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GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

P.O. BOX 621
HONOLULU, HAWAII 96809

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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DEAN D. UYENO
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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

April 29, 2024

Mary Alice Evans, Acting Director
Office of Planning and Sustainable Development
c/o Environmental Review Program
235 South Beretania Street, Room 702
Honolulu, Hawaiʻi 96813

SUBJECT: Publication of the Environmental Impact Statement Preparation Notice (EISPN) for the Proposed Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Project Located in Kekaha, West Kauaʻi on the Island of Kauaʻi, Further Identified as Tax Map Key(s): (4)1-2-001:001, 006, & 010; (4)1-2-002:001, 010-013, 015, & 024-030; (4) 1-2-016:011; (4) 1-4-001:002, 013, 014, & 999; and (4) 2-1-003:018

Dear Ms. Evans:

With this letter, the Department of Land and Natural Resources (DLNR) submits the Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement Preparation Notice (EISPN) for publication in the next available edition of The Environmental Notice on May 8, 2024. The applicants for the action are the United States Department of the Navy (U.S. Navy) and the National Aeronautics and Space Administration (NASA).

The DLNR has coordinated with the applicants to determine the appropriate level of environmental review for the action. So as to not overlook any potentially significant impact to the natural and/or human environment, an Environmental Impact Statement will be prepared pursuant to Hawaiʻi Revised Statutes (HRS) §343-5(e) and Hawaiʻi Administrative Rules (HAR) §11-200.1-14(d)(2).

The required publication form and files have been provided electronically via the "Online Submittal Form" on the Office of Planning and Sustainable Development, Environmental Review Program website. The submittal includes a .pdf file of the EISPN and .zip file containing a shapefile of the project's location boundary. Concurrent with the electronic submittal and as required by HAR §11-200.1-5(4)(B), paper copies of the EISPN have been submitted to the nearest state library (Waimea Public Library, Kauaʻi) and the Hawaiʻi Documents Center (Hawaiʻi State Library, Oʻahu).

Pursuant to HAR §11-200.1-23(10)(c), publication of the EISPN in *The Environmental Notice* initiates a 30-day public comment period for parties to provide comments regarding potential effects of the proposed action. A Notice of Intent for the project will also be published in the Federal Register. The applicants are preparing a single EIS compliant with both the Hawai'i Environmental Impact Statements law (HRS Chapter 343) and the National Environmental Policy Act as allowed under HAR §11-200.1-31.

Should you have any questions, please contact Mr. Russell Tsuji, Land Division Administrator at (808) 587-0422.

Sincerely,

Dawn N.S. Chang,
Chairperson

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Wednesday, May 1, 2024 8:41:33 AM

Action Name

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Type of Document/Determination

Environmental impact statement preparation notice (EISPN)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (2) Propose any use within any land classified as a conservation district

Judicial district

Waimea, Kauaʻi

Tax Map Key(s) (TMK(s))

(4) 1-2-002:001; (4) 1-2-002:012; (4) 1-2-002:015; (4) 1-2-002:027; (4) 1-2-002:028; (4) 1-2-001:006; (4) 1-2-016:011; (4) 1-4-001:999; (4) 1-2-002:029; (4) 1-2-002:030; (4) 2-1-003:018; (4) 1-2-001:001; (4) 1-2-002:024; (4) 1-2-002:025; (4) 1-2-002:026; (4) 1-4-001:002; (4) 1-4-001:013; (4) 1-4-001:014; (4) 1-2-002:013; (4) 1-2-001:010; (4) 1-2-002:010; (4) 1-2-002:011; (4) 1-4-001:013

Action type

Applicant

Other required permits and approvals

Numerous

Discretionary consent required

Use of State land

Approving agency

Department of Land and Natural Resources, Land Division

Agency contact name

Russell Tsuji

Agency contact email (for info about the action)

dlnr.land@hawaii.gov

Email address or URL for receiving comments

info@PMRF-KPGO-EIS.com

Agency contact phone

(808) 587-0419

Agency address

1151 Punchbowl Street
Room 220
Honolulu, Hawaii 96813
United States
Map It

Public Scoping Meeting information

6/4/2024, 5-8pm 3215 Kaua‘i Veterans Memorial Highway, Līhu‘e

Accepting authority

State of Hawaii Board of Land and Natural Resources

Applicant

United States Department of the Navy

Applicant contact name

Kerry Wells

Applicant contact email

info@PMRF-KPGO-EIS.com

Applicant contact phone

(808) 473-0662

Applicant address

400 Marshall Road
Building X-11
Pearl Harbor, Hawaii 96860
United States
Map It

Is there a consultant for this action?

Yes

Consultant

Cardno GS-AECOM Pacific Joint Venture

Consultant contact name

Michele Lefebvre

Consultant contact email

info@PMRF-KPGO-EIS.com

Consultant contact phone

(808) 791-9872

Consultant address

737 Bishop Street
Suite 3050
Honolulu, Hawaii 96813
United States
Map It

Action summary

The Navy proposes to retain the use of 8,348 acres of State lands on Kauaʻi, Hawaiʻi, for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at Pacific Missile Range Facility (PMRF). NASA proposes to retain the use of 23 acres of State lands on Kauaʻi, Hawaiʻi, in support of continued operations including measurements of the Earth's rotation and local land motion at Kōkeʻe Park Geophysical Observatory (KPGO).

Attached documents (signed agency letter & EA/EIS)

- 240429-ERP-Transmittal-Letter-for-PMRF-EISPN-RUSH-part-1-signed.pdf
- PMRF-and-KPGO-RE-EIS-Version-Report-EISPN-1May2024.pdf

Action location map

- PMRF-and-KPGO-Real-Estate-EIS-Location-Boundary.zip

Authorized individual

Michele Lefebvre

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

for

PACIFIC MISSILE RANGE FACILITY AND KŌKEʻE PARK GEOPHYSICAL OBSERVATORY REAL ESTATE

KAUAʻI, HAWAIʻI

May 2024

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Project Information Summary (Abstract)

Project Name:	Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement	
Applicants (Joint Lead Agencies under NEPA):	United States Department of the Navy Naval Facilities Engineering Systems Command Environmental OPHEV2 400 Marshall Road Building X-11 Pearl Harbor, HI 96860 Contact: Kerry Wells Phone: 808-473-0662 Email:info@PMRF-KPGO-EIS.com	National Aeronautics and Space Administration Goddard Space Flight Center 34200 Fulton Street Wallops Island, VA 23337, Contact: Shari Miller Phone: 757-824-2327 Email: Shari.A.Miller@nasa.gov
Approving Agency:	Department of Land and Natural Resources, Land Division 1151 Punchbowl Street, Room 220 Honolulu, Hawaiʻi 96813 Phone: 808-587-0419 Email: dlnr.land@hawaii.gov	
Accepting Authority:	State of Hawaii Board of Land and Natural Resources	
Planning Consultant:	Cardno GS-AECOM Pacific Joint Venture Local Office: Stantec GS Inc. 737 Bishop Street, Suite 3050 Honolulu, HI 96813 Contact: Michele Lefebvre Phone: 808-791-9872 Email: info@PMRF-KPGO-EIS.com	
Location:	County of Kauaʻi, Hawaiʻi	
District:	Waimea	
Tax Map Keys:	(4) 1-2-002:001, (4) 1-2-002:012, (4) 1-2-002:015, (4) 1-2-002:027, (4) 1-2-002:028, (4) 1-2-001:006, (4) 1-2-016:011, (4) 1-4-001:999, (4) 1-2-002:029, (4) 1-2-002:030, (4) 2-1-003:018, (4) 1-2-001:001, (4) 1-2-002:024, (4) 1-2-002:025, (4) 1-2-002:026, (4) 1-4-001:002, (4) 1-4-001:013, (4) 1-4-001:014, (4) 1-2-002:013, (4) 1-2-001:010, (4) 1-2-002:010, (4) 1-2-002:011, (4) 1-4-001:013	
Land Area:	Navy lease area and easements: 8,348 acres	NASA lease area and easements: 23 acres
Recorded Fee Owner:	State of Hawaiʻi	
Existing Use:	Navy Uses: Antenna structures, ordnance storage/assembly facilities, missile tracking and surveillance facilities, water well, undeveloped land used for safety zone buffers, drainage management, roadways, and access to utilities	NASA Uses: Kōkeʻe Park Geophysical Observatory, antenna structures, data collection systems, and supportive infrastructure
State Land Use District:	Agricultural, Conservation	
Zoning:	Agricultural, Conservation, Open Space, Special Treatment – Ecological	
Flood Zone Designation:	A, AE, D, VE, X	

Proposed Action:	The Navy proposes to retain the use of 8,348 acres of State lands on Kaua‘i, Hawai‘i, for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at Pacific Missile Range Facility (PMRF). NASA proposes to retain the use of 23 acres of State lands on Kaua‘i, Hawai‘i, in support of continued operations including measurements of the Earth’s rotation and local land motion at Kōke‘e Park Geophysical Observatory (KPGO).
HRS Chapter 343 Trigger(s):	Proposed use of state or county lands, propose any use within any land classified as a Conservation District

Project Summary:

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) as applicants and joint lead agencies have prepared this Environmental Impact Statement Preparation Notice (EISPN) and a separate Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) in accordance with the following: the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321 et seq.), as amended by the Fiscal Responsibility Act of 2023 (Public Law [P.L.] No. 118-5, div. C, tit. III, 321(b), 137 Stat. 10, 40 (amending NEPA § 107) (2023) (codified at 42 U.S.C. § 4336a); Council on Environmental Quality, Navy and NASA policies and regulations; and Hawai‘i Revised Statutes (HRS) Chapter 343 and Hawai‘i Administrative Rules (HAR) § 11-200.1. The Navy proposes to retain the use of 8,348 acres of State lands on Kaua‘i, Hawai‘i, for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF). NASA proposes to retain the use of 23 acres of State lands on Kaua‘i, Hawai‘i, in support of continued operations including measurements of the Earth’s rotation and local land motion at Kōke‘e Park Geophysical Observatory (KPGO). The Proposed Action is needed because the existing real estate agreements for these lands are set to expire between 2027 and 2030. The Navy and NASA are considering two action alternatives and the No Action Alternative. The Draft EIS will evaluate potential environmental impacts associated with these alternatives. The following resource areas are evaluated: archaeological and historic resources, cultural practices, biological resources, land use, socioeconomics, environmental justice, water resources, utilities, public health and safety, air quality and greenhouse gases, transportation, hazardous materials and wastes, and visual resources.

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement Preparation Notice

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Abbreviations and Acronyms

ACHP	Advisory Council on Historic Preservation
AFFF	Aqueous Film Forming Foam
APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act
AT	Anti-Terrorism
BMP	Best Management Practice
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CIA	Cultural Impact Assessment
CNRH	Commander, Navy Region Hawai‘i
CO	Carbon Monoxide
COMNAVREG	Commander, Navy Region
CRM	Cultural Resources Management
CZMA	Coastal Zone Management Act
DAR	Division of Aquatic Resources
DHHL	State of Hawai‘i Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DoD	Department of Defense
DOFAW	DLNR Division of Forestry and Wildlife
DOH	Hawai‘i Department of Health
DORIS	Doppler Orbitography and Radio-positioning Integrated by Satellite
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
EO	Executive Order
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
GHA	Ground Hazard Area
GHG	Greenhouse Gas
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HAR	Hawai‘i Administrative Rules
HEPA	Accepted Term for Hawai‘i Revised Statutes Chapter 343
HRS	Hawai‘i Revised Statutes
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
ITRF	International Terrestrial Reference Frame
KISC	Kaua‘i Invasive Species Committee
KPGO	Kōke‘e Park Geophysical Observatory
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NASA	National Aeronautics and Space Administration
Navy	Department of the Navy
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NRHP	National Register of Historic Places
O_3	Ozone
OPNAVINST	Office of the Chief of Naval Operations Instruction
PA	Programmatic Agreement
P.L.	Public Law
PCB	Polychlorinated Biphenyl
PFAS	Per- and Polyfluoroalkyl Substances
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter Less than or Equal to 2.5 Microns in Diameter
PM_{10}	Particulate Matter Less than or Equal to 10 Microns in Diameter
PMRF	Pacific Missile Range Facility
RADAR	Radio Detecting and Ranging

RDT&E	Research, development, test and evaluation
REPI	Readiness and Environmental Protection Integration
SECNAVINST	Secretary of the Navy Instruction
SGP	Space Geodesy Project
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Office
SLUD	State Land Use District
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SOS	Save Our Shearwaters
T&E	Test and Evaluation
U.S.	United States
U.S.C.	United States Code
USCB	United States Census Bureau
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VLBI	Very Long Baseline Interferometry

1 Purpose of and Need for the Proposed Action

This chapter provides the following: an introduction and overview of the project; the project location, background, purpose of and need for the Proposed Action; scope of analysis; relevant laws and regulations; and public and agency participation.

1.1 Project Introduction and Overview

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are joint lead agencies and are preparing a Draft Environmental Impact Statement (EIS) in coordination with the Hawai‘i Department of Land and Natural Resources (DLNR) (Hawai‘i Administrative Rules [HAR] § 11-200.1-23 (a)(4)). The EIS will evaluate the potential environmental consequences of the Navy’s and NASA’s proposal to retain the use of 8,348 acres and 23 acres, respectively, of State lands including leaseholds and easement lands on Kaua‘i, Hawai‘i, for operational continuity and sustainment (in support of the military’s continued and ongoing military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF), and NASA’s continued operations including measurements of the Earth’s rotation and local land motion at Kōke‘e Park Geophysical Observatory (KPGO).

The Navy’s current real estate agreements with DLNR include 684 acres of leaseholds and 7,664 acres of easement lands, for a total of 8,348 acres. These existing Navy real estate agreements with DLNR are set to expire between 2027 and 2030. The Navy’s current leases and easements are primarily used for passive encroachment buffers, as well as for mission readiness (see Section 1.2 and Appendix D), access, and utilities at the following five general locations: Main Base, Kamokalā Ridge, Mānā Water Well, Miloli‘i Ridge, and Mākaha Ridge. No ground-based training occurs on these parcels. The Navy’s 8,348 acres of leaseholds and easement lands are part of the larger PMRF installation.

NASA’s current real estate agreements with DLNR include 16 acres of leaseholds and 7 acres of easement lands, for a total of 23 acres. NASA uses the land for operations at KPGO that include collecting and coordinating geodetic data that contribute to daily measurements of the Earth’s rotation and orientation in space. NASA issued the Navy a Use Permit in 2016 for portions of KPGO to conduct radar, telemetry, and communications services in support of PMRF operations. In addition to their mission operations, the Navy and NASA also conduct environmental management and stewardship activities on these lands.

These leases and easements collectively comprise the Project Area that will be analyzed in the EIS.

Figure 1-1 depicts an overview of general locations for PMRF and KPGO (Main Base, Kamokalā Ridge, Mānā Water Well, Miloli‘i Ridge, Mākaha Ridge, and KPGO) on the Island of Kaua‘i. The Project Area includes leaseholds and easement lands within these locations; it does not include the 1,933 acres of federally owned fee simple lands.

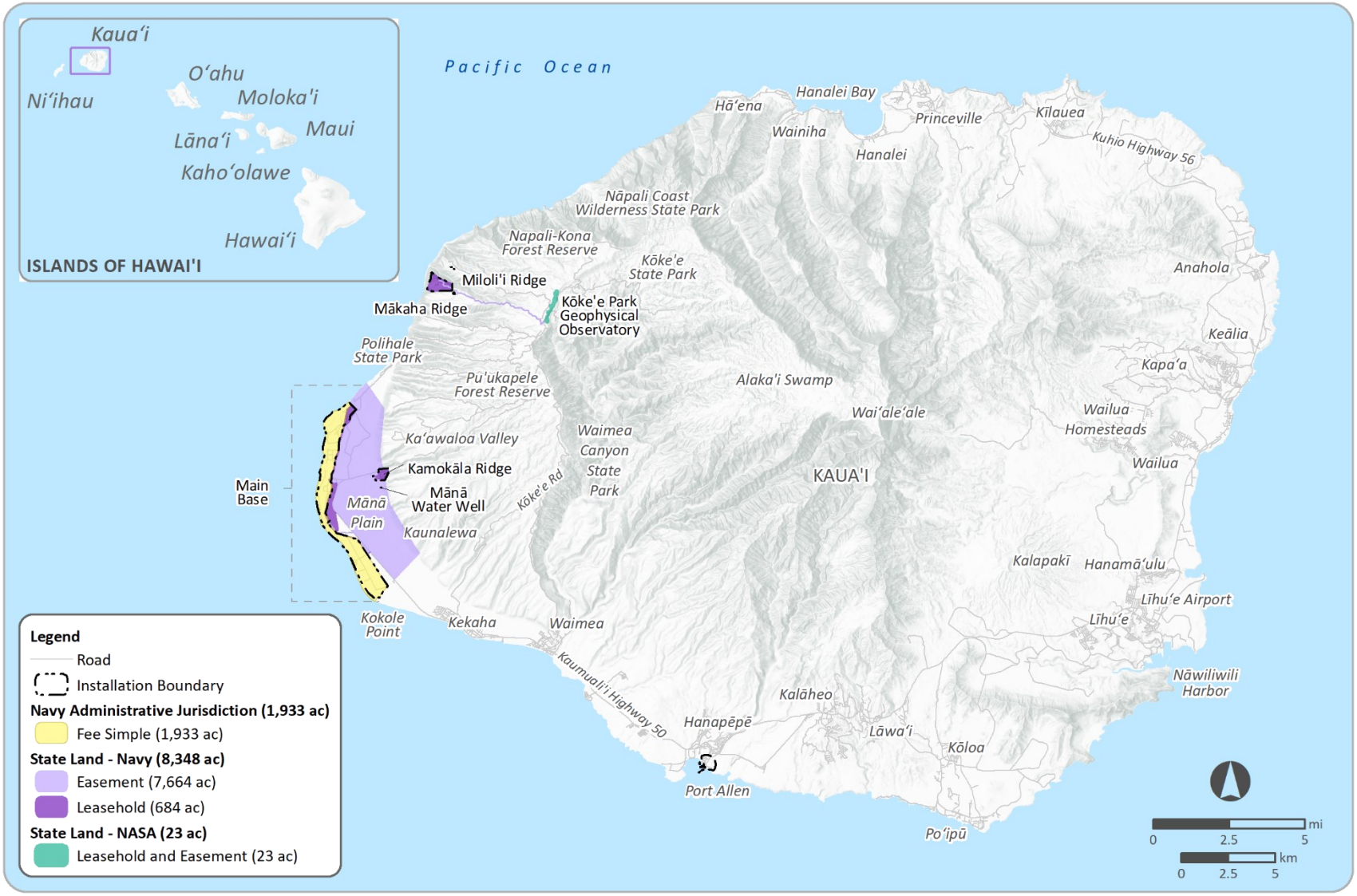

Figure 1-1 General Location

The Navy and NASA have jointly prepared this document and a separate Notice of Intent (NOI) to prepare an EIS in accordance with federal and state law including: the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321–4370), as amended by the Fiscal Responsibility Act of 2023 (Public Law [P.L.] No. 118-5 , div. C, tit. III, § 321(b), 137 Stat. 10, 40 (amending NEPA § 107) (2023) (codified at 42 U.S.C. § 4336a)); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508); Navy and NASA regulations and policies for implementing NEPA (32 CFR § 775, 14 CFR § 1216, OPNAVINST 5090.1E, and NPR 8580.1A, 32 CFR); all applicable federal environmental laws and agency guidance listed in Appendix B; Hawai‘i Revised Statutes (HRS) Chapter 343 (the state law governing preparation of an EIS and commonly referred to as “HEPA”); and HAR § 11-200.1 (implementing HRS Chapter 343).

As requested by and in coordination with DLNR, the Navy and NASA identified that an EIS is the appropriate level of environmental review for the Proposed Action (HAR § 11-200.1-23 (a)(5)) (Lauren Yasaka e-mail message to Kerry Wells, email title: Lauren Pacific Missile Range Facility and Kōke‘e Park Geophysical Observatory Real Estate EIS, January 18, 2024). HAR § 11-200.1-14(d)(2) supports this determination, which provides “[if the] proposing agency or approving agency determines, through its judgment and experience that an EIS is likely to be required, then the proposing agency may choose to prepare, or an approving agency may authorize an applicant to prepare, an EIS in accordance with subchapter 10, beginning with preparation of an EISPN.” Additionally, due to the nature of the Proposed Action, the Navy and NASA concur with DLNR’s determination that an EIS is likely to be required. An EIS also helps ensure that input from the public and agencies is integrated into the process of assessing environmental impacts of the Proposed Action and conducting fully informed decision making.

DLNR’s mission is to “[e]nhance, protect, conserve and manage Hawai‘i’s unique and limited natural, cultural and historic resources held in public trust for current and future generations of the people of Hawai‘i nei, and its visitors, in partnership with others from the public and private sectors” (Hawai‘i DLNR, 2024). DLNR is also responsible for issuing and managing leases of State lands (agricultural, pasture, commercial, industrial, governmental, and resort leases). DLNR’s responsibilities include managing and maintaining the state’s coastal lands and waters, water resources, conservation and forestry lands, historic sites, small boat harbors, parks, and recreational facilities. DLNR also performs public safety duties (e.g., flood and rockfall prevention), maintains unencumbered public lands, and enforces the agency’s rules and regulations.

For this Proposed Action, DLNR is responsible for issuing leases and easements to the Navy and NASA. DLNR is the agency with the responsibility for approving the real estate action since the State lands are under the management of DLNR’s Land Division. DLNR is required to conduct an environmental review of this Proposed Action because the Navy and NASA are proposing the continued use of State lands (HRS § 343-5(a)(1), (2), (4)). Pursuant to HRS § 343-5(h): “[w]henever an action is subject to both the National Environmental Policy Act of 1969 (Public Law 91-190) and the requirements of this chapter, [DLNR] shall cooperate with federal agencies to the fullest extent possible to reduce duplication between federal and state requirements. Such cooperation, to the fullest extent possible, shall include joint environmental impact statements with concurrent public review and processing at both levels of government. Where federal law has environmental impact statement requirements in addition to but not in conflict with this chapter, [DLNR] and agencies shall cooperate in fulfilling these requirements so that one document shall comply with all applicable laws.” Under HAR § 11-200.1-28, DLNR, as the accepting authority for HEPA,

evaluates whether the EIS fulfills the intent of HRS Chapter 343. In addition, during review of the EIS, DLNR will consider HRS Title 12, Chapter 171 (Hawai‘i’s land lease law).

1.2 Project Area

PMRF is located approximately 100 miles from O‘ahu on the northwest coast of the Hawaiian island of Kaua‘i (refer to Figure 1-1). KPGO is located within Kōke‘e State Park on the island of Kaua‘i, at an elevation of approximately 3,600 feet above sea level near Waimea Canyon.

The Project Area overview is shown in Figure 1-2. Current real estate details for the Main Base, Kamokalā Ridge, and Mānā Water Well portions of the Project Area are shown in Figure 1-3. Mākaha, Miloli‘i Ridge, and KPGO portions of the Project Area are shown in Figure 1-4.

The Project Area consists of the following:

- Main Base: leaseholds (392 acres) and easement lands (7,267 acres), located adjacent to the fee-simple lands at the installation, used for PMRF operational support, utilities and flood control, and as safety buffers;
- Kamokalā Ridge: leaseholds (89 acres) and easement lands (355 acres) used for ordnance storage, utilities access, and tsunami evacuation;
- Mānā Water Well: leaseholds (0.29 acre) used as the primary potable water source for PMRF;
- Mākaha Ridge: leaseholds (203 acres) and easement lands (42 acres) used for missile tracking and surveillance;
- Miloli‘i Ridge: leaseholds (0.015 acre) used for radar and telemetry activities; and
- KPGO: leaseholds (16 acres) and easement lands (7 acres) used for surveillance and tracking, as well as NASA geodetic data collection and backup power generation.

1.3 Background

1.3.1 Historic Land Use at PMRF

The history of the Mānā Plain is complex, with the earliest known traditional Hawaiian archaeological site at PMRF dating to the eleventh century (NAVFAC Pacific, 2012). Appendix A provides a more detailed summary of land use history at PMRF.

Traditionally, the people of Mānā were noted as fishermen. It is likely that permanent settlements were concentrated at the inland edge of the Mānā Plain, where houses, temples, and agricultural complexes were built in the foothills at the base of the cliffs, on high ground overlooking the wetlands and coastline. Small seasonal fishing communities were scattered along the coast. The people of Mānā developed and maintained brackish water loko pu‘uone fishponds in the wetlands of the Mānā Plain. Inland of the wetlands, they grew sweet potatoes and gourds on the fertile strip of land at the foot of the pali. The coastal dunes of the Mānā Plain, particularly at Nohili, were the burial grounds of ancient Hawaiians. Several important heiau were located at Mānā. These heiau include Polihale, where rites associated with departing souls were conducted, and ‘Elekuna, which King Kalakaua and his priests visited many times in the nineteenth century.

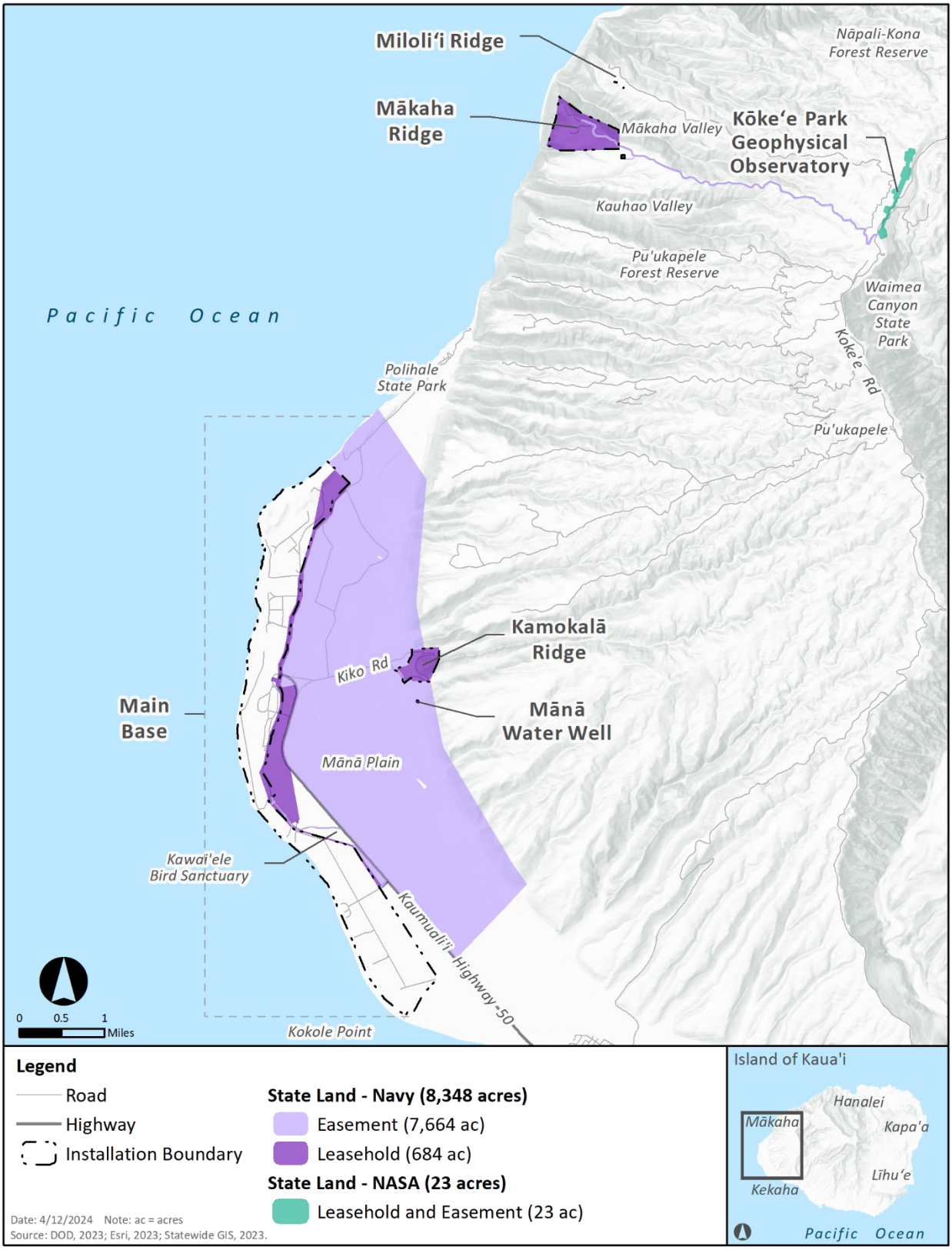

Figure 1-2 Project Area: Overview

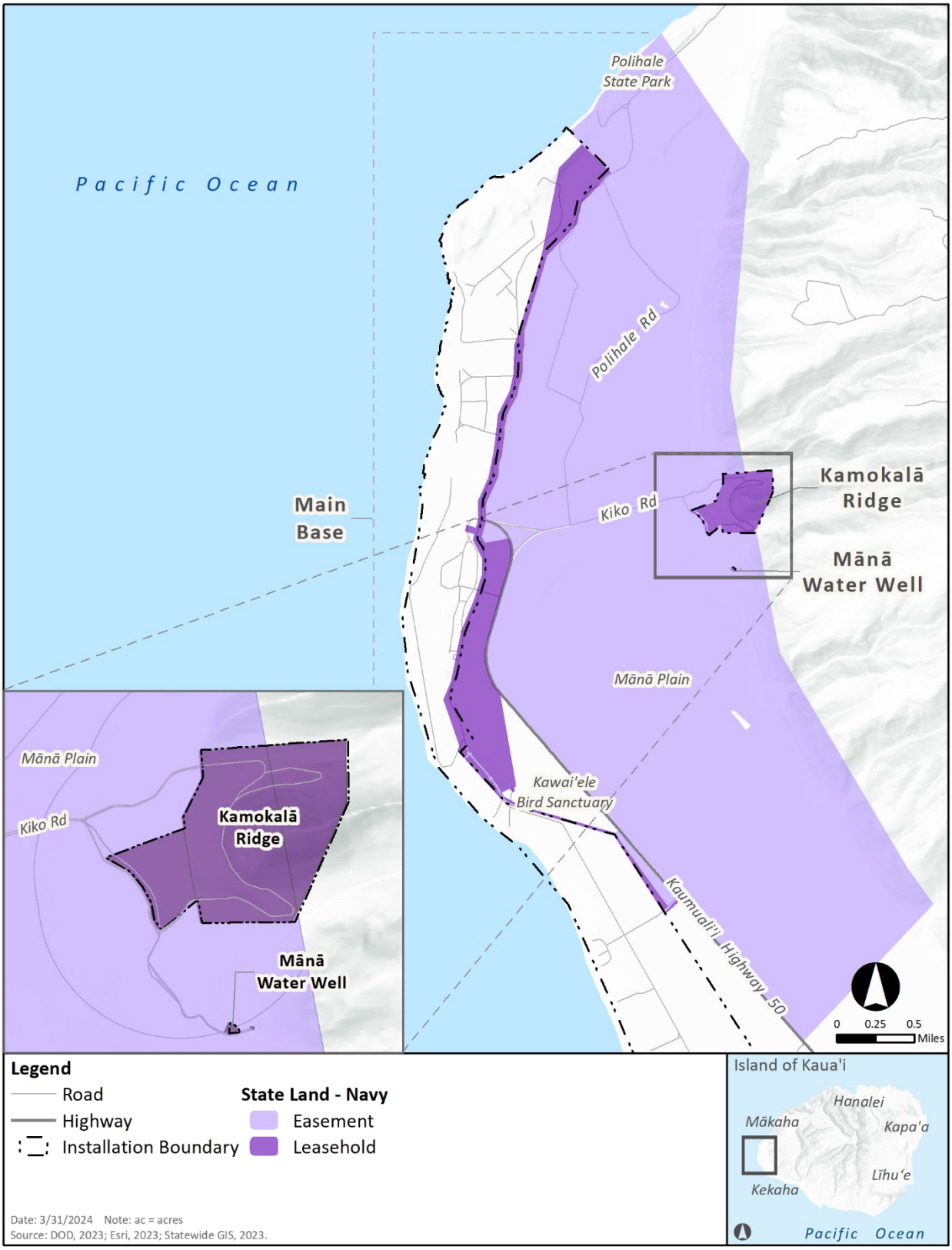

Figure 1-3 Project Area: Main Base, Kamokalā, and Mānā Water Well

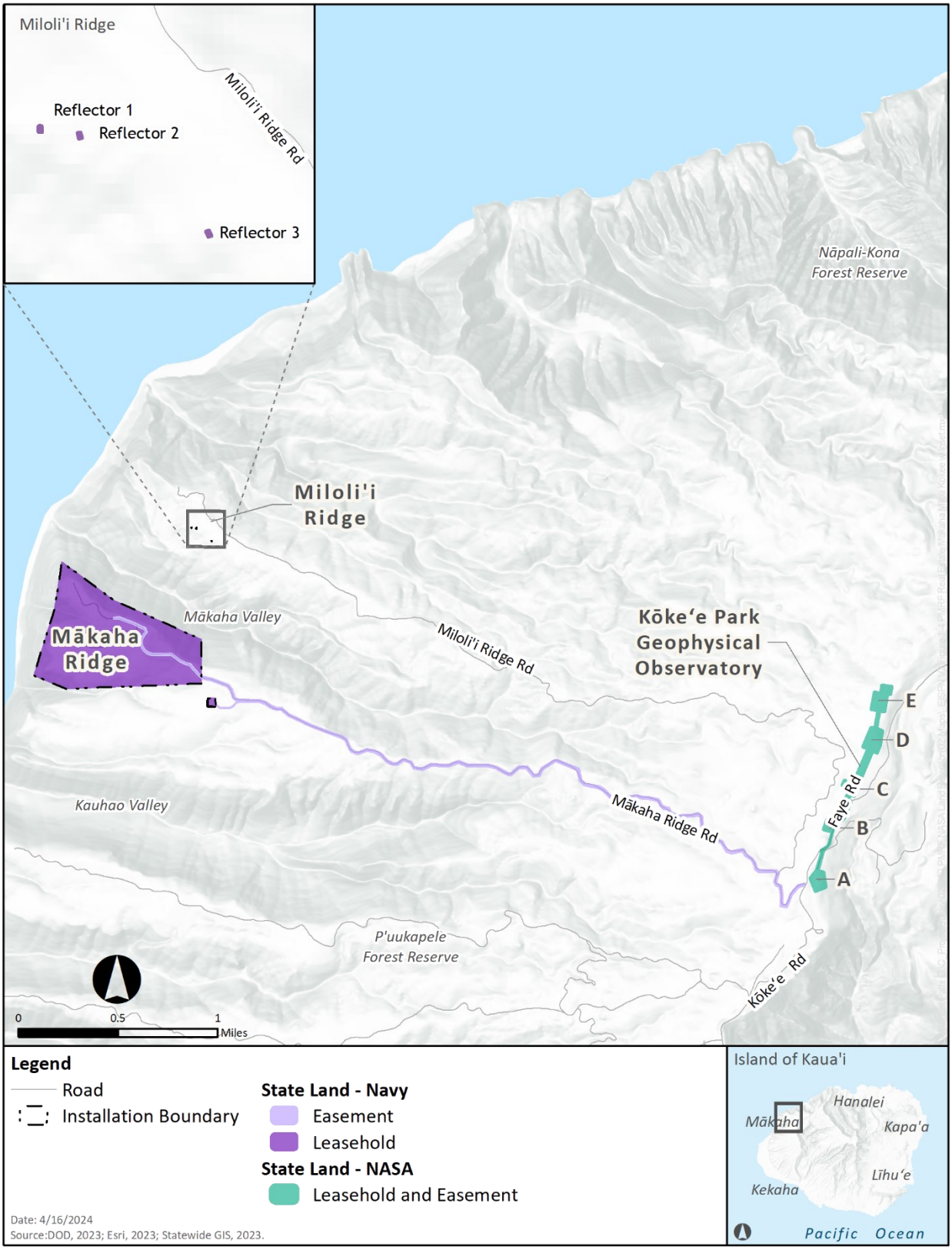

Figure 1-4 Project Area: Mākaha Ridge, Miloli'i Ridge, and KPGO

The Māhele of 1848 placed the ahupua'a of Waimea, including the Mānā Plain, into the possession of the Crown, and shortly afterwards the Crown leased these lands for commercial agriculture, such as livestock grazing, rice production, and sugarcane cultivation. As these agricultural ventures grew over the next three decades, contract laborers from China, then Japan, and finally the Philippines were brought to the area. Plantation camps were built to house the laborers. Mānā Camp eventually included a school, three stores, a company office, and a post office. Much of the wetlands were drained or filled to create more arable land for sugarcane cultivation under the Kekaha Sugar Company, Ltd., which was formed in 1898. Commercial sugarcane cultivation continued through the twentieth century.

