource management activities, including but not limited to, habitat management, erosion control, forestry activities, hunting, fishing, agricultural outleasing, conservation law enforcement, invasive weed management, and prescribed burning;
- Installation support activities, including, but not limited to, administration, retail sales, food service, health care, water and sewage treatment, supply and storage, education, housing, equipment maintenance, base transportation, laundry and dry cleaning, recreation, and religious activities;
- Operation of industrial activities;
- Construction, maintenance, renovation, or demolition of facilities that support the activities described above; and

• Prevention or abatement of pollution or detrimental alteration of the environment of the benefit of migratory birds, as practicable.

The 2014 MOU does not alter or waive any responsibilities of DoD or USFWS, under the MTBA, the Bald and Golden Eagle Protection Act, and the Endangered Species Act; nor does it authorize the take of migratory birds.

Bird-related management activities with a potential to affect airfield operations or safety is managed according to Department of Defense Instruction 4165.57 – *Air Installations Compatible Use Zones (AICUZ)* and the airfield's Bird/Wildlife Aircraft Strike Hazards Program.

Protocols and procedures for the protection of migratory birds on WSMR are discussed in the WSMR INCRMP (WSMR 2015). The project areas associated with the Proposed Action cover a wide range of vegetative communities and habitat associations. As such, a variety of birds protected by the MBTA are expected to occur within these sites.

Raptor species common on WSMR and likely to hunt over both Proposed Action areas include red-tailed hawk (*Buteo jamaicensis*), Swainson's hawk, northern harrier, and prairie falcon (*Falco mexicanus*). Proximity to rocky outcrops and cliffs of the San Andres and Oscura Mountains, there is potential for raptors and other resident birds to nest nearby, including red-tailed hawks, prairie falcons, peregrine falcons (*Falco peregrinus anatum*), Golden Eagles, ravens, and turkey vultures (*Cathartes aura*). All these species are protected under the MBTA.

Existing Environment

Table 3-11 lists federal and state threatened or endangered listed wildlife and plants that occur or have the potential to occur at WSMR, with their potential to occur at the Proposed Action areas noted in the rightmost column. The potential occurrence was determined based on past documentation of each species and suitability of habitat within the Proposed Action areas. There is one critical habitat on WSMR, but it is outside both proposed project areas (USFWS 2020).

In addition to the federally and state threatened or endangered plant species, there are 13 federal and state species of concerns and one state species of concern without federal listing. There are four federal or state bird species of concern that have the potential to occur at WSMR. There are ten mammal species of concern that have the potential to occur at WSMR. There are ten mammal species of concern that have the potential to occur at WSMR. There are ten mammal species of concern that have the potential to occur at WSMR. There are ten mammal species of concern that have the potential to occur at WSMR with eight of these being bats or myotis species. Descriptions of these species can be found in the WSMR INCRMP (WSMR 2015). No threatened or endangered plant species have been detected in either Proposed Action areas.

3.4.1.4 Invasive Species

The only documented invasive non-native plant species to occur at either location is at the JDETC Central Complex location, where a known population of African rue (*Peganum harmala*) exists. African rue prefers disturbed and barren areas, is drought tolerant, and has deep, robust perennial root systems. Efforts should be taken to contain further spread by implementing control and removal methods provided in the WSMR Integrated Pest Management Plan.

	Status			Potential to Occur	
Species	Federal State		Base Presence	on Project Sites	
Plants		~~~~~		j	
Todsen's pennyroyal,	Б	Б	San Andrea Manutaina	N.	
Hedeoma Todsenii	E	E	San Andres Mountains	NO	
Night-blooming cereus,	SOC	Б	Occure Mountaing	No	
Peniocereus greggii var. greggi	SOC	E	Oscura Mountains	NO	
Organ Mountains pincushion cactus,	SOC	Б	Organ Mountaing	No	
Escobaria organensis	300	E	Organ Wouldanis	NO	
Mescalero milkwort,	SOC	F	Two isolated populations	No	
Polygala rimulicola	300	Ľ	1 wo isolated populations	NO	
Fish					
White Sands pupfish	Under	т	Perennial springs;	No	
Cyprinodon Tularosa	review	1	Tularosa Basin.	110	
Birds					
Least tern (interior population)	F	F	Transient	No	
Sterna antillarum	L	L	Transient	110	
Northern anlomado falcon			Savannas and grasslands,		
Falco femoralis sententrionalis	E	E	often with scattered trees	No	
			or tall yuccas		
Southwestern willow flycatcher	E	E	One individual observed;	No	
Empidonax trailii extimus	Ľ	Ľ	potentially on migration	110	
Bald eagle		Т	Rarely observed in	Yes	
Haliaeetus leucocephalus		-	winter	1.00	
Mexican spotted owl	Т	SGCN	Species or critical habitat	No	
Strix occidentalis lucida			not on WSMR		
American peregrine falcon	000	-	Suspected breeding in	17	
Falco peregrinus anatum	SOC	Т	Oscura and San Andres	Yes	
			mountains		
Baird's sparrow	SOC	Т	Grasslands, Jornada	No	
Ammaaramus bairaii					
Doll's virgo			riperion thickets. Son		
Vince hellij	SOC	SOC T	Andrea Mountaing	No	
			(< 5,000 ft)		
Vellow-billed cuckoo			Limited rinarian		
Coccyzus americanus	Т	SGCN	woodland	No	
Brown pelican					
Pelecanus occidentalis		E	Migration/stopover only	No	
Neotropic cormorant					
Phalacrocorax brasilianus		Т	Migration/stopover only	No	
			Higher desert canyons		
Broad-billed hummingbird		Т	and washes, riparian and	No	
Cyanthus latirostris			foothill woodlands		
Costa's hummingbird		т	Shrublands within dry	N	
Calypte costae bourcier		1	washes and canyons	NO	
Gray vireo	Species	т	Juniper and foothill	V	
Vireo vicinior	at risk	1	woodlands	Yes	
Variad hunting			Dense thorny scrub in		
Passavina varsicolor		Т	canyons, San Andres	No	
			Mountains		
Pinyon jay		SGCN	Pinyon-juniper	Ves	
Gymnorhinus cyanocenhalus		JUCH	woodlands*	1 05	

Table 3-11 Protected Species Potentially Occurring at WSMR

Spacing	Status		Dasa Drasanaa	Potential to Occur
Species	Federal	State	Dase r resence	on Project Sites
			Note:	
Golden eagle Aquila chrysaetos	MBTA	-	High mountain areas, woodlands, and shrublands.	Yes
Mammals				
Oscura Mountains Colorado chipmunk Neotamias quadrivittatus oscuraensis	Species at risk	Т	Oscura Mountains pinyon-juniper associations	No
Organ Mountains Colorado chipmunk Neotamias quadrivittatus australis	SOC	Т	Texas Canyon, Organ Mountains	No
Spotted bat Euderma maculatum		Т	Chihuahuan Desert to tree line; Mound Springs	Yes

E = endangered, T = threatened, C = candidate, Expn = Experimental, SOC = species of concern, SGCN = species of greatest conservation need, -- = no listing. Sources = WSMR 2015, WSMR 2018, NMDGF 2020, USFWS 2020.

*Note: Access routes to Salinas Peak include Pinyon-juniper woodlands. Recent research on pinyon jays suggest they are shifting into new habitat which includes Ponderosa Pine Forests, which is present near Salinas Peak.

3.4.2 Environmental Consequences

3.4.2.1 No-Action Alternative

Under the No-Action Alternative, the construction activities described in Section 2.1.1 would not occur, and RDT&E and training activities associated with the nine Use Cases would not be conducted under the JDETC Program at WSMR.

3.4.2.2 Alternative 1 – JDETC Central and Salinas Peak Upgrades and Operations

This alternative includes construction and facility improvements at the JDETC Central and Salinas Peak sites, as provided in Table 2-1. The JDETC Central site would house 21 permanent personnel, and operations would occur as described in Section 2.1.2 and its subsections.

Vegetative Communities

The proposed Salinas Peak construction is within an area of existing infrastructure at a relatively high elevation. There is minimal vegetation currently at the site. The site is above the tree line but contains microhabitats associated with the Pinyon Pine Woodland association. To reduce potential effects, existing facilities and structures will be utilized and renovated whenever possible. Existing roadways and access points will be utilized to limit the impact on the surrounding environment further but may require widening, especially in tight turns. There will be minor vegetative impacts associated with construction and widening roads to accommodate material delivery. The two new facilities, concrete pads, and generators do not represent a significant impact on the existing environment because of the already substantially disturbed nature of the site. Post-construction, areas of disturbance should be reseeded with native seed mix to limit future erosion.

There is a known population of *Silene plankii* (Plank's catchfly) that exists on the side of the existing bunkhouse on top of Salinas Peak. Plank's catchfly is a New Mexico-listed rare plant, and Navajo Nation listed as Imperiled (Natural Heritage conservation rank S2). The distribution is sporadic, typically found along igneous cliffs and rocky outcrops, preferring cooler climates. The population is small and should be monitored and delineated during the construction of the Salinas Peak site.

There are many uncommon plants found on Salinas Peak, due to the elevation and uniqueness of the habitat. Not enough is known about these species to determine if they are endemic, and located in the area of potential construction. WSMR Garrison Environmental Division recommends that before construction begins that project proponents coordinate with a New Mexico State Forestry Division botanist and conduct a plant survey in proposed construction areas. This will help identify what species are in the area and gain a better understanding of population viability.

Among the uncommon plants with potential to occur at the Salinas Peak site include:

- Scribner's needle grass (Stipa scribneri [*Achnatherum scribneri*]). grows on rocky slopes, in pinyon-juniper and ponderosa pine associations at 1500-2700 m. Little is known about this species; however, it does occur on Salinas Peak; and
- Geyer's sedge (*Carex geyeri*) commonly occurs in dry coniferous forest types. Forest types in which Geyer's sedge occurs include those dominated by ponderosa pine. Geyer's sedge is a climax indicator or dominant species in the understory layer of several habitat types of forest, shrub, and pine-savanna ecosystems.

The JDETC Central location is within proximity of the HELSTF site, an already developed and disturbed area. Both vegetative communities are generally uniform, with little structural plant diversity. The construction of the new facilities and installation of CONEX boxes will remove a small portion of the associated vegetative communities but do not represent major long-term effects or a significant impact on local flora.

Wildlife

At both proposed sites, wildlife species would likely vacate areas temporarily when human activity levels are high during construction, instrumentation emplacement, and test preparation. Small mammals, rodents, and reptiles would likely withdraw to burrows during these same activities. The Salinas Peak project area is within habitat of several large predators (e.g., black bear, mountain lion, bobcat, Mexican wolf). To avoid human-wildlife conflicts, personnel are required to receive an environmental brief regarding mitigation of potential encounters with predators and other wildlife.

The likelihood that fauna would be hit directly by HEL or HPM during testing is minimal. These test articles would generally disperse over a relatively small surface area, and when combined with the low density of wildlife across a sizable area and the tendency for fauna to scatter during a threat, a very low probability of a direct impact is expected. Individual mortality may occur; however, no population-level impacts are anticipated. Therefore, no major or long-term effects on wildlife populations are anticipated.

Threatened and Endangered Species

There are no known populations of federally- or state-listed threatened or endangered species or critical habitats present at the proposed project sites; however, there are Golden Eagles breeding at WSMR (31 territories) that are year-round residents. In addition, there are wintering eagles from the north. Peregrine falcons could nest on Salinas Peak, and Bald Eagles are occasional as migrants or wintering birds, but do not breed on WSMR.

The proposed site on Salinas Peak does fall within the potential habitat for the White Sands pupfish (a statelisted threatened species) in the Oscura Watershed. While falling within the potential habitat, the proposed project location on Salinas Peak does not have any available water resources in which White Sands pupfish may reside. There is a potential for impact from the water runoff during the construction process. Development and implementation of a USACE-approved SWPPP will minimize runoff impacts and potential impacts to the pupfish.

The American peregrine falcon may occur downslope of the Salinas Peak site. They have been documented nesting and breeding on the San Andreas Mountains. Peregrine falcons prefer wooded and forested cliffs with large gulfs. They hunt over a wide variety of habitats that include an open, featureless habitat so long as there is ample prey. The proposed construction is outside known nest or breeding areas and therefore is not anticipated to have any direct impact.

Migratory Birds

Surveys for nesting migratory birds, which includes all species protected by the MBTA, would take place within seven days of construction and demolition activities with the potential to disturb nesting birds occur. Surveys would be conducted by a qualified biologist and would use WSMR Garrison Environmental Division survey standards (i.e., thoroughly survey vegetation to be removed, buildings or any other areas that would be affected). If occupied bird nests are found during surveys, avoidance mitigation would be employed to either adjust or delay impacts until the nestlings have fledged. WSMR Garrison Environmental Division would be consulted to determine how to avoid MBTA violations. WSMR Garrison Environmental Division would consult with the USFWS, if needed. Through the implementation of these measures, the Proposed Action would not adversely affect migratory bird populations.

Bald and Golden Eagles

While it is possible for an eagle nest to be hit by an errant HEL or HPM, eagle nests are not expected to be affected because HEL and HPM are most likely to hit the centerline of each target or impact area and are much less likely to hit the periphery of a target or impact area. In the case of the Salinas Peak potential effect area, the eagle nests are approximately a half mile (800 m) west of the centerline of the proposed firing range.

While it is possible for an eagle to be injured or killed by HEL or HPM while roosting or flying within an impact, the risk is low due to the low probability of a bird crossing the trajectory of a HEL or HPM. The following avoidance/minimization measures would be implemented to prevent take of eagles or eagle nests:

- Eagle biologists (via the WSMR Garrison Environmental Division) will monitor the eagle nests at or adjacent to each impact to determine which nests are active during a given breeding season.
- Eagle nest locations (active and inactive) will be provided to the test operators to avoid impacts to Golden Eagle nests, and targets will not be constructed within 0.5 mi (800 m) of any eagle nest.
- Human and vehicle activity will remain outside of the 0.5-mi (800-m) buffer area for any active eagle nest throughout the nesting season of mid-January through July.
- Test personnel will immediately provide the locations to the WSMR Garrison Environmental Division of any munitions landing near eagle nests (active or inactive), and will immediately report any injured or dead birds (including eagles) discovered in an impact area.