In the 1920s, an airstrip was built by the Territory of Hawai'i. Beginning in 1940, the U.S. military acquired the airstrip and surrounding land to develop Barking Sands Army Air Base. During World War II, units from all branches of the armed forces and the Hawai'i National Guard were assigned to the base. The base was transferred to the Air Force in 1948. During the 1950s, the facility was redesignated Bonham Air Force Base, and the Navy, as a tenant of the base, began testing, evaluating, and training sailors on using guided missile systems. In 1958, the Navy's activity was named the Pacific Missile Range Facility as part of a newly designated larger Pacific Missile Range used by the Department of Defense (DoD) and NASA (NAVFAC Pacific, 2012). It was during this period that the Air Force transferred Bonham Air Force Base (which had been redesignated Bonham Auxiliary Landing Field) to the Navy. The transfer was finalized in 1966, at which time the entire installation became PMRF. A more detailed history of land use at PMRF is in Appendix A.

1.3.2 Historic Land Use at KPGO

Desktop and documentary research for historic land use at KPGO is ongoing. The Draft EIS will include additional information on historic land use at KPGO.

1.3.3 Navy Mission at PMRF

PMRF is the world's largest instrumented multi-environment range, capable of simultaneously supporting surface, subsurface, air, and space operations. As a Major Range and Test Facility Base, PMRF is part of the designated core set of DoD Test and Evaluation (T&E) infrastructure and associated workforce components that must be preserved as a national asset to provide T&E capabilities to support the DoD acquisition system. PMRF's unique location includes broad ocean areas to the north, south, and west with a relatively isolated and encroachment-free environment that safely and effectively supports these operations, as well as Navy Fleet training, as analyzed in the NEPA document titled *Hawaii-Southern California Training and Testing Final EIS/OEIS* (Navy, 2018).

The Navy's primary military mission at PMRF is to provide integrated range services in a modern, multi-threat, multi-dimensional environment that ensures the safe evaluation and execution of research, development, test and evaluation (RDT&E) missions. These capabilities are critical for DoD's ability to achieve its statutory Title 10 military readiness requirements[1], to provide commercial entities with the ability to conduct commercial T&E activities (see 10 U.S.C. § 4175 providing for the use of T&E installations by commercial entities), and Title 51 national and commercial space program requirements

[1] The legal basis for the roles, missions, and organization of each of the services are set forth in 10 U.S.C. § 7062 (Army), 10 U.S.C. § 8062 (Navy), 10 U.S.C. § 8063 (Marine Corps), 10 U.S.C. § 9062 (Air Force), and 10 U.S.C. § 9082 (Space Force).

by supporting commercial space activities (see 51 U.S.C. §§ 50504, 50901—50909 authorizing commercial space launch and reentry activities).

Activities at PMRF are monitored with real-time tracking and command/control capabilities located at or connected to the land-based PMRF facilities. This unique facility provides a realistic environment for training and testing in the use of surface, subsurface, air, and space weapons systems as well as land-based weapons systems located at the Main Base. The Navy conducts missile systems tests and has supporting facilities to track and evaluate these tests from the ocean floor to the outer atmosphere.

PMRF's space, air, surface, and subsurface tracking are accomplished from radar sites at multiple elevations. PMRF is linked to other range and data-processing facilities and can transmit real-time training and testing data anywhere in the world. The Navy, Air Force, Army, Marine Corps, allied foreign forces' RDT&E programs, and other non-DoD agencies (including NASA and commercial entities), all utilize PMRF's unique capabilities.

On Kaua'i, the Navy is the largest high-tech employer and third largest overall employer. It employs approximately 900 military and civilian personnel and contributes approximately $150 million annually in salary, contract goods, and services to the local economy. Moreover, as described in Section 1.3.6, *Environmental Management and Stewardship*, the Navy actively manages the natural and cultural resources at PMRF for the leased and easement lands.

1.3.4 NASA KPGO Space Geodesy Mission

Geodesy is the science of the Earth's shape, orientation in space, and gravity, and underpins modern navigation technology such as the Global Positioning System (GPS) that is used every day in a wide variety of devices, from handheld smartphones to satellites. NASA's Space Geodesy Project (SGP) was initiated to develop and maintain a global network of space geodetic observing instruments. The network is composed of core sites around the world that use four primary space-geodetic observation platforms: the Very Long Baseline Interferometry (VLBI), the Satellite Laser Ranging, the Doppler Orbitography by Radiopositioning Integrated on Satellite (DORIS), and the Global Navigation Satellite System (GNSS). The SGP maintains the International Terrestrial Reference Frame (ITRF), which is the foundation for virtually all Earth observations and georeferenced data used by society. Additionally, the SGP is fundamental for spacecraft tracking, as well as terrestrial, airborne, and maritime navigation. The scientific disciplines that rely on these data include sea level change, earthquake early warning systems, volcano deformation, flooding patterns, and glacier dynamics.

One of the core sites for NASA's SGP is KPGO, located within the Kōke'e State Park. The observatory sits at an elevation of approximately 3,600 feet above sea level near Waimea Canyon. KPGO is composed of five sites (Sites A through E), all of which have differing technologies and supportive infrastructure to collectively aid in the observatory's responsibilities. The mission of KPGO is to host three of the four primary geodetic platforms of NASA's SGP: VLBI, DORIS, and GNSS. KPGO collects these geodetic data to support satellites globally, and is a critical component of the SGP as part of its global network of space geodetic observatories.

KPGO consists of 16 acres of State leaseholds and 7 acres of easement lands (see Figure 1-4). The Navy holds a Use Permit and Memorandum of Understanding with NASA for portions of KPGO to utilize

NASA's facilities for the purpose of conducting PMRF mission support with radar, telemetry, and communications services at the NASA facilities.

1.3.5 Navy and NASA Use of State Lands

The Navy and NASA began leasing property on Kaua'i from the State of Hawai'i in 1964 and 1965, respectively. The Navy required the land to develop sophisticated testing, evaluation, and training of military weapons systems at PMRF. Since then, PMRF's mission has expanded in response to new technologies and geopolitical threats. NASA's lease began in 1965 when KPGO was part of the NASA Manned Space Flight Network. Since that time, KPGO has supported many NASA and other projects with a variety of equipment. It is a highly versatile and multifunctional geodetic site.

Navy and NASA uses of the lease and easement areas that will be analyzed in the EIS are summarized in Table 1-1 and depicted in Figures 1-3 and 1-4. Appendix D includes details about Navy and NASA activities at KPGO (see Figure 1-4). A detailed and current list of leases and easement uses is included in Appendix D with a description of current activities and operational elements.

Table 1-1 Navy and NASA Activities on Leaseholds and Easement Lands

Area[1]	*Agency*	*Description of Activities*	*Figure Number*
Main Base	Navy	The Main Base includes the following: 1,933 acres of fee simple land, 392 acres of leaseholds, and 7,267 acres of easement lands. The systems that support activities on the Main Base are integrated across fee simple land, leaseholds, and easements. The Main Base is the principal operations area for PMRF and supports surface, subsurface, air, and space activities. Activities on the leased parcels at the Main Base include ordnance assembly, operation and maintenance of drainage ditches and pumps to protect adjacent land from flooding, travel along roadways, and accessing utilities. Additionally, undeveloped land serves as safety zone buffers for missile/target launch operations and explosives safety. GHA safety arcs have a radius between 6,000 and 10,000 feet from the missile launch location; the public is excluded from being within this area prior to, during, and immediately following a launch. For the portion of the GHA on leased lands adjacent to the Main Base, the Navy works with DLNR Division of State Parks to establish safety controls during missile launches and restricts entry to the southern portion of Polihale Beach Park prior to launches. Explosives storage and munitions assembly locations have ESQD arcs for explosives safety zones based on quantities and types of ammunition stored in magazines, being transported, and staged on ordnance handling pads. ESQD arcs overlay ground areas of restricted non-ammunition-related facilities and activities located on an easement subject to a MOA with DLNR.	1-3
Kamokalā Ridge	Navy	Kamokalā Ridge includes 444 acres consisting of the following: 89 acres of leaseholds and 355 acres of easement lands. Kamokalā Ridge provides ordnance storage for the Navy, Hawai‘i Air National Guard, Department of Energy, and other military commands with requirements for training and storage. The site consists of ordnance storage magazines that have been excavated into the cliff face of Kamokalā Ridge. The magazines provide secure storage for Class 1.1 explosives. Activities on easements at Kamokalā Ridge include roadways to access utilities and ordnance storage. This area also serves as a tsunami evacuation site.	1-3

Area[1]	*Agency*	*Description of Activities*	*Figure Number*
Mānā Water Well	Navy	The Mānā Water Well includes 0.29 acre of leaseholds. Activities on leased land include maintenance and use of the Mānā Water Well, which is the primary source of potable water for PMRF and critical to all activities at the facility.	1-3
Miloliʻi Ridge	Navy	Miloliʻi Ridge includes 0.015 acre of leaseholds. Activities at Miloliʻi Ridge leaseholds include passive use of the frequency shift reflectors (a specific type of antenna system), which work with the radar and telemetry stations on Mākaha Ridge. The reflectors help calibrate and operate the radar systems used at the Main Base.	1-4
Mākaha Ridge	Navy	Mākaha Ridge consists of 245 acres composed of 203 acres of leaseholds and 42 acres of easement lands. The Mākaha Ridge Tracking Station serves as PMRF's secondary missile tracking and surveillance station. The station has tracking and surveillance radars as well as primary telemetry systems for the range. The site is also used by other agencies to test new radar technologies. Due to the sensitivities of the technology and the erosion rate at Mākaha Ridge, public access is restricted at this location. Activities on easement lands at Mākaha Ridge include roadways to and around the features.	1-4
KPGO	Navy and NASA	KPGO consists of 16 acres of leaseholds and 7 acres of easement lands. The Navy has a Use Permit for Sites A through D which support surveillance and tracking. Navy infrastructure at KPGO supports tracking radars as well as command and control systems. Sites A through E support KPGO activities which include collecting and coordinating geodetic data and contributing to daily measurements of the Earth's orientation in space and rotation. The diesel generator at Site B provides backup power to Sites A, C, D, and E.	1-4

Note: [1]See Figures 1-3 and 1-4.

Key: DLNR = Department of Land and Natural Resources; ESQD = Explosive Safety Quantity-Distance; GHA = Ground Hazard Area; KPGO = Kōkeʻe Park Geophysical Observatory; MOA = Memorandum of Agreement; NASA = National Aeronautics and Space Administration; PMRF = Pacific Missile Range Facility.

1.3.6 Environmental Management and Stewardship

The Navy manages natural and cultural resources on PMRF including leased and easement lands. Conservation management of natural and cultural resources is a priority for both stewardship and mission readiness. This includes activities such as protecting the endangered Hawaiian monk seal (*Neomonachus schauinslandi*), green sea turtle (*Chelonia mydas*), wetlands, archaeological sites, iwi kupuna (sensitive human remains), and historic buildings and structures. The Navy also protects natural and cultural resources, including native Hawaiian sacred resources, against encroachment. PMRF's awareness of the importance of Native Hawaiian cultural values is embodied in PMRF's slogan: E Pane Mai Ka Nonoi O Nohili – Answering the Requests of Nohili.

Table 1-2 lists Navy funded and managed natural and cultural programs on State lands.

Table 1-2 Navy Programs on State Lands

Program	*Description*
REPI Projects	Mitigation for the effects of sea level rise on agricultural land on the Mānā Plain by: • creating an open floodable space to reduce the quantity and improve the quality of stormwater runoff discharged from agricultural drainage ditches into the nearshore environment at PMRF; • reducing the threat erosion poses to PMRF infrastructure; and • promoting the regeneration of historic wetland habitat for endemic and endangered Hawaiian waterbirds. https://www.repi.mil/Portals/44/Documents/Buffer_Fact_Sheets/Navy/PMRF_BarkingSands.pdf
PMRF INRMP	Natural resource management that includes erosion management, invasive plant management, native plant management, federally listed plant species management (at Mākaha Ridge), wildland fire management, nuisance and invasive animal management, special-status species management, terrestrial invertebrate and pollinator management, data collection, database and records management, outdoor recreation, and natural resources awareness, education, and training.
PMRF ICRMP	Cultural resource management, including implementation of the cultural resources management program and oversight of all cultural resource operations and activities at the range. Nohili Dunes, at the Main Base, is a spiritual place for Native Hawaiians where their ancestors were buried as an ascending point to lani (heaven). The Navy, in collaboration with Na ʻOhana Papa O Mana, respectfully re-inters exposed remains in the Lua Kupapau O Nohili crypt located on base.
Agricultural Preservation Initiative	Ensures agricultural land areas surrounding the installation remain in agricultural use, which is compatible with PMRF operations.

Key: ICRMP = Integrated Cultural Resources Management Plan; INRMP = Integrated Natural Resources Management Plan; PMRF = Pacific Missile Range Facility; REPI = Readiness and Environmental Protection Integration.

Specific Navy environmental stewardship activities that occur on leased and easement lands at PMRF and KPGO are presented in detail in Section 2.5, *Best Management Practices* (see Table 2-6), and include:

- Responding to requests for public access and for cultural access to individuals and organizations.
- Maintaining ungulate exclusion fencing for erosion control at Mākaha Ridge.
- Out-planting and managing native plants in areas identified as having erosion and soil compaction issues.
- Improving and protecting habitat for the federally endangered Niʻihau panicgrass (*Panicum niihauense*) and Hawaiian picture-wing fly (*Drosophila musaphilia* and *D. sharpi*).
- Continuing predator control to protect Migratory Bird Treaty Act (MBTA)-listed species including Laysan albatross (*Phoebastria immutabilis*).
- Working with the PMRF Archery Club to control ungulate populations at the Kamokalā Ridge site.
- Conducting observations to identify feral cats at Kamokalā Ridge (with possibility of expanding cat trapping if necessary).

- Removing deadfall in high-risk fire areas including near the Main Base missile launch site and the Kamokalā Ridge Magazines and replanting with native, low fire risk species.
- Coordinating with U.S. Fish and Wildlife Service (USFWS), Division of Forestry and Wildlife (DOFAW), PMRF Air Ops, and PMRF Public Works to update and implement nēnē (*Branta sandvicensis*) management procedures.

See Chapter 2, Section 2.5 for a more detailed description of Navy and NASA Best Management Practices (BMPs) and management strategies for natural and cultural resources.

1.4 Purpose of and Need for the Proposed Action

The Navy's purpose of the Proposed Action is to maintain long-term DoD use of 8,348 acres of State lands (including leaseholds and easement lands) on Kauaʻi, Hawaiʻi, for operational continuity and sustainment of the military readiness mission. NASA's purpose of the Proposed Action is to maintain long-term use of 23 acres of State lands (including leaseholds and easement lands) on Kauaʻi for continued operations of KPGO. The Proposed Action is needed because the existing real estate agreements for these State lands are set to expire between 2027 and 2030. Preserving the long-term DoD and NASA use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global significance. It also ensures the continued conservation management by the Navy and NASA of natural and cultural resources on these lands.

For DLNR, in addition to its role as the lessor of State lands, the proposed real estate action presents an opportunity for the agency to secure a revenue source to support its management of public lands and associated environmental and conservation programs. Fees from leases and easements are put into a State fund as required by law.

By ensuring continued Navy and NASA operations on Kauaʻi, the real estate action would also preserve local jobs and income for the residents of Kauaʻi, financially contribute to the overall economic well-being of Kauaʻi, and maintain continued conservation management of natural and cultural resources on State lands at no cost to the State of Hawaiʻi.

1.5 Scope of Environmental Analysis

The EIS will evaluate the potential environmental effects of the Proposed Action and alternatives that includes current activities that occur on leaseholds and easements, including the No Action Alternative. The EIS will satisfy both federal and State of Hawaiʻi requirements and provide the necessary analyses to allow the Navy, NASA, and DLNR to consider the environmental effects of the Proposed Action as part of their decision making.

Consistent with CEQ regulations and HAR § 11-200.1-24(b) the scope of the analysis for the alternatives in the EIS will be proportionate to the potential for environmental impacts.

1.6 Relevant Laws and Regulations

The Navy and NASA are preparing this EIS in accordance with applicable federal and State of Hawaiʻi laws, statutes, regulations, and policies applicable to implementation of the Proposed Action. A

description of the Proposed Action's consistency with these laws, policies, and regulations, as well as the names of regulatory agencies responsible for their implementation, is described in Appendix B.

1.7 Public and Agency Participation and Intergovernmental Coordination

Public participation is a key component of the EIS process (Figure 1-5). Opportunities for public input and participation in the EIS process occur during two stages:

1. During the scoping period, following the joint publication of the NOI (40 CFR 1501.7), and the Environmental Impact Statement Preparation Notice (EISPN) (HAR § 11-200.1-23); and
2. During the comment period following publication of the Draft EIS.

Figure 1-5 illustrates the stages of public involvement in the NEPA and HEPA environmental processes. Table 1-3 provides a summary of public engagement for these processes, and Appendix C provides a list of interested parties who were contacted as part of scoping. The public involvement processes for NEPA and HEPA for this EIS are running concurrently to meet the requirements of both State of Hawai'i and federal laws and regulations.

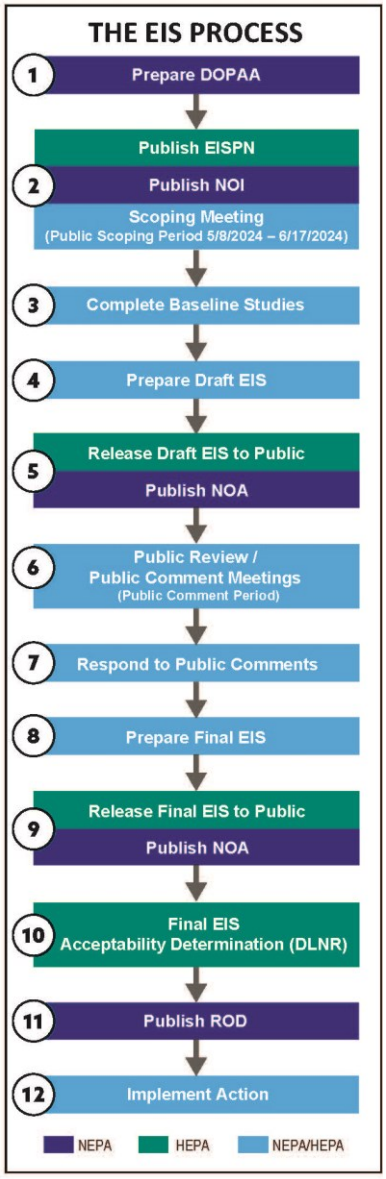

Figure 1-5 EIS Process

1.7.1 Scoping

Public scoping meetings during the scoping period for this EIS will be held on June 4, 5, and 6, 2024, from 5:00–8:00 p.m. at the Kaua'i Veterans Center in Līhu'e (3215 Kaua'i Veterans Memorial Highway, Līhu'e), Kekaha Neighborhood Center (8130 Elepaio Road, Kekaha), and Sheraton Kaua'i Coconut Beach Resort (650 Aleka Loop, Kapa'a), respectively (Table 1-3). Public scoping will serve as an opportunity to obtain input from the community, agencies, and other stakeholders regarding the issues and resources they would like to see addressed and analyzed throughout the EIS process, as well as identify reasonable alternatives. The public is invited to provide oral and written comments at the scoping meetings. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) and HRS § 6E-42.

Methods to solicit public input during the scoping period for this EIS include notification, publication of project information, and invitations to participate in scoping. Additionally, a joint notice will be published on May 8, 2024, in *The Garden Island*, *MidWeek Kaua'i*, and *The Honolulu Star-Advertiser* announcing the publication of the EISPN and NOI and the date and time of the scoping meetings.

Table 1-3 Public Engagement under NEPA and HEPA

Date	*Description*
May 2024	Notification letters sent to stakeholders (individuals, agencies, and organizations)
May 2024	NOI published in the *Federal Register* (NEPA), EISPN Published in *The Environmental Notice* (HEPA)
May 2024	Public website available: http://www.PMRF-KPGO-EIS.com
June 2024	Public scoping meetings on Kauaʻi: Kekaha, Līhuʻe, and Kapaʻa
Summer 2025	• NOA of Draft EIS for public review • Public meetings for Draft EIS: Kekaha, Līhuʻe, and Kapaʻa • Draft EIS public review period closes
Winter 2025	Publication of NOA for Final EIS in the *Federal Register* (NEPA), Publication of Final EIS (NEPA, HEPA) and DLNR Decision in *The Environmental Notice* (HEPA)
Winter 2025	30-day wait period
Spring 2026	Publication of Record of Decision (NEPA)

Key: DLNR = Department of Land and Natural Resources; EIS = Environmental Impact Statement; EISPN = Environmental Impact Statement Preparation Notice; HEPA = Accepted Term for Hawaiʻi Revised Statutes Chapter 343; NEPA = National Environmental Policy Act; NOA = Notice of Availability; NOI = Notice of Intent.

Letters with similar information will be sent to individual, agency, and organization stakeholders (Appendix C). Stakeholders consist of agencies with a regulatory role, individuals and organizations interested in the project, and elected officials whose jurisdiction includes PMRF and KPGO.

1.7.2 Draft EIS

All comments received during the public scoping period will be considered during EIS preparation. A summary of public comments and responses to substantive scoping comments will be provided in the Draft EIS.

1.7.3 Final EIS

Substantive public comments on the Draft EIS will be considered in the development of the Final EIS. A detailed summary of public comments, revisions made to the Draft EIS in response to comments, and responses to substantive comments will be provided in the Final EIS.

1.7.4 Intergovernmental Coordination

The Navy and NASA are consulting with USFWS and National Marine Fisheries Service (NMFS) in compliance with the Endangered Species Act (ESA) Section 7 for federally listed species. The Navy and NASA are coordinating with DLNR's DOFAW regarding potential impacts to state-listed species pertaining to the leased lands under the Proposed Action. The Navy and NASA are also consulting with the Hawaiʻi State Historic Preservation Officer (SHPO) as part of their NHPA requirements and coordinating with the DLNR, State Historic Preservation Division (SHPD) to satisfy HRS § 6E-42 requirements. The Navy is coordinating with the State of Hawaiʻi Office of Planning and Sustainable Development, Planning Division under the Coastal Zone Management Act (CZMA). The Navy and NASA will coordinate with DLNR, Office of Conservation and Coastal Lands, as applicable, as part of any Conservation District Use Permit application. Applicable State of Hawaiʻi and federal laws, regulations, and policies are described in Appendix B.

2 Proposed Action and Alternatives

This chapter includes a description of the Proposed Action, the screening factors used to determine reasonable alternatives, alternatives carried forward for analysis, alternatives considered but eliminated from detailed analysis, and BMPs included in the Proposed Action.

2.1 Proposed Action

The Navy proposes to retain the use of 8,348 acres of State land on Kaua‘i in support of continued and ongoing military training and testing at PMRF. NASA proposes to retain the use of 23 acres of State land on Kaua‘i in support of maintaining data collection efforts of global significance at KPGO. The Proposed Action includes current operations that occur on leased and easement lands.

2.2 Alternative Screening Process

NEPA’s implementing regulations provide guidance on the consideration of alternatives and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives that meet the purpose and need of the Proposed Action and are deemed reasonable following the application of alternatives screening criteria are carried forward for detailed analysis in the Draft EIS, as is the No Action Alternative.

For NEPA and HEPA, an EIS “shall describe in a separate and distinct section discussion of the alternative of No Action as well as reasonable alternatives that could attain the objectives of the action” (HAR § 11-200.1-24(h) and 40 CFR 1502.14(c), respectively).

The screening factors used to select reasonable alternatives that would allow the Navy and NASA missions to be fulfilled are:

1. Maintain long-term use of State land currently used to support DoD and NASA missions on Kaua‘i;
2. Preserve current DoD and NASA operations on Kaua‘i;
3. Retain existing DoD and NASA infrastructure on Kaua‘i; and
4. Support DLNR management of public lands and associated environmental and conservation programs on Kaua‘i.

All screening factors must be met for an alternative to be considered reasonable. Table 2-1 identifies the five alternatives considered.

Table 2-1 Description of Alternatives Identified

Alternative Name	*Alternative Description*
Alternative 1: Succeeding Current Real Estate Agreements	The Navy and NASA would apply to DLNR for new long-term real estate agreements in the same manner and for the same uses as the current leases and easements.
Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds	The Navy and NASA would pursue fee simple acquisition of 700 acres (684–Navy, 16–NASA) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1.
Alternative 3: No Action Alternative	The Navy and NASA would not seek any real estate agreements for the State lands on Kaua‘i after expiration of the leases and easements between 2027 to 2030. The current real estate agreements for 8,348 acres with the Navy and 23 acres with NASA would expire. All existing infrastructure would be removed, or abandoned in place (as determined by the existing real estate agreements), from the Navy and NASA leased and easement lands.
Alternatives Considered but Not Carried Forward for Detailed Analysis	
Succeeding Leases and Easements Except for Current Leases at Mākaha Ridge and KPGO	The Navy and NASA would obtain succeeding leases and easements on leased land not currently located in the State of Hawai‘i’s Conservation District. These would include leases at the Main Base, Kamokalā Ridge, Mānā Water Well, and Miloli‘i Ridge, but would not include succeeding leases or easements at Mākaha Ridge or KPGO.
Succeeding Leases Only with No Easements	The Navy and NASA would only obtain succeeding lease agreements and not succeeding easements. These would include succeeding leases at the Main Base, Kamokalā Ridge, Mānā Water Well, Miloli‘i Ridge, Mākaha Ridge, and KPGO, but not easements at the Main Base, Kamokalā Ridge, or Mākaha Ridge.

Key: DLNR = Department of Land and Natural Resources; KPGO = Kōke‘e Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; PMRF = Pacific Missile Range Facility.

Table 2-2 summarizes the application of the screening factors to these alternatives and the results. Two alternatives met all screening factors: (1) extend succeeding current real estate agreements in their present form, and (2) fee simple acquisition of all leased parcels. Section 2.3 includes a description of alternatives carried forward for detailed analysis and Section 2.4 includes a description of alternatives considered but eliminated from detailed analysis.

Table 2-2 Screening Evaluation Factors and Results

Screening Factors	*Alternatives Carried Forward for Detailed Analysis*			*Alternatives Considered but Not Carried Forward for Detailed Analysis*	
	Alternative 1: Succeeding Current Real Estate Agreements[1]	*Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds*[2]	*Alternative 3: No Action Alternative*[3]	*Succeeding Leases and Easements Except for Current Leases at Mākaha Ridge and KPGO*[4]	*Succeeding Leases Only (Current Easements are Not Renewed)*[5]
Maintain long-term use of State land currently used to support DoD and NASA missions on Kaua‘i	Yes	Yes	No	No	No
Preserve current DoD and NASA operations on Kaua‘i	Yes	Yes	No	No	No
Retain existing DoD and NASA infrastructure on Kaua‘i	Yes	Yes	No	No	No
Support DLNR management of public lands and associated environmental and conservation programs	Yes	Yes	Yes–with limitations	Yes	Yes–with limitations
Alternative Carried Forward	**Yes**	**Yes**	**Yes**[6]	**No**	**No**

Notes: See Section 2.3 for detailed analysis of alternatives carried forward and Section 2.4 for alternatives considered but eliminated from detailed analysis.

[1]See Section 2.3.1, *Alternative 1: Succeeding Current Real Estate Agreements*.

[2]See Section 2.3.2, *Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds*.

[3]See Section 2.3.3, *Alternative 3: No Action Alternative*.

[4]See Section 2.4.1, *Succeeding Leases and Easements Except Current Leases at Mākaha Ridge and KPGO are Not Renewed.*

[5]See Section 2.4.2., *Succeeding Leases Only (Current Easements are Not Renewed).*

[6]Carried forward per NEPA and HEPA requirements.

Key: DLNR = Department of Land and Natural Resources; DoD = Department of Defense; KPGO = Kōke‘e Park Geophysical Observatory; NASA = National Aeronautics and Space Administration.

2.3 Alternatives Carried Forward for Detailed Analysis

The screening analysis resulted in two action alternatives (Alternatives 1 and 2), depicted in Figures 2--1 and 2-2. Alternative 3 is the No Action Alternative, which will be carried forward for analysis in the Draft EIS (Section 2.3.3, *No Action Alternative*) as required by NEPA and HEPA. This alternative is depicted in Figure 2-3.

A comparison of these alternatives is provided in Table 2-3, which lists the acres of leaseholds and easements under existing conditions.

2.3.1 Alternative 1: Succeeding Current Real Estate Agreements

Under this alternative, the Navy and NASA would apply to DLNR for new long-term real estate agreements in the same manner, similar duration, and for the same uses as the current leases and easements (see Table 1-1 and Appendix D). The Navy's agreements would include 684 acres of land leased exclusively by the Navy and 7,664 acres of easements (for a total of 8,348 acres). NASA's agreements would include 16 acres of land leased exclusively by NASA, 7 acres of easement lands (for a total of 23 acres) and would continue its Use Permit with the Navy.

Securing the new real estate agreements from DLNR must occur prior to expiration of the current real estate agreements to ensure uninterrupted operation of all federal agency missions. Under this alternative, there are no proposed changes to the type or frequency of current activities occurring on state leased and easement lands. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities. This alternative would also preserve the Navy and NASA-funded natural and cultural resource management activities on the leased and easement lands.

The leased areas are currently used for safety buffers, Anti-Terrorism (AT) security requirements (Main Base), ordnance storage-related facilities (Kamokalā Ridge), potable water (Mānā Water Well), radar and telemetry related facilities (Miloliʻi and Mākaha Ridges), and data collection and tracking (KPGO). The easement areas are currently used for utilities, roadways, and as encroachment buffers for Navy activities on fee simple lands. Many of these easements also preserve existing land use and prevent incompatible development that would affect the ability of PMRF to meet its mission requirements.

Under this alternative, the Navy and NASA would maintain succeeding agreements for the current real estate agreements, and this alternative meets all screening factors (see Section 2.2, *Alternative Screening Process*).