All eagle nests around Salinas Peak should be monitored annually to determine if a pair is nesting and which nests are being used so that the mission can avoid impacts to nesting or flying eagles. This level of effort is above/beyond the common level of service (occupancy monitoring) that the Garrison currently provides, so additional funds would be required from the proponent. If possible, using satellite transmitters on the birds would be the most efficient method of monitoring. All eagle monitoring must be carried out by eagle biologists with The Peregrine Fund, which conducts all eagle monitoring activities on the range.

Bald and Golden Eagles are not documented to nest near the proposed JDETC Central site location. Any potential activity that would occur there would be brief, transient, or foraging.

3.4.2.3 Alternative 2 - Salinas Peak Location Only

Alternative 2 would include construction and upgrade of facilities at Salinas Peak and Salinas Base Camp, as provided in Table 2-3. The JDETC Central facility would not be constructed near HELSTF. JDETC Program operations would be conducted at Salinas Peak only.

The potential impacts and effects on vegetation, wildlife, threatened and endangered species, migratory birds, and Golden and Bald Eagles are the same as those detailed in Alternative 1, relative to the Salinas Peak location. As such, the same BMPs and mitigation measures would be applied, and no takes of sensitive wildlife, migratory birds, Bald Eagles, or Golden Eagles are anticipated.

3.4.2.4 Alternative 3 – JDETC Central Location Only

Under Alternative 3, the JDETC Central facilities would be constructed as provided in Section 2.1.1.2. No construction or improvements would occur at Salinas Peak or Salinas Base Camp. All JDETC program operations would be conducted at the JDETC Central location, with 21 permanent personnel. The Salinas Peak operations, including air to ground tests to the desert floor, would not be conducted under this alternative.

The potential impacts and effects on vegetation, wildlife, threatened and endangered species, migratory birds, and Golden and Bald Eagles are the same as those detailed in Alternative 1, relative to the JDETC Central location. As such, the same BMPs and mitigation measures would be applied, and no takes of sensitive wildlife, migratory birds, Bald Eagles, or Golden Eagles are anticipated.

3.4.3 Best Management Practices and Mitigations

As specified in 32 CFR 651 (2002), the project proponent has the responsibility of ensuring that all BMPs and mitigation measures are implemented. BMPs are practices taken by an agency to prevent disturbance. Mitigations are measures implemented to reduce the impact of an action to insignificant and would be included in a FONSI. The following BMPs and mitigation measures would be applied to minimize impacts to biological resources:

BMPs:

- Whenever possible, removal or modification of vegetation would occur outside of bird nesting season (generally March through August);
- The WSMR Garrison Environmental Division would be contacted regarding wildlife concerns and personnel would report to include nuisance issues, injury or death of an animal, active nests or nestlings, or determination of any seasonal wildlife restrictions;
- Measures to prevent wildlife damages to property or negative human/wildlife interactions would be taken, including:
 - Structures would be closed to prevent inhabitation of wildlife to the extent practical;
 - o Exterior conduit, piping would use coatings/coverings that discourage wildlife damages; and
 - Trash and uneaten food would be policed to prevent nuisance bears on Salinas Peak.
- Personnel would not feed, water, harass, collect, possess, harm, disturb, or destroy wildlife or their parts to include but not limited to snakes, bats, birds, nests, eggs, or nestlings.

Mitigation Measures

- If vegetation must be removed during nesting season, it would be surveyed for nesting migratory birds within seven days of construction activities following survey methods approved by the WSMR Garrison Environmental Division;
- If bird nests are found during surveys, the WSMR Garrison Environmental Division would be consulted to determine actions to be taken;
- All power poles or banks modified or added for this project would incorporate raptor protection as described in the 2014 WSMR Avian Protection Plan;
- Human and vehicle activity would remain outside of the 0.5-mi (800-m) buffer area of any active eagle nest, throughout the nesting season of mid-January through July; and
- Test personnel would immediately provide the locations to the WSMR Garrison Environmental Division of any munitions landing near eagle nests (active or inactive), and would immediately report any injured or dead birds (including eagles) discovered in an impact area or through recovery effort.

3.5 HUMAN HEALTH AND SAFETY

Safety is defined as the protection of workers and the public from hazards. The total accident spectrum encompasses not only injury to personnel but also damage or destruction of property or products. For worker safety, the boundary of the immediate work area defines the region of influence. For public safety, the region of influence varies depending on the nature of the operation; this area may extend for miles beyond the source of the hazard.

3.5.1 Affected Environment

3.5.1.1 Regulatory Environment

Construction Phase

The Occupational Safety and Health Administration (OSHA) is responsible for protecting worker health and safety in non-military workplaces. Relevant OSHA regulations are found in 20 CFR 1910. Protection of public health and safety is an EPA responsibility mandated through a variety of laws such as the Resource Conservation and Recovery Act (RCRA; 42 USC § 6901 et seq. [1976]); the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC § 9601 et seq. [1980], Sections 101[14] and 101[33]) and the Superfund Amendments and Reauthorization Act (SARA) of 1986, (PL 99-499); the Clean Water Act; and the CAA. Additional safety responsibilities are mandated by the Department of Transportation, whose regulations can be found in 49 CFR.

RDT&E Operations

The Army's policies, responsibilities, and procedures to protect Army personnel and property are contained in AR 385-10, *Army Safety Program* (2017). The regulation provides for operational safety, safe and healthy workplaces, and assures compliance with applicable laws and regulations. Department of the Army Pamphlet (DA PAM) 385-64, *Ammunition and Explosives Safety Standards* (2011), provides guidance for the safe storage, handling, and transportation of ammunition and explosives. Regulations and guidance pertaining to the safe use of ranges on Army installations is contained in AR 385-63, *Range Safety* (2012). This regulation covers range usage from the live firing of small arms to rockets, guided missiles, lasers, and provides guidance for minimizing the risk of using these weapons.

There are many applicable directives and standards regarding the safe maintenance and operation of radiofrequency emitting equipment including HEL and HPM systems. Key among these are the following:

- DA PAM 385-24, Army Radiation Safety Program (2015);
- Department of Defense Instruction (DODI) 6055.8, *Occupational Radiation Protection Program* (2018);
- DODI 6055.11, Protecting Personnel from Electromagnetic Fields (2018);
- DODI 6055.15, DoD Laser Protection Program (2007);
- DODI 3222.03, DoD Electromagnetic Environmental Effects (E3) Program (2014);
- MIL-HDBK-828C, Department of Defense Handbook: Range Laser Safety (2017);
- MIL-HDBK-240A, Hazards of Electromagnetic Radiation to Ordnance Test Guide (2011);
- MIL-STD-464C, Electromagnetic Environmental Effects Requirements for Systems (2010);
- Joint Ordnance Test Procedure-001, *Hazards of Electromagnetic Radiation to Ordnance (HERO)* Safety Test (2013);

- American National Standards Institute (ANSI) Z136.1, *American National Standard for Safe Use of Lasers* (2014);
- ANSI Z136.6, Safe Use of Lasers Outdoors (2015);
- Institute of Electrical and Electronics Engineers (IEEE) C95.1-2019, *Safety Levels with Respect to Human Exposure to Radio Frequency. Electromagnetic Fields, 0 Hz to 300 GHz*; and
- IEEE C95.3-2002, Recommended Practice for the Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz-300 GHz.

3.5.1.2 Existing Conditions

Both hazardous and non-hazardous activities occur daily at WSMR. Hazardous activities are activities that can pose a safety hazard to personnel and include construction activity, weapons firing, bomb drops, hazardous lasers, and similar operations. Most activities are non-hazardous, involving installation management, test setup, calibration of equipment and communication systems, and "dry runs." All hazardous activities performed on WSMR are subject to applicable regulations, review, and approval. WSMR plans test events carefully to meet requisite ground and flight safety criteria. Radiofrequency operations are coordinated, and applicable frequency assignments and limitations are established prior to use.

The primary safety issues associated with the Proposed Action include those inherent to construction and RDT&E activities. These safety concerns include, but are not limited to:

- Construction work-related risks associated with heavy equipment and machinery;
- Vehicle accidents;
- Bites from venomous animals;
- Exposure to kinetic weapons, targets, explosive devices, and unexploded ordnance (UXO); and
- Exposure to electromagnetic radiation.

The safety policy of WSMR is to take every reasonable precaution in the planning and execution of all operations that occur at WSMR to prevent injury to people and damage to property. This involves implementing extensive measures for risk mitigation, as well as increased range control in the areas determined to have the highest risk to public safety.

3.5.2 Environmental Consequences

3.5.2.1 No-Action Alternative

Under the No-Action Alternative, no new construction or JDETC Program operations would occur. RDT&E operations at WSMR would continue as previously conducted and would therefore yield no new health and safety impacts.

3.5.2.2 Alternative 1 – JDETC Central and Salinas Peak

General Safety Measures

All construction and RDT&E activities would comply with Army and WSMR policies and procedures to minimize potential health and safety hazards. Each site will be surveyed for UXO prior to starting construction. Prior to excavation, utility surveys will be conducted and flagged, through coordination with

U.S. Army Garrison White Sands. Hazardous material spills, fires, and other accidents would be reported immediately to the following:

- Hazardous spills are to be reported to the Directorate of Emergency Services for cleanup and WSMR Garrison Environmental Division for environmental compliance;
- Fires are reported to the Directorate of Emergency Services for control; and
- Accident reports and job hazard reductions are to be submitted to the Safety Directorate.

Cars and trucks used for personnel and delivery transport to Salinas Peak and JDETC Central will follow all posted speed limits. The 2-mile (3.2-km) stretch of Salinas Road closest to the peak will be controlled via phone and/or radio communications to coordinate two-way traffic. Salinas Road will be maintained in a safe, drivable condition. This maintenance may include road widening in a limited number of locations. Deliveries will be avoided in wet, icy, or high wind conditions.

All personnel would receive UXO training, would remain in approved areas, and would not handle unfamiliar objects. Additionally, all personnel would be trained on how to avoid venomous snakes and how to reduce the risks of exposure to inclement weather and dehydration.

Routine Operational Safety

Storage and handling of kinetic weapons, targets, explosives, and propellants would be undertaken to minimize risk of endangerment to personnel from explosion and chemical exposure in accordance with the *DoD Ammunition and Explosives Safety Standards: General Explosives Safety Information and Requirements Manual*, DoD 6605.09-M. This manual and other applicable Army and WSMR policies and procedures set separation distances between explosive ordnance and buildings, vehicles, and other inhabited areas.

Public access to WSMR lands is restricted and would not allow members of the public to be present during RDT&E activities. The Salinas Peak site is closed to public access. For tests and training at the JDETC Central site, WSMR would enact closure of US 70, generally for a period of 75 minutes or less.

WSMR manages restricted airspace on and off the installation's land boundaries. The WSMR Flight Safety Office has the authority to terminate flight tests to protect personnel and equipment and is required to approve all flight tests, based on a comprehensive review of safety factors, risk analysis, and relevant SOPs. Flight safety analysis is actively performed for both catastrophic failure and flight control failures for trajectories above populated areas. Test support includes monitoring missiles and targets trajectories during tests to ensure that flight termination systems (FTS) are activated if needed.

Laser Safety

Before any lasers are used at WSMR, operations must comply with MIL-HDBK-828C and be approved by the White Sands Test Center Laser Safety Officer. MIL-HDBK-828C incorporates the industry standard, ANSI Z136.1. In addition to MIL-HDBK-828C, the White Sands Test Center would implement a detailed range hazard assessment and SOP process prior to the use of a laser system on WSMR. To allow a full evaluation of risks and safety considerations and permit the planning and preparation for laser operations, the following data shall be provided: a written description of test objectives, how laser(s) or laser system(s)

would be used, and people involved. If it is determined that the Test Center can support the test, then the following would be required or developed:

- Detailed test plan(s) describing objectives, risks, and hazard zones;
- Layout diagram(s), if applicable, of the test scenario showing land sites, surface craft and/or aircraft locations, maneuver patterns, altitudes, timelines, and targets;
- SOPs governing the use of the system(s) during the test events; and
- Qualification/certification statements for operators of the laser system(s).

A team of Test Center safety engineers, scientists, and the safety officer would review every step of planned laser tests, and if there were any unknown factors that had not been addressed or mitigated, the test would not proceed.

General Laser Control Measures

General laser control measures have been established for the protection of scientists, DoD personnel, and the public. These include laser safety analysis, SOPs, safety buffer zones, remote viewing and operation, range control measures (barriers and warning systems), interlock controls, target backstops, and administrative controls. These measures are described below and would apply to the Proposed Action.

- *Laser Safety Analysis.* A prerequisite prior to each test is a laser safety analysis that quantifies potential ocular and skin hazards and provides recommendations for their mitigation.
- *Laser System SOPs.* As required by ANSI Z136.1 and ANSI Z136.6 standards, as well as the DoD laser protection standard, DODI 6055.15, each laser system and designated firing must have an SOP developed and approved. This SOP designates the individual(s) responsible for the safe operation of the laser system, the specific control measures employed to minimize unintended exposures, conditions under which the laser system may be operated and appropriate personal protective equipment for operators, and the specific nominal ocular hazard distance and nominal hazard zone. Each laser system SOP must be submitted to the White Sands Test Center Laser Safety Officer for approval; only after approval may the laser test be conducted. SOPs require laser safety training as well as medical surveillance for the operators to ensure their health and safety.
- Safety Buffer Zone (Laser Hazard Cone). Range control measures include use of safety zones, from which personnel are excluded during testing and training. In accordance with laser range operational procedures, horizontal and vertical buffer zones are established prior to lasing activities.
- Administrative Controls. Access to laser operating areas is restricted to authorized and properly trained personnel only, which reduces the possibility of inadvertent exposure to laser radiation. Prior to any lasing activities, and in accordance with laser SOPs, the area is swept to clear it of all unauthorized personnel. In addition, prior to lasing activities, materials with reflective surfaces are either cleared from the area or otherwise covered/obscured to minimize reflective hazards. Each laser system has SOPs established for its use to ensure operational safety. Signage indicating a laser-controlled area would be posted in accordance with ANSI Z136.1 specifications for the operation of Class 4 lasers. Additional administrative controls are outlined in ANSI Z136.1, which has been adopted by the DoD as the governing standard for laser safety.
- *Barriers and Warning Systems*. Barriers are erected before tests to exclude personnel from the lasercontrolled area. Various types of warning systems, such as warning lights (flashing siren and light)

and audible sirens and alarms are initiated prior to testing and training to alert personnel of the pending laser operation.