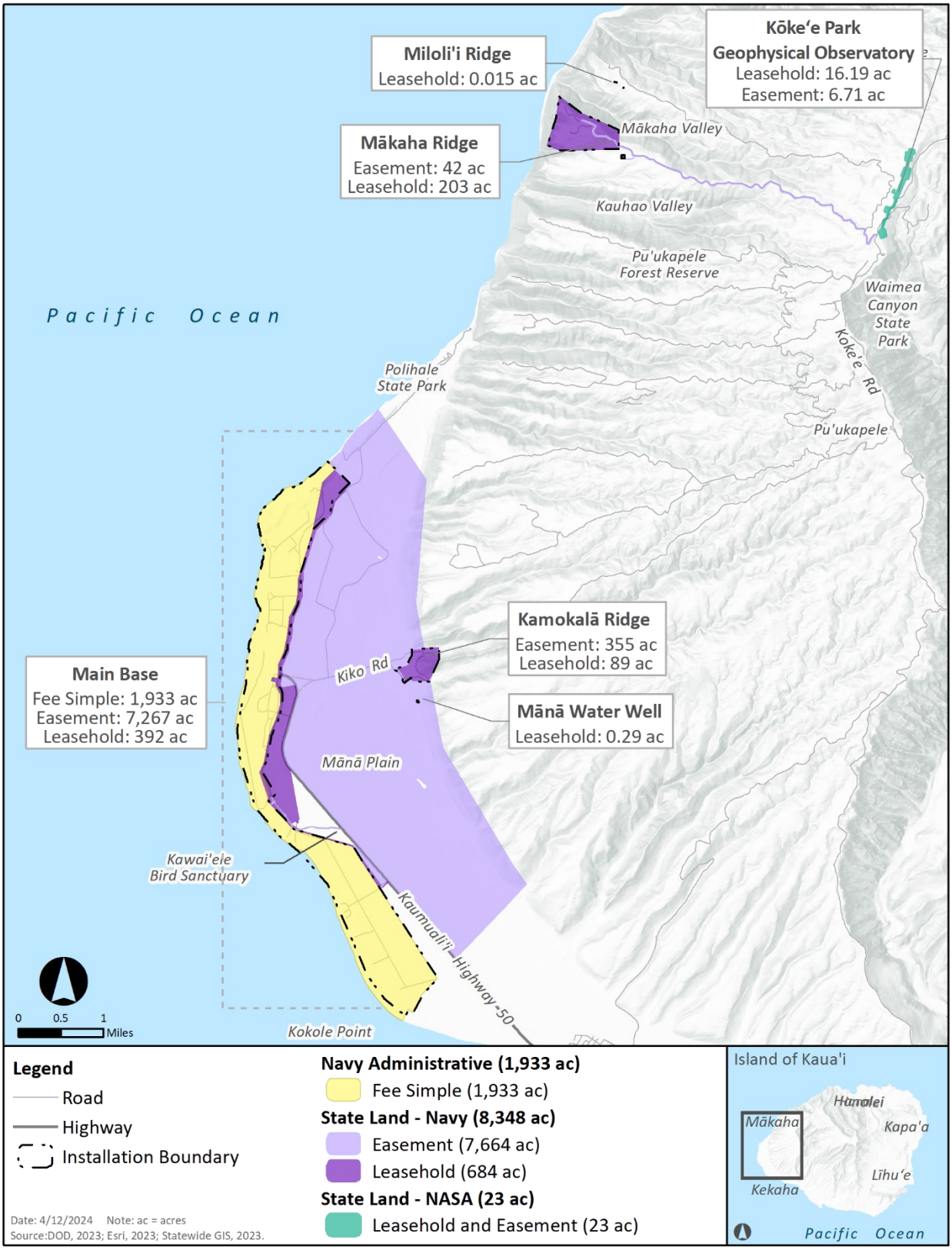

Figure 2-1 Alternative 1: Succeeding Current Real Estate Agreements

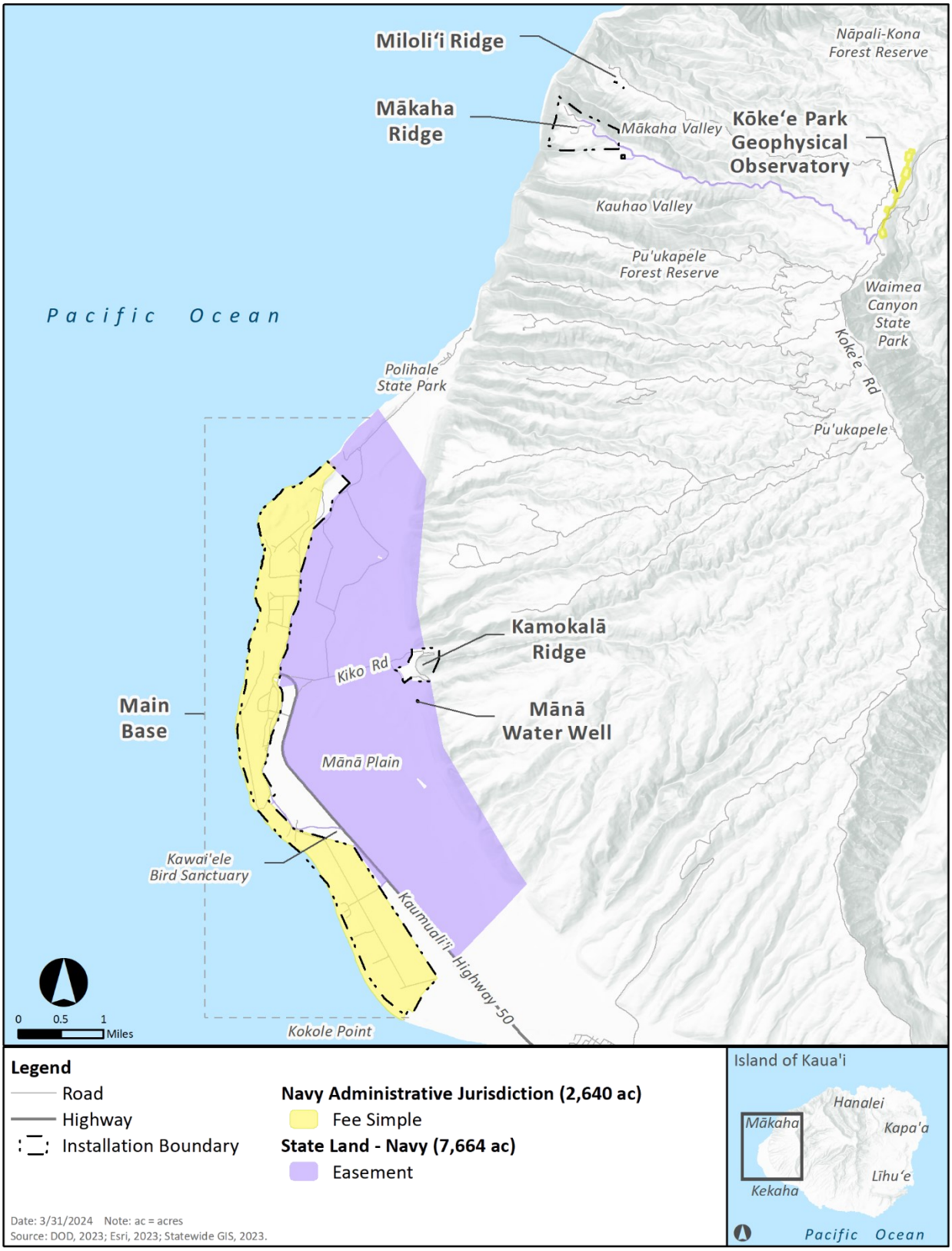

Figure 2-2 Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds

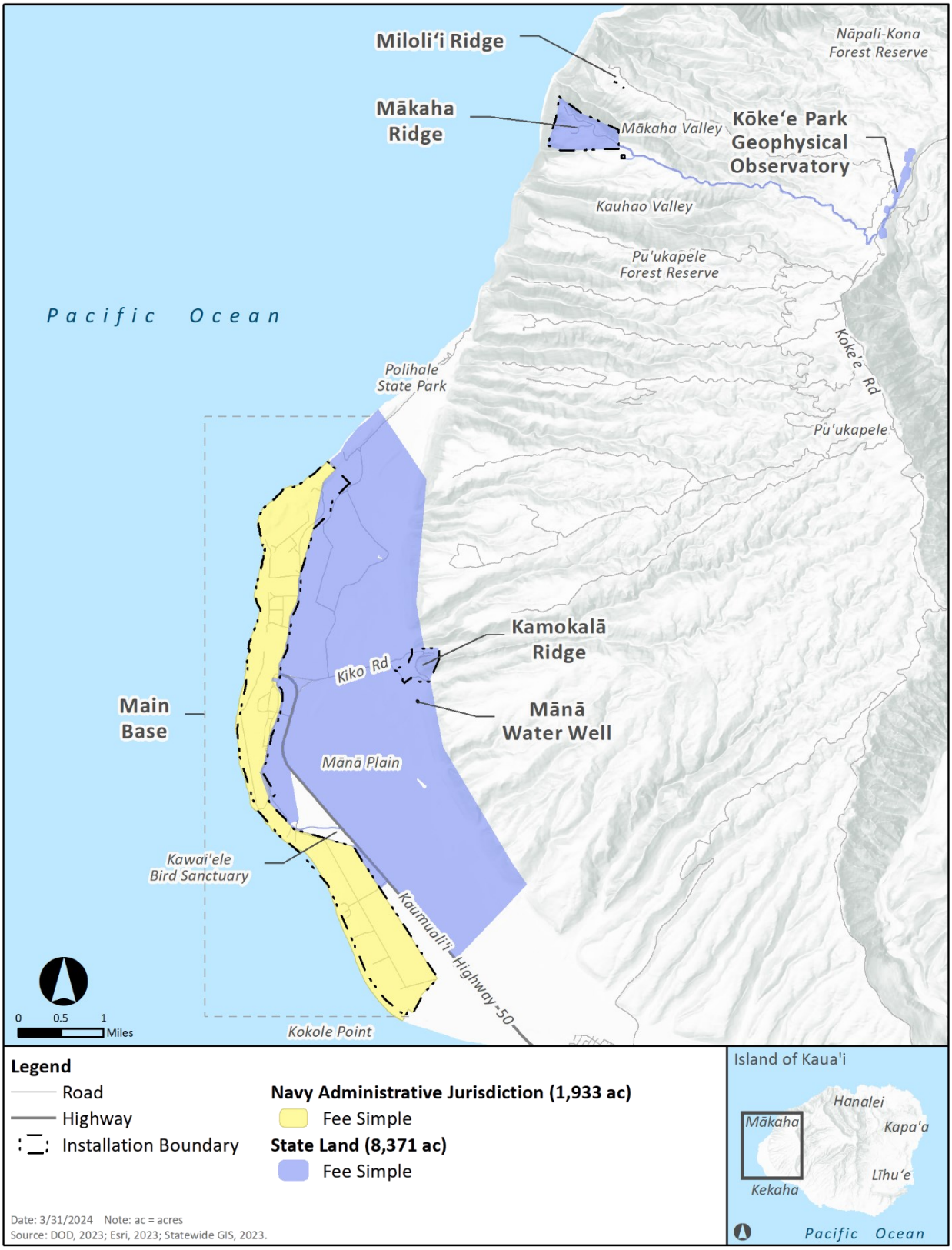

Figure 2-3 Alternative 3: No Action Alternative

Table 2-3 Comparison of Alternatives: Navy and NASA Land Status and Acreages by Location

Location	Existing Conditions/Alternative 1 (acres)				Alternative 2 (acres)				Alternative 3 (acres)			
	Lease-hold	Ease-ment	Fee Simple	Total	Lease-hold	Ease-ment	Fee Simple	Total	Lease-hold	Ease-ment	Fee Simple	Total
Navy												
Main Base	392	7,267	1,933	9,592	NA	7,267	2,325	9,592	NA	NA	1,933	1,933
Kamokalā Ridge	89	355	NA	444	NA	355	89	444	NA	NA	NA	NA
Mānā Water Well	0.29	NA	NA	0.29	NA	NA	0.29	0.29	NA	NA	NA	NA
Miloliʻi Ridge	0.015	NA	NA	0.015	NA	NA	0.015	0.015	NA	NA	NA	NA
Mākaha Ridge	203	42	NA	245	NA	42	203	245	NA	NA	NA	NA
Total	**684**	**7,664[1]**	**1,933**	**10,281**	**NA**	**7,664**	**2,617**	**10,281**	**NA**	**NA**	**1,933**	**1,933**
NASA												
KPGO	16	7	NA	23	NA	NA	23	23	NA	NA	NA	NA
Total	**16**	**7**	**NA**	**23**	**NA**	**NA**	**23**	**23**	**NA**	**NA**	**NA**	**NA**

Note: [1]7,664 acres includes 7,491 acres of Restrictive Use Easements and 173 acres of Utility and Roadway Easements.
Key: KPGO = Kōkeʻe Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; NA = not applicable.

Under Alternative 1, in addition to the operational missions, Navy and NASA natural and cultural resource activities and responsibilities on these lands would continue as currently conducted (see Section 1.3, *Background*). This includes continued Navy funding and managing resource management actions and public use programs (see Section 1.3.6, *Environmental Management and Stewardship*); pursuing Readiness and Environmental Protection Integration (REPI) projects; continuing general natural resource management as identified in the PMRF Integrated Natural Resources Management Plan (INRMP); and continuing cultural resource management as identified in the PMRF Integrated Cultural Resources Management Plan (ICRMP).

Additionally, the Navy and NASA would continue to adhere to applicable federal and state laws as well as policies and regulations applicable to Navy and NASA regarding investigation, removal, and cleanup of hazardous and toxic materials and wastes.

The six locations are shown in Figure 2-4 (Main Base), Figure 2-5 (Kamokalā Ridge and Mānā Water Well), Figure 2-6 (Miloliʻi Ridge), Figure 2-7 (Mākaha Ridge), and Figure 2-8 (KPGO).

2.3.2 Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds

Under this alternative, the Navy and NASA would pursue fee simple acquisition of 700 acres (684 acres for Navy use and 16 acres for NASA use) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1. The new Navy fee simple land of 684 acres would include 392 acres of land at the Main Base, 89 acres at Kamokalā Ridge, 0.29 acre at the Mānā Water Well, 0.015 acre at Miloliʻi Ridge, 203 acres at Mākaha Ridge, and the NASA fee simple land would include 16 acres at KPGO. This acreage would be transferred from ownership by the State of Hawaiʻi to the United States.

This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities. The activities at these sites would continue as currently used (see Section 1.3, *Background* and Section 2.3.1, *Alternative 1: Succeeding Current Real Estate Agreements*). The land would be managed in perpetuity by the Navy and NASA according to federal requirements. Under this alternative, Navy and NASA activities and responsibilities on these lands would continue as currently conducted (see Section 1.3, *Background* and the description above for Section 2.3.1, *Alternative 1: Succeeding Current Real Estate Agreements*). Under this alternative, the Navy would continue to operate at KPGO under the Use Permit with NASA.

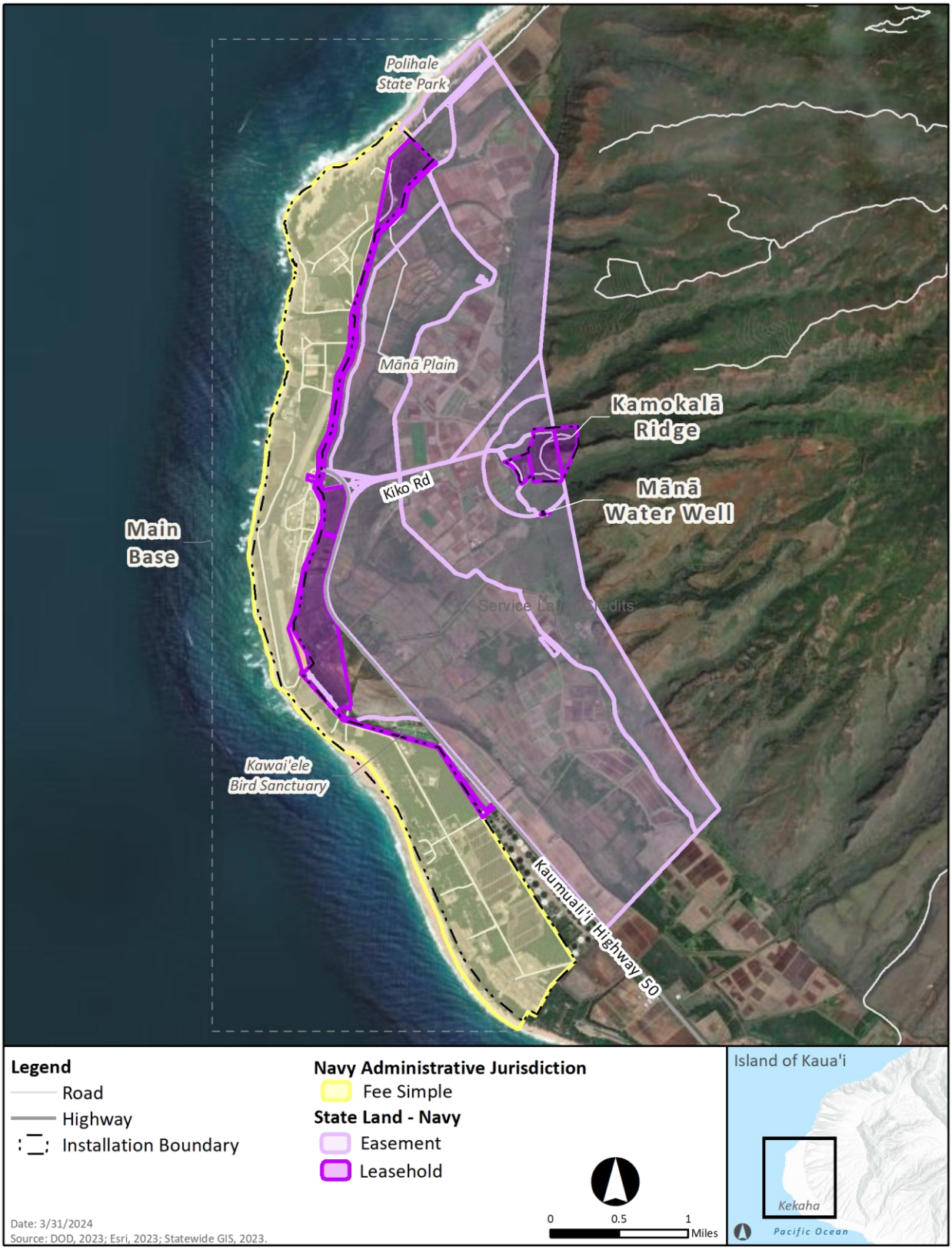

Figure 2-4 Alternative 1: Main Base: Aerial View

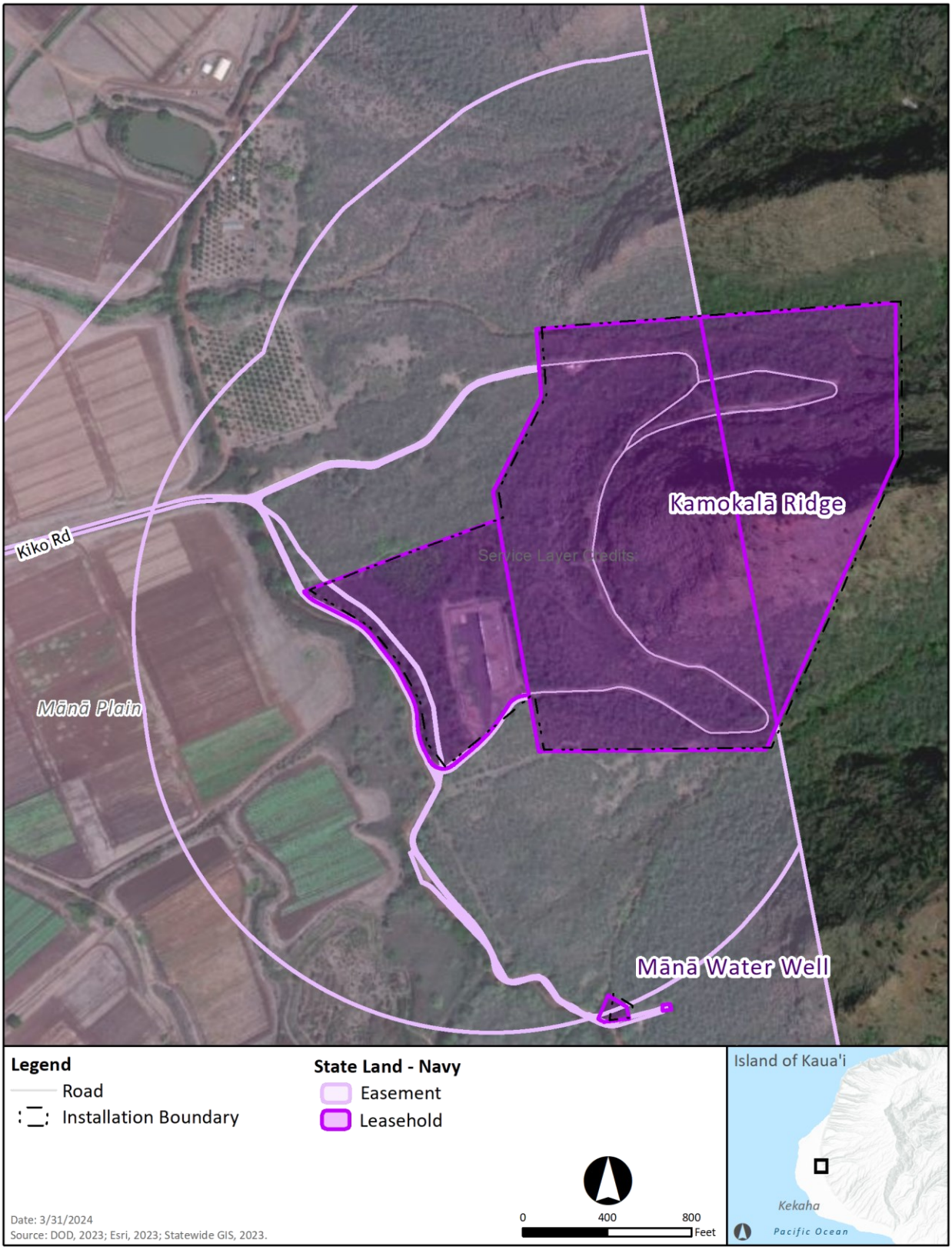

Figure 2-5 Alternative 1: Kamokalā Ridge and Mānā Water Well

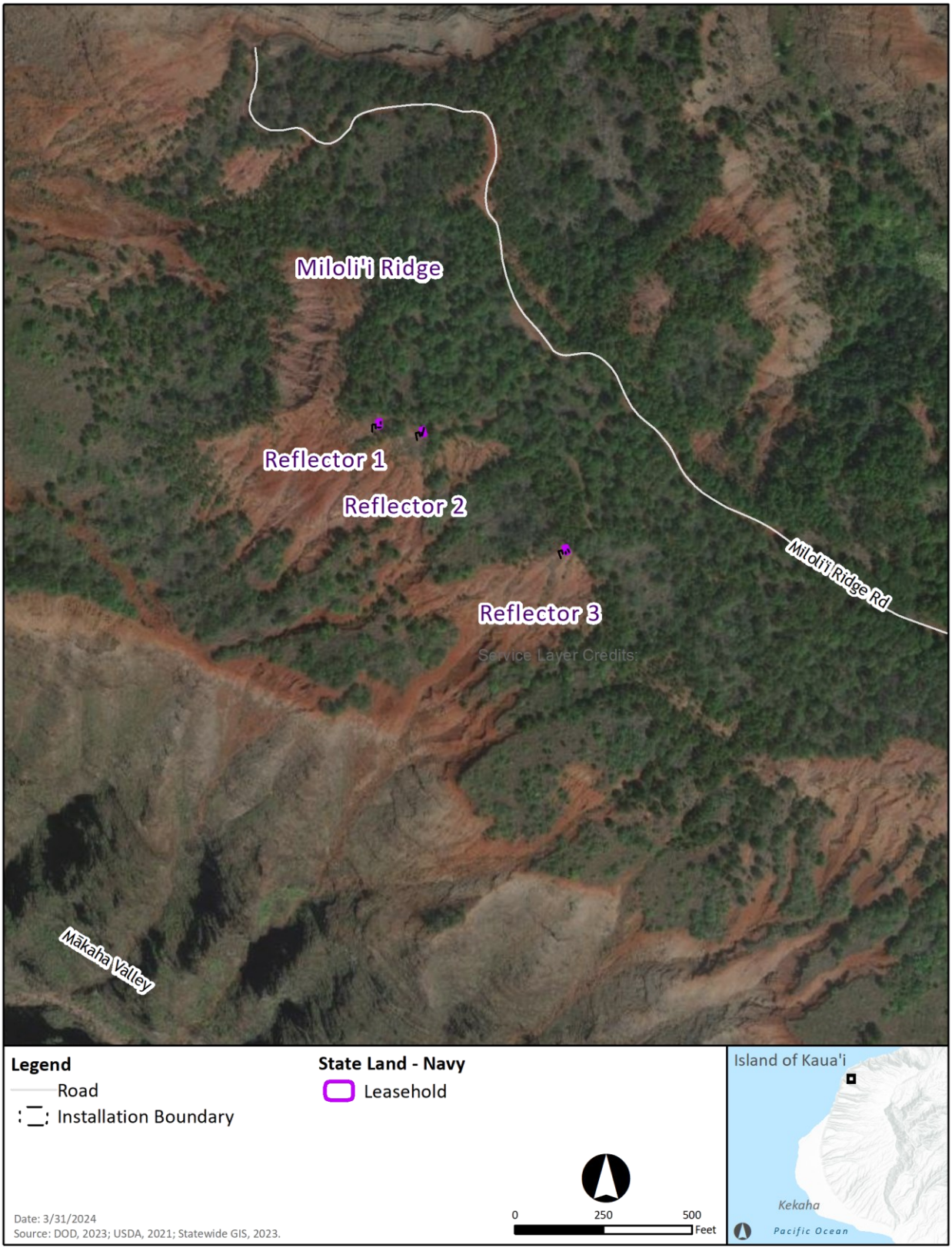

Figure 2-6 Alternative 1: Miloli‘i Ridge

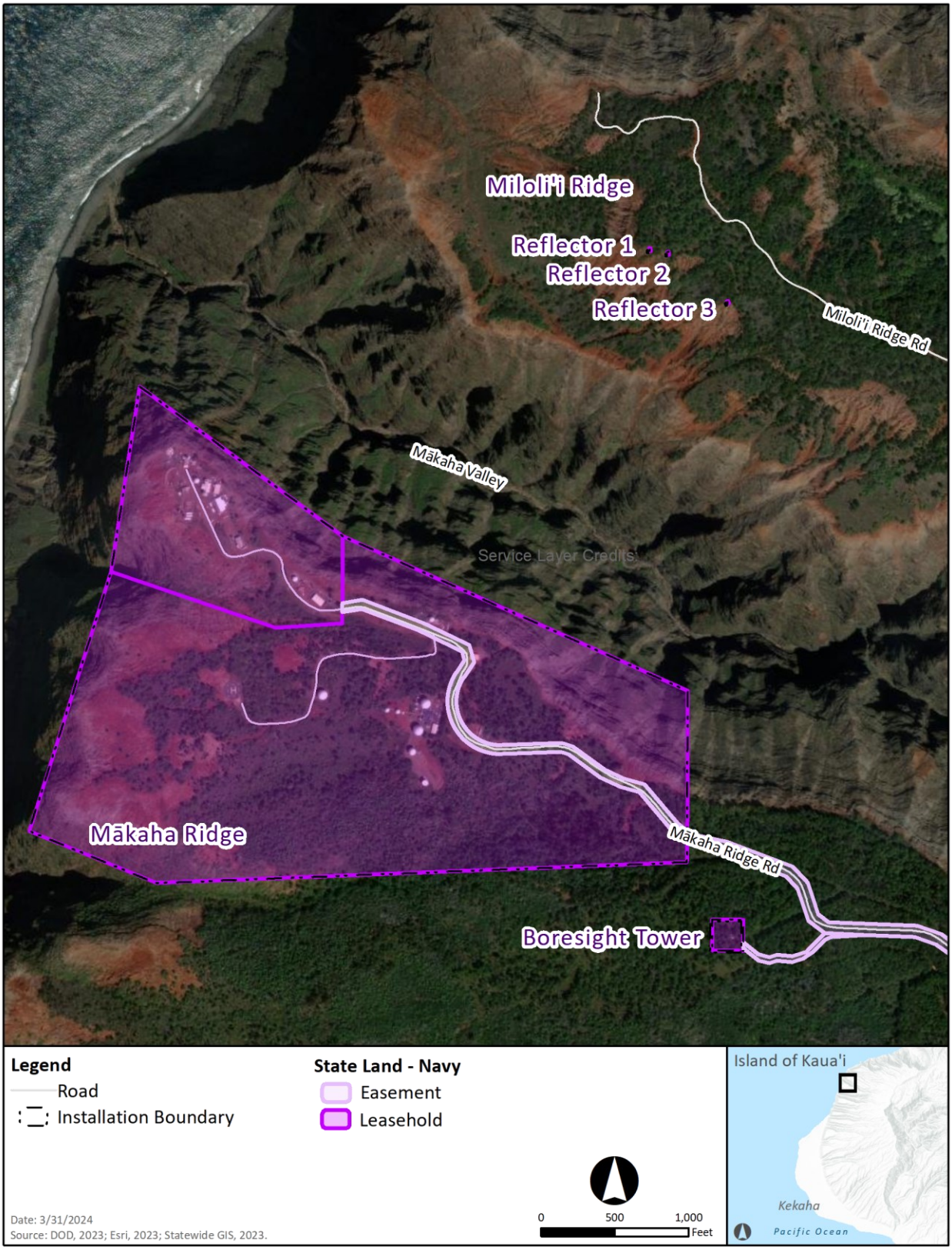

Figure 2-7 Alternative 1: Mākaha Ridge

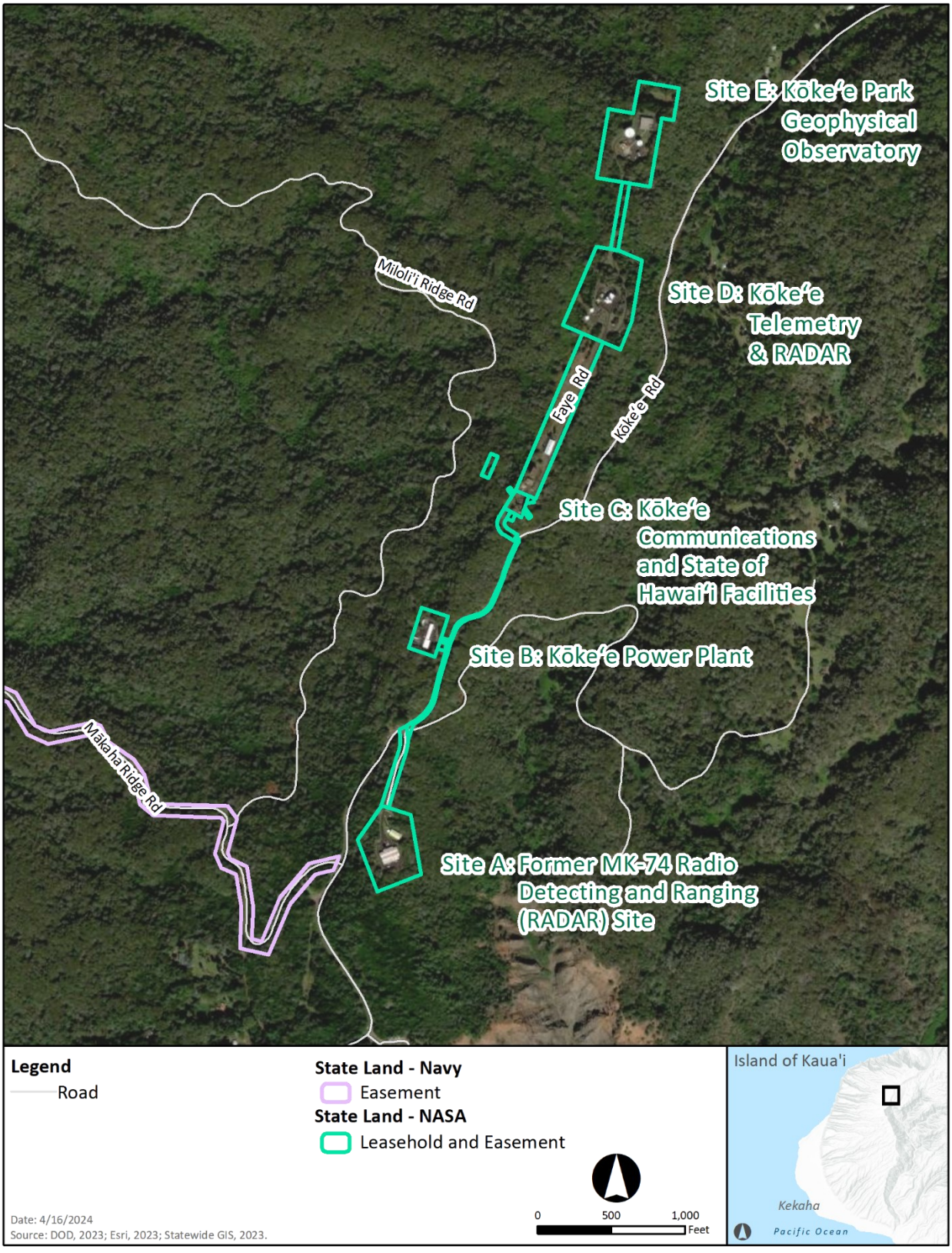

Figure 2-8 Alternative 1: KPGO

By acquiring the leased parcels, this alternative meets the purpose and need of the Proposed Action, secures the long-term Navy and NASA use of State lands near Navy lands on Kaua‘i, and preserves the long-term use of State land for military readiness and continuation of Navy activities, as well as NASA’s current geodetic activities. This alternative also meets all of the screening factors (see Section 2.2, *Alternative Screening Process*). It would result in federal ownership of land that is currently leased from the state, which would allow the Navy to maintain long-term use of DoD land on Kaua‘i, preserve current DoD operations, and retain existing DoD infrastructure. Under this alternative, the Navy and NASA would continue current management of natural and cultural resources on these lands, which are consistent with DLNR’s environmental and conservation programs.