- *Remote Operation.* Personnel operate laser systems from remote locations because safety procedures require that personnel be a safe distance from the operating laser systems. The laser system is connected to a computer system, allowing the operators and technicians to monitor its operation and measurement instruments in a safe manner. Hazard distances and zones are determined for each laser system to ensure that the operators, as well as other personnel and the general public, are located beyond the distances where skin or ocular hazards are present, including specular (highly reflective, such as from a mirror) or diffuse reflection of laser energy.
- *Laser Safety Interlock Controls*. Safety interlocks work through an instantaneous feedback loop to cut off the power to an emitting laser if a single mechanical or electrical component fails or if the laser beam strays from the anticipated beam path. The efficacy of the safety interlock ensuring the correct beam path is tested using lower power beams to validate that the center of the intended target is being illuminated when fired upon. Validation is accomplished by calorimeter sensors placed around the intended aim point of the target. The sensors detect the position of the narrow laser beam by fractions of an inch relative to the center of the aim point. The laser beam is then intended path, the beam would heat up the calorimeter sensors, which would in turn send a signal that the laser is off-target and instantaneously turn off the power to the laser. Another safety interlock example is a system that must be engaged to allow power to flow to the area where the laser system is operated. If this door is opened, electrical power would be disconnected from the system to ensure that the laser system cannot operate.
- *Laser Backstops*. A laser beam is composed of light, which, if it encounters no obstacle, can continue traveling in a straight line to infinity. Hillsides or landmasses can be used as backstops. To minimize reflected laser energy, all materials and objects associated with the target for example, a stand holding it in place are painted with or composed of light-absorbing materials.
- *Airspace Clearance*. Any laser operations that have the potential of creating hazards to aircraft shall be coordinated with the Federal Aviation Administration to ensure that when the laser is fired no non-participating aircraft are in the hazard area. Similar coordination with the Laser Clearinghouse would occur whenever laser testing and training creates potential hazards to satellites.

Non-Beam Control Measures

Potential non-beam hazards associated with the use of lasers, along with the health and safety measures in place to minimize these hazards, are described below.

- *Electrical Accidents*. Operators of the laser systems have many controls in place, including electrical interlocks, ground fault circuit interrupters, proper grounding, and SOPs outlining how to operate the system to minimize the possibility of electrical accidents.
- *Fire Hazard*. The irradiation of objects by a Class 4 laser beam presents a fire hazard; however, the targets are constructed of flame-retardant material, as defined by the National Fire Protection Association, thus minimizing the potential fire hazard. Furthermore, the control of the beam path and target area minimizes the potential for any resulting fires to spread beyond the immediate target area.

• *Collateral Radiation*. Potential collateral radiation or broad-band black-body radiation (i.e., ultraviolet or blue light) produced because of air breakdown at the laser/target interface does not present an immediate hazard to personnel because no personnel would be within close proximity to the target impact area. Once lasing activities stop, collateral radiation (if any) would cease, and no residual collateral radiation would remain.

HPM Safety

The use of HPM systems poses hazards of electromagnetic radiation to fuels, electronic hardware, ordnance, and personnel. These hazards are generally segregated as follows:

- Hazards of electromagnetic radiation to personnel (HERP);
- Hazards of electromagnetic radiation to ordnance (HERO); and
- Hazards of electromagnetic radiation to fuel (HERF).

Current industrial specifications for radiation hazards are contained in IEEE C95.1-2019 whose predecessor document was used as a reference to create the combined Navy regulation NAVSEA OP3565/NAVAIR 16-1-529. Volume I of the Navy document contains HERP and HERF limits - its current version is Sixth Revision. Volume II (Nineteenth Revision) covers HERO.

The potential dangers to ordnance and fuels are obvious because an explosion could set off an explosive "chain reaction"; consequently, these limits are generally lower than personnel limits.

The danger of HERP occurs because the body absorbs radiation, and significant internal heating may occur without an individual's knowledge because the body does not have an internal sensation of heat. Thus, tissue damage may occur before the excess heat can be dissipated. Two maximum hazard limits are defined:

- *Controlled Environments* Personnel are aware of the potential danger of radiofrequency exposure concurrently with employment, or exposure that may occur incidental to passage through an area; and
- Uncontrolled Environments A lower maximum level where there is no expectation that higher levels should be encountered, such as living quarters.

Prior to conducting activities with HPM systems, project engineers will conduct an exposure assessment to determine safe distances for personnel, ordnance, and fuel. The assessments will be submitted to the WSMR Test Center Safety Office for review and approval.

Based on the SOPs and BMPs, provided in Section 3.5.3, that would be followed to ensure safe construction practices and operations safety, there would be no significant impacts on human health and safety under Alternative 1.

3.5.2.3 Alternative 2 – Salinas Peak Only

Alternative 2 would involve construction and RDT&E and training operations at Salinas Peak only. There would be no new construction or RDT&E and training activities conducted at the existing HELSTF area.

Based on the SOPs and BMPs, provided in Section 3.5.3, that would be followed to ensure safe construction practices and operations safety, there would be no significant impacts on human health and safety under Alternative 2.

3.5.2.4 Alternative 3 – JDETC Central Only

Alternative 3 would involve construction and RDT&E and training operations at the JDETC Central site near HELSTF only. There would be no new construction or RDT&E and training activities conducted at Salinas Peak.

Based on the SOPs and BMPs, provided in Section 3.5.3, that would be followed to ensure safe construction practices and operations safety, there would be no significant impacts on human health and safety under Alternative 3.

3.5.3 Best Management Practices and Mitigations

As specified in 32 CFR 651 (2002), the project proponent has the responsibility of ensuring that all BMPs and mitigation measures are implemented. BMPs are practices taken by an agency to prevent disturbance. Mitigations are measures implemented to reduce the impact of an action to insignificant and would be included in a FONSI. To minimize human health and safety impacts, the following BMPs would be applied:

- Test programs will write and implement SOPs for each particular test series, which will be followed as stated; and
- The USACE will require a safety plan prior to construction, which will be followed as stated.

3.6 SUMMARY OF POTENTIAL IMPACTS AND MITIGATIONS

BMPs are standard practices that are implemented as part of the Proposed Action to minimize or avoid adverse impacts. Additional mitigation measures are proposed to rectify or compensate for unavoidable adverse environmental effects that could be significant without mitigation. Table 3-12 provides a summary of the potential impacts associated with the Proposed Action alternative, as well as the proposed BMPs and mitigation measures.

The No-Action Alternative would represent no change in the current operational environment of WSMR. Therefore, no impacts to the resource areas analyzed would be expected.
1 abit 5-12	Environmental Enects Summary				
Impacts of the Proposed Action Alternatives	Proposed Best Management Practices and Mitigation Measures				
Air Quality					
 No significant impacts There would be land disturbance at the Salinas Peak and JDETC Central locations; Fugitive dust would be generated construction, vehicle traffic on unpaved roads, and during road maintenance; and Criteria air pollutants would be generated by motor vehicles and equipment. 	 BMPs To the fullest extent possible, unpaved roads and other cleared areas would be wettedto minimize fugitive dust emissions during heavy usage; During construction or other earth-moving activities, truckloads of dirt would be covered with tarps to reduce windborne dust; Acquisition of any generators will be coordinated with WSMR Garrison Environmental Compliance to ensure EPA or other standards are meet. Mitigation Measures None 				
Cultural Resources					
 No adverse effects Site-specific construction activities and placement of test equipment or targets will go through an environmental review to ensure compliance with the Integrated Cultural Resource Management Plan and the National Historic Preservation Act, Section 106. 	 BMPs Recovery of targets will be conducted in accordance with the WSMR SOP for Environmental Protection During Recovery Actions; and In the event of inadvertent discovery, program personnel would report to the WSMR Garrison Environmental Division, as specified in Cultural Resources Management SOP #9 of the WSMR INCRMP. Mitigation Measures None 				
Soil Erosion Effects					
 No significant impacts Salinas Peak has high slopes, with high potential for erosion; and Increased traffic on Salinas Road would lead to higher erosion potential. 	 BMPs Salinas Road would be monitored and maintained or improved as needed; Following target recovery, the excavation areas would be re-contoured to match the existing drainage condition; Erosion control measures will be implemented in accordance with a U.S. Army Corps of Engineers approved SWPPP. Mitigation Measures None 				
Biological Resources					
 No significant impacts Reduction in habitat may occur on a small scale but would not impact the ability to maintain plant populations; Possible risk of spreading invasive plant species; 	 BMPs Whenever possible, removal or modification of vegetation would occur outside of birdnesting season (generally March through August); The WSMR Garrison Environmental Division would be contacted regarding wildlife concerns and personnel would report to include nuisance issues, injury or death of an animal, active nest or nestlings; or determination of any seasonal wildlife 				

Table 3-12Environmental Effects Summary

Impacts of the Proposed Action Alternatives	Proposed Best Management Practices and Mitigation Measures
 Targets would impact a small surface area over a sizable test area; Construction and testing operations would avoid known sensitive wildlife species populations; Individual mortality may occur; however, no population-level impacts are anticipated; and No critical habitat located within the project areas. 	 restrictions; Measures to prevent wildlife damages to property or negative human/wildlife interactions will be taken. Structures would be closed to prevent inhabitation of wildlife to the extent practical; Exterior conduit, piping would use coatings/coverings that discourage wildlife damages. Trash and uneaten food would be policed to prevent nuisance bears on Salinas; Personnel would not feed, water, harass, collect, possess, harm, disturb, or destroy wildlife or their parts to include but not limited to snakes, bats, birds, nests, eggs, or nestlings.
	Mitigation Measures
	 If vegetation must be removed during nesting season, it would be surveyed for nesting migratory birds within seven days of construction activities following survey methods approved by the WSMR Garrison Environmental Division; If bird nests are found during surveys, the WSMR Garrison Environmental Division would be consulted to determine actions to be taken; All power poles or banks modified or added for this project would incorporate raptor protection as described in the 2014 WSMR Avian Protection Plan; Human and vehicle activity would remain outside of the 0.5-mi (800-m) buffer area of any active eagle nest, throughout the nesting season of mid-January through July; and Test personnel would immediately provide the locations to the WSMR Garrison Environmental Division of any munitions landing near eagle nests (active or inactive), and would immediately report any injured or dead birds (including eagles) discovered in an impact area or through recovery effort.
Human Health and Safety	
 No significant impacts All construction and RDT&E activities would comply with Army and WSMR policies and procedures; Public access to WSMR is restricted; All targets would be subject to flight safety analysis. 	 BMPs Cars and trucks used for personnel and delivery transport to Salinas Peak and JDETC Central will follow all posted speed limits; The 2-mile (3.2-km) stretch of Salinas Road closest to the peak will be controlled via phone and/or radio communications to coordinate two-way traffic; Salinas Road will be maintained in safe, drivable condition; All test proponents, employees, and visitors conducting activities outside the WSMR cantonment will be presented an environment and safety brief that will increase awareness; All personnel would receive UXO training; Underground utility surveys will be conducted prior to excavation activities;

Impacts of the Proposed Action Alternatives	Proposed Best Management Practices and Mitigation Measures
	• During construction and any use of heavy equipment, a 20-pound ABC fire extinguisher will be onsite as well as two shovels and two 5-gallon backpack pumps for fire suppression;
	• Testing and training operations with HEL systems will be conducted in accordance with MIL-HDBK-828C, ANSI Z136.1, ANSI Z136.6, DODI 6055.15, and other applicable Army and WSMR standards;
	• HPM system operations would meet safety specifications provided in IEEE C95.1-2019 and other applicable Army and WSMR standards;
	• Test proponents will coordinate with WSMR regarding quantity-distance (QD) requirements prior to commencing testing activities;
	• Test proponents, through coordination with the Test Center Safety Office, will ensure all HERP, HERO, and HERF safety distances are identified and maintained; and
	• Personnel in the vicinity of the HEL and HPM systems would be housed in trailers, vans, or shelters to provide protection from electromagnetic radiation.

Environmental Assessment	Final
Joint Directed Energy Test Center	December 2021

[This page intentionally left blank]

CHAPTER 4 CUMULATIVE IMPACTS

Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of NEPA define cumulative impacts as:

the impact on the environment resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Actions by federal, non-federal agencies, and private parties must be considered (40 CFR 1508.7 [2002])

Each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects based on its own time and space parameters. Therefore, cumulative effects analysis will typically encompass a Region of Influence (ROI) or geographic boundaries beyond the immediate area of the Proposed Action and a time frame including past actions and foreseeable future actions, to capture these additional effects.

For the Proposed Action to have a cumulatively significant impact on an environmental resource, two conditions must be met. First, the combined effects of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the effects of the Proposed Action, must be significant. Second, the Proposed Action must make a substantial contribution to that significant cumulative impact. In order to analyze cumulative effects, a cumulative effects region must be identified for which effects of the Proposed Action and other past, present, and reasonably foreseeable actions would occur.

The Army uses a process for cumulative effects analysis that follows three steps:

- 1. Identify the boundary of each resource category. Boundaries may be geographic or temporal. For example, the Air Quality Control Region might be the appropriate boundary for the air quality analysis, while a watershed could be the boundary for the water quality analysis. Depending upon the circumstances, these boundaries could be different and could extend off the installation;
- 2. Describe the threshold level of significance for that resource category. For example, a violation of air quality standards within the Air Quality Control Region would be an appropriate threshold level; and
- 3. Determine the environmental consequence of the action. The analysis should identify the cause and effect relationships, determine the magnitude and significance of cumulative effects, and identify possible mitigation measures.

This analysis depends on the availability of data and the relevance of effects of past, present, and future actions. Although certain data (e.g., extent of forest cover) may be available for extensive periods in the past (i.e., decades), other data (e.g., water quality) may be available for much shorter periods. Because specific information and data on past projects and action are usually scarce, the analysis of past effects is often qualitative (CEQ 1997).