2.3.3 Alternative 3: No Action Alternative

Under the No Action Alternative, the Navy and NASA would not seek any real estate agreements for the State lands on Kaua‘i after expiration of the leases and easements between 2027 to 2030. The current real estate agreements for 8,348 acres with the Navy and 23 acres with NASA would expire. All existing infrastructure would be removed, or abandoned in place, from Navy and NASA leased and easement lands.

Under the No Action Alternative, the Navy would not be able to conduct a substantial portion of training and testing events because of the loss of safety and buffer areas for missile and target launches and access to critical infrastructure necessary to support ongoing operations at PMRF. This includes Mānā Water Well (the primary potable water source for operations at the Main Base), support facilities at Mākaha Ridge, ordnance storage at Kamokalā Ridge, utility infrastructure and roads at the Main Base, secondary and operation access roads to the Main Base and Mākaha Ridge, frequency shift reflectors at Miloli‘i Ridge, utility and drainage easements, and the secondary access gate necessary for ensuring a safe route for ordnance transport to and from the Main Base. The Navy would not be able to calibrate instrumentation and antennas used to ensure safety on the range, resulting in a loss of support to surface, subsurface, air, and space operations. Loss of Navy radar and telemetry systems at KPGO would also limit effectiveness during data collection and could result in safety issues related to tracking on the range. The loss of ordnance storage at Kamokalā Ridge would prohibit the Navy from supporting certain missions at PMRF. The loss at KPGO would impact NASA’s ability to maintain a global network of space geodetic observatories that work together to maintain a stable terrestrial reference system contributing to NASA missions, military and civilian navigation, and the scientific community.

In addition, the environmental management and stewardship currently conducted by Navy and NASA on leased land and by the Navy on easement lands would no longer occur (see Section 1.3.6, *Environmental Management and Stewardship*).

The sections below provide details about the No Action Alternative in relation to state actions and responsibilities, as well as federal actions and responsibilities (DoD and NASA). A more detailed description of impacts by lease and easement from the No Action Alternative are included in Appendix E. The No Action Alternative does not meet the purpose and need (see Section 1.4, *Purpose of and Need for the Proposed Action*). However, the analysis associated with the No Action Alternative is carried forward as required by NEPA and HEPA for comparative purposes.

2.3.3.1 State Actions and Responsibilities

The No Action Alternative would result in the State of Hawai‘i assuming full control and management of the leased and easement lands after expiration of the leases and easements in 2027, 2029, and 2030. This would result in DLNR assuming sole responsibility, including funding, for the natural and cultural resources and public activities that are presently maintained by the Navy on the leased and easement lands.

2.3.3.2 Federal Actions and Responsibilities

Under this alternative, there would be a considerable change in how the Navy uses its fee simple property, and for NASA, its operations at KPGO would cease, severely impacting the SGP. The existing leases and easements impose certain obligations on the Navy and NASA prior to returning the property to the State. These obligations include reforestation, removal of signs, demolition and removal of existing and abandoned structures, and removal of surface weapons used in connection with DoD training activities.

2.3.3.2.1 Navy Actions and Responsibilities

PMRF Training and Testing Mission

Under the No Action Alternative, the Navy would conduct only a portion of its current mission at PMRF. Without succeeding long-term real estate agreements, most of the current training and testing could not occur, resulting in an irreplaceable loss of capabilities that would severely diminish the military value of PMRF and cause severe disruption to the DoD mission and negatively impact national security.

A summary of impacts to the Navy is provided in Table 2-4.

Table 2-4 Impacts to PMRF Training and Testing Mission from the No Action Alternative

Activities	*Impact to Mission from the No Action Alternative*
Missile/Target Launches	The loss of required setback distances and easement areas would substantially reduce essential safety buffer zones required for training and testing missions as well as for preventing incompatible development. Without these setbacks and safety buffer zones, operations at the Main Base could not continue as currently conducted. Only a limited set of aerial targets could potentially be launched without the land needed for safety buffer zones.
Encroachment Planning	The loss of required setback distances and easement areas would eliminate the ability of the Navy to maintain encroachment buffers that help prevent real estate development around the installation incompatible with the PMRF training and testing mission.
Facility Use and Management	The Navy would have no access to critical infrastructure facilities that support operations at Mākaha Ridge (including a guard shack, a Frequency Interference Control Building, Maintenance Facility, Telemetry Building, a boresight tower, telemetry antennas, water tanks, a laboratory, radar sites, communications, a power plant, antennas, and a helicopter pad), ordnance storage at Kamokalā Ridge, 22 buildings with utility infrastructure and roads at the Main Base, secondary and operation access roads to the Main Base, access roads to Mākaha Ridge, and frequency shift reflectors at Miloli‘i Ridge, as well as utility and drainage easements. This alternative would also result in the loss of the Navy’s environmental management and stewardship programs described in Section 1.3.5, *Environmental Management and Stewardship*.

Activities	*Impact to Mission from the No Action Alternative*
Flood Protection	Loss of drainage easements could impact range and daily operations until drainage management is established to prevent flooding of adjacent agricultural lands.
Support Facilities and Utilities Transmission	Buildings at the Main Base located on leased lands are strategically located and cannot be moved; therefore, the loss of these buildings and the utility easements that support them would result in losing the ability to conduct missions at PMRF associated with this infrastructure. Loss of utility easements would impact all range and daily operations unless new utility connections could be established.
Potable Water	Loss of access to the Mānā Water Well would result in severe impacts to daily operations as it is the primary source of all potable water for PMRF. Without access to a steady, reliable source of potable water, there would be effects on overall living conditions and PMRF would not have water for a myriad of operations, such as for supply chillers and fire suppression.
Instrumentation	With the loss of Mākaha Ridge, most of the training and testing operations would cease since there would be an inability to calibrate instrumentation and antennas, which would limit effectiveness during data collection and could result in safety issues related to tracking on the range. This would result in a loss of support to surface, subsurface, air, and space operations. Loss of frequency shift reflectors at Miloli'i Ridge would result in the inability to calibrate instrumentation and antennas, which would limit effectiveness during data collection and could result in safety issues related to tracking on the range. Loss of radar and telemetry systems at KPGO would also limit effectiveness during data collection and could result in safety issues related to tracking on the range.
Ordnance Storage/ Management	With the loss of ordnance storage at Kamokalā Ridge, the base would not be able to meet explosive safety storage requirements and could not support certain missions at PMRF. Without storage, the missile assembly building could not be used since there would be no safe place to store the assembled munitions.
Access	Loss of access roads at the Main Base located on State land would result in impacts to operations, since the secondary access gate is utilized by personnel during peak commute times and is used as a primary access point when the primary access gate is closed. The loss of the ordnance gate would result in shifting of ordnance transport through the primary gate, which could result in impacts to safety and would limit access to and from the base during times when ordnance is being transported.
Power	Loss of Site B, which includes the back-up plant diesel generator for Sites A, C, D, and E, would impact the source of reliable power when systems at KPGO are supporting range operations.

Key: KPGO = Kōke'e Park Geophysical Observatory; PMRF = Pacific Missile Range Facility.

Navy Environmental Management and Stewardship

Under the No Action Alternative, environmental management and stewardship activities conducted by the Navy on lease and easement lands would cease. These activities include, but are not limited to, REPI projects, implementation of the PMRF INRMP and PMRF ICRMP, as well as the Agricultural Preservation Initiative.

2.3.3.2.2 NASA Actions and Responsibilities

Under the No Action Alternative, NASA would lose access to Sites A through E at KPGO. Without succeeding long-term real estate agreements, all of NASA's current activities at KPGO would cease. This would result in a loss of capabilities to the larger SGP which includes a global network of interconnected

instruments that are the foundation for Earth observations and georeferenced data used by virtually all of society. A summary of impacts to the NASA mission from this alternative is provided in Table 2-5.

Table 2-5 Impacts to NASA Activities from the No Action Alternative

NASA Activities	*Impact to NASA Activities from the No Action Alternative*
Space Geodesy Project	Without use of KPGO Sites A through E, NASA would lose its northern Pacific VLBI and DORIS stations, and two GNSS stations, substantially reducing the capability of NASA's global SGP to support the following: spacecraft tracking; as well as military and civilian terrestrial, airborne, and maritime navigation; and the scientific disciplines that rely on the data produced at KPGO.

Key: DORIS = Doppler Orbitography and Radio-positioning Integrated by Satellite; GNSS = Global Navigation Satellite System; KPGO = Kōkeʻe Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; SGP = Space Geodesy Project; VLBI = Very Long Baseline Interferometry.

The loss at KPGO would impact NASA's ability to maintain a global network of space geodetic observatories that work together to maintain a stable terrestrial reference system which provides the foundation for virtually all other Earth observations and georeferenced data used by society. It is fundamental for spacecraft tracking, as well as terrestrial, airborne, and maritime navigation. The scientific disciplines that rely on these data include areas of study such as sea level changes, earthquake early warning systems, volcano deformation, flooding patterns, and glacier dynamics. This loss would impact NASA missions, military and civilian navigation, the scientific community, and society overall.

The No Action Alternative would not meet the purpose of and need for the Proposed Action; however, as required by NEPA and HEPA, this alternative is carried forward for analysis in the Draft EIS. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action and will serve to establish a comparative baseline for analysis.

2.4 Alternatives Considered but Not Carried Forward for Detailed Analysis

As part of the alternative identification process, agencies are required to describe the alternatives considered but eliminated from detailed analysis and to provide a brief discussion of the rationale for not studying the alternative in detail. The following alternatives were considered but not carried forward for detailed analysis because they do not meet the purpose and need for the Proposed Action.

2.4.1 Succeeding Leases and Easements Except Current Leases at Mākaha Ridge and KPGO are Not Renewed

Under this alternative, the Navy would obtain succeeding leases and easements on leased land not currently located in the State of Hawaiʻi's Conservation District, except for leases at Polihale State Park. These would include leases at the Main Base, Kamokalā Ridge, Mānā Water Well, and Miloliʻi Ridge, but would not include succeeding leases or easements at Mākaha Ridge or KPGO. Under this alternative, the Navy would not have access to the secondary missile tracking and surveillance station. Without this secondary operations area, the Navy could not conduct radar tracking, telemetry receiving/recording, frequency monitoring, or target control and would lose access to the land with the buildings and facilities located there. Without leaseholds at KPGO, NASA operations, including support of navigation systems and spacecraft tracking, would cease. This alternative does not meet screening factors (1) maintain long-term use of land currently used to support DoD and NASA missions on Kauaʻi, (2) preserve

current DoD and NASA operations on Kaua‘i, and (3) retain existing DoD and NASA infrastructure on Kaua‘i.

2.4.2 Succeeding Leases Only (Current Easements are Not Renewed)

Under this alternative, the Navy and NASA would only obtain succeeding lease agreements and not succeeding easements. These would include succeeding leases at the Main Base, Kamokalā Ridge, Mānā Water Well, Miloli‘i Ridge, Mākaha Ridge, and KPGO, but not easements at the Main Base, Kamokalā Ridge, Mākaha Ridge, and KPGO. Without succeeding easements, the Navy would lose required setback distances that provide essential safety buffer zones required for training and test missions, access roads, and utility easements. Without access to or use of the roads, the Navy would not be able to access the leaseholds located at Kamokalā Ridge, Mānā Water Well, or Mākaha Ridge. Additionally, the Navy would not be able to continue environmental management or stewardship programs. This alternative does not meet screening factors (1) maintain long-term use of land currently used to support DoD and NASA missions on Kaua‘i, (2) preserve current DoD operations, (3) retain existing DoD infrastructure, and (4) support DLNR management of public lands and associated environmental and conservation programs. Under this alternative, NASA could also not continue its mission.

2.5 Best Management Practices

BMPs are policies, practices, and measures the Navy uses to reduce the environmental impacts of designated activities, functions, or processes. Although these actions mitigate potential impacts by avoiding, minimizing, or reducing/eliminating impacts, they are distinguished from potential mitigation measures because these actions are (1) existing requirements for the Proposed Action; (2) on-going, regularly occurring practices; or (3) not unique to this Proposed Action. More specifically, these conservation measures are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the environmental review or approval process for the Proposed Action.

Table 2-6 lists currently used PMRF and KPGO BMPs which include Standard Operating Procedures (SOPs) from the ICRMP and resource management strategies from the INRMP, as well as those established by the applicable regulations, policy, and other installation SOPs. Proposed mitigation measures to minimize the impacts of the Proposed Action will be discussed in the Draft EIS. Under the No Action Alternative, the Navy and NASA would not continue the BMPs and management strategies listed in Table 2-6 on leaseholds and easement lands.

NASA’s contractor operates KPGO (Site E) in accordance with the Environmental Management Plan under the Space Exploration Network Services and Evolution contract. Implementation of the Environmental Management Plan includes the following steps: implementation of the plan; evaluation, checking, and corrective action; environmental planning and impact process (see Table 2-6); water management; air quality management; and waste management.

Table 2-6 PMRF and KPGO Best Management Practices and Resource Management Strategies

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
PMRF – Cultural Resources Management (CRM)[1]			
CRM-1	Impacts to historic properties	ICRMP SOP # 1: NHPA Section 110 Compliance. The Navy has an ongoing management responsibility to identify, preserve, and protect the significant cultural resources at PMRF. Section 110 mandates agencies to assume responsibility for the preservation of historic properties under their jurisdiction and, to the maximum extent feasible, use historic properties available to the agency.	Ongoing and future activities.
CRM-2	Impacts to historic properties	ICRMP SOP #2: Coordination with Natural Resources Management. DoD Instructions 4715.03 and 4715.16 and Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1E require that cultural resources management programs be integrated with natural resources programs. This coordination is meant to make certain, to the maximum extent feasible, that the Navy complies with all applicable Executive Orders and federal natural and cultural resources statutory and regulatory requirements. The PMRF CRM is responsible for the coordination of cultural and natural resources at PMRF and conducting NHPA Section 106 reviews in conjunction with NEPA reviews and Section 7 of the ESA. SOP #2 of the ICRMP describes this process at PMRF.	Ongoing and future activities.
CRM-3	Impacts to historic properties	ICRMP SOP #3: Cultural Resources Data Management. The Navy maintains an effective data management system to facilitate compliance with Sections 106 and 110 of the NHPA as well as NEPA and requirements for curating federally owned and administered archaeological collections (36 CFR Part 79). SOP #3 of the ICRMP describes the Cultural Resources Data Management program at PMRF.	Ongoing and future activities.
CRM-4	Impacts to historic properties	ICRMP SOP #4: NHPA Section 106 Compliance. Section 106 of the NHPA is a process designed to ensure that historic properties are taken into account during the planning and execution of federal undertakings. SOP #4 describes the integration of the Section 106 process of the NHPA, implemented by regulations of the ACHP (36 CFR Part 800), as well as ARPA and the provisions of the Commander, Navy Region Hawai‘i (CNRH) PA for Navy undertakings in Hawai‘i that is followed at PMRF.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-5	Impacts to historic properties	ICRMP SOP #5: ARPA Compliance. Per this Act, it is a federal offense to excavate, remove, damage, alter, or otherwise deface archaeological resources on federal lands without authorization. The sale, purchase, exchange, transport, or receipt of archaeological resources obtained in violation of this law also is a federal offense. SOP #5 of the ICRMP describes the enforcement of ARPA at PMRF.	Ongoing and future activities.
CRM-6	Impacts to historic properties and traditional Hawaiian cultural resources	ICRMP SOP #6: Native Hawaiian Consultation. Consultation is mandated by federal laws, including the NHPA, American Indian Religious Freedom Act, NAGPRA, and ARPA. Consultation is also mandated by the MOA among the U.S. Navy, PMRF, Hawai‘i SHPO, and ACHP regarding activities proposed within the 1998 PMRF Enhanced Capacity Final EIS, DoD Directive 4710.03, and CNRH PA. SECNAVINST 4000.35A also specifies that appropriate consultation will be initiated with Native Hawaiians “whenever the [Navy] conducts or supports undertakings that may affect any National Register resource, whether [Navy]-managed or not.” SOP #6 describes this process at PMRF.	Ongoing and future activities.
CRM-7	Cultural resource protection	ICRMP SOP #7: Management of Historic Properties. In cases in which Navy undertakings will have effects or adverse effects on cultural resources, the PMRF CRM will activate the Section 106 consultation process with the Hawai‘i SHPO and the ACHP. If the project, however, meets The Secretary of the Interior’s Standards for the Treatment of Historic Properties, including preserving, rehabilitating, restoring, and reconstructing historic buildings, the undertaking may be determined to be exempt from the full Section 106 consultation process. The PMRF CRM must consult with CNRH, the Hawai‘i SHPO, ACHP, and Native Hawaiian organizations regarding any effects to historic properties as a result of base activities, and shall also refer to, and comply with, existing MOAs, PAs, and The Secretary of the Interior’s Standards for the Treatment of Historic Properties.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-8	Cultural resource protection	ICRMP SOP # 8: Monitoring During Construction and/or Ground-Disturbing Activities. Archaeological monitoring will be conducted during construction and/or ground-disturbing activities within areas of potential effect identified as archaeologically sensitive areas. The primary responsibility for carrying out this BMP lies with on-site managers of the undertaking, professional archaeological monitors, the PMRF CRM, and the Navy Region Hawai'i Historic Preservation Officer. SOP #8 of the ICRMP describes this process, and a copy of the SOP should be provided to all on-site managers and supervisors who are carrying out work in archaeologically sensitive areas.	Ongoing and future activities.
CRM-9	Cultural resource protection	ICRMP SOP# 9: Inadvertent Discovery of Archaeological Remains. Inadvertent discovery refers to the unintentional discovery of archaeological resources during the course of operations at PMRF. On-site managers of undertakings, the PMRF CRM, and the Navy Region Hawai'i Historic Preservation Officer are responsible for planning for subsequent discoveries through PAs pursuant to 36 CFR Part 800, Section 800.14(b) (agency program alternatives) or other agreement documents when a survey indicates that historic properties are likely to be discovered during implementation of an undertaking. PMRF shall make reasonable efforts to avoid, minimize, or mitigate adverse effects to such properties until a mitigation plan is carried out. SOP #9 of the ICRMP describes this process, and a copy of the SOP should be provided to all on-site managers and supervisors who are carrying out work that could result in inadvertent discovery of remains.	Ongoing and future activities.
CRM-10	Cultural resource protection	ICRMP SOP #10: Inadvertent Discovery of Human Remains. Inadvertent discovery refers to the unintentional discovery of human remains during the course of operations at PMRF. In 2011, the Navy and Na Ohana Papa o Mana executed a NAGPRA CA to address all federal agency land management activities that could result on the intentional excavation or inadvertent discovery of NAGPRA items. The CA documents the process for carrying out the requirements of 43 CFR 10, Subpart B for standard consultation procedures, determination of custody, treatment, and disposition of NAGPRA items. SOP #10 of the ICRMP describes this process, and a copy of the SOP should be provided to all on-site managers and supervisors who are carrying out work that could result in inadvertent discovery of human remains.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-11	Cultural resource protection	ICRMP SOP #11: Curation. The Navy's cultural resources responsibilities include providing for the curation of artifact collections and historical documents recovered from agency-owned or -leased property as required under 36 CFR Part 79, 36 CFR Part 1220, and 36 CFR Part 1228, as well as SECNAVINST 4000.35A and OPNAVINST 5090.1E.	Ongoing and future activities.
CRM-12	Cultural resource protection	ICRMP SOP #12: Use of Historic Properties. In accordance with Section 110 of the NHPA and SECNAVIST 4000.35A, the Navy should use available historic buildings to the maximum extent feasible (while preserving their historic character and function) prior to new construction, lease, or the acquisition of buildings used to carry out its responsibilities as long as reuse does not conflict with the mission of the Navy. SOP #12 of the ICRMP provides uniform guidelines for PMRF staff and tenants/users when planning projects that involve demolition, removal, or replacement of a historic building or structure that is listed, or is eligible for listing, in the NRHP, or has not been evaluated for eligibility.	Ongoing and future activities.
CRM-13	Cultural resource protection	ICRMP SOP #13: Historic Asset Management Process. The HAMP is a project planning tool that provides access to information and a standard method to support compliance with the NHPA and NEPA. Once a proponent identifies project requirements, the HAMP tools guide the proponent through steps to identify project alternatives that will have the least effect on built-environment historic properties, including reuse/rehabilitation, new construction, or demolition footprint reduction.	Ongoing and future activities.
CRM-14	Cultural resource protection	ICRMP SOP #14: Emergency Situations. Provides guidelines in the event of (1) emergencies involving imminent threat to national security, to life or property, or a declaration of a natural disaster, and (2) damage to sites from natural actions such as erosion.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-15	Cultural resource protection	ICRMP SOP #15: Public Involvement and Outreach. The PMRF CRM routinely coordinates with CNRH and the Hawai'i SHPO on cultural resources management issues. Additionally, DoD Instruction 4715.16 states, "all installations with cultural resources will have a public outreach program." PMRF has an active and robust public outreach program, ranging from educational programs to facilitating public access to culturally important sites. Outreach visitors and participants have included, and will continue to include, local residents and Hawaiian descendants, plantation, and military community members; Native Hawaiian organizations; congressional delegations; officials from DoD and the Missile Defense Agency, as well as state and county officials; and local school groups and a myriad of nongovernmental organizations.	Ongoing and future activities.
CRM-16	Cultural resource protection	ICRMP SOP #16: Public and Cultural Access. SOP #16 provides guidelines and procedures for responding to requests for public access and for cultural access to individuals and organizations, including any Native Hawaiian organization that attaches cultural significance to historic properties on PMRF.	Ongoing and future activities.
CRM-17	Cultural resource protection	ICRMP SOP #17: Permits, Leases, and Contracts. SOP #17 provides standardized ARPA statements for inclusion in permits, leases, contracts, or other legal agreements between CNRH and other military branches, government agencies, individuals, businesses, or organizations. It is based on ARPA and OPNAVINST 5090.1E. The primary responsibility for implementing this SOP lies with real estate, contracting, and legal staff preparing permits, leases, contracts, or other legal agreements	The Proposed Action and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
PMRF – Natural Resources[2]			
Soil management	Impacts to soils	• Conduct general monitoring for coastal dune habitat and soil compaction issues annually to prevent and minimize the potential for soil degradation. • Mitigate and prevent soil erosion of coastal dune habitat by outplanting, establishing, and monitoring native dune building plants in areas identified as having erosion issues. • Implement additional security measures such as increased signage and roping off specific areas to alleviate undue pressures from off-road vehicle presence, especially in Nohili Dune areas. • Maintain Mākaha Ridge ungulate exclusion fencing for erosion control. • Outplant native, drought tolerant plants in areas identified as having erosion and soil compaction issues. Ensure that a regular monitoring schedule and a sufficient irrigation system are in place until plants are well established.	Ongoing and future activities.
Designated critical habitat	Impacts to designated critical habitat for panicgrass	• Work to improve protection, habitat, and/or consider outplanting Ni‘ihau panicgrass. • Protections will be aimed at preventing unauthorized off-road vehicle use, and invasive plant removal and to demonstrate benefit to the species. • Outplant native species and remove invasive species in areas with suitable Ni‘ihau panicgrass habitat and ensure an irrigation system is in place until plants become well established. • Consider undergoing the approval process to outplant the endangered *Panicum niihauense* in the effort to remove or reduce amount of PMRF property designated as critical habitat for the species. Coordinate with federal and state partners to secure material for outplanting if pursued.	Ongoing and future activities. Construction.
Hawaiian picture-wing fly management	Impacts to Hawaiian picture-wing flies	• Conduct surveys every 5 years to assess presence/absence of endangered Hawaiian picture-wing fly species at and directly adjacent to KPGO. • Conduct invasive plant removals annually in areas near known Hawaiian picture-wing fly habitat to promote native tree health and propagation and reduce introductions of invasive species into adjacent habitat due to Navy operations.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Marine nearshore management	Impacts to nearshore environments	• Establish a monitoring program for the nearshore environment of PMRF to inform future management decisions and monitor changes over time. • Partner with DLNR Division of Aquatic Resources (DAR) to incorporate regular monitoring site(s) in PMRF's nearshore waters into the state's regular monitoring schedule, as feasible.	Ongoing and future activities.
Monk seal management	Impacts to Hawaiian monk seals	• Continue to ensure that Security reports sightings of monk seals during daily patrols at PMRF beaches and erects signage and barricades if observed where people frequent. • Continue to report observations of hauled-out Hawaiian Monk Seals to NOAA as soon as possible and provide high-quality photos to assess seal health, identification, and aid in population abundance monitoring. • Conduct regular surveys approximately 5 times per week on beaches near the Nohili Ditch outfall and Diver's Landing for monk seal presence, and all other beaches approximately twice per week. • Continue to conduct surveys through partnership with NOAA Fisheries for Hawaiian Monk Seals on Niʻihau.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Sea turtle management	Impacts to sea turtles	• Continue to partner with Security in ensuring daily patrols of PMRF's beaches for sea turtles to collect observational data and check for stranded, injured, or entangled turtles. • Conduct surveys by biologists approximately 5 times per week on beaches near the Nohili Ditch outfall and Diver's Landing for sea turtle presence and ensure that marine surveys in nearshore areas quantify sea turtles and potential foraging or resting habitat. • Continue to survey beaches for sea turtle nesting activity during the nesting season, protect all nests observed with ropes and signage, mitigate light attraction issues on beaches, and coordinate with DAR to excavate nests. • Continue to encourage good communication between Security and natural resources staff regarding sea turtle activity on PMRF beaches to reduce negative impacts to the species from Security beach patrol vehicles. • Develop and use USFWS-approved outreach, educational materials, and signage with the objective to educate and provide information to residents, recreational users, visitors, and staff about proper procedures and acceptable activities within sea turtle habitat and how to act when coming in contact with sea turtles.	Ongoing and future operations.
Marine mammal management	Impacts to marine mammals	• Continue to report all observations of marine mammal strandings or deaths to NMFS and assist in response efforts. • Range users continue to adhere to protective measures for all training and testing per requirements under *Hawaii-Southern California Training and Testing Final EIS/OEIS* authorizations.	Ongoing and future operations.
Ungulate management	Impacts to natural resources habitats ESA terrestrial species	• Maintain efficacy of ungulate-proof fence at Mākaha Ridge. • Conduct regular monitoring for ungulates inside the fence, as well as vulnerable areas along the fence. • Maintain Mākaha Ridge fence for erosion control.	Ongoing and future operations.
Predator management	Impacts to MBTA species and Laysan albatross	• Continue base-wide predator control to protect MBTA-listed species including Laysan albatross; monitor for pigs, dogs, and cats in known breeding areas prior to the albatross breeding season and increase control efforts as needed.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Predator management	Impacts to monk seals	• Continue base-wide predator control to remove feral cats and collaborate with partners on studies regarding toxoplasmosis at PMRF to inform these efforts; conduct outreach about the disease and its effects on wildlife and human health.	Ongoing and future operations.
Predator management	Impacts to natural resources	• Work with the PMRF Archery Club to control ungulate populations at the Kamokalā Ridge site by implementing trapping and baiting stations if the animals become a nuisance to Navy operations or pose a risk to protected species. • Conduct observations to identify feral cats at Kamokalā Ridge and consider expanding cat trapping if use is consistent or becomes a nuisance.	Ongoing and future operations.
Wildland fire management	Impacts to natural resources	• Remove deadfall (woody debris) in high-risk areas including near the Barking Sands missile launch site and the Kamokalā Ridge Magazines and replant with native, low fire risk species.	Ongoing and future operations.
Wildland fire management	Impacts to natural and cultural resources	• Coordinate with the PMRF Fire Department on developing updates to the existing Fire Management Plan.	Ongoing and future operations.
Nēnē management	Impacts to nēnē	• Coordinate with USFWS, DOFAW, PMRF Air Ops, and PMRF Public Works to annually review and update the PMRF Nēnē Management Plan. • Work with PMRF Air Ops and USDA-WS to insure nēnē hazing efforts are increased prior to and during the breeding season with the possibility of including weekends, especially if a nēnē pair has been regularly observed on or near the airfield. • Collaborate with DOFAW to have all nēnē that hatch at PMRF banded and pursue permission and permits for PMRF natural resources staff to band birds if allowable.	Ongoing and future operations.
Nēnē management	Impacts to nēnē	• Continue to conduct regular, standardized surveys for nēnē at PMRF Barking Sands, Mākaha Ridge, and KPGO sites to effectively detect nēnē nests and inform management and determine habitat types that attract the species.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Nēnē management	Impacts to nēnē	• Continue to communicate with facilities maintenance personnel about nēnē nest locations and collaborate to develop effective protective measures for the species and ensure that no vegetation removal or other persistent disturbances occur within 100 feet of nest sites and goslings to reduce risk of take. • Support regular outreach to PMRF visitors and personnel on the importance of not providing food and water to nēnē and develop outreach material aimed at increasing awareness of the species.	Ongoing and future operations.
Nēnē management	Impacts to nēnē	• For all new construction at Barking Sands, including construction for tenant or customer DoD commands or other federal agencies, concrete, asphalt, gravel, xeriscaping, or native vegetation that does not act as a nēnē attractant, rather than lawn, will be installed in open areas surrounding buildings and parking areas to decrease attraction of nēnē.	Construction.
Waterbird risk management	Impacts to waterbirds, public health, and safety	• Continue to coordinate closely with Facilities Maintenance regarding restrictions on vegetation removal practices within a 100-foot radius of waterbirds or their nests. • Discourage waterbird presence and nesting at the oxidation pond complex by maintaining vegetation at a height of less than 6 inches and by funding the installation of exclusionary measures. • Continue to coordinate with Facilities Maintenance to obtain environmental data on the oxidation pond regularly to better inform causes of avian botulism outbreaks and identify high-risk conditions that require management actions. • Coordinate with Public Works to develop oxidation pond flushing protocols in response to avian botulism outbreaks or high-risk conditions. • Coordinate with Facilities Maintenance on all oxidation pond complex construction and restoration plans. • Supplement ongoing water quality testing to detect particulates and soluble chemicals in waters at PMRF. Testing should be conducted at least quarterly.	Ongoing and future operations.
Waterbird risk management	Impacts to waterbirds	• Replace and improve waterbird crossing signage at PMRF as needed to reduce risk of vehicle strikes, evaluate efficacy of signs, and explore new tools to reduce vehicle strikes.	Ongoing and future activities.
Waterbird Risk management	Impacts to waterbirds	• Continue to conduct regular monitoring for Hawaiian waterbird species at Barking Sands to effectively detect and reduce impacts to nests.	Ongoing and future activities.

Best Management Practice	***Impacts Reduced/Avoided***	***Description of Best Management Practices and Management Strategies***	***Applicability***
MBTA management	Impacts to MBTA species	• Continue to incorporate monitoring of shorebirds, cattle egrets (*Bubulcus ibis*), and black-crowned night herons (*Nycticorax nycticorax*) at wetland sites. Record opportunistic observations of barn owls (*Tyto alba*) and pueo (*Asio flammeus sandwichensis*) at all other areas of base to inform control measures for non-native species and protective measures for native species. • Keep track of non-native songbird species at PMRF and their numbers by participating in the annual Audubon Christmas Bird Count.	Ongoing and future activities.
MBTA management	Impacts to MBTA species	• Continue to advise development projects at PMRF that have potential to negatively impact native MBTA species and their habitat on how to avoid impacts. • Advise development projects at PMRF on how to avoid creating habitat and foraging availability for non-native MBTA species at PMRF especially near the PMRF airfield.	Ongoing and future activities.
Laysan albatross management	Impacts to Laysan albatross	• Coordinate with DOFAW on potential new albatross release sites. • Work with partners to ensure that as many albatross eggs as possible stay on Kaua‘i and find new suitable egg relocation locations. • Closely monitor re-sights of translocated albatross by working with partners on the north shore of Kaua‘i to enter data into the Airtable application database.	Ongoing and future activities.
Laysan albatross management	Impacts to Laysan albatross	• Continue the PMRF Laysan Albatross Egg Swap program. • Continue to translocate albatross to the north shore of Kaua‘i from January–April. • Support research on PMRF albatross populations that increases the understanding of their behavior as it relates to the PMRF airfield.	Ongoing and future activities.
Shearwater management	Impacts to shearwater nesting	• Enhance wedge-tailed shearwater (*Ardenna pacifica*) habitat in areas far from the PMRF airfield and human presence and develop deterrent measures for burrows in areas of human traffic and near the airfield. • Research and work with facilities and Morale, Welfare, and Recreation to implement methods for discouraging wedge-tailed shearwater burrowing in the immediate vicinity of the PMRF Beach Cottages. • Continue to implement protective measures that prevent the crushing of burrows in the beach cottages area (e.g., signage, temporary rope fencing, wooden burrow tents, outreach materials in cottages).	Ongoing and future activities.