Table 4-1 lists the past, present, and reasonably foreseeable future actions within the ROI that have had, continue to have, or would be expected to have some impact on the natural and human environment. The projects in this table are limited to those implemented in the last five years or those with ongoing contributions to environmental effects. Projects with measurable contributions to impacts within the ROI for a resource area were included in the cumulative analysis.

Ducient Title	Ducient Description	Pro	ject Timef	rame
Project Thie	Project Description	Past	Present	Future
Boeing Commercial Crew Transportation System Landing and Recovery	Starliner spacecraft launched from the Cape Canaveral Air Force Station would land and be recovered at two locations at WSMR. The proposed action includes the grading and vegetation management of approximately 5 ac (2 ha) of land.	~	~	~
Supplemental Assessment to the Boeing Commercial Crew Transportation System Landing and Recovery	This project includes the clearance of two additional sites for the landing and recovery of the Starliner spacecraft. The two sites include an area within the northern extent of the WSMR boundaries (known as WSMR-N) and a site at the White Sands Space Harbor (WSSH). The WSMR-N site would represent a clearance of up to 20 ac (8.1 ha), and the WSSH site would encompass up to 300 ac (121 ha).			4
Collateral Effects Testing at the Permanent High Explosive Test Site (PHETS)	Continued testing at the PHETS at WSMR to allow for the analysis of real-world chemical and biological threats. These tests are performed to improve response capabilities to such threats.	V	~	V
Granite Test Site	Testing and evaluation of weapon systems against simulated enemy military assets including hardened and reinforced structures that could be used to produce weapons of mass destruction. The test bed covers approximately 50 ac (20 ha) and has the potential to affect two Golden Eagle nests approximately 1,950 ft (595 m) from the target site.	~	~	~
Advanced Gunfire Program	Construction and operation of a test facility in support of DoD's hypervelocity projectile and electromagnetic railgun technologies on WSMR. Impact areas would be limited to existing WSMR weapon impact targets and a 10-ac (4-ha) impact area in the Northern Callup Area (NCA).	~	~	~
Precision Fires Rocket and Missile Flight Testing	Construction of one target area and up to three missile assembly buildings. Testing to include long-range test flight performance of missiles launched from Fort Wingate and impacting into approved areas on WSMR. Three missile assembly buildings would be constructed, with a total of approximately 72 ac (29.1 ha) of disturbance, inclusive of roads. Approximately 11 ac (4.45 ha) of the existing Yucca Impact Area would be bladed to facilitate target, instrumentation placement, and operational access.		¥	¥
Extended Range Capabilities at WSMR	Testing of a suite of Extended Range Launch Test Articles comprised of G-A, G-G and A-A articles at WSMR while operating three new extended airspace corridors in and beyond WSMR's restricted airspace over the NCA as well as designate and utilize a new 1,000-ac (405-ha) debris impact area in the NCA.	~	✓	1
Solid-Fueled Rocket Motor Launches from Fort Wingate Launch Complex	Flight tests involving launching solid-fueled rocket targets from Fort Wingate to WSMR in support of the Ballistic Missile Defense System. The launches use a mobile launcher, placed within an existing hazard area. Telemetry/optics/radar are provided by mission support. The action required no clearing of vegetation or ground disturbance.	√	✓	1

Table 4.1. Reasonably Foreseeable Actions within the Region of Influence

4.1 AIR QUALITY

The Proposed Action would lead to criteria air pollutant emissions below *de minimis* thresholds and would not trigger a conformity determination under Section 176(c) of the CAA. Moreover, these negligible impacts, when added to the other listed projects and activities, would account for a small percentage increase of overall air emissions for the region. As a result, the emissions associated with the Proposed Action would not be expected to have a cumulative impact on air quality.

4.2 CULTURAL RESOURCES

Until Section 106 consultation is complete, no determination of effect can be made on the Proposed Action activities. However, targets used in the Proposed Action could impact the same areas as the projects listed in Table 4-1. The increased use of these areas could lead to a higher probability of inadvertent discoveries, which would lead to the implementation of SOP #9 of the WSMR INCRMP as directed by the WSMR CRM. These measures would minimize potential impacts on historic and prehistoric resources. Following completion of Section 106 analysis, the Proposed Action in conjunction with other past, present, and foreseeable activities, would not result in cumulative impacts to cultural resources.

4.3 SOIL EROSION EFFECTS

The Proposed Action would have soil erosion effects, limited to the project areas' vicinities. Such effects are limited to ground disturbance during construction activities, use and maintenance of unpaved roads, and recovery of targets. As described in the NEPA documents for the past, ongoing, and proposed future projects listed in Table 4-1, the regional activities are not expected to significantly affect geology and soils. Due to the scope of potential impacts associated with the Proposed Action of this EA, there would only be minor effects that would not measurably add to effects of other activities. Hence, there would be no cumulative impact on soil erosion effects.

4.4 **BIOLOGICAL RESOURCES**

Implementation of the Proposed Action would have small-scale impacts to vegetation communities but would not impact the ability to maintain plant populations. There are chances of individual mortalities during RDT&E activities; however, no population-level impacts are anticipated. It should be noted that significance of individual mortalities varies among species (e.g., one eagle mortality would be more significant than an ant mortality). The proposed project areas do not contain critical habitat. When combined with the effects of other past, present, and foreseeable project activities, implementation of the Proposed Action is unlikely to have any additional cumulative effect on regional plant and animal populations, including threatened and endangered species.

4.5 HUMAN HEALTH AND SAFETY

All Proposed Action activities would comply with Army and WSMR health and safety policies and procedures. Public access to WSMR is restricted, limiting public exposure to the construction and RDT&E activities. All use of targets would be subject to flight safety analysis, and all projectiles would be fired on trajectories that would impact only within WSMR impact areas. Therefore, implementation of the Proposed Action in conjunction with other past, present, and foreseeable actions would not result in cumulative impacts to human health and safety.

CHAPTER 5 REFERENCES

- Army 2007. NEPA Analysis Guidance Manual. U.S. Army Environmental Command. Aberdeen Proving Ground, Maryland. May.
- CEQ 1997. Considering Cumulative Effects under the National Environmental Policy Act. Council on Environmental Quality. Washington, District of Columbia. January.
- Cutler 2021. Personal conversation with WSMR Garrison Environmental Division wildlife biologist, Patricia Cutler, regarding Golden Eagle breeding territories at WSMR.
- Dagenhardt, W. G., C. W. Painter, and A. H. Price 1996. The Amphibians and Reptiles of New Mexico. University of New Mexico Press, Albuquerque, New Mexico.
- EPA 2020. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018. EPA 430-R-20-002. Washington, DC. April.
- Muldavin, E., Y. Chauvin, G. Harper, and P. Neville. 2000. The vegetation of White Sands Missile Range, New Mexico. Vol. 1, Handbook of vegetation communities; vol. 2, Vegetation map. Final report for Cooperative Agreement no. 14-16-002-91-233, WSMR, USFWS, The Nature Conservancy, and the University of New Mexico. New Mexico Natural Heritage Program, Albuquerque, New Mexico.
- NMBGMR 2003. Geologic Map of New Mexico. New Mexico Bureau of Geology and Mineral Resources, New Mexico Institute of Mining & Technology, Socorro, New Mexico.
- NMDGF 2020. Biota Information System of New Mexico. New Mexico Department of Game and Fish website, http://www.bison-m.org/databasequery.aspx, accessed 13 April 2020.
- NRCS 2014. Soil Survey Geographic (SSURGO) Database for White Sands National Monument, New Mexico. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. June.
- NRCS 2018. Web Soil Survey Suitability of Roads (Natural Surface) White Sands Missile Range, New Mexico, Parts of Dona Ana, Lincoln, Otero, Sierra, and Socorro Counties. U.S. Department of Agriculture Natural Resources Conservation Service website.
- NRCS 2020. Updated T and K Factors Questions and Answers. Department of Agriculture Natural Resources Conservation Service website.
- WRCC 2020. White Sands National Monument, New Mexico (299686) 1939-2005 monthly Climate Summary. Desert Research Institute Western Regional Climate Center, Reno, Nevada.
- WSMR 2005. Environmental Assessment High Energy Laser Systems Test Facility (HELSTF) Enhanced Laser and Range Operations. White Sands Missile Range, New Mexico. June.
- WSMR 2007. Programmatic Environmental Assessment for Directed Energy Test Sites and Operations on White Sands Missile Range, New Mexico. December.

- WSMR 2008. Supplemental Environmental Assessment for Joint Directed Energy Test Site (JDETS) on White Sands Missile Range. July.
- WSMR 2009. Final Environmental Impact Statement for Development and Implementation of Range-Wide Mission and Major Capabilities at White Sands, New Mexico. White Sands Missile Range, New Mexico. November
- WSMR 2013. Bird Checklist for White Sands Missile Range. White Sands Missile Range, New Mexico. October.
- WSMR 2015. White Sands Missile Range Integrated Natural and Cultural Resources Management Plan and Environmental Assessment: 2015-2019. White Sands Missile Range, New Mexico. June.
- WSMR 2019. Planning Charrette Report J-DETC Central Directed Energy Facility Salinas Peak High Energy Laser Facility, White Sands Missile Range, Final. White Sands Missile Range, New Mexico. August.
- USFWS 2020. United States Fish and Wildlife Service Information for Planning and Consultation (IPaC). Website, https://ecos.fws.gov/ipac access 13 April 2020.
- Zeedyk 2006. A Good Road Lies Easy on the Land... Water Harvesting from Low Standard Rural Roads. Zeedyk Ecological Consulting, LLC, Sandia Park, New Mexico. April

CHAPTER 6 LIST OF PREPARERS

This EA was prepared by Epsilon Systems Solutions, Inc. for WSMR. Members of the professional staff are provided below.

ATEC, Test Center Operations

Cathy Giblin, Environmental Engineer April Banks, White Sands Test Center Facility Manager Brian Wilson, Environmental Scientist Jamie Hall, Environmental Scientist

WSMR Garrison Environmental Division

Brian Knight, Environmental Division Chief Deborah Hartell, Environmental Customer Support Branch Chief Deborah Nethers, Ecologist Jim Bowman, Conservation Branch Chief William Godby, Archaeologist Patricia Cutler, Wildlife Biologist Michael A. Stowe, Senior Archaeologist

<u>WSMR</u>

Kevin M. Dent, Staff Judge Advocate

Epsilon Systems Solutions, Inc.

Mark Dimsha, Environmental Planner Jacob Richards, Biological Resources and NEPA SME Brad Beacham, Archaeologist Phil Esser, Architectural Historian Justin Pooley, GIS Analyst Becki Graham, Quality Assurance

CHAPTER 7 AGENCIES AND CONSULTATIONS

Reviewing agencies encompass federal, state, and local government agencies and tribes which have a vested interest in the planning area and wish to collaborate with WSMR to implement the requirements of NEPA. Federal and state agencies and local and tribal governments have qualified as reviewing agencies because of proximity or estate ownership within the planning area or by legal jurisdiction or special expertise.

Collaboration can be used to describe a wide range of external and internal working relationships, including the relationship between reviewing agencies. WSMR strongly supports the engagement of reviewing agencies in developing EAs.

[This page intentionally left blank]

APPENDIX A AIR POLLUTANT EMISSION CALCULATIONS

The U.S. Environmental Protection Agency (EPA) published *Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule,* in the Federal Register on 30 November 1993 (40 CFR Parts 6, 51, and 93). EPA published *Revisions to the General Conformity Regulations; Final Rule,* in the Federal Register on 5 April 2010 (40 CFR Parts 51 and 93). These publications provide implementing guidance to document Clean Air Act Conformity Determination requirements. Regulations within the General Conformity Rule state that no department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license to permit, or approve any activity that does not conform to an applicable implementation plan. It is the responsibility of the federal agency to determine whether a federal action conforms to the applicable implementation plan, before the action is taken (40 CFR Part 1 51.850[a]).

The General Conformity Rule applies to federal actions proposed within areas which are designated as either non-attainment or maintenance areas for a National Ambient Air Quality Standard (NAAQS) for any of the criteria pollutants. Former non-attainment areas that have attained a NAAQS are designated as maintenance areas. Emissions of pollutants for which an area is in attainment are exempt from conformity analyses.

The proposed action would occur at White Sands Missile Range (WSMR), New Mexico, which is in attainment for all criteria pollutants; therefore, the provisions of the General Conformity Rule and *de minimis* thresholds do not apply. The nearest nonattainment area to WSMR lies 17 miles south of the southernmost boundary of WSMR at Anthony in Doña Ana County, classified as moderate nonattainment for PM₁₀. Sunland Park, New Mexico is located approximately 39 miles south of WSMR and is in nonattainment for ozone. The greater part of WSMR within parts of Doña Ana, Otero, Sierra, and Lincoln counties, is encompassed by the New Mexico portion of the El Paso-Las Cruces-Alamogordo Interstate Air Quality Control Region 153. The northernmost portion of the installation that lies in Socorro County is within the Southwestern Mountains-Augustine Plains Intrastate Air Quality Control Region 156.

An emissions analysis for construction and operations associated with the Joint Directed Energy Test Center (JDETC) Program is provided below. Emissions estimates for the proposed action have been compared to *de minimis* thresholds of a nonattainment area. *de minimis* thresholds for criteria pollutants would not be exceeded as a result of implementation of the Proposed Action and a formal Conformity Determination is not considered necessary.

PROPOSED ACTION

Action Proponent: White Sands Test Center.

Location: White Sands Missile Range, New Mexico.

Proposed Action Name: Joint Directed Energy Test Center.

<u>Proposed Action Summary</u>: The Proposed Action includes construction of testing facilities at two sites within WSMR boundaries: the JDETC Central site and Salinas Peak. Construction at the JDETC Central location includes the installation of a Class B runway. Maintenance of the Salinas Peak access road is

included. The Proposed Action also includes operations including testing and training involving directed energy systems, both as standalone systems and in conjunction with kinetic energy weapon systems.

Air Emissions Summary: Estimated annual criteria air pollutant emissions and greenhouse gases (GHG) were calculated for the actions associated with Alternative 1 (the alternative with the highest estimated emissions). These include the construction activities at Salinas Peak and JDETC Central as well as material deliveries for construction and operations. Grading and gravel application to Salinas Road were also included. The analysis also considered roundtrip personnel transport from Las Cruces to the project sites. Table 1 provides a summary of the criteria pollutant emissions associated with Alternative 1, and Table 2 provides a summary of GHG emissions. Calculations for Alternatives 2 and 3 are available upon request.

		Biiiissioi						
Emission Source		Pollutant (tons/year)						
Emission Source	VOC	NOx	CO	SOx	PM ₁₀	CO_2^1	CH4 ¹	
Vehicle Emissions ²	0.033	0.241	0.484	0.00171	0.00729	175	0.00296	
Construction Emissions ³	0.0877	0.612	0.524	0.00137	0.924	120	0.00792	
Runway Construction Emissions ⁴	2.34	7.43	8.43	0.0477	3.13	7,314	0.173	
Total	2.46	8.28	9.44	0.0508	4.06	7,609	0.184	
<i>de minimis</i> threshold ⁵	100	100	100	100	100	NA	NA	

Total Emissions (tons/year) – Alternative 1 Table 1

¹ CO₂ and CH₄ emission estimates provided for GHG analysis. Notes:

² Vehicle emissions include personnel transport and equipment delivery for construction and operations.

³ Construction emissions include construction equipment and fugitive dust emissions, not including runway construction.

⁴ Runway construction emissions include fugitive dust emissions, emissions due to construction equipment, and vehicles used during the construction of the runway at JDETC Central. It should be noted that the runway construction would not be in the same year as facility construction.

⁵ de minimis thresholds do not apply to actions taken on WSMR as it is in attainment/unclassified for the NAAOS. However, emissions estimates for the Proposed Action have been compared to de minimis thresholds of a basic nonattainment area for planning purposes.

NA = Not Applicable.

Table 2	GHG Emissions for	r Alternative 1
Pollutant	Actual emissions (toppes/year)	CO2e emissions
	(tonnes/year)	(tonnes/year)
CO_2	6,903	6,903
CH ₄	0.167	3.50
Total		6,907
% U.S. emissions		0.000117

Emission Calculations – Proposed Action

1. Salinas Peak Construction and Operations

Auto	VOC	NOX	CO	SOX	PM10	CO2	CH4
g/mile	0.021034	0.05336	0.80655	0.002806	0.00172	283.52	0.003574
lb/mile	4.64E-05	0.000118	0.001778	6.19E-06	3.79E-06	0.625058	7.88E-06
Pickup	VOC	NOX	СО	SOX	PM10	CO2	CH4
g/mile	0.058762	0.15555	1.69306	0.003277	0.002676	331.121	0.008958
lb/mile	0.00013	0.000343	0.003733	7.22E-06	5.9E-06	0.730001	1.97E-05
Truck heavy	VOC	NOX	CO	SOX	PM10	CO2	CH4
a/mila							
g/mile	0.388952	4.859276	0.820255	0.010947	0.127191	1158.731	0.015869
lb/mile	0.388952 0.000857	4.859276 0.010713	0.820255 0.001808	0.010947 2.41E-05	0.127191 0.00028	1158.731 2.554578	0.015869 3.5E-05
lb/mile	0.388952 0.000857	4.859276 0.010713	0.820255 0.001808	0.010947 2.41E-05	0.127191 0.00028	1158.731 2.554578	0.015869 3.5E-05
lb/mile Truck light	0.388952 0.000857 VOC	4.859276 0.010713 NOX	0.820255 0.001808 CO	0.010947 2.41E-05 SOX	0.127191 0.00028 PM10	1158.731 2.554578 CO2	0.015869 3.5E-05 CH4
lb/mile Truck light g/mile	0.388952 0.000857 VOC 0.378172	4.859276 0.010713 NOX 3.837919	0.820255 0.001808 CO 0.832862	0.010947 2.41E-05 SOX 0.010842	0.127191 0.00028 PM10 0.127345	1158.731 2.554578 CO2 1147.649	0.015869 3.5E-05 CH4 0.015429

source emfac 2017 for fleet aggregate mix 2020

	VOC	NOX	СО	SOX	PM10	CO2	CH4
Auto	5.10095	12.94032	195.5962	0.680482	0.417117	68756.37	0.86673
Pickup	8.550215	22.63344	246.3501	0.476823	0.389374	48180.04	1.303441
Light delivery	15.59077	158.2246	34.33612	0.446979	5.250009	47313.73	0.636086
Heavy							
delivery	3.772986	47.13687	7.956794	0.10619	1.233802	11240.14	0.153935
TOTAL tpy	0.016507	0.120468	0.24212	0.000855	0.003645	87.74514	0.00148

Auto - 500 RT per year (includes construction and operations)

Pickup - 300 RT (construction)

Light delivery - 35 concrete + 50 fuel/h2o

Heavy delivery - 20 building material deliveries

RT = 220 miles

Equipment EFs (lb/hour)

	Max HP	VOC	NOX	СО	SOX	PM10	CO2	CH4
grader	175	0.0918	0.5622	0.7282	0.0014	0.0303	124	0.0083
dozer	175	0.0703	0.3868	0.6637	0.0013	0.0195	112	0.0063
water truck	250	0.1326	1.1048	0.3761	0.0019	0.0368	167	0.012
TOTAL		0.2947	2.0538	1.768	0.0046	0.0866	403	0.0266

Source: SQAQMD Off-Road Model Mobile Source Emissions for Fleet Year 2020

	hours	VOC	NOX	СО	SOX	PM10	CO2	CH4
grader	100	0.00459	0.02811	0.03641	0.00007	0.001515	6.2	0.000415
dozer	80	0.002812	0.015472	0.026548	0.000052	0.00078	4.48	0.000252
water truck	200	0.01326	0.11048	0.03761	0.00019	0.00368	16.7	0.0012
	TOTAL	0.020662	0.154062	0.100568	0.000312	0.005975	27.38	0.001867

Equipment emissions - Salinas Construction + road maintenance

Fugitive Dust - Construction equipment

grading	0.008989
dozing	0.03

	VOC	NOX	СО	SOX	PM10	CO2	CH4
Vehicle	0.016507	0.120468	0.24212	0.000855	0.003645	87.74514	0.00148
Construction	0.020662	0.154062	0.100568	0.000312	0.044964	27.38	0.001867
TOTAL	0.037169	0.27453	0.342688	0.001167	0.048609	115.1251	0.003347

2. JDETC Central Construction (except runway) and Operations

Auto	VOC	NOX	CO	SOX	PM10	CO2	CH4
g/mile	0.021034	0.05336	0.80655	0.002806	0.00172	283.52	0.003574
lb/mile	4.64E-05	0.000118	0.001778	6.19E-06	3.79E-06	0.625058	7.88E-06

Pickup	VOC	NOX	СО	SOX	PM10	CO2	CH4
g/mile	0.058762	0.15555	1.69306	0.003277	0.002676	331.121	0.008958
lb/mile	0.00013	0.000343	0.003733	7.22E-06	5.9E-06	0.730001	1.97E-05

Truck heavy	VOC	NOX	СО	SOX	PM10	CO2	CH4
g/mile	0.388952	4.859276	0.820255	0.010947	0.127191	1158.731	0.015869
lb/mile	0.000857	0.010713	0.001808	2.41E-05	0.00028	2.554578	3.5E-05

Truck light	VOC	NOX	СО	SOX	PM10	CO2	CH4
g/mile	0.378172	3.837919	0.832862	0.010842	0.127345	1147.649	0.015429
lb/mile	0.000834	0.008461	0.001836	2.39E-05	0.000281	2.530146	3.4E-05

source emfac 2017 for fleet aggregate mix 2020

	VOC	NOX	CO	SOX	PM10	CO2	CH4
Auto	5.10095	12.94032	195.5962	0.680482	0.417117	68756.37	0.86673
Pickup	8.550215	22.63344	246.3501	0.476823	0.389374	48180.04	1.303441
Light delivery	15.59077	158.2246	34.33612	0.446979	5.250009	47313.73	0.636086
Heavy							
delivery	3.772986	47.13687	7.956794	0.10619	1.233802	11240.14	0.153935
TOTAL tpy	0.016507	0.120468	0.24212	0.000855	0.003645	87.74514	0.00148

Auto - 1500 RT per year (includes construction and operations)

Pickup - 300 RT (construction)

Light delivery - 187 RT Heavy delivery - 300 building material deliveries RT = 60 miles

Equipment EFs (lb/hour)

	Max HP	VOC	NOX	СО	SOX	PM10	CO2	CH4
grader	175	0.0918	0.5622	0.7282	0.0014	0.0303	124	0.0083
dozer	175	0.0703	0.3868	0.6637	0.0013	0.0195	112	0.0063
water truck	250	0.1326	1.1048	0.3761	0.0019	0.0368	167	0.012
TOTAL		0.2947	2.0538	1.768	0.0046	0.0866	403	0.0266

Source: SQAQMD Off-Road Model Mobile Source Emissions for Fleet Year 2020

Equipment emissions - Salinas Construction + road maintenance

	hours	VOC	NOX	СО	SOX	PM10	CO2	CH4
grader	500	0.02295	0.14055	0.18205	0.00035	0.007575	31	0.002075
dozer	500	0.017575	0.0967	0.165925	0.000325	0.004875	28	0.001575
water truck	400	0.02652	0.22096	0.07522	0.00038	0.00736	33.4	0.0024
	TOTAL	0.067045	0.45821	0.423195	0.001055	0.01981	92.4	0.00605

Fugitive Dust - Construction equipment

grading 0.6345 dozing 0.225

	VOC	NOX	СО	SOX	PM10	CO2	CH4
Vehicle	0.016507	0.120468	0.24212	0.000855	0.003645	87.74514	0.00148
Construction	0.067045	0.45821	0.423195	0.001055	0.87931	92.4	0.00605
TOTAL	0.083552	0.578678	0.665315	0.00191	0.882955	180.1451	0.00753

Alternative 1 totals

	VOC	NOX	СО	SOX	PM10	CO2	CH4
Vehicle	0.033015	0.240935	0.484239	0.00171	0.00729	175.4903	0.00296
Construction	0.087707	0.612272	0.523763	0.001367	0.924274	119.78	0.007917
TOTAL	0.120722	0.853207	1.008002	0.003077	0.931564	295.2703	0.010877

The following pages provide output files from the Airport Construction Emissions Inventory Tool (ACEIT). The ACEIT modeling package was used to estimate criteria air pollutant emissions associated with the proposed runway construction.

[This page intentionally left blank]

Environmental Assessment Joint Directed Energy Test Cel	Enter Final December 2021	
3. JDETC Central Runway Airport Construction Emissions In Version 1.0 Run Date & Time: 12/3/2020 4:09	7 Construction Emissions (calculated using the Airport Construction Emissions Inventory Tool [ACEIT]) Inventory Tool (ACEIT) 19:23 PM	
STUDY Study Name JDETC Runway Study Description Construction of a Class B runway	y adjacent to proposed JDETC Central	
EMISSIONS INVENTORY - SU Total Emissions by Year Units for Non-Greenhouse Gases Units for Greenhouse Gases (CO2 Year CO NOx SO2 2022 9.291974896 8.1921 0.05340942 Total Emissions by Source Catego	JMMARY Emission: Short Ton 2, CH4, and N2O) Emission: Metric Ton PM10 PM2.5 VOC CO2 CH4 N2O 113218 0.052539754 3.446605736 0.386015591 2.58447519 8062.145637 0.190458384 gories	
Units for Non-Greenhouse Gases	Emission: Short Ton	
Units for Greenhouse Gases Emis	ssion: Metric Ton	
Year Emission Source CO 2022 NonRoad 4 2278	NOX SOZ PM10 PM2.5 VOC COZ CH4 N2O 821618 6 859144772 0 036500963 0 369945327 0 340349701 2 247660067 6625 879435	
2022 OnRoad 5.064153278 0.05340942	1.332968446 0.016038791 0.046509836 0.04566589 0.336815123 1436.266201 0.19045	8384
2022 Fugitive 0 0 2022 TOTAL 9 291974896	0 3.030150574 8.192113218 0.052539754 3.446605736 0.386015591 2.58447519 8062.145637 0.19045	58384