Best Management Practice	***Impacts Reduced/Avoided***	***Description of Best Management Practices and Management Strategies***	***Applicability***
Shearwater management	Impacts to shearwater populations	• Conduct annual wedge-tailed shearwater population surveys in the Kinikini Ditch, beach cottages, and Nohili Dune areas. • Work with partners to collect additional data that supports adaptive management on PMRF and regional conservation objectives for shearwater species.	Ongoing and future activities.
Bat management	Impacts to Hawaiian hoary bat (pupping season)	• Tree trimming/removal activities shall be conducted outside of the bat pupping season of June 1 to September 15 to the maximum extent practicable to avoid and minimize effects of base infrastructure, operations, and maintenance. • Conduct follow-up acoustic surveys for Hawaiian hoary bats every 5 years. • In situations where trimming or removal of a tree with a known bat roost is determined necessary, the Navy shall work with the USFWS to develop and implement an SOP for bat roosting surveys.	Ongoing and future activities. Construction.
Invasive plant species management	Impacts to natural resources	• Native vegetation shall be used as practicable, and recommended by agencies, for revegetation efforts. • Ensure species identified as invasive in Hawai‘i are not utilized for outplanting, landscaping, or erosion control efforts. Develop a Landscaping Guide to include in all base contracts and integrate into the installation appearance plan.	Ongoing and future activities.
Invasive plant species management	Impacts to natural resources	• Ensure early detection and a rapid response to invasive plant species in sensitive areas. Conduct removal of invasive plant species in sensitive areas, monitor for re-growth, and restore with outplantings, if necessary, with a target of 80% reduction in invasive species within the areas of concern.	Ongoing and future activities.
Invasive animal species management	Impacts to natural resources	• Include biosecurity requirements and provisions in Base Operating Support (BOS) and construction contracts to ensure invasive ants, frogs, and other non-native wildlife are not introduced via equipment or landscaping efforts.	Ongoing and future activities. Construction.

Best Management Practice	***Impacts Reduced/Avoided***	***Description of Best Management Practices and Management Strategies***	***Applicability***
Invasive animal species management	Impacts to natural resources	• Increase outreach to base personnel on reporting and early detection for invasive species not yet established at PMRF. Ensure all observations or reports of high-risk invasive species are communicated to KISC and to all other appropriate agencies. • Increase outreach with all personnel on PMRF about the hazards of feeding feral/invasive species and assist in the enforcement of such policies by practicing good communication with Security.	Ongoing and future activities.
Invasive animal species management	Impacts to natural resources	• Conduct surveys to improve baseline knowledge of populations of invasive animals at PMRF. • Conduct ant surveys to assess presence of invasive ants including the little fire ants (*Wasmannia auropunctata*) at the Nohili Dune's wedge-tailed shearwater colony. If little fire ants are detected, report to KISC and implement active control by using granular bait after fledglings have left the area. • Continue to partner with the Hawai'i Department of Agriculture to ensure Coconut Rhinoceros Beetle (*Oryctes rhinoceros*) traps are checked and maintained at PMRF.	Ongoing and future activities.
Endangered seabird management	Impacts from night lighting (disorientation/ fallout)	• Whenever feasible, exterior night lighting shall include bat- and bird-friendly design features such as shielded lights (to reduce ambient light), use of motion detectors and/or other automatic controls, and lighting design that uses shields to prevent light from shining upward into the sky.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Endangered seabird management	Impacts from exterior facility lighting	• Exterior lighting shall be architecturally integrated with the character of all structures, energy efficient, and shielded or recessed so that direct glare and reflections shall be confined, to the maximum extent feasible, within the boundaries of the site. Shielded lighting directs rays toward the ground, and the light source, whether bulb or tube, shall not be visible from adjacent properties. • Exterior lighting shall be directed downward and away from adjacent properties. • Parking and security lighting shall consist of full-cutoff fixtures, which permit no upward light, unless a different cutoff classification is specifically authorized through the architectural review process. • Obtrusive light shall be minimized by limiting outdoor lighting that is misdirected, excessive, or unnecessary, and light required for the development shall be directed downward to minimize spill over onto adjacent properties and reduce vertical glare or up-lighting.	Ongoing and future activities.
Native plant habitat management	Impacts to native plant communities	• Continue to update baseline floral surveys to improve understanding of plant communities at PMRF. • Ensure post-planting care, including irrigation, invasive plant removal, and long-term monitoring and maintenance is implemented for all native plant restoration projects.	Ongoing and future activities.
Native plant habitat management	Impacts to pollinators	• Identify suitable locations for planting native Hawaiian plants, particularly those that benefit native pollinators in support of national pollinator objectives. • Ensure that plant communities found to support native terrestrial invertebrate species are protected, enhanced, and that construction or removal projects have minimal effects on these populations.	Ongoing and future activities. Construction.
Terrestrial invertebrate management	Impacts to pollinators	• Conduct species inventory at additional PMRF sites and conduct monitoring for native invertebrate species.	Ongoing and future activities.
Terrestrial invertebrate management	Impacts to pollinators	• Coordinate all use of pesticides by natural resources staff with the NAVFAC PAC Pest Management Consultant (PMC) and ensure that all applicators have received appropriate certifications. • Ensure that treatments will not have negative effects on protected species. Prohibit the use of neonicotinoids at PMRF sites.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Endangered seabird management	Impacts to seabirds	• Continue to host a Save Our Shearwaters (SOS) aid station at PMRF and monitor station during business days with SOS monitoring on weekends and holidays. • Advise various tenants on PMRF on appropriate safety lighting that is less attractive to endangered seabirds (i.e., motion sensing lights that go off after a set time period, shielded lights, facing light away from the coast, lower lumen, and lower to the ground). • Provide a 10-year calendar to mission planners with high-risk dates for endangered seabird fall out.	Ongoing and future activities.
Endangered seabird management	Impacts to seabirds	• Continue to fund and implement surveys to assess seabird strikes at KPGO Site C. • Minimize the potential for death or injury of seabirds due to collisions with PMRF communication towers located at KPGO Site C.	Ongoing and future activities.
Endangered sea bird management	Impacts to seabirds from night lighting (disorientation/fallout)	• Continue to promote base-wide awareness and implementation of the PMRF Dark Skies Program through annual trainings. • Continue Dark Skies implementation in areas adjacent to colonial nesting grounds at high elevation nesting sites during critical fledging timeframes. • Conduct systematic ground searches for fallen out seabirds after high-risk night operations.	Ongoing and future activities.
Public health and safety management	Impacts to public health and safety	• Continue to restrict access during missile testing and launches at the restricted easement adjacent to Barking Sands. • Adhere to applicable regulations and policy to limit interaction with vessel traffic when range activities occur.	Ongoing and future operations.
Public health and safety management	Impacts to public health and safety	• PMRF will coordinate with the Agribusiness Development Corporation to ensure compliance with the Clean Water Act and other environmental regulatory requirements where there is a nexus with federal monies or property.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
KPGO – Environmental Management Plan[3]			
Endangered Species	Impacts to endangered and threatened species	• Space Exploration Network Services and Evolution (SENSE) has surveyed the endangered and threatened species around the area. Any changes to SENSE operations or construction activities are planned with the consideration of endangered and threatened species impacts to minimize or eliminate the effects on wildlife. SENSE leverages local agencies for guidance on current regulatory requirements and reduction of impacts.	Ongoing and future operations.

Key: ACHP = Advisory Council on Historic Preservation; ARPA = Archaeological Resources Protection Act; BMP = Best Management Practice; BOS = Base Operating Support; CA = Comprehensive Agreement; CFR = Code of Federal Regulations; CNRH = Commander, Navy Region Hawaii; COMPACFLT = Commander, U.S. Pacific Fleet; CRM = Cultural Resources Management; DAR = Division of Aquatic Resources; DoD = Department of Defense; DOFAW = Division of Forestry and Wildlife; DOI = Department of the Interior; EIS = Environmental Impact Statement; ESA = Endangered Species Act; HAMP = Historic Asset Management Process; ICRMP = Integrated Cultural Resources Management Plan; KISC = Kaua'i Invasive Species Committee; MBTA = Migratory Bird Treaty Act; MOA = Memorandum of Agreement; NAGPRA = Native American Graves Protection and Repatriation Act; NAVFAC PAC = Naval Facilities Engineering Systems Command Pacific; NEPA = National Environmental Policy Act; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NRHP = National Register of Historic Places; OPNAVINST = Office of the Chief of Naval Operations Instruction; PA = Programmatic Agreement; PMC = Pest Management Consultant; PMRF = Pacific Missile Range Facility; SECNAVINST = Secretary of the Navy Instruction; SENSE = Space Exploration Network Services and Evolution; SHPO = State Historic Preservation Office; SOH = Safety and Occupational Health; SOP = Standard Operating Procedure; SOS = Save our Shearwaters; USDA-WS = United States Department of Agriculture-Wildlife Services; USFWS = United States Fish and Wildlife Service.

Sources: [1]NAVFAC Pacific, 2012.
[2]NAVFAC Pacific, 2023.
[3]Space Exploration Network Services and Evolution, 2023.

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3 Project Setting

This chapter provides a preliminary overview of the project setting, or existing environmental conditions, for the resources within the State land (leaseholds and easement lands) at PMRF and KPGO. The Draft EIS will include further details on the existing conditions and potential effects of the Proposed Action and alternatives, as well as measures to minimize or mitigate these potential environmental effects.

The EISPN provides a preliminary overview of existing conditions relevant to the analysis of the Proposed Action and alternatives. The following 13 resources will be analyzed in the Draft EIS: archaeological and historic resources, cultural practices, biological resources, land use, socioeconomics, environmental justice, water resources, utilities, public health and safety, air quality and greenhouse gases, transportation, hazardous materials and wastes, and visual resources.

3.1 Archaeological and Historic Resources

The term "historic resource" as used in both NEPA and HEPA applies broadly to a variety of resources such as historic buildings, historic districts, archaeological sites, traditional places, and traditional ways of life. Several federal laws and regulations address cultural resources, including the NHPA and the Archaeological Resources Protection Act (ARPA), as well as agency-specific instructions and policies. The NHPA defines a historic property as any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property or resource." Hawai'i State law also regulates historic properties in HRS Chapter 6E. Under HRS Chapter 6E, historic properties include any building, structure, object, district, area, or site, including heiau (a Hawaiian sacred temple) and underwater site, which is over 50 years old; and burial sites, defined as any specific unmarked location where prehistoric or historic human skeletal remains and their associated burial goods are interred, and its immediate surrounding archaeological context. Through the HRS Chapter 6E-42 review process, historic properties are assessed for "significance" as defined in HAR § 13-284-2 before project effects are analyzed.

Under the NHPA, the affected environment for historic properties is called the Area of Potential Effects (APE). The APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." Under HRS Chapter 6E, the affected environment for cultural resources is referred to as a "Project Area," which is defined in HAR § 13-284-2 as "the area the proposed project may potentially affect, either directly or indirectly" and includes "not only the area where the proposed project will take place, but also the proposed project's area of potential effect."

The NEPA/HEPA impact analysis will be conducted within the NHPA APE and the HRS-6E Project Area to determine potential impacts on historic resources. These areas are the same and comprise the leaseholds and easement lands at the Main Base, Kamokalā Ridge, Mānā Well, Miloli'i Ridge, Mākaha Ridge, and KPGO. The APE for the Proposed Action is depicted as the State lands shown in Figure 1-2.

The Draft EIS will characterize the affected environment for cultural resources for Navy and NASA leasehold and easement lands. The document will identify cultural resources and assess the impacts resulting from implementation of the Proposed Action and alternatives to those cultural resources. Surveys are currently being conducted to identify cultural resources. These resources will be evaluated

for NHPA eligibility and HRS Chapter 6E significance. Both the Navy and NASA are responsible for managing historic properties under their control. PMRF's NHPA responsibilities are governed by the Commander, Navy Region (COMNAVREG) Hawai'i Programmatic Agreement (PA) with the SHPO and the Advisory Council on Historic Preservation (ACHP) (NAVFAC Pacific, 2012). Analysis of potential impacts to cultural resources will be conducted in accordance with the PA. The Draft EIS will evaluate potential impacts to archaeological and historic resources from implementation of the Proposed Action and alternatives.

3.2 Cultural Practices

The State of Hawai'i has an affirmative obligation to preserve and protect Native Hawaiians' customary and traditional rights to the extent feasible under the Hawai'i State Constitution, Article XII, Section 7.

Hawaii Session Law H.B. No. 2895, known as "Act 50", provides that "there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights" (H.B. No. 2895). Act 50 requires state agencies and other developers to assess the effects of proposed land use or shoreline developments on the "cultural practices of the community and State" as part of the HEPA environmental review process. In *Ka Pa'akai O Ka 'Āina v. Land Use Commission*, 94 Hawai'i 31, 7 P.3d 1068 (2000), the Hawai'i Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing interests. HEPA requires including natural or human-made resources of historic, cultural, archaeological, or aesthetic significance in this assessment.

Traditional land uses near the Project Area include habitation, subsistence activities, burial, and travel. It is likely that permanent settlements were concentrated at the inland edge of the Mānā Plain. Small fishing communities, possibly limited to temporary camps, were scattered along the coast. The people of Mānā were noted fishermen, taking advantage of the rich waters of the channel between Kaua'i and Ni'ihau. Fishing was not confined to the ocean and shoreline of Mānā, but also included the swamps and ponds on the coastal plain, where wild resources could be obtained alongside those raised through aquaculture. The coastal plain was a source of natural resources that were collected and used for a variety of purposes, including 'a'ali'i shrubs for firewood, hi'aloa and other plants for medicine, and makaloa and neki for weaving. The coastal dunes of the Mānā Plain were the burial grounds of ancient Hawaiians. Past and present cultural practices have been identified through prior consultation with Native Hawaiian Organizations and other stakeholders.

A Cultural Impact Assessment (CIA) will be prepared for the Proposed Action consistent with HEPA and Act 50 (Session Laws of Hawai'i, H.B. No. 2895), and will follow the State of Hawai'i's 1997 *Guidelines for Assessing Cultural Impacts*. The CIA will collect information relating to the practices and beliefs of Native Hawaiians who have knowledge of the Project Area. The area evaluated for the proposed CIA will be larger than the area associated with implementation of the Proposed Action to account for cultural practices that may be affected but are not included within the boundaries of the Project Area. Consequently, a large portion of the Mānā Plain inland from the Main Base will be included in the CIA. The information used in the CIA will be obtained through ethnographic and oral history interviews with knowledgeable organizations and persons such as traditional cultural practitioners, and through archival research that will include Hawaiian language sources. The assessment will consider cultural practices

and beliefs related to subsistence (e.g., fishing, gathering, and agriculture), habitation, commercial activities, access issues, recreation, religious/spiritual activities, and customs. Previously documented traditional cultural and other historic properties that are essential to these cultural practices and beliefs will be included in the analysis. The analysis conducted in the CIA will be incorporated into the Draft EIS.

3.3 Biological Resources

The Draft EIS will include a description of the biological resources in the Project Area. It will also include a discussion of known occurrences and potential habitat for species that are federally listed as endangered or threatened, habitats with substantial populations of native plants or animals, and designated critical habitats. Currently flora and fauna surveys, as well as wetland delineations, are being conducted in the area of interest.

Undeveloped leased lands at the Main Base comprise scrubland vegetation, sparse wetlands, and rolling sand dunes; easement areas include agricultural plains containing an interconnected system of irrigation ditches (Figure 3.3-1). Elevations at the Main Base range from sea level to 60 feet above sea level. Agricultural fields in the Project Area consist of both fallow and active landscapes with predominantly non-native vegetative scrub in and around the fields. Isolated wetland features support ESA-listed waterbirds, including the Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*), Hawaiian gallinule (*Gallinula galeata sandvicensis*), Hawaiian stilt (*Himantopus mexicanus knudseni*), and Hawaiian goose or nēnē (*Branta sandvicensis*). ESA-listed plant species, including lauʻehu (*Panicum niihauense*) and ʻakoko (*Euphorbia celastroides*), occur within coastal vegetation communities. The state-recognized endemic Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*) has been observed; however, it is only state-listed as endangered on Oʻahu. The endangered Hawaiian monk seal (*Neomonachus schauinslandi*), threatened green sea turtle (*Chelonia mydas*), and endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) have been observed in the coastal regions of the Main Base. Hawaiian stilts and Hawaiian yellow-faced bees (*Hylaeus* sp.) have also been observed in coastal areas adjacent to the Main Base.

Kamokalā Ridge is above adjacent agricultural lands with limited features that could provide ESA-listed flora or fauna habitat. Elevations at Kamokalā Ridge range from 240 to 320 feet above sea level. Vegetation, though sparse and lacking diversity, is consistent throughout steep cliff areas. Non-native and native trees provide canopy, while non-native scrub provides sparse understory amongst rocky terrain. The Hawaiian hoary bat, the state's only terrestrial ESA-listed mammal, has been observed in the Kamokalā Ridge area.

Mānā Well, located southeast of Kamokalā Ridge, is a small area containing an underground aquifer that provides potable water to the Main Base at an elevation of 120 feet above sea level. Mānā Well is in proximity to unmanaged lands with no known restoration efforts at the location, potential habitat for protected species is minimal.

The reflectors on Miloliʻi Ridge are situated amongst mixed coastal cliff vegetation, containing sparse native species at elevations from 1,760 to 1,790 feet above sea level. Much of the canopy comprises non-native trees with a mixed understory consisting of native and non-native shrubs and grasses.

Figure 3.3-1 Vegetation Types

Mākaha Ridge, with its diverse topography, varies in landscape and vegetation. Elevations at Mākaha Ridge range from 1,400 to 1,850 feet above sea level. Its features include eroded ridges with ruderal vegetation, as well as non-native canopies with dense understory patches. The following five federally listed plants have been documented within the coastal cliff plant communities at Mākaha Ridge: Niʻihau lobelia (*Lobelia niihauensis*), makou (*Peucedanum sandwicense*), Hawaiʻi scaleseed (*Spermolepis hawaiiensis*), dwarf iliau (*Wilkesia hobdyi*), and māʻoliʻoli (*Schiedea apokremnos*). The Hawaiian hoary bat and nēnē are ESA-listed species that have been observed in the region, as well as the state-listed pueo. ESA-listed seabirds including Newell's shearwater (*Puffinus auricularis newelli*), Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*), and the band-rumped storm petrel (*Oceanodroma castro*) have the potential to fly over Mākaha Ridge or utilize the area.

KPGO consists of maintained landscaped grass, planted fruit trees, and non-native shrubs surrounding isolated building structures located along Kaunuohua Ridge, 3,700 feet above sea level. Mixed vegetation is sparse and consists of native and non-native plant communities. The Hawaiian hoary bat, nēnē, Hawaiian petrel, Newell's shearwater, band-rumped storm petrel, Hawaiian picture-wing fly (*Drosophila musaphilia* and *Drosophila sharpi*), and ʻakoko are ESA-listed species present in the montane mesic forest region dominated by native trees. Rare state-recognized endemic forest birds such as scarlet honeycreeper or ʻiʻiwi (*Vestiaria coccinea* syn. *Drepanis coccinea*), ʻapapane (*Himatione sanguinea*), and ʻamakihi (*Chlorodrepanis stejnegeri*) have been observed in the region. Critical habitat for bluegrass (*Poa mannii*), ʻakoko (*Euphorbia halemanui*), ʻaiakeakua (*Solanum sandwicense*), *Xylosma crenatum*, *Dubautia latifolia*, ʻaiea (*Nothocestrum peltatum*), and Hawaiian picture-wing fly (*D. musaphilia*), occur outside of KPGO, along the western region of Kaunuohua Ridge.

The Draft EIS will evaluate potential impacts to biological resources from implementation of the Proposed Action and alternatives.

3.4 Land Use

The State of Hawaiʻi has a unique system of classifying and managing lands in which both state and county agencies hold distinct responsibilities. The State Land Use Law (HRS § 205) classifies all lands in Hawaiʻi into one of four State Land Use Districts (SLUDs): urban, rural, agricultural, and conservation. The land that is leased and in easement by the Navy and NASA is classified as a conservation or agricultural district. The conservation district is further divided into five subzones: limited, resource, general, protected, and special. Navy and NASA leased and easement lands lie within the following conservation subdistricts: limited, resource, and general. In addition, each county has its own classification system of zoning districts that complement the SLUD designations. The County of Kauaʻi Zoning for the Project Area includes agriculture, conservation, open space, and special treatment – ecological. Table 3.4-1 summarizes SLUD and zoning designations in the Project Area.

Table 3.4-1 State Land Use Districts and Zoning Designations in and Surrounding the Project Area

Geographical Area	*Tax Map Key Parcel*[1]	*County of Kaua'i Zoning*	*State Land Use Districts*	*Conservation Subzone*	*Owner*
Main Base	1-2-002:001, 011, 012, 013, 015, 024, 025, 026, 030; 1-2-016:011	Agriculture, Open Space, Conservation, Special Treatment–- Ecological	Agriculture, Conservation	Limited, General Subzone	State of Hawai'i, U.S. Government
Kamokalā Ridge	1-2-002:001, 027, 029	Agriculture, Open Space	Agriculture	None	State of Hawai'i
Mānā Well	1-2-002:028	Open Space	Agriculture	None	State of Hawai'i
Miloli'i Ridge	1-2-001:006	Conservation	Conservation	Resource Subzone	State of Hawai'i
Mākaha Ridge	1-2-001:001, 006, 010; 1-4-001:002, 013, 014, 999	Conservation	Conservation	Resource Subzone	State of Hawai'i
KPGO	1-4-001:013	Conservation	Conservation	Resource Subzone	State of Hawai'i

Note: [1]Some Tax Map Key Parcels may be only portions or included for more than one geographical area.
Legend: KPGO = Kōke'e Park Geophysical Observatory; U.S. = United States.
Source: State Land Use Law (Chapter 205, Hawai'i Revised Statutes).

The Main Base consists of the fee simple lands held by the U.S. Government. Mānā Plain is east of the Main Base and is utilized for agriculture and is bordered by the Kekaha Game Management Area (which encompasses Kamokalā Ridge and Mānā Well). The southern boundary for the Main Base ends at Kokole Point. Miloli'i Ridge and Mākaha Ridge are located within the Pu'u Ka Pele Forest Reserve managed by DLNR, DOFAW. Adjacent to Mākaha Ridge, KPGO is located within Kōke'e State Park, which is managed by DLNR, State Parks Division. Both are accessible by Kōke'e Road (Figure 1-2).

Land uses in the Project Area include public beach access, local and federal government activities, agriculture, hiking, hunting, and other public uses. Highway 50 (also known as Kaumuali'i Highway) is the primary public access route through the Main Base (Figure 1-2).

The Draft EIS will evaluate potential impacts to land use from implementation of the Proposed Action and alternatives.

3.5 Socioeconomics

The area that will be considered for socioeconomic analysis is the County of Kaua'i.

Population Characteristics. In 2021, the population of the County of Kaua'i was 73,247, representing approximately 5 percent of the total population for the state. The population of the County of Kaua'i grew 9.2 percent from 2010 to 2021. This growth rate was faster than for the state (6.9 percent) and U.S. (6.8 percent) over the same period. Table 3.5-1 shows 2010 and 2021 population data.

Table 3.5-1 Population of the County of Kaua‘i, State of Hawai‘i, and United States (2010 and 2021)

Location	*2010*	*2021*	*Percent Change*
United States	308,745,538	329,725,481	6.8
State of Hawai‘i	1,360,301	1,453,498	6.9
County of Kaua‘i	67,091	73,247	9.2

Sources: U.S. Census Bureau, 2010, 2022a.

Employment Characteristics. In 2021, 36,294 individuals in the County of Kaua‘i were employed in the civilian labor force and 239 individuals in the armed forces (U.S. Census Bureau [USCB], 2022b). The three largest civilian-employed industries in the County of Kaua‘i in terms of workforce employed are arts, entertainment, recreation, accommodations, and food services (23.1 percent); educational services, health care, and social assistance (17.8 percent); and retail trade (11.4 percent) (USCB, 2022b). PMRF is currently the largest high-tech and third-largest overall employer on Kaua‘i with nearly 1,000 personnel, including defense personnel and civilian contractors (State of Hawai‘i Department of Business, Economic Development, and Tourism 2023). The median household income for the County of Kaua‘i was $86,287 compared to the statewide median household income of $88,005 (USCB, 2022b). In 2021, the Bureau of Labor Statistics reported an 8.1 percent unemployment rate in the County of Kaua‘i, which is higher than the U.S. (5.3 percent) and the State of Hawai‘i (6.0 percent) (Bureau of Labor Statistics, 2021, 2023).

The Draft EIS will include an analysis of potential socioeconomic impacts from implementation of the Proposed Action and alternatives.

3.6 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs agencies to address environmental and human health conditions in minority and low-income communities. Environmental justice addresses the disproportionate and adverse impacts of a federal action on low-income or minority populations. The intent of the order and related directives and regulations is to ensure that low-income and minority populations do not bear a disproportionate burden of adverse impacts resulting from federal actions.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs each federal agency to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, and ensure that its activities and standards address disproportionate risks to children that result from environmental health or safety risks.

Impacts associated with environmental justice would be to disadvantaged communities that could be adversely affected by the Proposed Action. The West Kaua‘i Community Plan was adopted in 2020 and guides the long-term development, growth, and maintenance in the Waimea-Kekaha and Hanapēpē-‘Ele‘ele districts. The West Kaua‘i Community Plan recognizes that challenges, such as a lack of housing to the growing effects of climate change, will negatively impact vulnerable households disproportionately (County of Kaua‘i, 2020). The potential disadvantaged communities would be identified based on the spatial distribution of low-income and minority populations in the Project Area. As defined by the Environmental Justice Guidance under NEPA (CEQ, 1997), minority populations include persons who identify themselves as Asian, Native Hawaiian or other Pacific Islander, Native American or Alaskan Native, Black (not of Hispanic origin), or Hispanic or Latino. A minority population

exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. In addition, a minority population also exists if there is more than one minority group present and the minority percentage, when calculated by aggregating all minority persons, meets one of the above thresholds (CEQ, 1997).

The Draft EIS will consider whether there are such disadvantaged communities on West Kaua‘i within the vicinity of PMRF and, if so, assess whether the Proposed Action results in disproportionate and adverse impacts on environmental and human health conditions in minority and low-income communities. Potentially disadvantaged communities will be identified by comparing communities on West Kaua‘i within the vicinity of PMRF to demographic and socioeconomic indicators for the County of Kaua‘i as a whole.

3.7 Water Resources

Water resources include surface water (e.g., streams, lakes, rivers, and wetlands), groundwater, floodplains, and coastal waters, which comprise watershed hydrology.

Mean annual rainfall at the Main Base is approximately 20 inches. The developed water system, consisting of three human-made open irrigation ditches through the agricultural lands on Mānā Coastal Plain draining into the Pacific Ocean, is fed by upland streams, surface waters, and associated sediment. Wetlands, floodplains, mudflats, and shallow ponds are present along the lowlands and coastal regions (Figure 3.7-1). The only natural wetland habitat on the Main Base comprises estuarine and marine systems along the shoreline region. A human-made sewage oxidation pond complex is located on the southern portion of the Main Base.

Mean annual rainfall in the Kamokalā Ridge area is 20 inches. Surface water from Nahomalu Valley (north) and Ka‘awaloa Valley (south) of Kamokalā Ridge drains into the Mānā Plain. A basal unconfined dike aquifer is located in the Waimea Aquifer Sector within the Kekaha Aquifer System (Figure 3.7-2).

Mean annual rainfall in Mānā is approximately 20 inches. Mānā Well, located at the southeastern end of Kamokalā Ridge, pumps water upwards from a below-ground aquifer. The water from the well is properly treated before it is piped into the PMRF drinking water distribution system. Drinking water on the Main Base is provided by Mānā Well, as well as the County of Kaua‘i’s Waimea-Kekaha system.

Mean annual rainfall on Miloli‘i Ridge is 30 inches. Due to the rocky, stony, and volcanic makeup of the terrain on Miloli‘i Ridge, runoff is rapid and erosion is prevalent. There are no perennial water features and no groundwater resources.

Mean annual rainfall at Mākaha Ridge is 30 inches. Due to the rocky, stony, and volcanic makeup of the terrain on Mākaha ridge, runoff is rapid and erosion is prevalent. There are no perennial water features, only intermittent streams in the region. Two aquifers, both part of the Waimea Aquifer Sector of the Kekaha Aquifer System, are beneath this site (Figure 3.7-2).

Mean annual rainfall on the Kaunuohua Ridge at KPGO ranges from 50 to 60 inches. Surface water runoff is medium due to highly-eroded volcanic terrain on the ridgeline, and generally follows a northwesterly/southeasterly course. Numerous streams are located around the base of the mountains. One unconfined dike aquifer, located in the Waimea Aquifer Sector within the Kekaha Aquifer System, lies beneath KPGO.

Figure 3.7-1 NWI Wetlands

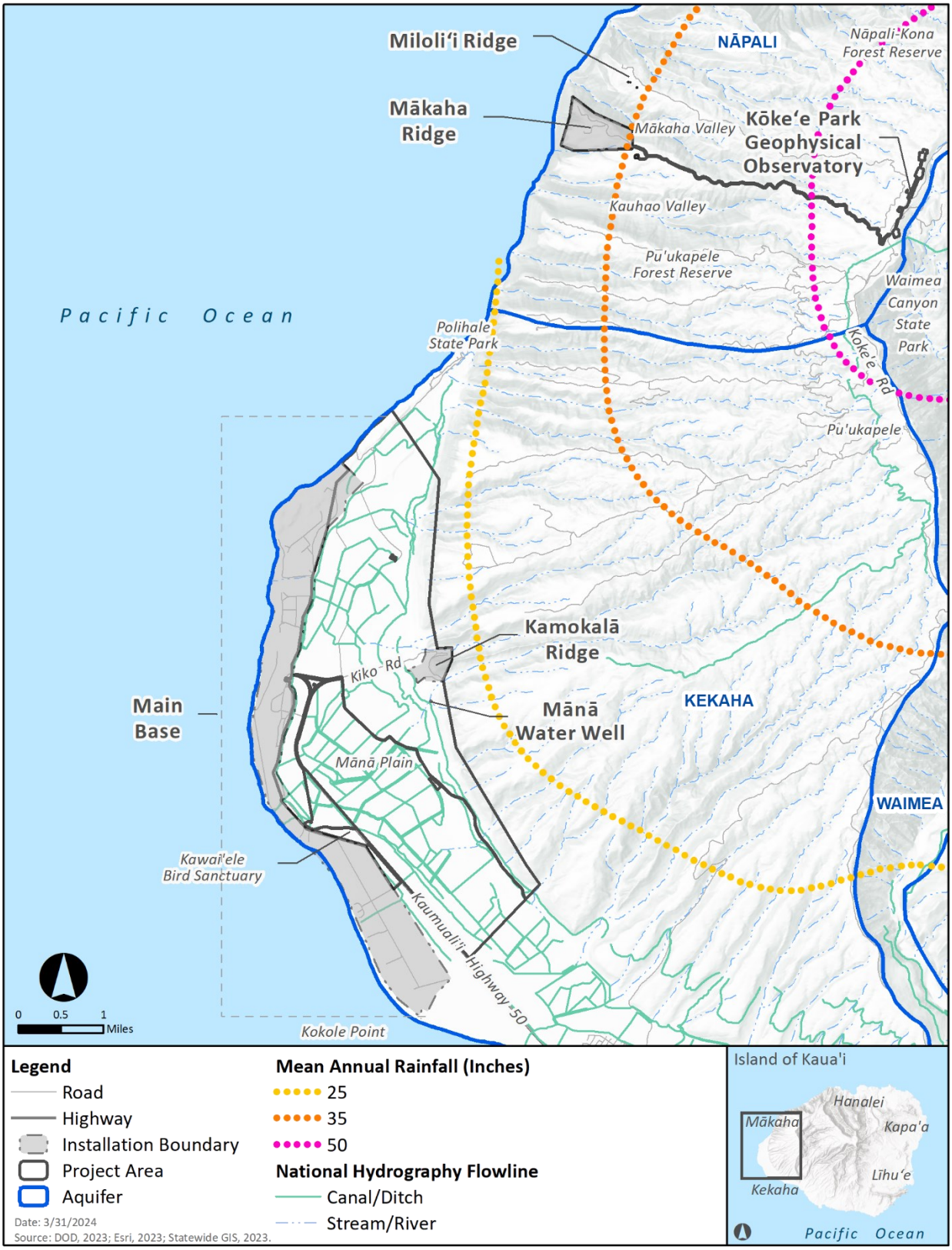

Figure 3.7-2 Aquifers

The Draft EIS will evaluate potential impacts to water resources from implementation of the Proposed Action and alternatives.

3.8 Utilities

There are utility leases and easements included as part of the Proposed Action. Utility systems' usage, available supply capacity, and the overall real property condition of the utility systems will be analyzed. The primary utilities that will be assessed in the Draft EIS are potable water, wastewater, electrical, and communications.

Potable water for the Main Base lease areas comes primarily from Mānā Water Well. Potable water resources for Kamokalā Ridge, Mākaha Ridge, and KPGO are supplied by either existing wells or municipal sources from several reservoirs. The Navy treats water from all sources, except water provided by the State of Hawai'i (Navy, 2008).