INPUT DATA AND SPECIFICATIONS State/County New Mexico

Dona A	Ana Cour	nty											
Scenar	ios												
Scenar	io ID	Year	Number of Months	Season Average	e Daily T	emp (deg	ςF)	Max Daily	Temp Change	(degF)	Min Da	aily Temp	Change
(degF)													
1	2022	9	Summer 50 < T <= 80	20 <= Change in	Т	$0 \le Ch$	ange in T	Γ < 10					
2													
1	New R	unway	Clearing and Grubbing	Chipper/Stump (Grinder	Diesel	46.00 A	cre 12	2 Hours per 1.0	0 Acre	552	hours	
1	New R	unway	Clearing and Grubbing	Pickup Truck	Diesel	46.00 A	cre	16 Hours p	ber 1.00 Acre	736	hours		
1	New R	unwav	Concrete Placement	Air Compressor	Diesel	87653.0	0 CY	8 Hours pe	er 1000.00 CY	701.22	hours		
1	New R	unwav	Concrete Placement	Concrete Saws	Diesel	87653.0	0 CY	8 Hours pe	er 1000.00 CY	701.22	hours		
1	New R	unwav	Concrete Placement	Concrete Truck	Diesel	87653.0	0 CY	8 Hours pe	er 240.00 CY	2921.77	hours		
1	New R	unwav	Concrete Placement	Other General E	auinment	Diesel	87653.0	0 CY 16	6 Hours per 100	00.00 CY	1402.45	5 hours	
1	New R	unwav	Concrete Placement	Pickup Truck	Diesel	87653.0	0 CY	24 Hours r	er 1000.00 CY	2103.67	hours		
1	New R	unway	Concrete Placement	Rubber Tired Lo	ader	Diesel	87653.0	0 CY 8	Hours per 1000	0.00 CY	701.22	hours	
1	New R	unwav	Concrete Placement	Slip Form Paver	Diesel	87653.0	0 CY	8 Hours pe	er 1000.00 CY	701.22	hours		
-	1.0.1			5.1.p 1 01111 0 01	210001	0,00010	0.01	0 110 mio p 1	1 1000100 0 1	,	110 1110		
1	New R	unway	Concrete Placement	Surfacing Equip	ment (Gro	ooving)	Diesel	87653.00 0	CY 8 Hours	s per 1000	0.00 CY	701.22	hours
1	New R	unway	Drainage - 24 inch SICPP	Dozer Diesel	10310.0	00 LF	8 Hours	per 250.00	LF 329.92	hours			
1	New R	unway	Drainage - 24 inch SICPP	Dump Truck	Diesel	10310.0	0 LF	8 Hours pe	er 250.00 LF	329.92	hours		
1	New R	lunway	Drainage - 24 inch SICPP	Excavator	Diesel	10310.0	0 LF	8 Hours pe	er 250.00 LF	329.92	hours		
1	New R	lunway	Drainage - 24 inch SICPP	Loader Diesel	10310.0	00 LF	8 Hours	per 250.00	LF 329.92	hours			
1	New R	lunway	Drainage - 24 inch SICPP	Other General E	quipment	Diesel	10310.0	0 LF 8	Hours per 250.	.00 LF	329.92	hours	
1	New R	lunway	Drainage - 24 inch SICPP	Pickup Truck	Diesel	10310.0	0 LF	8 Hours pe	er 250.00 LF	329.92	hours		
1	New R	lunway	Drainage - 24 inch SICPP	Roller Diesel	10310.0)0 LF	8 Hours	per 250.00	LF 329.92	hours			
1	New R	lunway	Drainage - 6 inch Perforat	ed Underdrain	Dump 7	Fruck	Diesel	20620.00 I	LF 8 Hours	s per 900.	00 LF	183.29	hours
1	New R	lunway	Drainage - 6 inch Perforat	ed Underdrain	Loader	Diesel	20620.0	0 LF 8	Hours per 900.	.00 LF	183.29	hours	
1	New R	lunway	Drainage - 6 inch Perforat	ed Underdrain	Other G	General Ed	quipment	Diesel 20	0620.00 LF	8 Hours	per 900.	.00 LF	183.29
	hours	2	C C				1 1				1		
1	New R	unwav	Drainage - 6 inch Perforat	ed Underdrain	Pickup	Truck	Diesel	20620.00 I	LF 8 Hours	s per 900.	00 LF	183.29	hours
1	New R	lunwav	Drainage - 6 inch Perforat	ed Underdrain	Tractors	s/Loader/	Backhoe	Diesel 20	0620.00 LF	8 Hours	per 900.	.00 LF	183.29
	hours	5	6								1		
1	New R	unwav	Dust Control Water T	ruck Diesel	270.00	Dav	8 Hours	per 1.00 D	av 2160	hours			
1	New R	unwav	Excavation (Borrow)	Dozer Diesel	87653.0)0 CY	8 Hours	per 600.00	CY 1168.71	hours			
1	New R	lunway	Excavation (Borrow)	Dump Truck (12	cy)	Diesel	87653.0	0 CY 8	Hours per 600.	00 CY	1168.71	hours	

1	New Runway	Excavation (Borrow)	Pickup T	ruck	Diesel	87653.0	0 CY	8 Hours	per 600.	00 CY	1168.71	hours	
1	New Runway	Excavation (Borrow)	Roller	Diesel	87653.0	00 CY	8 Hours	per 1300).00 CY	539.4	hours		
1	New Runway	Excavation (Cut to Fill)	Dozer	Diesel	87653.0	00 CY	8 Hours	per 800.	00 CY	876.53	hours		
1	New Runway	Excavation (Cut to Fill)	Dump Tr	ruck (12	cy)	Diesel	87653.0	0 CY	8 Hours	per 300.	00 CY	2337.41	hours
1	New Runway	Excavation (Cut to Fill)	Excavato	r	Diesel	87653.0	0 CY	8 Hours	per 1000	0.00 CY	701.22	hours	
1	New Runway	Excavation (Cut to Fill)	Pickup T	ruck	Diesel	87653.0	0 CY	8 Hours	per 1000	0.00 CY	701.22	hours	
1	New Runway	Excavation (Cut to Fill)	Roller	Diesel	87653.0	00 CY	8 Hours	per 1000	0.00 CY	701.22	hours		
1	New Runway	Excavation (Cut to Fill)	Scraper	Diesel	87653.0	00 CY	8 Hours	per 800.	00 CY	876.53	hours		
1	New Runway	Excavation (Topsoil Strip	ping)	Dozer	Diesel	210367.	20 SY	8 Hours	per 5100	0.00 SY	329.99	hours	
1	New Runway	Fencing Concrete Truck	Diesel	10300.0	0 LF	2 Hours	per 180.	00 LF	114.44	hours			
1	New Runway	Fencing Dump Truck	Diesel	10300.0	0 LF	8 Hours	per 180.	00 LF	457.78	hours			
1	New Runway	Fencing Other General Ed	quipment	Diesel	10300.0	00 LF	8 Hours	per 180.	00 LF	457.78	hours		
1	New Runway	Fencing Pickup Truck	Diesel	10300.0	0 LF	8 Hours	per 180.	00 LF	457.78	hours			
1	New Runway	Fencing Skid Steer Loade	r	Diesel	10300.0	00 LF	8 Hours	per 180.	00 LF	457.78	hours		
1	New Runway	Fencing Tractors/Loader/	Backhoe	Diesel	10300.0	00 LF	8 Hours	per 180.	00 LF	457.78	hours		
1	New Runway	Grading Dozer Diesel	222015.5	50 SY	8 Hours	per 8000	0.00 SY	222.02	hours				
1	New Runway	Grading Grader Diesel	222015.5	50 SY	8 Hours	per 8000	0.00 SY	222.02	hours				
1	New Runway	Grading Roller Diesel	222015.5	50 SY	8 Hours	per 8000	0.00 SY	222.02	hours				
1	New Runway	Hydroseeding Hydrose	eder	Diesel	200014	0.00 SF	8 Hours	per 8000	00.00 SF	200.01	hours		
1	New Runway	Hydroseeding Off-Roa	d Truck	Diesel	200014	0.00 SF	8 Hours	per 8000	0.00 SF	200.01	hours		
1	New Runway	Lighting Dump Truck	Diesel	20968.0	0 LF	8 Hours	per 1200	0.00 LF	139.79	hours			
1	New Runway	Lighting Loader Diesel	20968.00) LF	8 Hours	per 1200	0.00 LF	139.79	hours				
1	New Runway	Lighting Other General Ec	uipment	Diesel	20968.0	00 LF	8 Hours	per 1200).00 LF	139.79	hours		
1	New Runway	Lighting Pickup Truck	Diesel	20968.0	0 LF	8 Hours	per 1200	0.00 LF	139.79	hours			
1	New Runway	Lighting Skid Steer Loade	r	Diesel	20968.0	00 LF	8 Hours	per 1200).00 LF	139.79	hours		
1	New Runway	Lighting Tractors/Loader/	Backhoe	Diesel	20968.0	00 LF	8 Hours	per 1200).00 LF	139.79	hours		
1	New Runway	Markings Flatbed	Truck	Diesel	189520	0.00 SF	8 Hours	per 3500).00 SF	4331.89	hours		
1	New Runway	Markings Other G	eneral Equ	uipment	Diesel	1895200	0.00 SF	8 Hours	per 3500	0.00 SF	4331.89	hours	
1	New Runway	Markings Pickup	Fruck	Diesel	189520	0.00 SF	8 Hours	per 3500).00 SF	4331.89	hours		
1	New Runway	Soil Erosion/Control	Other Ge	neral Ec	quipment	Diesel	46.00 A	cre	4 Hours	per 1.00	Acre	184	hours
1	New Runway	Soil Erosion/Control	Pickup T	ruck	Diesel	46.00 A	cre	8 Hours	per 1.00	Acre	368	hours	
1	New Runway	Soil Erosion/Control	Pumps	Diesel	46.00 A	cre	4 Hours	per 1.00	Acre	184	hours		
1	New Runway	Soil Erosion/Control	Tractors/	Loader/	Backhoe	Diesel	46.00 A	cre	4 Hours	per 1.00	Acre	184	hours
1	New Runway	Subbase Placement	Dozer	Diesel	210367	.20 SY	8 Hours	per 3800	0.00 SY	442.88	hours		
1	New Runway	Subbase Placement	Dump Tr	ruck (12	cy)	Diesel	70122.4	0 CY	8 Hours	per 180.	00 CY	3116.55	hours

Environmental Assessment Joint Directed Energy Test Center				Final December 2021						
<u>501111 L</u>	Sheerea Energy				Deteri	1001 2021				
1	New Runway	Subbase Placement	Pickup Truck	Diesel 210367	.20 SY 8 Hours	s per 3800.00 SY	442.88	hours		
1	New Runway	Subbase Placement	Roller Diesel	70122.40 CY	8 Hours per 130	0.00 CY 431.52	hours			
1	New Runway	Topsoil Placement	Dozer Diesel	37002.60 CY	8 Hours per 600	.00 CY 493.37	hours			
1	New Runway	Topsoil Placement	Dump Truck	Diesel 37002.0	60 CY 8 Hours	s per 600.00 CY	493.37	hours		
1	New Runway	Topsoil Placement	Pickup Truck	Diesel 37002.0	50 CY 8 Hours	s per 600.00 CY	493.37	hours		
Activit	y: On-Road (Estim	nated based on engineering	experience)							
Scenari	io ID Project	Equipment On-road	l Activity Fuel	Roadway Type	Round Trip Dist	ance (miles)	Number	r of Em	ployees	Or \$M*11
(Which	ever larger)	Number of Project Days	Project Length	Project Width	Project Area	Building Height	(Building	g Demol	ition Only	/)Open
Space I	Height (Building D	Demolition Only) Number	r of Trees Activity	y Size						
1	New Runway	Cement Mixer Materia	l DeliveryDiesel	Urban Unrestric	ted Access40	193	10300	184		
1	New Runway	Dump Truck Subbase Ma	terial Materia	al DeliveryDiesel	Urban Unrestrict	ted Access40		193	10300	184
1	New Runway	Passenger Car Employ	ee Commute	GasolineUrban V	Unrestricted Acces	ss30 220	193			
Emissi	on Factor: Non-Ro	ad (from NONROAD)								
Scenari	o ID Project	Construction Activity	Equipment	Fuel Type	Avg Rated HP	Load Factor	CO (g/h	ıp-hr)	NOx	(g/hp-hr)
	CO2 (g/hp-hr)	SO2 (g/hp-hr) PM10 (g/hp-hr) PM2.5	(g/hp-hr) VOC E	xhaust (g/hp-hr)	VOC Evaporativ	ve (g/equi	pment-d	ay)	
1	New Runway	Clearing and Grubbing	Chain Saw	Diesel 11	0.7 293.534	19938 1.32299	93003	685.99	63939	
	0.14019155	9.748189014 8.96833	61.8883	36015 26.4554	42662 *** G	ASOLINE DAT	A USEI	D. DIES	SEL DA	TA NOT
AVAIL	LABLE ***									
Scenari	o ID Project	Type Equipment	Fuel Type	Roadway Type	CO(g/mi)	NOx(g/mi)	CO2(g/:	mi)	SO2(g/	mi)
	PM10(g/mi)	PM2.5(g/mi) CH4(g/s	mi) N2O(g/	mi) VOC(g	/mi) RV CO	(g/veh-day)	RV NO	x(g/veh-	day)	
1	New Runway	Cement Mixer Diesel	Urban Unrestrict	ted Access0.651	1.455 1404.71	0.01	0.053	0.052	0.164	0.07
	0.003 23.897	0.081								
1	New Runway	Dump Truck Subbase Ma	terial Diesel	Urban Unrestric	ted Access0.651	1.455 1404.71	18	0.01	0.053	0.052
	0.164 0.07	0.003 23.897 0.081								
1	New Runway	Passenger Car Gasolin	eUrban Unrestrict	ted Access2.253	0.122 375.735	5 0.006 0.004	0.004	0.063	0.005	0.002
	25.417 1.775									
Fugitiv	e Emissions (Emis	ssion Factors from Various	Sources including	; AP-42)						
Scenari	o ID Project	Fugitive Type Variable	e Default Values	Units User Va	alue					
1	New Runway	Concrete Mixing/Batching	gV = Volume of a	asphalt = 0.111 x I	L x W x 1.25 / 3	87653 yd3				
1	New Runway	Concrete Mixing/Batching	gPM10 = 0.037 x	V 3243.2	lbs					
1	New Runway	Material Movement (Unp	aved Roads)	s = Surface mate	rial silt content	0.043 fraction	l			
1	New Runway	Material Movement (Unp	aved Roads)	Wt. = Mean veh	icle weight	32 tons				
1	New Runway	Material Movement (Unp	aved Roads)	VMT = Vehicle	miles traveled	48968.9 miles				
1	New Runway	Material Movement (Unp	aved Roads)	PM10 = 1.5 x [(s	s/12)^0.9] x [(Wt./	(3)^0.45] x VMT	1341.2	lbs		
1	New Runway	Material Movement (Pave	ed Roads) $sL = Rc$	oad surface silt loa	ding 0.1	g/m3				

Enviro Loint I	nmental Assessn	nent Final
Joini L	nrecieu Energy	Test Center December 2021
1	New Runway	Material Movement (Paved Roads) Wt. = Mean vehicle weight 32 tons
1	New Runway	Material Movement (Paved Roads) VMT = Vehicle miles traveled 43425 miles
1	New Runway	Material Movement (Paved Roads) $PM10 = 0.0022 \text{ x} (sL^{0.91}) \text{ x} (Wt^{1.02}) \text{ x VMT}$ 403.1 lbs
1	New Runway	Unstabilized Land and Wind Erosion $A = Area affected = L \times W / 43560.0$ 43.5 acres
1	New Runway	Unstabilized Land and Wind Erosion TPConv = TSP/PM10 conversion 0.5 fraction
1	New Runway	Unstabilized Land and Wind Erosion $CE = Control efficiency 0.63$ fraction
1	New Runway	Unstabilized Land and Wind Erosion $t = year (e.g. 0.65 year) 0.75$ years
1	New Runway	Unstabilized Land and Wind Erosion $PM10 = 0.38 \text{ x A x TPConv x (1-CE) x t}/2000 0.001 \text{ lbs}$
1	New Runway	Soil Handling u = Wind speed 5 mph
1	New Runway	Soil Handling $m = Moisture content$ 0.25 fraction
1	New Runway	Soil Handling $T = Mass of aggregate storage pile = L x W x 0.5 x 110 / 2000 52118 tons$
1	New Runway	Soil Handling $PM10 = T \ge 0.35 \ge 0.0032 \ge [(u/5)^{1.3}] / [(m/2)^{1.4}] = 1072.8$ lbs

ASSUMPTIONS

Emission factors were developed from the following models:

On-Road Vehicles: MOVES 2010b, revised January 2013

Non-Road Equipment: NONROAD2008a, July 2009

In addition to the overall project size dimensions (e.g., Length and width) provided by the user, an additional 10 ft length and 10 ft width is added to account for disturbance areas.

The number of employees is based on the higher of two methods: (1) number of equipment, and (2) multiply the project cost in million by 11.

The average employee travels 30 miles round-trip from home to construction site each day.

The average on-road material delivery round-trip distance per truck is 40 miles per day.

For calculating fugitive, re-entrained PM emissions from on-road and non-road material delivery and handling equipment, a nominal VMT of 5 miles is used for each vehicle per day.

In deriving emission factors from NONROAD, the horsepower for each equipment represents the most popular in each equipment category.

The total length of each modeled scenario is used to define the number of days associated with vehicle/equipment evaporative emissions.

The choice of location and season are assumed to adequately represent differences in fuel characteristics affecting emissions.

Only two seasons (Summer and Winter) are used to represent all seasons.

14 U.S. Counties are used to represent all other counties in the U.S. (all other counties are mapped to the 14).

The default methods assume that all construction equipment use diesel as well as heavy-duty on-road vehicles, while passenger vehicles (including motorcycles) use gasoline.

Fugitive emissions are only modeled for:

Asphalt drying

Asphalt storage and batching

Concrete mixing/batching Soil handling Unstabilized land and wind erosion Material movement (unpaved roads) Material movement (paved roads)

On-Road vehicle speeds are not explicitly modeled. The associated emission factors for each modeled vehicle from MOVES represent averages over the driving cycles, the roadway type, and daily temperature variations.

The default equipment hours-of-use data are developed based on the overall size of the project provided by the user and activity rates based on expert engineering judgment.

Under the Construction Activity Type list (Activity Tab), when a choice between asphalt and concrete materials occurs, asphalt is always selected as default. To choose concrete, de-select the asphalt item and select the corresponding concrete item.

Two trips per day were assumed for each on-road material handling trucks.

Only CO2, CH4, and N2O are used to represent greenhouse gas emissions. Other potential greenhouse gases including air conditioning refrigerants were not included.

APPENDIX B PUBLIC PARTICIPATION

The Draft EA was made available to members of the public via electronic means at <u>https://www.wsmr.army.mil/gar/GarrisonPublications/Pages/default.aspx</u>. and by hardcopies posted at local libraries. The document was posted on the White Sands Missile Range website: The document was delivered to the following libraries:

Thomas Branigan Memorial Library	White Sands Missile Range Post Library
200 E. Picacho Avenue	Building 465
Las Cruces, New Mexico 88001	White Sands Missile Range, New Mexico 88002
Alamogordo Public Library	Socorro Public Library
920 Oregon Avenue	401 Park Street
Alamogordo, New Mexico 88310	Socorro, New Mexico 87801

Reviewers were requested to submit comments to Ms. Deborah Nethers (U.S. Army Directorate of Public Works-Environmental Division) at White Sands Missile Range, or by e-mail at usarmy.wsmr.imcom-central.mbx.dpw-nepa-support@mail.mil. Comments could also be submitted via fax at (575) 674-2048. Comments were to be postmarked or received within 30 days of publication of the draft document (October 29, 2021). Comments could also be sent to the following address:

Department of the Army U.S. Garrison White Sands Environmental Division (Bldg. 163/DPW) JDETC EA Comments Building 163 White Sands Missile Range, New Mexico 88002

A Notice of Availability (NOA) was posted in New Mexico newspapers including: the Sierra County Sentinel (Truth or Consequences, New Mexico), the Socorro El Defensor-Chieftain, the Alamogordo Daily News, and the Las Cruces News-Sun. The NOA was posted in three consecutive publication dates in each paper. Copies of the affidavits of publication are provided below.

Las Cruces Sun News.

Affidavit of Publication Ad # 0004975355 This is not an invoice

MARK DIMSHA 1908 BUFFALO DANCER NE

ALBUQUERQUE, NM 87112

I, a legal clerk of the Las Cruces Sun News, a newspaper published daily at the county of Dona Ana, state of New Mexico and of general paid circulation in said county; that the same is a duly qualified newspaper under the laws of the State wherein legal notices and advertisements may be published; that the printed notice attached hereto was published in the regular and entire edition of said newspaper and not in supplement thereof in editions dated as follows:

10/29/2021, 11/05/2021, 11/12/2021

Despondent further states this newspaper is duly qualified to publish legal notice or advertisements within the meaning of Sec. Chapter 167, Laws of 1937.

dert us

Legal Clerk

Subscribed and sworn before me this November 12,

2021:

Nate of WI, County of Brown

7-25 1-

My commission expires



Ad # 0004975355 PO #: LEGAL NOTICE # of Affidavits 1

This is not an invoice

White Sands Missile Range (WSMR) has prepared a Draft Environmental Assess-Winte Sands Missile Kange (WSMR) has prepared a Draft Environmental Assess-ment (DEA) investigating potential impacts associated with the construction and operation of facilities at two WSMR sites to provide di-rected energy (DE) and counter-DE test capabilities, as well as comprehensive In-tegrated Air and Missile De-fense (IAMD) test and evalu-ation capabilities, Specifical-ly, the construction and op-erational phases of the JDETC Program will provide a persistent testbed and prototype-like capability to support the analysis of the synergies among weapon systems (DE, kinetic energy [KE], cyber, and electronic weapons). These evaluations would include joint suites of operational-quality sensors (including ground, air, sea, and space), full kill chain evaluations, and simultane-ous evaluations of joint/integrated command and control nodes as re-quired by several U.S. De-partment of Defense strat-egy and planning docu-ments. WSMR invites members of the DEA prior to document finalization, Hardcopies of the Draft PEA are available to the public at the follow-ing information repositories: Thomas Branigan Memorial Library 200 E. Picacho Avenue Las Cruces. New Mexico Thomas Branigan Memorial Library 200 E. Picacho Avenue Las Cruces, New Mexico 88001 White Sands Missile Range Post Library Building 456 White Sands Missile Range, New Mexico 88002 Alamogordo Public Library 920 Oregon Avenue Alamogordo, New Mexico 88310 Socorro Public Library Allanogoroo, new measo 88310 Socorro Public Library 401 Park Street Socorro, New Mexico 87801 The document is posted on the White Sands Garrison website: https://www.wsmr. army.mil/gar/GarrisonPublic ations/Pages/default.aspx Members of the public may also request hardcopies of the Draft EA via electronic communication to the email address below or in writing the Draft EA via electronic communication to the email address below or in writing to the U.S. Garrison White Sands address below. Written comments concern-ing the DEA should be di-rected to Ms. Deborah Neth-ers (US Army, Directorate of Public Works-Environmental Division) at White Sands Missile Range, or by e-mail at usarmy.wsmr.imcom-cent ral.mbx.dpw-nepa-support@ mail.mil. Comments may al-so be submitted via fax at (575) 678-2048. All com-ments must be received or postmarked by November 29, 2021. Comments can be sent to the following ad-dress: Department of Army U.S. Garrison White Sands Environmental Division (Bldg.163/DPW) Bataan Memorial Death March PEA Comments White Sands Missile Range, NM 88002 #4975355,Sun-News, Oct 28, Nov 5, 12, 2021



White Sands Missile Range (WSMR) has prepared a Draft Environmental Assess-ment (DEA) investigating potential impacts associated with the construction and operation of facilities at two WSMR sites to provide di-rected energy (DE) and counter-DE test capabilities, as well as comprehensive In-tegrated Air and Missile De-fense (IAMD) test and evalu-ation capabilities. Specifical-ly, the construction and op-erational phases of the JDETC Program will provide a persistent testbed and prototype-like capability to support the analysis of the syntems (DE, kinetic energy [KE], cyber, and electronic weapons). These evaluations would include joint suites of operational-quality sensors (including ground, air, sea, and space), full kill chain evaluations, and simultane-ous evaluations of joint/integrated comment and control nodes as re-quired by several U.S. De-partment of Defense strat-egy and planning docu-ments. WSMR invites members of the public to comment on the DEA prior to document finalization. Hardcopies of the public to comment on the DEA prior to document finalization. Hardcopies of the Dublic at the follow-ing information repositories: Thomas Branigan Memorial Library W h i t e Sands Missile Range Post Library 200 Ce; Picacho Avenue Building 465 Las Cruces, New Mexico 88001 White Sands Missile Range. New Mexico 88002 Alamogordo, New Mexico 8810 Secorro, New Mexico 8810 New Kevico 87801 The document is posted on the White Sands Garrison website: https://www.wsmr.army.mil/ garGarrisonPublications/Pag exidefault.aspx Members of the public may also request hardcopies of the Draft EA via electronic communication to the email address below or in writing rested to Ms. Deborah Neth-ers (US Army, Directorate of Public Works-Environmental Division) at White Sands Missile Range, or by e-mail at usarmy.wsmr.imcom-cent ral.mil. Comments concern-ing the DEA should be di-rected to Ms. Deborah Neth-esent to the following ad-tores: Department of Army U.S. Garrison White Sands Environmental Division at White Sand

BLDG for Sand White Sands Missile Range, NM 88002 #4960027, Daily News, Oct. 26, Nov. 2, 9, 2021

Draft Environmental As-sessment, Joint Directed Energy Test Center (JDETC), White Sands Mis-sile Range, New Mexico – Notice of Availability

AFFIDAVIT of PUBLICATION

Wanda Moeller, being first duly sworn, deposes and says that she is Chief Executive Officer of the El Defensor Chieftain, printed and published each week in the County of Socorro, State of New Mexico, and of general circulation in the city of Socorro, County of Socorro, State of New Mexico and elsewhere, and the hereto attached

:SS

Notice of Availability White Sands Missile Range (WSMR) has prepared a Dirac Environmental Assessment DEA) investigating potential impacts associated with the construction and operation receiling at two WSMR sites to provide directed energy (DE) and counter-DE test capability De-Integrated AL and Missile De-Missile Dewas printed and published correctly in the regular and entire issue of said **EL DEFENSOR CHIEFTAIN** for Sisue(s), that the first was made on day of <u>Ovende</u>, 2021 and subsequent publications being: the Duembe

Request of EL DEFENSOR CHIEFTAIN

By: anda Moeller Affiant

Subscribed and sworn to me this 18 day of 10 per , 2021 in the County of Socorro, State of New Mexico.

N Public Notary

Notary Public in and for the Soundy of Socorro, State of New Mexim My Commission Expires: lowing address: Department of Army U.S. Garrison White Sands Environmental Division (Bldg.

OFFICIAL SEAL

Seal

Price

Environmental Division (Bug. 163/DPW) Bataan Memorial Death March PEA Comments BLDG 163 White Sands Missile Range, NM 88002 Denise R. Ortega NOTARY PUBLIC - State of New Mexico My Commission Expires Published on El Defens Chieftian on November 4, & 18, 2021 81225 3 Ad Number: Account Number:

(Statement to come at end of month)

ing addr

Program will provide a persis-tent testbed and prototype-like capability to support the analy-sis of the synergies among weapon systems (DE, kinetic energy (KE, cyber, and elec-tronic weapons). These evalu-tions would include joint suites of operational-quality, seas and space), full kill chain evaluations, and simultaneous evaluations, and simultaneous as required by several U.S. Department of Defense stat-eyd and planning documents. WSMR invites members of the public to comment on the DEA prior to document finalization. Hardcopies of the Drart PEA are available to the public at the following information repo-sitories: itories: 'homas Branigan Memorial Library 200 E. Picacho Avenue Las Cruces, New Mexico 88001 White Sands Missile Range Post Library Building 456 White Sands Missile Range, New Mexico 88002 Alamogordo Public Library 220 Oregon Avenue Alamogordo, New Mexico 38310 8310 orro Public Library Socorro Public Library 101 Park Street Socorro, New Mexico 87801 The document is posted on he White Sands Garrison vebsite: https://www.wsmr. a r m y m i l / a r m y m i l g a r Carrison Publications/ Pages/detuit aspx Members of the public may al-so request hardcopies of the Draft EA via electronic com-munication to the email ad-dress below or in writing to the U.S. Garrison White Sands address below. Written comments concerning the DEA should be directed to Ms. Deborah Nethers (US Ar-my, Directorate of Public Works-Environmental Divi-sion) at "Vhite Sands Missile

STATE OF NEW MEXICO,

County of Sierra

Frances Luna, being first duly sworn, on her oath says: That she is the publisher of the Sierra County SENTINEL, a newspaper published in the Town of Truth or Consequences, in the County of Sierra and State of New Mexico, and that said newspaper is now, and was at all times herein mentioned, a newspaper of general circulation.

SS.

That the advertisement, a copy of which is hereto attached, was published in said herein before mentioned newspaper once each and every week for Three (3) consecutive weeks, the first publication thereof having been made on the 29th day of October , A.D. 2021, and the last publication thereof having been made on the 12th day of November, A.D. 2021.