Wastewater services for PMRF include domestic sewage treatment facilities and a collection system that services PMRF (Navy, 2008). The Kamokalā Ridge, Mākaha Ridge, and KPGO wastewater utility supply and uses will be identified in the Draft EIS.

Primary electric power is supplied to the Main Base, Kamokalā Ridge, and Mānā Water Well by purchase from the Kaua'i Island Utility Cooperative and a 14-megawatt solar facility with a 70 megawatt-hour battery energy storage system on the Main Base (Figure 3.8-1). KPGO power is supplied by a Navy-operated power plant at Mākaha Ridge. Electricity is provided through both overhead and underground transmission lines. Emergency diesel backup generators provide alternate power when needed at KPGO. Communications infrastructure for the Main Base, Kamokalā Ridge, Mākaha Ridge, and KPGO consist of cable, fiber optics, cellular towers, and communications towers.

The Draft EIS will analyze potential impacts to utilities from implementation of the Proposed Action and alternatives.

Photo courtesy of U.S. Navy, November 16, 2021.

Figure 3.8-1 Solar Facility and Battery Energy Storage System

3.9 Public Health and Safety

Public health and safety pertains to activities, occurrences, and training, and RDT&E activities that have the potential to affect the well-being, safety, and health of the public.

NASA operates KPGO in accordance with the Environmental Management Plan under the Space Exploration Network Services and Evolution contract. To ensure operations at KPGO do not result in impacts to public safety or the environment, the Environmental Management Plan describes procedures for the following: environmental planning; risk assessment; spill prevention; operational controls; education, training, awareness, and competency; evaluation, checking, and corrective action; water management; air quality management; and waste management.

Range Safety at PMRF is controlled by Range Control, which is responsible for hazard area surveillance and clearance and control of all operational areas. Range Control maintains real-time surveillance, clearance, and safety at all PMRF areas. The PMRF Range Safety Officer is responsible for establishing Ground Hazard Areas (GHAs) and Launch Hazard Areas over water. The Ground and Launch Hazard Areas for missile launches are determined by size and flight characteristics of the missile, as well as individual flight profiles of each flight test. Data processed by ground-based or onboard missile computer systems may be used to recognize malfunctions and terminate missile flight. Before a launch is allowed to proceed, the Navy uses input from ship sensors, visual surveillance from aircraft and range safety boats, radar data, and acoustic information to ensure the offshore range is clear of vessels and aircraft.

PMRF operates pursuant to Range Commanders Council 321, *Common Risk Criteria for National Test Ranges*. Range Commanders Council 321 sets requirements for minimally acceptable risk criteria to occupational and non-occupational personnel, test facilities, and non-military assets during range operations.

Ordnance safety includes procedures to prevent premature, unintentional, or unauthorized detonation of ordnance. All programs require an Explosive Safety Approval before ordnance is allowed on PMRF or used on a test range. This approval involves a detailed analysis of the explosives and of the proposed training and RDT&E activities. The analysis also covers procedures and facilities for surveillance and control, an adequacy analysis of movement and control procedures, and a design review of the facilities where the ordnance items will be handled.

PMRF transports ordnance by truck from Nāwiliwili Harbor to the Main Base along Highway 50 (Figure 3.9-1). The barges carrying ordnance are met at Nāwiliwili Harbor by trained ordnance personnel and special vehicles for transit and delivery to PMRF. PMRF Instruction 8023.G controls the handling and transportation of ammunition, explosives, and hazardous materials on the facility. All ordnance is transported in accordance with PMRF Instruction 8023.G and U.S. Department of Transportation regulations.

Ambulance and Class II Emergency Medical Technician services are provided by Emergency Medical Technicians assigned to Crash/Fire. These contractor-operated services are available to military, civil service, and non-government personnel at PMRF, 24 hours a day, 7 days a week. More extensive emergency medical services are available from the West Kauaʻi Medical Center in Waimea, 10 miles from PMRF's main gate (Figure 3.9-1).

Figure 3.9-1 Ordnance Transport Route and Emergency Medical Services Route

Fire service at the Main Base includes PMRF Crash/Fire equipment located at the Air Traffic Control Tower. Personnel are trained to respond to activities such as aircraft firefighting and rescue in support of airfield operations, hazardous material incidents, confined space rescue, and hypergolic fuel releases, plus structure and brush firefighting, fire prevention instruction, and fire inspections.

The Draft EIS will evaluate potential impacts to public health and safety from implementation of the Proposed Action and alternatives.

3.10 Air Quality and Greenhouse Gases

3.10.1 Air Quality

The U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for the criteria pollutants sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), lead, particulate matter (PM) measured less than or equal to 10 microns in diameter (PM_{10}), and PM less than or equal to 2.5 microns in diameter [$PM_{2.5}$]).

The Hawai‘i Department of Health (DOH), Clean Air Branch regulates and monitors air pollutants under HAR Chapter 11-59, *Ambient Air Quality Standards*, and HAR Chapter 11-60.1, *Air Pollution Control*. Based on ambient air monitoring results, the island of Kaua‘i is designated unclassified/attainment for all criteria pollutants (USEPA, 2023). The Clean Air Branch currently operates one monitoring station on the island of Kaua‘i approximately 1.0 mile downwind of Nāwiliwili Harbor to measure SO_2 emissions from cruise ships (DOH, 2023).

The prevailing winds on Kaua‘i (known as trade winds) blow in from east-northeast and prevail approximately 9 months of the year. When there is volcanic activity, trade winds blow volcanic fog (“vog”) from Hawai‘i Island volcanoes. When trade winds are absent for prolonged periods, vog travels up the island chain and can affect air quality by increasing levels of airborne SO_2 and $PM_{2.5}$.

Sources of air emissions from the Navy include vehicle traffic, diesel-fuel powered generators, aircraft, power generation, and rocket launches. Sources of air emissions from NASA include vehicle traffic and the diesel power generator.

The Draft EIS will assess the potential impacts to air quality from implementation of the Proposed Action and alternatives.

3.10.2 Greenhouse Gases

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Global climate change is impacting temperature, precipitation, wind, sea level, and other elements of Earth’s climate system. The recent buildup of GHGs in the atmosphere from human activities has changed the earth’s climate and has resulted in adverse effects to human health and welfare, and to ecosystems.

Sea level rise, altered rainfall patterns, and rising ocean and air temperatures result from climate change. These changes impair access to clean water and healthy food, undermine human health, threaten the cultural and built environment, exacerbate inequities, and disrupt economic activity and diversity of ecosystems in Hawai‘i (U.S. Global Change Research Program, 2023).

The Draft EIS will analyze potential impacts from GHGs and climate change from implementation of the Proposed Action and alternatives.

3.11 Transportation

The roadways used to access or in the vicinity of PMRF include Highway 50, Kōkeʻe Road, Kao Road/Kiko Road, Mānā Road, Mākaha Ridge Road, and Miloliʻi Ridge Road.

Highway 50 is a principal arterial roadway providing regional mobility in the western part of Kauaʻi. It begins in Līhuʻe and ends in the vicinity of PMRF, where it is a two-lane, undivided roadway with painted shoulders along both sides of the road. There are median left turn lanes at selected intersections along Highway 50.

Kōkeʻe Road branches north from Highway 50 in Waimea and provides access from Kekaha to Waimea Canyon State Park and Kōkeʻe State Park. It also provides access to the KPGO site. In the vicinity of the KPGO site, it is a two-lane, undivided roadway with grass shoulders along both sides of the road.

The Draft EIS will analyze the potential impacts of the Proposed Action and alternatives on the roadway facilities in the vicinity of the PMRF and KPGO sites along with multi-modal facilities, such as pedestrian, bicycle, and public transit facilities.

3.12 Hazardous Materials and Wastes

Hazardous materials are currently utilized or present on lease and easement lands at KPGO, the Main Base, and Mākaha Ridge.

Hazardous materials present on the Main Base leased area include the following: cleaning agents, solvents, lubricating oils, jet fuel, diesel fuel, propane, gasoline, aqueous film forming foam[2] (AFFF), chlorine, used oil, and paint. No known components within the Main Base leased area contain polychlorinated biphenyls (PCBs). PMRF's management and disposal procedures for used oils and fuels are in its Hazardous Waste Management Plan. Most waste is collected and containerized at the Main Base leased area for direct offsite disposal through the Defense Reutilization and Marketing Office, which also provides for the transportation and disposal of the waste to a final disposal facility.

PMRF uses gasoline and diesel fuel to power trucks and equipment across leasehold areas. Table 3.12-1 includes a summary of fuel storage on PMRF leased lands and KPGO.

Hazardous materials on Mākaha Ridge include diesel storage tanks and oil storage tanks. Used oil is taken to the Main Base to be recycled.

KPGO Site B has multiple diesel fuel tanks used for emergency power generation. Site B also has a hazardous material storage facility which holds paint, oil, mechanical lubricating fluids, and cleaning

[2] Based on guidance from the Assistant Secretary of the Navy, DON has strict firefighting performance requirements for AFFF formulations to protect the safety of our personnel and the public in the event of an emergency. DON amended the MILSPEC in September 2017 setting limits for PFOS and PFOA at the lowest levels of quantitation while maintaining fire-fighting performance requirements. DON is in the process of removing legacy AFFF and replacing it with new MILSPEC compliant AFFF. DON has also implemented system requirements to ensure DON installations and facilities are tested and certified in a manner that does not allow the release of legacy AFFF into the environment. MIL-PRF-32725 limits per- and polyfluoroalkyl substances (PFAS) to 1 part per billion, and Section 322 of the National Defense Authorization Act for Fiscal Year 2020 requires DoD to stop using AFFF containing PFAS on all installations by 1 October 2024.

substances. Used oil is taken to the Main Base to be recycled. NASA's Environmental Management Plan for KPGO describes waste management processes including handling of solid waste, recyclable materials, hazardous waste management, hazardous waste shipment, universal waste management, asbestos management, PCBs, and compliance with the Emergency Planning and Community Right-to-Know Act.

Table 3.12-1 PMRF Leased Area and KPGO Fuel Storage Locations

Fuel Storage Types	*Quantity*	*Capacity (nominal capacity) in gallons*	*Details*
Diesel ASTs	2	8,000	Mākaha Ridge
Diesel AST	3	275	Mākaha Ridge
Diesel USTs	1	25,000	KPGO Site B
Diesel USTs	2	500	KPGO Site B
Diesel ST	2	55	KPGO Site B
Diesel ST	1	244	KPGO Site B
Diesel ST	1	256	KPGO Site B

Key: AST = aboveground storage tank, UST = underground storage tank, ST = Storage Tank.

PMRF has a pollution prevention plan for all sites on Kaua'i, which follows the Navy's Consolidated Hazardous Materials Reutilization and Inventory Management Program for controlling, tracking, and reducing hazardous materials use and waste generation. Current programs involve waste elimination from toner cartridges, mercury from mercury lamps, and acid/lead batteries and asbestos management. Asbestos is managed in accordance with the base asbestos management plan which requires all structures on leased and easement land areas to be surveyed, and any asbestos removed by a certified asbestos contractor prior to disturbance/construction. Lead-based paint waste removal follows Department of Energy protocols, and all facilities on PMRF leased lands follow the lead-based paint management plan.

The Draft EIS will evaluate potential impacts to hazardous materials and wastes from implementation of the Proposed Action and alternatives.

3.13 Visual Resources

The discussion of visual resources includes the natural and built features of the landscape visible from viewpoints that contribute to an area's visual quality. Under NEPA, federal agencies should consider visual impacts of proposed projects on scenic resources, historic properties, and scenic experiences of public who view the landscape. Aesthetics and views of proposed projects at PMRF and the NASA lease area are mainly guided by the Kaua'i County General Plan (County of Kaua'i, 2018) or the West Kaua'i Community Plan (County of Kaua'i, 2020). Both plans include policies to preserve scenic views of ocean, coastline/beach areas, mountains, and other elevated landforms.

The Main Base leaseholds and easements are situated on the west coast of Kaua'i on the Mānā Coastal Plain (refer to Figure 1-2). The leased and easement areas in this area are relatively flat and consist primarily of agricultural and other undeveloped, partially-vegetated lands. The ridges that run east of these areas are the dominant view from the Main Base. The Pacific Ocean and coastlines can be viewed from higher elevation vantage points. Kaumuali'i Highway (Highway 50) is the main paved roadway in this area. Typical views from the highway include mixed vegetation and agricultural areas along both

sides of the road, with the mountains visible in the distance to the east, if travelling northbound on Kaumualiʻi Highway toward Barking Sands Beach and Polihale State Park. The facilities on these leaseholds and fee simple lands are visible to the west for some stretches when travelling northbound on Kaumualiʻi Highway.

The Kamokalā Ridge leaseholds are located upland from the Main Base. The ordnance storage facility and paved access roads are the primary human-made structures in the area. Vegetation of various heights is adjacent to both sides of the access roads. Obscured views of the Pacific Ocean and coastlines occur from certain vantage points along the roadway. Due to its higher elevation and the relatively dense vegetation in this area, the ordnance storage facility is not visible from the Main Base, Kaumualiʻi Highway, or other public roads west of the Kamokalā Ridge lease area.

The Mānā Water Well is approximately a quarter mile south of the Kamokalā Ridge area. The well is located at the point where the topography changes from flat to steep mountain cliffs. The site is reached by an access road from Kiko Road (Figure 1-4). Mountain views are dominant from this location because the nearest cliff line is less than a quarter mile from the well. No ocean or coastline views are available from this location.

Miloliʻi Ridge and Mākaha Ridge are both finger ridges of the Nāpali Coast on the west-northwest side of Kauaʻi within Puʻukapele Forest Reserve areas. The Miloliʻi Ridge lease area is approximately 8 miles north of the Main Base. Views of the Pacific Ocean and coastlines are not available due to dense vegetation coverage at this site. The facilities at Miloliʻi Ridge are not visible from public vantage points because of its secluded location.

The Mākaha Ridge area is located on the cliffs of the Nāpali Coast State Wilderness Park, approximately 1 mile south of Miloliʻi Ridge. Mākaha Ridge is accessed via the Mākaha Ridge Road (refer to Figure 2-7), which can be accessed by the public up to a gate outside of the radar site. Mākaha Ridge Road has forest vegetation lining both sides of the road, obstructing a view of any vista. The radar facilities are only partially visible from the segment of the Mākaha Ridge Road near the radar site gate.

The NASA lease area is located at the Kōkeʻe Park, approximately half a mile northeast of Mākaha Ridge Road. The site can be accessed through Kōkeʻe Road and Faye Road. Site facilities are located on landscaped or paved areas. The site is surrounded by taller forest vegetation. The heavily vegetated setting and mountain views are the main scenic resources from this area. The NASA facilities are partially visible to Kōkeʻe State Park visitors while traveling along Mākaha Ridge Road.

As part of the visual resources impacts evaluation, the Draft EIS will discuss visual resources in detail from the perspectives of dominant landscape features, visual diversity, elements of line, color, form, and texture, historic and cultural importance, as well as overall landscape character. The Draft EIS will evaluate potential impacts to visual resources from implementation of the Proposed Action and alternatives.

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4 Consistency with State and Local Government Plans and Policies

The Draft EIS will evaluate the Proposed Action's conformance with relevant state and local land use plans and policies.

4.1 Land Use Laws

The Draft EIS will include a discussion of the Proposed Action's conformance with relevant federal, state, and County of Kaua'i land use plans, policies, and controls.

4.2 Hawai'i State Plan and Hawai'i State Functional Plans

The Hawai'i State Plan, codified as HRS Chapter 226, establishes a set of themes, goals, objectives, and policies that are meant to guide the state's long-term growth and development activities. The Hawai'i State Plan also provides a basis for determining priorities, allocating limited resources, and improving the coordination between State and County plans, policies, programs, projects, and regulatory activities. These goals seek to promote a strong economy, a desired physical environment, and nourished community life. The State Plan also establishes objectives for each goal. The Proposed Action meets the statewide objectives by encouraging federal expenditures and national defense that is consistent with "Hawai'i's social, environmental, and cultural goals by building upon dual-use and defense applications" (HRS § 226-9). As stewards of the natural and cultural environment, the Navy and NASA work to enhance Hawai'i's scenic assets, natural beauty, and multi-cultural resources pursuant to HRS § 226-12.

The State Plan (HRS § 226-65) also initiated the Hawai'i 2050 Sustainability Plan to serve as long-range planning to achieve sustainability and climate adaptation goals, principles, and policies. Published in 2008, the plan reinforces the goals and objectives of the State Plan (above) in terms of economic, physical, and community sustainability with the objectives of promoting these sectors through renewable energy, water conservation, and increased food security, among others; an approach fully supported by the Proposed Action (Sustainability Task Force, 2008).

The Statewide Planning System identified in HRS Chapter 226 also requires State Functional Plans, which implement state and county actions. There are 13 Functional Plans used to assist with establishing the policies, statewide guidelines, and priorities within a specific field of activity when such an activity or program is proposed, administered, or funded by any state agency. Due to the nature of the leased and easement lands that fall under the Proposed Action, multiple Functional Plans may be applicable for the Draft EIS, including the Agriculture Functional Plan, the Conservation Lands State Functional Plan, the Historic Preservation State Functional Plan, and the Recreation State Functional Plan. All of these applicable Functional Plans were developed in 1991.

4.3 Kaua'i County General Plan, West Kaua'i Community Plan, Kaua'i Island Plan

The Kaua'i County General Plan underwent a comprehensive update in 2018 and serves as the county's guiding policy framework for growth, land use, and development issues. The Project Area falls within the Waimea-Kekaha Planning District and land uses include agriculture, natural preserve, and parks and recreation. The Proposed Action fits within this General Plan's future land use concept and is consistent with applicable goals and policies (County of Kaua'i, 2018). As stated in the Kaua'i County General Plan, Section 3.3 fostering High Tech and Clean Tech Jobs:

> The Pacific Missile Range Facility (PMRF), located on the West Side, is one of the foremost aerospace test sites in the United States. PMRF leverages Kaua'i's location in the center of the Pacific Ocean for the benefit of aerospace and space launch testing .... Historically, PMRF has been the driving force behind the establishment of technology-based business on Kaua'i. PMRF's continued vitality contributes significantly to Kaua'i's high technology industry and provides opportunities for supportive businesses and entrepreneurs (County of Kaua'i, 2018).

Land uses at PMRF are consistent with the 2020 West Kaua'i Community Plan, and include the following three general areas: Hanapēpē, Kekaha, and Waimea uplands (County of Kaua'i, 2020). The project is consistent with the applicable policies regarding heritage resources, resiliency, and shared spaces in the West Kaua'i Community Plan. As stated in the West Kaua'i Community Plan, Part IV: Other Communities and Significant Areas:

> Over the decades, PMRF has increased its connection with Kekaha and the West Kaua'i Community, such as development of the Junior Professional Program for high school students, restoration of the Kawai'ele Bird Sanctuary, establishment of protocols for the care and internment of inadvertently uncovered iwi, and support and partnership with local businesses and nonprofits (County of Kaua'i, 2020).

A separate Kaua'i Island Plan, last updated in 2004 and produced by the State of Hawai'i Department of Hawaiian Home Lands (DHHL), covers lands owned by the DHHL, which includes 15,061 acres adjacent to the Project Area in Waimea (DHHL, 2004) (Figure 4-1). PMRF is located in the coastal plain below the DHHL Mānā Plain property, and just north of State of Hawai'i Department of Hawaiian Home Lands Kekaha tracts. The project is consistent with land use plans for these two areas.

4.4 List of Potentially Required Permits, Consultations, Reviews, and Approvals

The Navy and NASA will prepare the Draft EIS with input, analysis, and review from the public and local, state, and federal agencies. The anticipated permits, consultations, reviews, and approvals required for implementation of the Proposed Action will depend on the features of the selected alternative. The list of anticipated permits and approvals in Table 4-1 will be refined as alternatives are developed. Input on other processes that may be necessary will be requested from government agencies and other participants as part of this environmental review process.

The Draft EIS will list all permits, consultations, reviews, and approvals necessary to implement the Proposed Action, including those overarching requirements listed in Table 4-1. Because the Proposed Action is a land management proposal, the associated permits and approvals are related to land use arrangements and resource management.

Table 4-1 Potential Required Permits, Consultations, Reviews, and Approvals for the Proposed Action

Potential Required Permits and Approvals	*Regulatory Agency*
Approval of request for new real estate agreements (HRS Chapter 171)	**BLNR**
Conservation District Use Application (HAR Title 13, ch. 5)	**DLNR, Office of Conservation and Coastal Lands**
NHPA (54 U.S.C. section 100101)	ACHP and the Hawai'i SHPO
ESA (16 U.S.C. section 1531 et seq.)	USFWS and NMFS[1]
CWA (33 U.S.C. section 1344)	USEPA and Hawai'i State Department of Health
CZMA, Subpart C (16 U.S.C. section 1451, et seq.)	Hawai'i Office of Planning and Sustainable Development
Hawai'i Historic Preservation Review HRS Chapter 6E-42 and HAR Chapter 13-275	DLNR, SHPD

Note: **Bold text** in table indicates approvals necessitating HRS Chapter 343 environmental review.

[1] This is pending review of monk seal haul-out on easement land; additional review of ESA species is covered in the *Hawaii-Southern California Training and Testing Final EIS/OEIS* (Navy, 2018).

Key: ACHP = Advisory Council on Historic Preservation; BLNR = Board of Land and Natural Resources; CWA = Clean Water Act; CZMA = Coastal Zone Management Act; DLNR = Department of Land and Natural Resources; ESA = Endangered Species Act; HAR = Hawai'i Administrative Rules; HRS = Hawai'i Revised Statutes; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; SHPD = State Historic Preservation Division; SHPO = State Historic Preservation Officer; U.S.C. = United States Code; USEPA = U.S. Environmental Protection Agency; USFWS = United States Fish and Wildlife Service.

Figure 4-1 Terrestrial Land Ownership

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Appendix A
Summary of Land Use at the Pacific Missile Range Facility

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ACRONYMS AND ABBREVIATIONS

ft	foot or feet	mi	mile
ha	hectare	Navy	Department of the Navy, United States
ICRMP	Integrated Cultural Resources Management Plan	PMRF	Pacific Missile Range Facility
		U.S.	United States
km	kilometer	WWII	World War II
m	meter		

GLOSSARY OF HAWAIIAN LANGUAGE WORDS

Hawaiian Spelling [a]	**Definition**
ʻaʻaliʻi	Hawaiian hopseed, *Dodonaea viscosa*; native shrubs and small trees
ahupuaʻa	land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (*ahu*) of stones surmounted by an image of a pig (*puaʻa*), or because a pig or other tribute was laid on the altar as tax to the chief
heiau	temple, shrine
hiʻaloa	small, downy, American weed, *Waltheria indica* var. *americana*; leaves and inner bark of root are very bitter and are used for tea or chewed to relieve sore throat
koa	the largest of native forest trees (*Acacia koa*), with light gray bark, crescent-shaped leaves, and white flowers in small, round heads
konohiki	headman of an ahupuaʻa land division under the chief
loko	pond, lake, pool
makaloa	a perennial sedge, *Cyperus laevigatus*
mauka	toward the mountain, or inland
neki	great bulrush
puʻuone	pond near the shore connected to the sea by a stream or ditch; sand dune

[a] Adapted from Mary K. Pukui and Samuel H. Elbert, 1986, *Hawaiian Dictionary*, University of Hawaiʻi Press, Honolulu, unless otherwise noted.

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1 Introduction

1.1 Project Scope

The Pacific Missile Range Facility (PMRF) consists of approximately 10,281 acres (ac), of which approximately 1,933 ac are United States (U.S.) fee simple lands under the administrative jurisdiction of the U.S. Department of the Navy (Navy). The balance of 8,348 ac is state land comprised of 684 ac of leaseholds and 7,664 ac of easements.

No active training or testing occurs on state-owned property. Infrastructure that supports PMRF operations is located in the leaseholds. The easement areas provide safety buffer zones for training and testing missions and prevent incompatible development. The existing leases and easements were acquired from the State of Hawai‘i, Department of Land and Natural Resources, and will expire between 2027 and 2030. The Navy is proposing to secure continued long-term Department of Defense use to support continued operational and mission requirements at PMRF. See Figure 1 and Figure 2 for the project areas of this summary.

The project consists of land that PMRF currently leases or has an easement for from the State of Hawai‘i.

1.2 Project Location

The entirety of the project area is on the western edge of Waimea Ahupua‘a, Kona District, Kaua‘i Island. The Controlled Industrial Area encompasses the Mākaha Ridge Tracking Station, Mākaha Ridge Road, boresight tower adjacent to Mākaha Ridge Road, and several large parcels east of PMRF Barking Sands on the Mānā Plain. The three primary study locations include Barking Sands, Mākaha Ridge Road and Kamokalā Ridge and portions of the surrounding area.

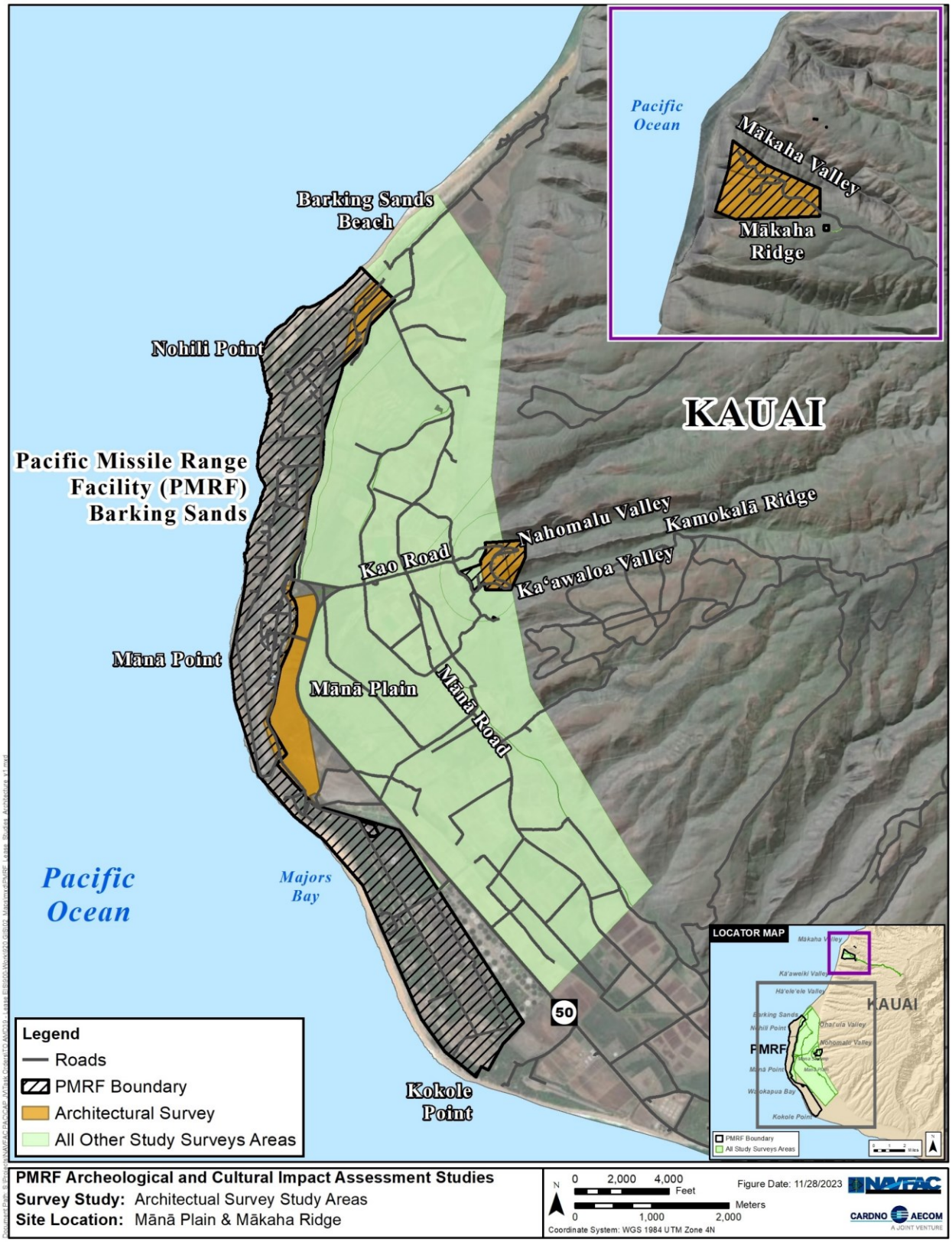

Figure 1 **Architectural survey areas in relation to PMRF Installation boundary and other survey areas.**

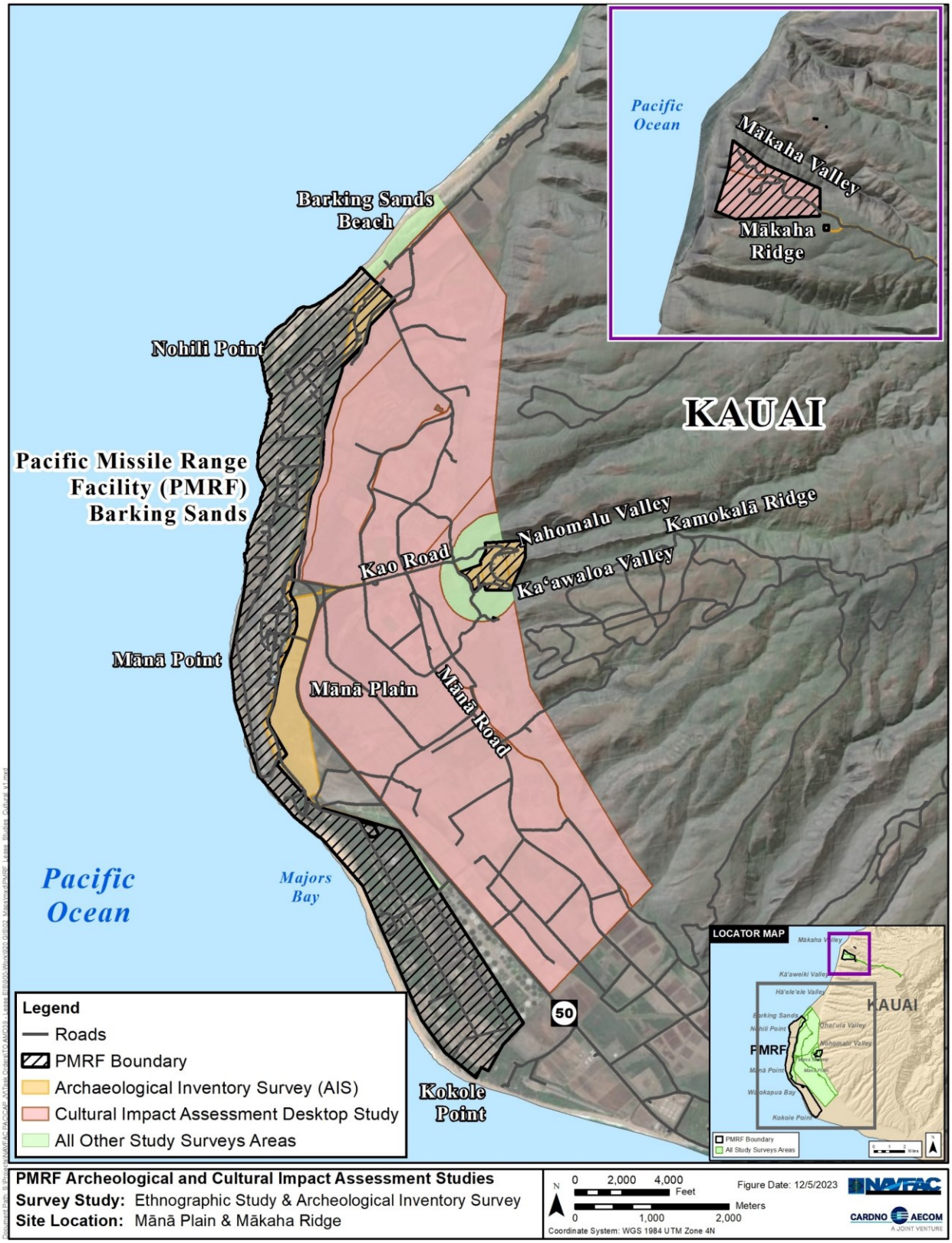

Figure 2 **Archaeology survey and Cultural Impact Assessment study area in relation to PMRF Installation boundary.**

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2 Background

This section presents background information to contextualize the current project and summarizes the physical environment, cultural and historical context, and previous archaeological research. Much of this information has been adapted from the 2005 and 2012 Integrated Cultural Resources Management Plans (ICRMPs) for PMRF (SEARCH 2012; Tomonari-Tuggle and Yoklavich 2005), Bell and Morrison (2009), Knecht and Rieth (2016). Clark et al. (2015) is a synthesized report summarizing information from previous ICRMPs and recent archaeological investigations and is also a common source for this background information. More detailed information about PMRF and the surrounding area can be found in the ICRMPs.

2.1 Physical Environment

PMRF occupies over 2,454 ac (993.5 ha) in five separate areas of the island of Kauaʻi: Barking Sands, Mākaha Ridge, Kōkeʻe, Kamokalā Ridge on the west side, and Port Allen on the south shore. Barking Sands and Port Allen are coastal locations. Mākaha Ridge and Kōkeʻe are situated on the central mountain mass of the island. Kamokalā Ridge is at the inland edge of the Mānā Plain at the base of the central mountain. The current cultural project is within and around the west side components of PMRF, which is the primary focus of this summary.

PMRF Barking Sands (the installation) covers more than 2,134 ac (864 ha) on the Mānā Plain. The installation occupies most of the coastal fringe of the plain, extending 7.77 miles (mi) (12.5 kilometers [km]) from Kokole Point in the south to Polihale State Park in the north. At its northern and southern boundaries, the installation is slightly over 0.62 mi (1 km) wide, narrowing to less than 0.31 mi (0.5 km) in the central portion. The northern two-thirds of the plain is a complex of three key physiographic features: coastal dune and back beach sands formed by aeolian and wave action, an arc of alluvial/colluvial deposition at the inland edge of the plain, and wetlands in the intermediate area. The southern third of the plain, in contrast, has a low dune, with relatively level soils extending back to the edge of the central mountain.

PMRF Mākaha Ridge Facility encompasses approximately 245 ac (99 ha) of a prominent Nā Pali ridgeline that overlooks the Mānā Plain. The ridge rises from 1,246.72 feet (ft) (380 meters [m]) to 1,853.67 ft (565 m) above sea level with an overall slope from east to west. The terrain surrounding the facility is steep, dropping quickly to the ocean along the west side and into narrow V-shaped drainages along the north and south sides.

PMRF Kamokalā Ridge is just inland from the Mānā Plain, in an area where the ancient 492.13 ft (150 m) to 656.17 ft (200 m) high sea cliffs have been incised by narrow, steep-walled gullies. The more gently sloped foothills at the base of the cliffs and mouths of the gullies have formed alluvial and colluvial arcs that project seaward. Kamokalā Ridge is bound by Nahomalu Valley to the north and Kaʻawaloa Valley to the south.

Rainfall across the survey area is very low, with mean annual precipitation averages of 15 to 20 inches (38–50.8 centimeters), increasing to 36 inches (91.44 centimeters) at Mākaha Ridge Tracking Station and gradually increasing further along Mākaha Ridge to the east with an average of 48 inches (121.92 centimeters) (Giambelluca et al. 2013). Most rain falls between October and April. The aridity of this region is caused by its location in the rain shadow of Mount Kawaikini and Mount Waiʻaleʻale (Tuggle and Tomonari-Tuggle 1997:37). The average minimum annual temperature occurs in January and is approximately 71°F, and the average maximum temperature occurs in August and is 78°F (Giambelluca et al. 2013).

Numerous soil types are found in the survey area due to the variation in terrain (Figure 3 and Figure 4). The following soil descriptions are adapted from Foote et al. (1972).

Along the coastal survey areas, five primary soil series are present. The Jaucas series, and Jaucas loamy fine sand (JfB), soils are excessively drained, calcareous soils that occur as strips on coastal plains. These soils develop by alluvial and aeolian deposition of sand formed from coral and seashells. Jaucas loamy fine sand (JfB, 0–8 percent slopes) occurs on old beaches and windblown sand deposits in the western and southern areas of Kaua‘i. The Kaloko series, and Kaloko clay (Kf) and clay loam (Kfa), are poorly drained soils on coastal plains. These soils developed in alluvium derived from basic igneous rocks; the alluvium has been deposited over marly lagoon deposits. The Mamala series, and Mamala stony silty clay loam (MnC), 0-12% slopes, consist of shallow, well-drained soils along coastal plains. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. The Lualualei series, and Lualualei clay (LuA), 0-2% slopes, consist of well-drained soils on coastal plains, alluvial fans, and talus slopes. These nearly level to gently sloping soils developed in alluvium and colluvium. The Nohili series, and Nohili clay (Nh), are poorly drained soils on coastal plains. These soils developed in alluvium that was deposited over marly lagoon deposits. Also present within this area are fill lands, which are low-lying or wetland areas that have been filled with bagasse and slurry from sugarcane processing, and dune lands, which are hills and ridges of sand drifted and piled by wind.

Along Kamokalā Ridge, two primary soil series are present. The Kekaha series, and Kekaha extremely stony silty clay loam (KOYE), 0-35% slopes, consist of well-drained soils on alluvial fans and flood plains that developed in alluvium washed from upland soils. The Waiawa series, and Waiawa extremely rocky clay (WJF), 30-80% slopes, are well-drained, very shallow, extremely rocky upland soils. These soils developed in colluvium and material weathered from basic igneous rock. Also present within this area are rubble lands, where 90 percent or more of the surface is covered by stones and boulders at the base of steep slopes.

Along Mākaha Ridge, five primary soil series are present. The Paaiki series, and Paaiki loam (PGE and PGF) 6-70% slopes, consists of well-drained soils on dissected uplands. These soils developed mainly in material weathered from basic igneous rock but partly in volcanic ash and ejecta. The Oli series, and Oli silt loam (OME and OMF), 10-70% slopes, consists of well-drained, moderately deep to deep soils on uplands. These soils developed in volcanic ash deposited over basic igneous rock. The Mahana series, and Mahana silt loam (MaD and MaE) 12-35% slopes, consists of well-drained soils on uplands. These soils developed in volcanic ash. The Puu Opae series, and Puu Opae silty clay loam (PwC and PwD), 8-40% slopes, consists of well-drained soils on uplands. These soils developed in material weathered from basic igneous rock. The Niu series, and Niu silty clay loam (NcC and NcD), 6-35% slopes, consists of well-drained soils on uplands. These soils developed in material weathered from basic igneous rock, possibly mixed with volcanic ash.

2.2 Traditional Land Use

Traditional land uses near the survey area include habitation, subsistence activities, burial, and travel. These topics are briefly summarized in the following sections.

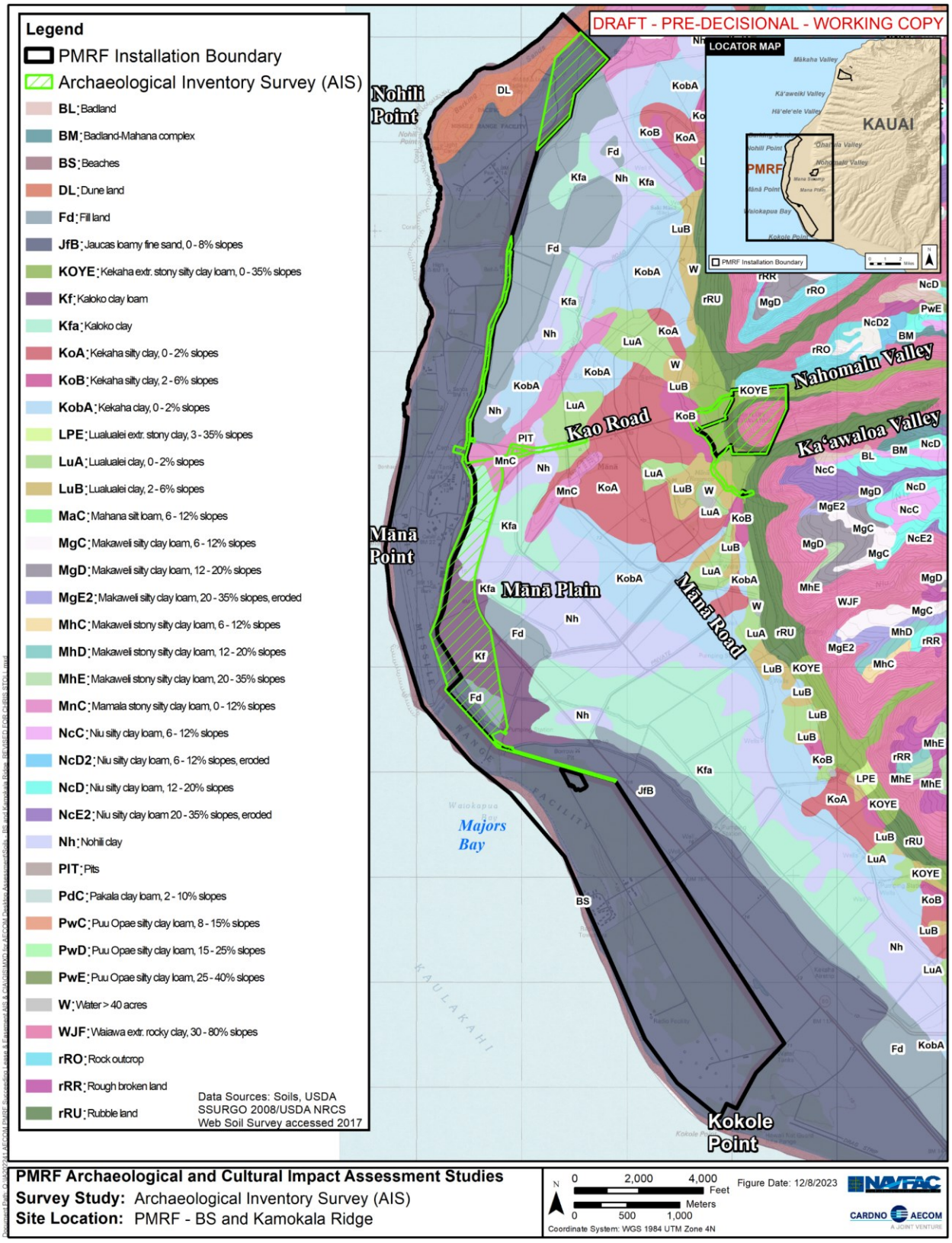

Figure 3 USDA soil classes in the vicinity of the survey area at Barking Sands and Kamokalā Ridge.

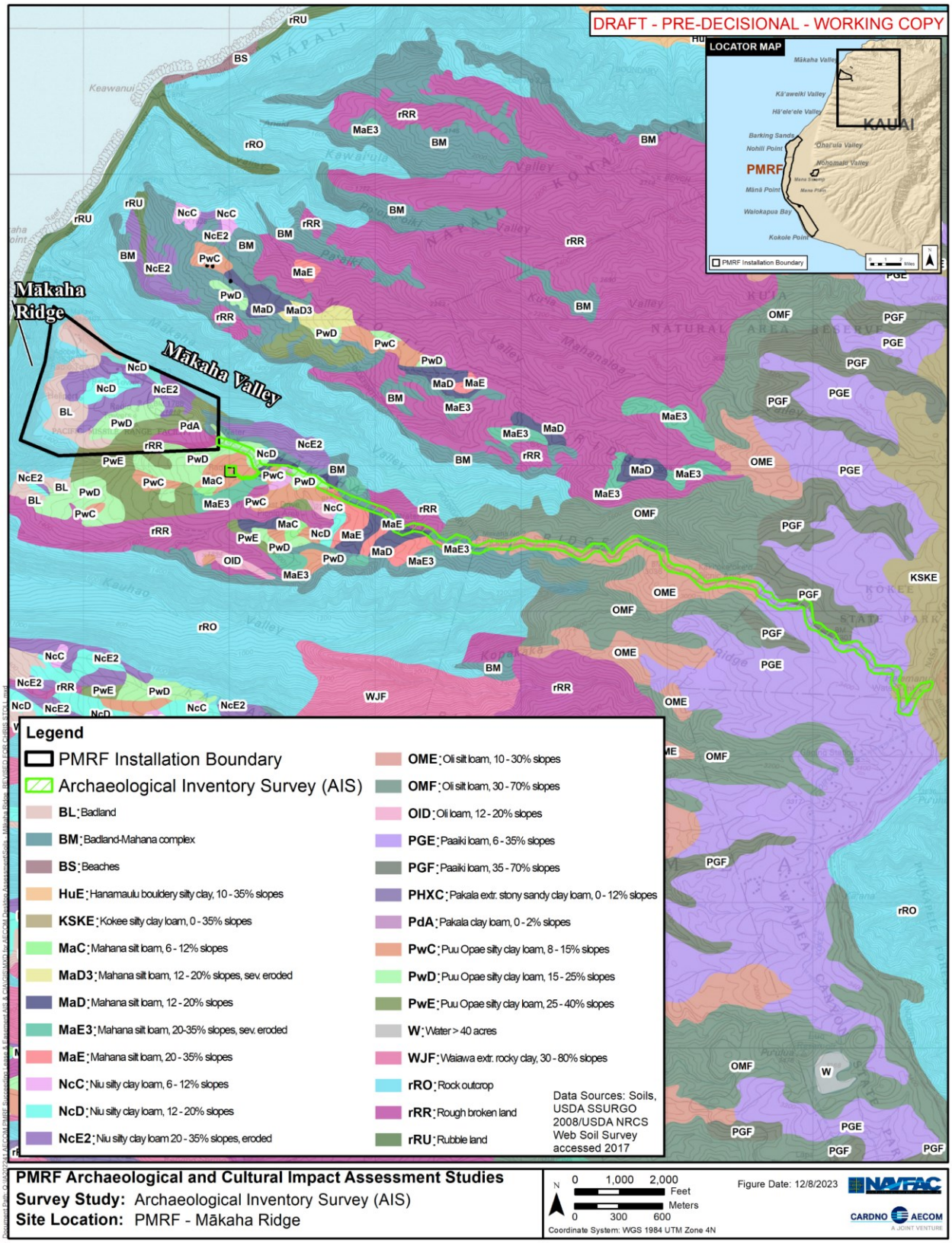

Figure 4 USDA soil classes in the vicinity of the survey area at Mākaha Ridge.

2.2.1 Settlement on the Mānā Plain

Wichman (1991:12), in relaying the story of Polihale, a konohiki (headman of an ahupua'a land division under the chief), describes the Mānā area in pre-Contact times as:

> … a land that stretched from the western cliffs of Na Pali to the eastern boundary shared with Waiawa. Mānā is a land of long white beaches with the ocean on one side and a large swamp that teemed with birds on the other. Inland of the marsh was a fertile strip of land where sweet potatoes and gourds were grown. Above these fields cliffs rose stiff backed, broken wide by valleys down which constantly flowed fresh spring or rain water. The ridges, covered with sandalwood and koa (*Acacia koa*) trees, stretched into the mountains wreathed with cold and misty rain.

It is likely that permanent settlements were concentrated at the inland edge of the Mānā Plain, where houses, temples, and agricultural complexes were built in the foothills at the base of the cliffs, on high ground overlooking the wetlands and coastline.

Small fishing communities, possibly limited to temporary camps, were scattered along the coast, concentrating near optimal localities such as breaks in the reef where canoes could be launched or where reefs provided rich habitat for near-shore marine resources. Some camps were located on the protected, lee sides of the high dunes from Nohili Point to Polihale. Bennett (1931:102) observed house sites marked "by single rows of stones … or by low walls" along the inland side of the dunes. Flores and Kaohi (1992:44) suggest that the sites on the inland side of the high dunes may have been permanent homes for:

> … Those families whose time was mostly occupied with fishing … [The dunes] provided them protection from ocean storm waves, flood waters, and strong on-shore winds—yet, still close enough to easily access the ocean resources. Taro was cultivated in portions of Kolo Swamp that were adjacent and mauka of these house sites.

2.2.2 Resource Collection and Subsistence

The people of Mānā were noted as fishermen, taking advantage of the rich waters of the channel between Kaua'i and Ni'ihau. Fishing was not confined to the ocean and shoreline of Mānā, but also included the swamps and ponds on the coastal plain. The swamp areas of Limaloa, Kawaiele, Nohili, and Kolo were utilized as brackish water loko pu'uone fishponds (Kikuchi 1987:5, 9; Kilauano 1991).

Although their modern forms are clearly related to the plantation era, the Nohili Ditch and the Kawaiele Ditch may have had earlier iterations as traditional Hawaiian ditches related to the functioning of the inland ponds for aquaculture. The Mānā Plain ponds were formed by water accumulating behind the dune berms with the natural ponds enhanced by excavation of channels through the dunes to allow the flow of ocean water into the ponds during high tide (Kikuchi 1987:9). The wetlands were also a place where wild resources could be collected.

Taro, sweet potato, bananas, and other food crops were also grown in and at the mouths of the narrow gulches that fed onto the plain; however, the aridity of the plain limited the amount of farming. Pukui (1983:271) writes of the proverb "Ola i ka 'ai uwahi 'ole o ke kini o Mānā, the inhabitants of Mānā live on food cooked without smoking." She says that in ancient days, the people of Mānā "did very little poi-making, except in a place like Kolo, where taro was grown" (see also Kilauano 1991). Handy (1940:61) notes that "wet taro has been grown at the northern end of the Mānā swamp, near the Barking Sands." However, most Mānā people exchanged fish and dryland products (like gourds) with taro producers from other parts of the island. Thus, because "all the taro cooking and poi-making was done elsewhere, the people of Mānā were said to live on 'smokeless food'" (Pukui 1983:271).

The coastal plain was a source of natural items that were collected and used for a variety of purposes. These included ʻaʻaliʻi shrubs for firewood, hiʻaloa and other plants for medicine, and makaloa and neki for weaving. The neki and makaloa were used in plaiting mats and other articles, the fashioning of which was called moena makaloa.

2.2.3 Burials

Hawaiians share a special connection to birthplace and homeland. As a consequence, burials were often placed close to households and those that have passed away are still considered to be part of the living family system (Flores and Kāohi 1992: 207). According to the Hawaiian tradition, upon death, the spirit travels to a leaping-off place where it is then assisted in its journey to the next realm by its ʻaumakua (Pukuʻi 1972: 40, cited in Flores and Kāohi 1992: 206). Burials form an incredibly important part of the Hawaiian spiritual world and many Hawaiians feel the spirit resides near the physical remains of the bones. When burials are disturbed, the spirit is insulted, resulting in shame and humiliation to the living descendants (Pukuʻi 1972: 109 cited in Flores and Kāohi 1992: 206).

The coastal dunes of the Mānā Plain were the burial grounds of ancient Hawaiians. Human skeletal remains have been found in the sands of PMRF Barking Sands, as well as in mixed sandy soils nearly 1 km inland, from the north end of the installation to Waiokapua Bay and Kokole to the south. References to burials in the Nohili area appear in oral traditions and literature (e.g., Fornander 1917).

In addition to burial locations, the spiritual significance of the Mānā Plain is also evidenced by the presence of several important *heiau*, most notably Polihale and ʻElekuna *heiau.* ʻElekuna was known as a particularly important and special *heiau* that King Kalakaua and his priests visited many times (Flores and Kāohi 1992: 45). Polihale *heiau* was a site of religious observance where rites associated with departing souls would be carried out. A sacred spring in a nearby cliff was used for purification of those souls making their journeys into the next realm (Flores and Kāohi 1992: 45).

2.2.4 Transportation

There were two primary traditional land routes across the Mānā Plain: one along the shoreline and the other along the base of the cliffs and ridges. Other trails ran inland from the coastal plain to the mountains. People also traveled by canoe, particularly going to and from the valleys of the Nā Pali coast, by launching from beaches with unobstructed reefs and passageways such as at Palaiholani, Keanapuka, Poʻoahonu, Keawanaiʻa, and Polihale.

An unusual means of travel in this area is noted in historical accounts that describe the Mānā Plain after heavy flooding from Kona storms. These accounts note that one could travel by canoe from Waimea to Kolo through Mānā swamps and marsh lands. Faye (1981) recalls that “in a low bottomed canoe you could row for miles on this lake.… The canoe would tip over and if you were very short you wouldn’t be able to touch bottom, but if you were taller, you could sort of tread over.”

2.3 Historical Land Use

Historical land uses in this area include agriculture and U.S. military activities.

2.3.1 Agriculture

Early Western explorers were not particularly interested in the Mānā Plain, which was described as a hot and dry place with large sections of marshland (Portlock 1789:170-171; SEARCH 2012). The inhabitants of Mānā largely lived in the traditional ways of their ancestors until the 1848 Māhele, which wrought wide-ranging social changes and provided for private land ownership. Shortly after the Māhele, commercial agricultural practices were brought to the Mānā Plain by leases on crown lands to Archibald Archer and

eventually Valdemar Knudsen, and practices included grazing cattle, harvesting timber, and cultivating crops such as tobacco, coffee, fruit, rice, and sugarcane (Jones 1992:6; Sweeney 1994:10; SEARCH 2012).

As commercial crop cultivation increased, so, too, did the number of agricultural workers. The majority of these agricultural workers came from China, Japan, and the Philippines. With the influx of agricultural workers, the need for workers' housing increased, and according to Smith (1989:4), the first camp for housing agricultural workers dates to 1852. As agricultural production on the Mānā Plain expanded, much of the marshland was filled in or drained to provide more arable land, with increasing amounts of land being converted to sugarcane cultivation. Much of this was operated by the Kekaha Sugar Company, Ltd, which was formed in 1898 by Knudsen and L'Orange and continued operations through the 20th century (SEARCH 2012).

At Kamokalā Ridge, the area developed in the mid-nineteenth century for cattle grazing and ranching as well as commercial sugar and rice plantations. Plantation workers lived in camps throughout Mānā Plain, including between Kamokalā Ridge and PMRF, and railroad lines extended through fields connecting the agricultural goods to the wharf at Waimea. Plantation operations in the area had all closed by 2000 (TEC Inc.–JV 2011a).

2.3.2 U.S. Military

The following section provides a brief historical overview of U.S. Military land use in the three primary survey areas.

2.3.2.1 Barking Sands

One of the first non-agricultural land uses in the study area was an airstrip. This facility was established by the Territory of Hawai'i in 1921 and constructed by 1928 on a portion of the land that would later become PMRF Barking Sands (SEARCH 2012). The landing field at Barking Sands was not intended to be a commercial airport due to its distance from Waimea but was considered a good location as a stopover for transpacific flights. However, the airfield was seldom used and poorly maintained. Figure 5 shows the location of the landing field in 1935.

In 1940, the airfield at Barking Sands was designated for military use by the U.S. Army (SEARCH 2012). The airfield was expanded by 2,058 ac (832.8 ha) in 1941, quadrupling in size. Figure 5 shows the location of the landing field in 1935 and Figure 6 shows the airfield in 1941, before U.S. involvement in World War II (WWII). The massive land acquisition occurred primarily to the north and south of the existing airstrip along the coast. In May 1942, following the Pearl Harbor attack, the airfield became Barking Sands Army Air Base (TEC Inc.–JV 2011a). Figure 7 shows the landing field in 1943 after the expansion and improvements were completed. After its establishment as an Air Base, Barking Sands was used for flight training and aircraft refueling as the U.S. became involved in WWII (SEARCH 2012). In 1943, Kamokalā Ridge underwent construction, and 10 tunnel magazines with monorail transportation were built for bomb storage. As World War II progressed, Barking Sands was designated as a Combat Crew Replacement Center in 1944, establishing the base as an aircraft maintenance center and training grounds for crew prior to deployment to the Pacific Theater (SEARCH 2012). After World War II ended in 1945, base activity gradually decreased.

The late 1940s saw a decline in military activities as Barking Sands was transferred from the Army to the U.S. Air Force, becoming Barking Sands Air Force Base in 1948 (SEARCH 2012). The U.S. Navy established PMRF at the airfield in 1958 after using the area in 1956 for training operations on Regulus guided missiles, the first major Cold War mission at Barking Sands. The Atomic Energy Commission was a major tenant on base and created the Kauai Test Facility in the early 1960s, operated by Sandia

National Laboratories. Mākaha Ridge, a northern outpost near Waimea Canyon, was developed by the Navy in 1966 to aid the new Barking Sands Tactical Underwater Range and to house radar and telemetry facilities (SEARCH 2012).

Figure 5 Barking Sands Landing Field in 1935. Source: National Archives.

Figure 6 Barking Sands Army Air Base in 1941. Source: National Archives.

Figure 7 Barking Sands Army Air Base in 1943. Source: National Archives.

2.3.2.1 Kamokalā Ridge

The naval facilities at Kamokalā Ridge were developed in 1942-43, shortly after the attack on Pearl Harbor (SEARCH 2012). As PMRF Barking Sands was expanded to include strategic offensive facilities to provide service, equipment, and maintenance for B-24 bombers heading into the Pacific, several critical facilities were built underground to provide greater protection from aerial attacks. It was during this initial construction phase that the Kamokalā Ridge magazines were dug out of its basalt cliffs, some with monorails to transport munitions (TEC Inc.–JV 2011a) in 1943 (see Figure 8 and Figure 9). Records also indicate that during the 1960s, the Navy stored High Altitude Sounding Projectile (HASP) boosters in the hard-rock magazines at Kamokalā Ridge as part of Cold War missions at PMRF (SEARCH 2012). Between 1966 and 1992, the Hawaii Air National Guard occupied portions of PMRF and, during this period, acquired one of the 10 hard-rock magazines to use for storage of weapons and ordinance. Two large, earth-covered missile magazines were constructed at Kamokalā Ridge in 2002 (TEC Inc.–JV 2011a).

Known extant historic-era built resources within Kamokalā Ridge include 10 National Register of Historic Places-eligible tunnel magazines (Facilities 1-10) (SEARCH 2012). Kamokalā Ridge is accessed via the Ordnance Gate of Barking Sands and Kamokalā Ridge Road, which follows its original 1942 alignment and includes an extant vehicular bridge (Facility 20) (TEC Inc.–JV 2011a).

2.3.2.2 Mākaha Ridge

Mākaha Ridge was formally developed by the Navy in 1966 to aid the new Barking Sands Tactical Underwater Range and to house radar and telemetry facilities (SEARCH 2012). Construction at Mākaha

Ridge was a large undertaking and required extensive development of the landscape, including the installation of access roads (Weitze 2008). The site is accessed by the Mākaha Ridge Access Road, which is a long, narrow, paved road located in the forested lands stemming from Kōkeʻe Road to the southeast (TEC Inc. 2011a).

Prior to the Cold War, one facility existed at Mākaha Ridge, The Command Control Transmit Van Site (Building 200531) was constructed in 1946. Facilities built during the Cold War on Mākaha Ridge included a communications facility (Building 708), power station (Building 711), tracking radar (Building 713), and surveillance radar (Building 715) (Weitze 2008). A filling station (Building 733) was added in 1960. A helicopter pad was installed on the western portion of the Mākaha Ridge site sometime after 1966.

Several additional facilities were added between 1967 and 1970, including a telemetry facility (Building 725) and three telemetry towers (Buildings 726, 727, and 728) (see Figure 10 and Figure 11) (Weitze 2008, SEARCH 2012). An electric and communication maintenance shop (Building 742) was added to Mākaha Ridge in 1983. Mākaha Ridge, in combination with the Barking Sands Tactical Underwater Range and PMRF launch complex, comprised a National Missile Range and an underwater range (TEC Inc. 2011a). These ranges were used to train personnel in nuclear submarines operations and anti-submarine warfare during the Cold War era, and Mākaha Ridge supported naval weapons tests and evaluations during Navy fleet exercises (SEARCH 2012). Prior historic building surveys conducted at Mākaha Ridge include Dowden and Rosendahl in 1993, Drolet et al. in 1996, and Maly and Wulzen in 1997.

Figure 8 Example of Kamokalā Ridge missile magazine. Source: Tomonari-Tuggle and Yoklavich (2005).

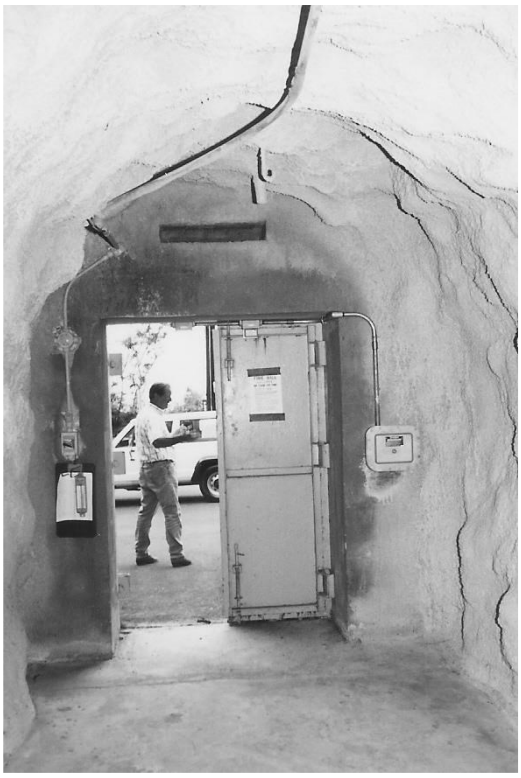

Figure 9 **Example of Kamokalā Ridge missile magazine. Source: Tomonari-Tuggle and Yoklavich (2005).**

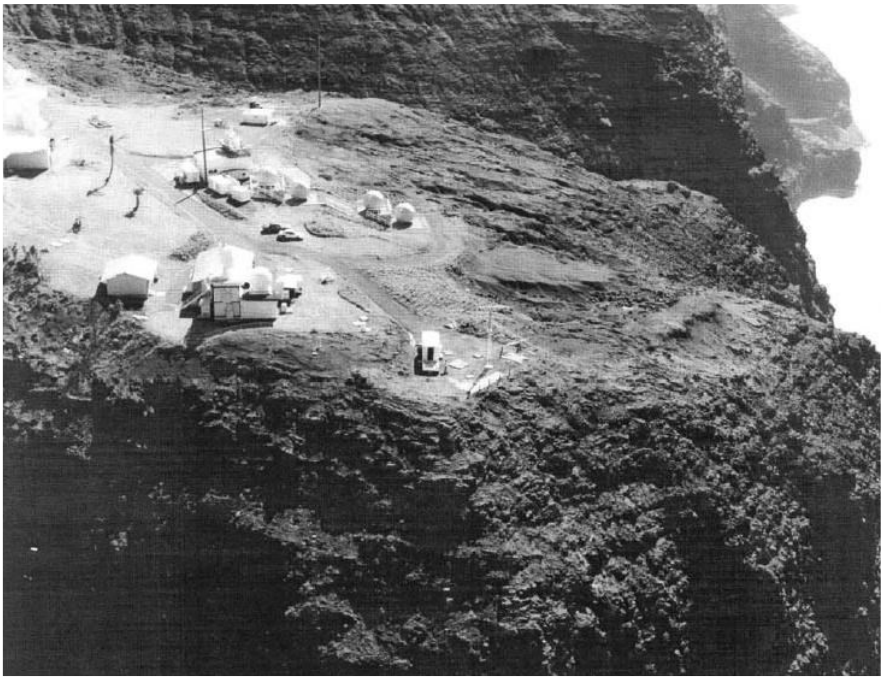

Figure 10 **Mākaha Ridge Tracking Station in the 1960s. Courtesy of PMRF.**

Figure 11 Mākaha Ridge Tracking Station with Mākaha Ridge Road in the background. Courtesy of PMRF.