That said newspaper was regularly printed, published and issued with said notice therein upon the following dates, to-wit: October 29, November 5 & 12, 2021.

of

ua

Subscribed and sworn to before me this ovember 2021

Notary Public C My commission expires

LEGAL NOTICE

White Sands Missile Range (WSMR) has prepared a Draft Environmen tal Assessment (DE Assessment (DEA) investigating potential impacts associated with the construction and operation of facilities at two WSMR sites to provide directed energy (DE) and counter-DE test capabilities, as well as comprehensive Integrated Air and Missile Defense (IAMD) test and evaluation capabilities. Specifically, the construction and opera-tional phases of the JDETC Program will provide a persistent testbed and proto-type-like capability to to support the analysis of the synergies among weapon systems (DE, kinetic energy [KE], cyber, and electronic weapons). These evalua-tions would include joint suites of operational-quality sensors (including ground air, sea, and space), full kill chain evaluations, and simultaneous evaluations of joint/integrated command and control nodes as required by several U.S. De-partment of Defense strategy and planning document

WSMR invites members of the public to comment on the DEA prior to document finalization. Hardcopies of the Draft PEA are available to the public at the following information repositories: Thomas Branigan Memorial

Library 200 E. Picacho Avenue Las Cruces, New Mexico 88001

White Sands Missile Range Post Library Building 465 White Sands Missile

Range, New Mexico 88002 Alamogordo Public Library 920 Oregon Avenue Alamogordo, New Mexico

88310 Socorro Public Library 401 Park Street

Socorro, New Mexico 87801

The document is posted on the White Sands Garrison website:

https://www.wsmr.army. mil/gar/GarrisonPublications/Pages/default.aspx

Members of the public may also request hardcopies of the Draft EA via electronic communication to the email address below or in writing to the U.S. Garrison White Sands address below.

Written comments con-cerning the DEA should be directed to Ms. Deborah Nethers (US Army, Direc-torate of Public Works-Envi-ronmental Division) at White Sands Missile Range, or by e-mail at us-army.wsmr.imcom-cenarmy.wsimitimeoin con tral.mbx.dpw-nepa-support @mail.mil . Comments may also be submitted via fax at (575) 678-2048. All comments must be received or postmarked by November 24, 2021. Comments can be sent to the following address:

Department of Army U.S. Garrison White Sands

Environmental Division (Bldg. 163/DPW) Bataan Memorial Death

March PEA Comments BLDG 163

White Sands Missile Range, NM 88002

Pub.: Oct. 29, Nov. 5 & 12, 2021 This legal posted at ewmexicopublicnotices.com

The Draft EA was delivered to the following local, state, and federal agencies.

Local (City and County) Government					
Ifo Pili	Brian Cesar				
City Manager	Alamogordo City Manager				
City of Las Cruces	1376 E Ninth Street				
700 N Main Street	Alamogordo, NM 88310				
Las Cruces, NM 88001	bcesar@ci.alamogordo.nm.us				
agranado@las-cruces.org					
Fernando R. Macias	Ravi Bhasker				
Dona Ana County Manager	Mayor of Socorro				
845 N Motel Blvd	111 School of Mines Road				
Las Cruces, New Mexico 88007	P.O. Box K				
fernandom@donaanacounty.org	Socorro, New Mexico 87801				
	RBhasker@socorronm.gov				
Pamela Heltner	Serina Bartoo				
County Manager	Sierra County Manager				
County of Otero New Mexico	855 Van Patten				
1101 New York Avenue	Truth or Consequences, NM 87901				
Alamogordo, NM 88310-6935	Phone: 575.894.6215				
Phone: 575.437.7427	sbartoo@sierraco.org				
pheltner@co.otero.nm.us					
Michael Hawkes					
Socorro County Manager					
PO Box 1					
Socorro, NM 87801					
mhawkes@co.socorro.nm.us					
Legislators					
Senator Martin Heinrich	Senator Ben Lujan				
201 North Church St., Ste. 305	120 South Federal Place, Suite 302				
Las Cruces, N.M. 88001	Santa Fe, NM 87501				
(575) 523-6561	Email POC - Angelo Champion				
Email POC- Ashley Beyer	Casework@lujan.senate.gov				
Ashley Beyer@heinrich.senate.gov	505.328.7488				
575.644.7200					
Congresswoman Yvette Herrell,					
4440 Sonoma Ranch Blvd, ste B					
Las Cruces, NM 88011					
Email POC - Horanburg, Michael					
Michael.Horanburg@mail.house.gov					
Work Cell: 202.748.2752					

State	
T. Justin Garoutte, MPH	Ms. Susan Rich
Director of Strategic Initiatives	Forest and Watershed Health Coordinator
New Mexico Environment Department	Forest and Watershed Health Office
P.O. Box 5469	EMNRD-Forestry Division
Santa Fe, NM 87502-5469	4001 Edith Blvd. NE
justin.garoutte2@state.nm.us	Albuquerque, NM, 87107
	susan.rich@state.nm.us
Abe Franklin	Mr. Blake Roxlau
Surface Water Quality Bureau, Watershed	Environmental Design Section Manager
Protection Section	Environmental Design Division
New Mexico Environment Department	New Mexico Department of Transportation
P O Box 5469	P O Box 1149
Santa Fe, NM 87502-5469	Santa Fe, NM 87504
abraham franklin@state nm us	blake roxlau@state nm us
Mr. Mark Watson	Stephanie Garcia Richard
New Mexico Dent of Came & Fish	Land Commissioner
$P \cap Box 25112$	The New Mexico State I and Office
Santa Fe NM 87504	P O Box 1148
mark watson@state nm us	Santa Fe NM 87504
mark.waison@state.mm.as	sgarciarichard@slo state nm us
	505 827 5760
	505.027.5700
rederal	
Ms. Susan Millsap	Ms. Corrie Borgman
U.S. Fish and Wildlife Service	Biologist
New Mexico Ecological Services Field Office	U.S. Fish and Wildlife Service
2105 Osuna Road NE	Migratory Birds
Albuquerque, NM 87113-1001	P.O. Box 1306
nmesfo@fws.gov	Albuquerque, NM 87103-1306
	Corrie_Borgman@fws.gov
Ms. Amy Lueders	Mr. Robert Houston
Regional Director	Compliance Assurance and Enforcement Division
U.S. Fish and Wildlife Service	U.S. Environmental Protection Agency
PO Box 1306	Region 6
Albuquerque, NM 87103-1306	1445 Ross Avenue, Suite 1200
RDLueders@fws.gov	Dallas, TX 75202
	houston.robert@epa.gov
Ms. Lindsay Smythe	Mr. Spencer Robison
Refuge Manager	NEPA
San Andres National Wildlife Refuge	Holloman AFB
U.S. Fish and Wildlife Service	49 th Civil Engineer Squadron
5686 Santa Gertrudis Drive	Asset Management Flight
Las Cruces, NM 88012	49 CES/CEIE
lindsay_smythe@fws.gov	550 Tobosa Avenue
	Holloman Air Force Base, NM 88330-8458
	Spencer.robison@us.af.mil

Ms. Marie Frias Sauter	Mr. Bill Childress				
Superintendent	District Manager				
White Sands National Park	Las Cruces District Office				
U.S. National Park Service	Bureau of Land Management				
P.O. Box 1086	1800 Marquess Street				
Holloman Air Force Base, NM 88330	Las Cruces, NM 88005-3371				
marie_frias@nps.gov	wchildre@blm.gov				
Yvette Waychus	Mark Matthews, Field Manager				
Conservation Branch Chief	Socorro Field Office				
USAG Fort Bliss, DPW-E-C	Bureau of Land Management				
624 Pleasonton Road	901 S. Highway 85				
Fort Bliss, TX 79916	Socorro, NM 87801-4168				
Yvette.m.waychus.civ@mail.mil	blm_nm_comments@blm.gov				

A generic (no addressee listed) agency letter is provided on the following page.


October 22, 2021

Dear Interested Stakeholder,

The White Sands Missile Range (WSMR) Test Center has prepared the draft Environmental Assessment (EA) *Joint Directed Energy Test Center (JDETC), White Sands Missile Range, New Mexico.* The action proposes to construct two sites within WSMR boundaries: Salinas Peak and/or JDETC Central. Once operational, the proposed facilities will provide directed energy (DE), counter-DE test capabilities, and comprehensive Integrated Air and Missile Defense (IAMD) test and evaluation capabilities. The operational phases of the JDETC Program will provide a persistent testbed and prototype-like capability to support the analysis and synergies among various weapon systems that support U.S. Department of Defense (DoD) strategies. The draft *EA* assessed impacts on valued environmental components for three alternatives. The preferred alternative is to construct and operate from two proposed locations. The environmental analysis shows there will be no significant impact.

Your interest in this draft EA is highly valued. The draft EA and draft Finding of No Significant Impact can be viewed on the WSMR Garrison Publication website under Environmental Documents:

https://home.army.mil/wsmr/index.php/about/garrison/directorate-public-worksdpw/en/vronmental. A printed version of the document can be mailed upon request. All correspondence or comments must be received no later than 30-days after the draft Finding of No Significant Impact is published in local area newspapers.

Department of the Army US Army Garrison White Sands Environmental Division (Bldg. 163/DPW) ATTN: Customer Support Branch White Sands Missile Range, New Mexico 88002-5000 E-mail to: usarmy.wsmr.imcom-central.mbx.dpw-nepa-support@*mail.*mil Fax: (575) 678-2048

Sincerely,





Brian Knight Chief, Environmental Division Signed by: KNIGHT.BRIAN.DANIEL.1271283330 The following table provides a summary of the comments received on the draft EA and responses to those comments.

Final

December 2021

Public Review Comments Received November 21 Draft JDETC Environmental Assessment WSMR, New Mexico

#	Commenter	Comment	Response
1.	USFWS –	Email dated 23 November 2021	The Agency (White Sands Missile Range) considered
	Lauren Range	Addressed To:	these comments and made modifications accordingly.
	lauren_rangel@fws.gov	Nethers, Deborah (Debbie) CIV USARMY USAG (USA);	None of these modifications changed the intent, the
	Fish and Wildlife Biologist	Cutier, Patricia L CIV US ARMY USAG (USA)	Purpose and Need, nor the analysis.
	Services Field Office		
	U.S. Fish and Wildlife		
	Service		
	2105 Osuna Rd NE		
	Albuquerque, NM 871131		
2.	USFWS	For Table 3-11, page 3-25:	The potential for Pinyon Jay and habitat to occur in the
		• We believe that the pinyon jay should be included in the list of	Salinas project area was modified from No to Yes.
		species with the potential to occur in the project area. The pinyon jay	
		occurs in the San Andres Mountains and has been observed around	
		Salinas Peak.	
		• Only the golden eagle is listed as having protections under the	
		Migratory Bird Treaty Act in the table. Baird's sparrow, Bell's vireo,	
		biowin pencan, neotropic connorant, broadonned numiningond, Costa s	
		included as having no federal status despite them also being in the list	
		of Migratory Bird Treaty Act Protected Species (10.13 List). We	
		suggest reflecting that status in the Federal status column for those	
		species.	
3.	USFWS	The United States Fish and Wildlife Service recently published the Birds	Reference to the USFWS Birds of Conservation Concern
		of Conservation Concern	2021 List
		2021 list (https://www.fws.gov/birds/management/managed-	(<u>https://www.fws.gov/birds/management/managed-</u>
		species/birds-of-conservation-concern.php) which identifies 269	species/birds-of-conservation-concern.php) was added.
		designation is intended to avert the need of ESA listing by promoting	Species identified on the Birds of Conservation Concern
		proactive conservation of these species. We suggest referencing this list	List was adjusted
		and highlighting the birds of conservation concern that may exist near	List was adjusted.
		the project area in the final Environmental Assessment. Of the protected	
		bird species identified in the draft Environmental Assessment with the	
		potential to occur at WSMR, the following species were identified in the	
		2021 list of Birds of Conservation Concern:	
		• Pinyon jay,	
		• Costa's hummingbird,	

Environmental Assessment

Joint Directed Energy Test Center

Final December 2021

#	Commenter	Comment	Response
		• Baird's sparrow, • Varied bunting, and	
		Varied building, and Interior least tern	
4.	Kathryn Albrecht <u>lapaz@zianet.com</u> PO Box 422 San Antonio, NM 87832 U.S.	 Email dated 29 November2021 To: USARMY WSMR IMCOM Central Mailbox DPW NEPA Support re: Deborah Nethers, Public Works-Environmental Division: Regarding the DEA for constructing two WSMR sites to provide 1) DIRECTED ENERGY & COUNTER-DIRECTED ENERGY, then evaluate 2) AIR & MISSILE DEFENSE capabilities, 3) PERSISTANT TESTBED & PROTOTYPE-LIKE capability, 4) analysis of synergies among KINETIC, CYBER & ELECTRONIC weapons, and 5) FULL KILL-CHAIN evaluations [nice talk!]: Please STOP doing this work! It is a shame upon humanity and an especial shame upon our country and all peoples, plus life on earth. Cease & desist!! 	The Agency considered these comments. The Finding of No Significant Impact was reviewed resulting in a slight adjustment to the Purpose and Need to highlight that execution of this action is a need identified in the National Defense Strategy (2018).
		Thank you for printing my comment.	
5.	Kathryn and Eric Albrecht <u>lapaz@zianet.com</u> PO Box 422 San Antonio, NM 87832 U.S.	Email dated 29 November2021 To: USARMY WSMR IMCOM Central Mailbox DPW NEPA Support Addenda: We live approx. 30-40 miles NW of your proposed testbeds. We oppose such abominable faux-lethal behavior upon our horizon in this rural agricultural area, once rendered reproductively sterile for human life in 1945. We insist upon a full EIS evaluation & preparation of the military's deadly play. Weapons corporations should have NO home to test their warfaring here! Full EIS!! Thank you for publishing these comments under NEPA. We are local citizens directly affected by such ill-will toward our fellow species! Kathryn & Eric Albrecht	The Agency considered these comments. The Environmental Justice section was clarified.
6.	Bear Albrecht ebear422@gmail.com San Antonio, NM (I/Me/My)	Email 29 November 2021 Addressed To: USARMY WSMR IMCOM Central Mailbox DPW NEPA Support We want to see a full EIS. An Environmental Assessment is a cheap trick. We live very nearby and we do not want to see this kind of evil activity in our neighborhood. "Democracy is good. I say this because other systems are worse." Jawaharlal Nehru	The agency considered these comments. The decision remains to proceed with a Finding of No Significant Impact.

[This page intentionally left blank]

[This page intentionally left blank]