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Appendix B
Regulatory Setting

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Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
County of Kaua'i	Kaua'i Kakou – Kaua'i County General Plan	The Kaua'i General Plan serves as the county's guiding policy framework concerning growth, land use, and development issues. The plan seeks to enhance and improve Kaua'i's physical and natural environment and overall quality of life. The plan is built upon a countywide vision and goals statement and sets forth key objectives and actions. The General Plan underwent a comprehensive update in 2018. Although the development plan does not apply to projects on federal property, protection of mountain and ocean views that benefit the visual quality of the ROI should be considered.	Visual Resources and Land Use	This EIS was developed in accordance with the guidance in this plan.
County of Kaua'i Transportation Agency – The Kaua'i Bus	County of Kaua'i Transportation Agency standards for public transit operation (physical and operational) and DTS Roadway and Traffic Operations Guidelines	County of Kaua'i Transportation Agency operates the Kaua'i Bus, the public transit system that provides service to PMRF.	Traffic	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
CEQ; Navy	NEPA; CEQ NEPA implementing regulations; Navy procedures for implementing NEPA (42 U.S.C. § 4331; 40 CFR parts 1500-1508; 32 CFR part 775)	Regulations applicable to and binding on all federal agencies for implementing the procedural provisions of NEPA.	All Resources	This EIS has been prepared in accordance with the President's revised CEQ Regulations implementing NEPA and Navy NEPA procedures effective for actions initiated after September 14, 2020. Preparation of this EIS and provisions for its public review are being conducted in compliance with NEPA.
CEQ	NEPA 40 CFR § 1502.16(a)(10)	States that environmental consequences should include "economic and technical considerations, including the economic benefits of the proposed action," where applicable.	Socioeconomics	Following these regulations, the socioeconomic analysis in this EIS evaluates economic benefits of the Proposed Action.
CEQ	NEPA 40 CFR § 1508.1(g)(1)	States that effects include "aesthetic, historic, cultural, economic (such as the effects on employment), social, or health" effects.	Socioeconomics	Following these regulations, the socioeconomic analysis in this EIS evaluates how elements of the human environment such as population, employment, housing, economic activity, and local government revenue might be affected by the Proposed Action.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
CEQ	NEPA 40 CFR § 1508.1(m)	States that the human environment means "comprehensively the natural and physical environment and the relationship of present and future generations of Americans with that environment."	Socioeconomics	Following these regulations, the socioeconomic analysis in this EIS uses this definition for the human environment.
CEQ	Environmental Justice Guidance Under the National Environmental Policy Act	Guidance document to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed in accordance with EO 12898.	Environmental Justice and Protection of Children	This EIS was developed in accordance with this guidance.
CEQ	Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews	Guidance to assist federal agencies in their consideration of the effects of GHG emissions and climate change when evaluating proposed federal actions in accordance with NEPA.	All Resources	This EIS was developed in accordance with this guidance.
CEQ	Fiscal Responsibility Act of 2023, PL 118-5	Amendments to NEPA	All Resources	This law was used to determine the joint status of NASA and Navy for the preparation of this EIS.
CEQ and Office of Science and Technology Policy	EO 13840 Ocean Policy to Advance the Economic, Security, and Environmental Interest of the U.S.	Ensure protection, maintenance, and restoration of the health of the ocean.	Water Resources; Marine Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
CNRH	IAP	The IAP is a guidance document that provides aesthetic and functional direction in site design, architecture, landscape architecture, and signage for new development and renovation efforts. The IAP helps to protect and preserve the installation's natural and historic integrity and ensures a unified appearance for each installation and continuity across the region.	Visual Resources	This EIS was developed in accordance with the guidance in this plan.
DLNR-SHPD	Hawai'i Revised Statutes 6E-42	Project requires compliance with state laws for preservation of historic properties.	Cultural Resources	Compliance with this law will be conducted.
DoD	DoD Inst. 4715.06 – Environmental Compliance in the United States	Establishes policies, assigns responsibilities, and provides procedures for achieving and maintaining environmental compliance in the U.S.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
DoD	DoD Inst. 6050.05 – DoD Hazard Communication Program	Manages hazardous substances to minimize health and environmental risks and operational costs. Provides known hazard information to military personnel and civilian employees using hazardous chemicals, including engineered nanomaterials.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	NAVSUP Pub. 573 (DLA Instruction 4145.11) – Storage and Handling of Hazardous Materials	Procedures for the receipt, storage, and handling of hazardous materials and wastes by DoD components, installation, and activities.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	Defense Explosives Safety Regulation 6055.09	Establishes explosives safety standards for the DoD that are designed to manage explosives related risk associated with DoD operations and installations by providing protection criteria.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	DoD Directive 4710.03, Consultation with Native Hawaiian Organizations (October 25, 2011, incorporating Change 1, August 31, 2018)	Provides policy, prescribes procedures, and assigns responsibilities for the management of archaeological and historic resources located in and on waters and lands under DoD control. It is the policy of DoD to integrate historic preservation requirements with the planning and management of activities under DoD control.	Cultural Resources	Consultation with NHOs, if required for compliance with NHPA according to the Programmatic Agreement, would be conducted in accordance with this directive.
DoD	Danger Zone and Restricted Area Regulations (33 CFR part 334)	Hazardous materials and wastes exposure, including MEC.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	Final Military Munitions Rule (40 CFR part 266, Subpart M)	Hazardous materials and waste exposure, including MEC.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	Naval Ordinance Safety and Security Activity Instruction 8020.15E. Explosives Safety Review, Oversight, and Verification of Munitions Responses	Munition exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA; DoD	CWA (33 U.S.C. §§ 1313, 1314, 303(d), 305(b) and most recent 304(a) list)	Mitigates impacts to surface water from construction activities and discharge to navigable waters.	Hazardous Materials and Wastes; Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
EPA; HDOH-CWB	CWA section 402, NPDES Program (42 U.S.C. § 7401 et seq.); Hawai'i Water Quality Standards (HAR 11- 55; HRS Chapter 342D) *includes NPDES and SWPPP	Regulates discharges of pollutants from point source to WOTUS and requires compliance with standards, limitations, and regulations. NPDES permits authorized discharges of stormwater associated with construction and industrial activities.	Hazardous Materials and Wastes; Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA; HDOH-CWB	CWA section 401 (33 U.S.C. § 1341; 40 CFR §§ 121.2(a)(3), (4), and (5) Water Quality Certification); Hawai'i Water Quality Standards (HAR 11- 54; HRS Chapter 342D)	Any federally authorized activity that may result in any discharge into state waters requires a Water Quality Certification. Water pollutants that enter state waters from all sources, point or non-point, shall comply with applicable requirements as established in HAR, Chapter 11-54.	Marine Biological Resources; Water Resources; Public Health and Safety; Geological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	Title 40 CFR et seq.: Protection of the Environment	EPA protects human health and the environment.	Hazardous Materials and Wastes; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	40 CFR § 125.94	Compliance with BTA Standards.	Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	National Primary Drinking Water Regulations 40 CFR part 141	Affects management of water sources by way of setting standards for drinking water quality. Groundwater quality and quantity are regulated under several statutes and regulations, including the Safe Drinking Water Act.	Water Resources; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Energy Independence and Security Act; PL 110-140 section 438	Federal agencies are required to reduce stormwater runoff from federal development and redevelopment projects to protect water resources.	Water Resources; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
EPA	RCRA 42 U.S.C. § 6901 et seq. and 40 CFR parts 260-272 as relates to hazardous waste management	Hazardous materials and wastes exposure. The EPA controls hazardous waste including generation, transportation, treatment, storage, and disposal of hazardous waste.	Hazardous Materials and Wastes; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in compliance with this Act.
EPA	Toxic Substances and Disease Registry – CERCLA 42 U.S.C. §§ 9601–9675; 40 CFR parts 300–311; 40 CFR part 373	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in compliance with this Act.
EPA	Pollution Prevention Act of 1990 (42 U.S.C. §§ 13101–13109)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. § 11001 et seq.; 40 CFR parts 350–372)	Hazardous materials and wastes exposure. Helps communities plan for chemical emergencies and requires industry to report on the storage, use, and releases of hazardous substances to federal, state, and local government.	Hazardous Materials and Wastes; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act.
EPA	EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	Health and safety of children (vulnerable population).	Public Health and Safety; Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts to children.
EPA	Federal Insecticide, Fungicide, and Rodenticide Act of 1996 (7 U.S.C. § 136 et seq.)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Federal Environmental Pesticide Control Act of 1972 (7 U.S.C. §§ 136–136y)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Federal Facilities Compliance Act of 1992 (PL 102–386)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
EPA	Noise Control Act of 1972 (PL 92- 574, 42 U.S.C. § 4901 et seq.) and Amendments of 1978 (PL 95-609)	Establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare.	Noise; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in compliance with this Act.
EPA	40 CFR part 50	NAAQS.	Air Quality	The Proposed Action would not cause a violation of the NAAQS.
EPA	40 CFR part 60	New Source Performance Standards.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	40 CFR parts 61-63	NESHAPs.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	40 CFR part 70	State Operating Permits.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
EPA	Memorandum addressing Children's Health through Reviews Conducted Pursuant to the NEPA and section 309 of the Clean Air Act	Memorandum on addressing the Protection of Children from environmental health risks and safety risks in NEPA and section 309 Clean Air Act Reviews in accordance with EO 13045.	Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts to children.
Federal Law	National Historic Preservation Act (NHPA), as amended (54 U.S.C. 300101 et seq.).	Establishes national policy for the preservation of historic properties. Section 106 of the NHPA requires federal agencies to consider the effects of proposed undertakings, mitigate adverse effects of projects, and afford the ACHP and interested parties the opportunity to comment.	Cultural Resources	Compliance with the NHPA will be conducted according to the 2012 COMNAVREG Hawaii Programmatic Agreement and any applicable amendments.
Federal Law	Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. §§ 3001-3013).	Provides for the protection and repatriation of Native American and Native Hawaiian human remains and cultural items discovered on federal or tribal lands or currently curated by federal or federally assisted curation facilities.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this law and its implementing regulation.
Federal Law	Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470aa-470ll).	Provides for the protection of archaeological resources and sites on public and Indian lands by requiring permits from the federal land manager for excavation or removal of archaeological resources.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this law and its implementing regulation.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
Federal Law	American Indian Religious Freedom Act of 1978 (42 U.S.C. § 1966)	Establishes the policy of the United States to protect and preserve the rights of American Indians, Eskimos, Aleuts, and Native Hawaiians to believe, express, and exercise their traditional religions.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this law and its implementing regulation.
FEMA	Floodplain Management, EO 11988	Requires federal agencies to avoid long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development. Flood potential of a site is usually determined by the 100-year floodplain, which is defined as the area that has a 1 percent chance of inundation by a flood event in a given year.	Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
HDOH	CWA section 401 (33 U.S.C. § 1341, 40 CFR §§ 121.2(a)(3), (4), and (5) Water Quality Certification); Water Pollution Control Act (33 U.S.C. § 1251 et seq.)	Any federally authorized activity that may result in a discharge into state waters requires a Water Quality Certification. Potential impacts from the Proposed Action through impacts on water quality. The Kawaiʻele Pumping Station as well as Canal discharge may fall under these regulations.	Marine Biological Resources; Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	22 HAR Title 11, Chapter 59	State AAQS.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	22 HAR Title 11, Chapter 60.1	Air Pollution Control.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	Hawaiʻi Underground Storage Tanks Act HAR 19-342L	Regulations pertaining to underground storage tanks, which includes hazardous substances release.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	Solid Waste Management Control HAR 11-58	Establishes minimum standards governing design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation, and transfer systems.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOT	HDOT traffic operational and safety standards and HDOT roadway design standards	Regional and sub-regional roadways providing access to PMRF are under the jurisdiction of HDOT, specifically Kuhio Highway.	Traffic	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
NASA	NASA's Procedures for Implementing NEPA, 14 CFR part 1216, et seq.	Regulations governing NASA's compliance with NEPA and CEQ's 40 CFR parts 1500–1508.	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
NASA	NASA Environmental Management, NPD 8500.1	NASA's environmental management policy	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these policies.
NASA	NASA National Environmental Policy Act Management Requirements, NPR 8580.1	Establishes procedures and responsibilities for complying with requirements of NEPA, CEQ's implementing regulations, EO 12114 – Environmental Effects Abroad of Major Federal Actions, and NPD 8500.1.	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
Navy	PMRF Installation Development Plan	Land use constraints.	Land Use	This EIS was developed in accordance with the guidance in this plan.
Navy	OPNAVINST 11010.40	Establishes an encroachment management program to ensure operational maintenance that has direct bearing on land use planning on installations.	Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	OPNAVINST 11010.36C	Provides guidance administering the AICUZ program, which recommends land uses that are compatible with noise levels, accident potential, and obstruction clearance criteria for military airfield operations.	Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	OPNAVINST 3550.1A	Provides guidance for the RAICUZ program. This program includes range safety and noise analyses and provides land use recommendations that are compatible with Range Compatibility Zones and noise levels associated with military range operations.	Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	OPNAVINST 5090.1 Environmental Readiness	Provides guidance for the management of the environmental, natural, and cultural resources for all Navy ships and shore activities.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	Environmental Readiness Program Manual (OPNAV-M 5090.1)	Navy's policy guidance for environmental readiness. It discusses requirements, delineates responsibilities, and issues policy guidance for the management of the environmental, natural and cultural resources for all Navy ships and shore activities.	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this manual.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
Navy	SECNAVINST 4000.35B Department of the Navy Cultural Resource Program	Provides clarification on the responsibilities for management of historic buildings, structures, districts, archaeological sites and artifacts, historic ships and aircraft, and other cultural resources.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	SECNAVINST 11010.14B Department of the Navy Policy for Consultation with Federally Recognized Indian Tribes, Alaska Native Tribal Entities, and Native Hawaiian Organizations	Provides policy, procedures, and responsibilities when consulting with representatives of federally recognized Indian tribes, including Native Hawaiian Organizations.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
NAVFAC	PW6 600-01, Public Works Utilities Criteria for Design and Construction of Electrical, Sewer, and Water, April 10, 2006	Utilities design criteria.	Utilities	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
NAVFAC	PW6 600-01 Public Works Utility Criteria for Design and Construction of Water Utilities	Utilities design criteria.	Utilities	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
NOAA; SOH, Office of Planning and Sustainable Development	National Coastal Zone Management Act (16 U.S.C. § 1451, 15 CFR part 930); Coastal Zone Management Act section 307(c)(1), HRS Chapter 205A – Coastal Zone Management	Federal actions or activities that affect any land or water use or natural resource of the coastal zone are to be carried out in a manner consistent to the maximum extent practicable with the enforceable policies of federally approved state coastal management program.	Hazardous Materials and Wastes; Land Use; Water Resources; Geological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act to the extent practicable, consistent with the enforceable policies of Hawai'i's federally approved coastal management program.
NOAA NMFS; USFWS; SOH, DLNR	ESA (16 U.S.C. § 1531 et seq.); State of Hawai'i Endangered Species Laws (HAR 12-124, Exhibit 2 and HRS § 195D)	Potential impacts to federally and state listed species.	Terrestrial Biological Resources; Marine Biological Resources; Land Use	Informal consultation with NMFS and USFWS has been initiated and is ongoing, and the Proposed Action analyzed in this EIS would be implemented in compliance with the ESA. Potential impacts to state-listed species are addressed in this EIS. This is pending review of monk seal haul-out in the leasehold area; additional review of ESA species is covered in the Hawaii-Southern California Training and Testing EIS.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
NOAA NMFS; SOH, DLNR; EPA	EO 13089, Coral Reef Protection	All federal agencies whose actions may affect U.S. coral reef ecosystems shall: (a) identify their actions that may affect U.S. coral reef ecosystems; (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems.	Marine Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
NOAA NMFS; HDOH	EO 12088, Federal Compliance with Pollution Control Standards	Ensures federal compliance with applicable pollution control standards. Related to impacts from sediment resuspension and runoff due to operations.	Marine Biological Resources; Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
NOAA NMFS	Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.)	EFH is not expected but could be designated in the study area.	Marine Biological Resources	The project is within areas designated as EFH; therefore, the Navy will provide NMFS with a written assessment of the effects of the Proposed Action on EFH. This analysis is covered in the Hawaii-Southern California Training and Testing EIS.
NOAA NMFS	Marine Mammal Protection Act (16 U.S.C. § 1361-1407)	Presence of one marine mammal, Hawaiian monk seal (*Neomonachus schauinslandi*), which is known to appear in study area.	Marine Biological Resources	Informal consultation with NMFS has been initiated under the ESA.
OSHA	Occupational Safety and Health Act of 1970 (PL 91-596); OSHA Occupational Noise Exposure (29 CFR § 1910.95)	Workforce safety, including occupational noise exposure limits.	Public Health and Safety; Noise	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
Office of the President	EO 11990, Protection of Wetlands (42 FR 26961, May 24, 1977)	Requires federal agencies to adopt a policy to avoid long- and short-term adverse impacts associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.	Water Resources; Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
Office of the President	EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations (59 FR 7629; February 16, 1994)	Requires agencies to identify and address any disproportionately high and adverse human health or environmental effects their programs, policies, and activities may have on minority populations and low-income populations.	Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts on low income populations, minority populations, or the Native Hawaiian population.
Office of the President	EO 13045, Protection of Children from Environmental Health Risks and Safety Risks (62 FR 19885; April 23, 1997)	Requires agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that their policies, programs, activities, and standards address those disproportionate risks.	Environmental Justice and Protection of Children; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
Office of the President	EO 13112, Invasive Species (64 FR 6183; February 3, 1999)	Requires federal agencies whose actions may affect the status of invasive species to identify those actions and use relevant programs and authorities to prevent and manage the introduction of invasive species in consultation with the Invasive Species Council.	Terrestrial Biological Resources; Marine Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
Office of the President	EO 14008, On Tackling the Climate Crisis at Home and Abroad (86 FR 7619; January 27, 2021)	Amends EO 12898 by updating the interagency working group and requiring the working group to report back with recommendations to improve environmental justice.	Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts on low income populations, minority populations, or the Native Hawaiian population.
State of Hawai'i - Office of Planning and Sustainable Development (OPSD)	Coastal Zone Management Act Section 307/CZM Program	The national Coastal Zone Management Act (CZMA), Section 307, requires federal agency activities and development projects affecting any coastal use or resource to be undertaken in a manner consistent to the maximum extent practicable with the state's CZM program. The CZM area encompasses the entire state because there is no point of land more than 30 miles from the ocean, a definite land-sea connection exists throughout the state. The project exists within the CZM area.	All Resources	A CZM federal consistency review and application will be completed and submitted to the State of Hawai'i CZM program office.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
State of Hawai'i – Department of Land and Natural Resources (DLNR)	Hawai'i Revised Statutes Chapter 343 commonly referred to as The Hawai'i Environmental Policy Act ("HEPA"). The trigger for compliance is the use of state lands.	The State of Hawai'i Department of Land and Natural Resources will be the accepting agency for the EIS document for Hawai'i Revised Statutes Chapter 343.	All Resources	This EIS was developed in accordance with the Hawai'i Revised Statutes Chapter 343
SOH	Hawai'i Administrative Code Title 19, 342F Noise Pollution	Describes environmental noise levels appropriate for noise sensitive land uses.	Noise	The Navy will consider state regulations for noise-sensitive land uses. Sources of noise and the associated sensitive receptors in the human environment are analyzed in this EIS.
USDA, NRCS	Farmland Protection Policy Act (7 U.S.C. §§ 4201-4209 7)	Requires federal agencies to evaluate the adverse effects of their activities on farmland, which includes prime and unique farmland and farmland of statewide or local importance, and to consider alternative actions that could avoid adverse effects.	Geological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act. The EIS includes an analysis to determine if federal actions would have adverse effects on farmland, which includes prime and unique farmland and farmland of statewide or local importance.
USDOT	49 CFR §§ 171.1-172.558	Regulates and ensures the safe and secure movement of hazardous materials to industry and consumers by all modes of transportation, including pipelines.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
USDOT	USDOT Hazardous Materials Ground Transport Regulations/Hazardous Materials Transportation Act (49 CFR parts 100–185)	Transportation safety; hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
USFWS	Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703–712)	Potential impacts to bird species protected by the Act.	Terrestrial Biological Resources; Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
USFWS	EO 13186: Responsibilities of Federal Agencies to Protect Migratory Birds	Potential impacts to migratory birds.	Terrestrial Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.

Key: § = section(s); AAQS = ambient air quality standards; ACHP = Advisory Council on Historic Preservation; AICUZ = Air Installation Compatible Use Zone; BTA = Best Technology Available; CEQ = Council on Environmental Quality; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CNRH = Commander Navy Region Hawaii; CWA = Clean Water Act; CWB = Clean Water Branch; DLA = Defense Logistics Agency; DLNR = Department of Land and Natural Resources; DoD = Department of Defense; DTS = Department of Transportation Services; ECF = entry control facility; EFH = Essential Fish Habitat; EIS = Environmental Impact Statement; EO = Executive Order; EPA = U.S. Environmental Protection Agency; ESA = Endangered Species Act; FEMA = Federal Emergency Management Agency; FR = Federal Register; GHG = greenhouse gas; HAR = Hawai'i Administrative Rules; HDOH = Hawai'i Department of Health; HDOT = Hawai'i Department of Transportation; HRS = Hawai'i Revised Statutes; IAP = Installation Appearance Plan; Inst. = Instruction; MEC = munitions and explosives of concern; Navy = U.S. Department of the Navy; NAAQS = National Ambient Air Quality Standards; NAVFAC = Naval Facilities Engineering Systems Command; NAVSUP = Naval Supply Systems Command; NEPA = National Environmental Policy Act; NESHAP = National Emission Standards for Hazardous Air Pollutant; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NPD = NASA Policy Directive; NPDES = National Pollutant Discharge Elimination System; NPR = NASA Procedural Requirement; NRCS = Natural Resources Conservation Service; OPNAVINST = Office of the Chief of Naval Operations Instruction; OSHA = Occupational Safety and Health Administration; PL = Public Law; Pub. = Publication; RAICUZ = Range Air Installation Compatible Use Zone; RCRA = Resource Conservation and Recovery Act; ROI = region of influence; SECNAVINST = Secretary of the Navy Instructions; SHPD = State Historic Preservation Division; SOH = State of Hawai'i; SWPPP = Stormwater Pollution Prevention Plan; U.S.C. = United States Code; USDA = U.S. Department of Agriculture; USCG = U.S. Coast Guard; USDOT = U.S. Department of Transportation; USFWS = U.S. Fish and Wildlife Service; WOTUS = Waters of the U.S.

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Appendix C
List of Interested Parties Contacted During Scoping

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Category	Group

Federal, state, and local elected officials	• Federal Elected Officials
	  ▪ U.S. Senators
	  o Mazie K. Hirono
	  o Brian Schatz
	• U.S. House of Representatives
	  ▪ Congressional District I: Ed Case
	  ▪ Congressional District II: Jill N. Tokuda
	• State Elected Officials
	  ▪ Governor: Josh Green
	  ▪ Lieutenant Governor: Sylvia Luke
	  ▪ Attorney General: Anne E. Lopez
	  ▪ State Senate
	  o District 8: Ronald D. Kouchi
	• State Assembly
	  ▪ House District 15: Nadine K. Nakamura
	  ▪ House District 16: Luke A. Evslin
	  ▪ House District 17: Dee Morikawa
	  ▪ Senate Committees
	  o Public Safety and Intergovernmental Affairs and Military
	  o Water and Land
	  o Ways and Means
	  ▪ House Committees
	  o Corrections, Military and Veterans
	  o Water and Land
	  o Finance
	• Local Elected Officials
	  ▪ County of Kaua‘i
	  o Mayor Derek S.K. Kawakami
	  ▪ County Council
	  o Mel Rapozo (Council Chair)
	  o KipuKai Kuali‘i (Council Vice Chair)
	  o Addison Bulosan (Councilmember)
	  o Bernard P. Carvalho, Jr. (Councilmember)
	  o Felicia Cowden (Councilmember)
	  o Bill DeCosta (Councilmember)
	  o Ross Kagawa (Councilmember)

Federal, state, and local regulatory and non-regulatory government agencies	• Federal Agencies
	  ▪ Advisory Council on Historic Preservation
	  ▪ National Oceanic and Atmospheric Administration Fisheries
	  ▪ U.S. Army Corps of Engineers Honolulu District
	  ▪ U.S. Coast Guard District 14
	  ▪ U.S. Department of the Interior, Office of Hawaiian Relations
	  ▪ U.S. Environmental Protection Agency
	  ▪ USFWS, Kilauea Point National Wildlife Refuge
	  ▪ USFWS, Pacific Islands Fish and Wildlife Office
	  ▪ USDA Forest Service, Institute of Pacific Islands Forestry
	  ▪ USDA, Hawai‘i and Western Pacific State Office
	  ▪ U.S. Geological Survey, Honolulu Field Station
	  ▪ National Park Service

Category	Group
	• State Agencies ▪ Department of Agriculture ▪ Agribusiness Development Corporation ▪ DLNR ▪ DLNR BLNR ▪ DLNR DOFAW ▪ DLNR Land Division (Kaua‘i District) ▪ DLNR OCCL (Conservation District) ▪ DLNR-SHPD ▪ DLNR Division of State Parks ▪ DLNR Commission on Water Resource Management ▪ Department of Transportation ▪ OHA ▪ OHA, Kaua‘i Burial Council ▪ Department of Health, Clean Water Branch ▪ OPSD ▪ OPSD, Environmental Review Program ▪ OPSD, CZM Program ▪ Department of Business, Economic Development and Tourism ▪ Department of Hawaiian Homelands ▪ Department of the Attorney General ▪ Department of Defense (State of Hawai‘i) ▪ Boards and Commissions ▪ Kaua‘i Circuit Court ▪ Kaua‘i District Office, Division of State Parks ▪ Hawai‘i State Parks • Regional/Local Agencies ▪ County of Kaua‘i Departments: o Parks and Recreation o Water o Kaua‘i Emergency Management Agency o Fire o Police o Economic Development o Planning o Public Works o Transportation o County of Kaua‘i Office of Boards and Commissions ▪ University of Hawai‘i System o Kaua‘i Community College o Kaua‘i Agricultural Research Center o Pacific Cooperative Studies Unit ▪ Native Hawaiian Federal Interagency Working Group, current members include: o Advisory Council on Historic Preservation o Office of the Deputy Under Secretary of Defense for Installations and Environment o Small Business Administration o Office of Native Hawaiian Relations

Category	Group
Native Hawaii Organizations	• ʻĀina Momona (State of Hawaiʻi) • Association of Hawaiian Civic Clubs (State of Hawaiʻi) • Hawaiian Native Corporation (supports NHOs – State of Hawaiʻi) • Koʻolau Foundation (State of Hawaiʻi) • Native Hawaiian Hospitality Association (State of Hawaiʻi) • Kawaileo Law A Limited Liability Law Company (State of Hawaiʻi) • Council For Native Hawaiian Advancement (State of Hawaiʻi) • Na Koa Ikaika Ka Lahui Hawaiʻi (Kauaʻi) • Na ʻOhana Papa O Manā (Kauaʻi) • EAO Hawaiʻi Inc. (Kauaʻi) • Nā Kuleana o Kānaka ʻŌiwi (Kauaʻi) • Hanalei River Heritage Foundation (Kauaʻi) • ALU LIKE, Inc. (Kauaʻi) • Kauaʻi Kupuna Council • Kauaʻi Burial Council
Community planning groups, and other community and civic organizations	• Community Planning Groups ▪ Kauaʻi Planning & Action Alliance • Community Organizations ▪ Hui Makaʻāinana O Makana ▪ Waipā Foundation ▪ Waimea Community Association • DON Advocacy Groups ▪ AMVETS Department of Hawaiʻi • Civic Groups ▪ Kauaʻi Planning & Action Alliance ▪ Hawaiʻi Community Foundation ▪ Kilauea Community Agricultural Center - Aina Hoʻokupu O Kilauea ▪ Kauaʻi Philippine Cultural Center ▪ Ke Kumu O Hihinui Cultural Center ▪ Kauaʻi Museum ▪ Kōkeʻe Natural History Museum
Small business associations, economic development/ tourism organization, and recreational and real estate interests	• Economic Development Organizations ▪ Kauaʻi Chamber ▪ Kauaʻi Filipino Chamber of Commerce • Tourism ▪ Camp Sloggett ▪ Waimea Japanese Cemetery ▪ Kauaʻi Visitors Bureau (Sue Kanoho) ▪ Smith Family Garden Luau ▪ Kōkeʻe Lodge ▪ The Cabins at Kōkeʻe
Local environmental organizations and other Non-Governmental Organizations	• Government Programs ▪ DLNR DOFAW Natural Area Reserves System ▪ Kauaʻi Seabird Habitat Conservation Plan • Environmental Organizations – Local ▪ National Tropical Botanical Gardens, Plant Extinction Prevention Program

Category	Group
	▪ Kaua‘i Forest Bird Recovery Project ▪ Kaua‘i Watershed Alliance ▪ Hanalei Watershed Hui ▪ Kaua‘i North Shore Community Foundation ▪ North Shore Community Land Trust ▪ Kaua‘i Invasive Species Committee ▪ Kōke‘e Resource Conservation Program ▪ Keahole Defense Coalition • Environmental Organizations – Regional/National ▪ Earthjustice ▪ Surfrider Foundation ▪ Sierra Club – Kaua‘i Chapter ▪ Reef Guardians ▪ Save our Shearwaters ▪ Conservation Council for Hawai‘i ▪ Kahea – The Hawaiian Environmental Alliance ▪ Hawai‘i Audubon Society ▪ Hawaiian Islands Land Trust ▪ Native Hawaiian Plant Society ▪ Hawai‘i Wildlife Center ▪ Nā Kia‘i Kai ▪ Nature Conservancy - Hawai‘i Chapter ▪ Pesticide Action Network North America • Fishing/Diving ▪ Hawai‘i Big Game Fishing Club ▪ Hawai‘i Freshwater Fishing Association • Boating/Yacht Clubs/Marinas ▪ Nawiliwili Yacht Club ▪ Kaua‘i Sailing Association ▪ West Side Boaters Association ▪ Holo Holo Charters ▪ Catamaran Kahanu ▪ Captain Andy’s ▪ Kauai Sea Tours ▪ Napali Odyssey ▪ Makana Charters ▪ Seasport Divers ▪ Nā Pali Riders ▪ Blue Dolphin Charters
Local media outlets	• Print ▪ Kaua‘i Island News ▪ The Garden Island ▪ MidWeek Kaua‘i ▪ The Honolulu Star-Advertiser ▪ Hawai‘i Tribune-Herald ▪ Ka Wai Ola • TV ▪ KITV 4 (ABC) ▪ KHON2 (Fox and CW)

Category	Group
	▪ Hawai‘i News Now • Radio ▪ Kong Radio 93.5 ▪ KHKU 94.3 FM ▪ KFMN FM 97 ▪ KJMQ Jamz 98.1 ▪ Sunny 101.3 ▪ Hawai‘i Public Radio (HPR) • Online ▪ Honolulu Civil Beat ▪ Kaua‘i Now ▪ Waimea Theater On-Screen Advertising
Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	• Dennis Eguchi • Pastor Daryl Kua • Alethea Kaohi • Bob Westerman • Toni Ricci • Lyle Tabata • Charlie Iona • Marissa Faye • Josh Mori • Keiko Napier • Kaua Mata • Tia Korete • Terry Lily • Barbara “Maka‘ala” Ka‘aumoana
Residents, business, agricultural operations, schools, and property owners near PMRF	• Communities of Kekaha, Waimea, Hanapepe, Ele‘ele, Port Allen, Kalaheo, Lawai, Omao, Koloa, Poipu, Kapa‘a, and Līhu‘e • Schools – Kaua‘i District, Waimea Complex ▪ Kekaha Elementary School ▪ Ni‘ihau High and Elementary School ▪ Waimea High School ▪ Waimea Canyon Middle School ▪ Ke Kula Ni‘ihau O Kekaha Public Charter School ▪ Kula Aupuni Ni‘ihau A Kahelelani Aloha Public Charter School ▪ St. Theresa’s School

Legend: AMVETS = American Veterans; BLNR = Board of Land and Natural Resources; CZM = Coastal Zone Management; DLNR = Department of Land and Natural Resources; DOFAW = DLNR Division of Forestry and Wildlife; DON = Department of the Navy; NHO = Native Hawaiian Organization; OHA = Office of Hawaiian Affairs; OPSD = Office of Planning and Sustainable Development; SHPD = State Historic Preservation Division; U.S. = United States; USDA = U.S. Department of Agriculture; USFWS = U.S. Fish and Wildlife Service.

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Appendix D
Detailed List of Activities and Operational Elements Under Current Real Estate Agreements

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D.1 List and Description of Navy Leaseholds and Easements

List and Description of Leases and Easements at the Main Base

Table D.1-1 includes a list of activities or operational elements for leaseholds and easements at the main base.

Table D.1-1 Navy Leases and Easements on State Land at the Main Base

Name	Grant Type	Activity/Operational Element	Size (ac)
Tract E-1	Lease	Contains ordnance related facilities, and lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	69.562
Tract E-2 Tract E-2-A	Lease	Operations. Includes lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	45.268 0.777
Lot B	Lease	Encroachment.	32.070
Lot 1	Lease	Drainage.	47.937
Lot 9	Lease	Drainage.	12.422
Lot 3	Lease	Access.	0.232
Lot 10	Lease	Drainage. Includes lands required to facilitate the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	5.171
Lot 13	Lease	Access. Includes lands required to facilitate access in support of the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	0.434
Lot 7	Lease	Access. Includes Exclusive Roadway Access Easement.	1.618
Lot A-1	Lease	Encroachment/Drainage. Includes Non-Exclusive Drainage Easement and Roadway Access Easement.	176.16
		Main Base Leases Subtotal	**391.651**
Easement 100 Easement 101 Easement 102 Easement 103 Easement 104 Easement 105	Easement	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	122.011 1,841.53 3,150.093 8.691 9.489 17.875
Easement 107 Easement B Easement B-1 Easement B-2 Easement B-3 Easement B-4	Easement	Includes Non-Exclusive Roadway Access Easement.	0.170 3.084 0.069 0.069 0.044 0.067
Easement D	Easement	Electrical.	1.363
Easement E	Easement	Roadway.	0.441
Easement F	Easement	Cable.	0.049
Easement G Part 1	Easement	Water.	0.671
Easement G Part 2	Easement	Water.	0.138
Easement H	Easement	Roadway.	0.028
Easement A Part 1	Easement	Access.	2.141

Name	Grant Type	Activity/Operational Element	Size (ac)
GHA Easement 1 GHA Easement 2	Easement	Ground hazard area.	2,039.167 69.579
		Main Base Easements Subtotal	**7,266.769**
		Main Base Total Leases and Easements	**7,658.42**

Key: ATFP = Antiterrorism and Force Protection; GHA=Ground Hazard Area.

List and Description of Leases and Easements at Kamokalā Ridge

Table D.1-2 includes a list of activities or operational elements for leases and easements at Kamokalā Ridge.

Table D.1-2 Navy Leases and Easements on State Land at Kamokalā Ridge

Name	Grant Type	Activity/Operational Element	Size (ac)
Tract E-3 Parcel 1 Tract E-3 Parcel 2	Lease	Magazines 1-12 are utilized for proper storage of explosives with effective flexibility to separate incompatible explosives.	25.686 48.777
Kamokalā Ridge Add	Lease	Magazines 12-13 are required for proper storage of explosives with effective flexibility to separate incompatible explosives.	14.372
		Kamokalā Ridge Leases Subtotal	**88.835**
Easement 106	Easement	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	176.372
Easement A Part 2 Por. A Easement A Part 2 Por. B Easement A Part 2 Por. C Easement A Part 2 Por. D Easement A Part 3	Easement	Includes Non-Exclusive Roadway Access Easement.	0.627 0.558 0.042 0.221 0.455
Easement G Part 3 Easement G Part 4 Easement G Part 5 Easement G Part 6	Easement	Water pipeline.	0.186 0.153 0.006 0.021
ESQD Easement S5604	Easement	Restrictive Use.	176.371
		Kamokalā Ridge Easements Subtotal	**355.012**
		Kamokalā Ridge Total Leases and Easements	**443.847**

Key: ESQD = Explosive Safety Quantity Distance.

List and Description of Leases at the Mānā Water Well

Table D.1-3 includes a list of leases at the Mānā Water Well.

Table D.1-3 Navy Leases on State Land at the Mānā Water Well

Name	Grant Type	Activity/Operational Element	Size
Tract E-4	Lease	Infrastructure associated with well.	0.264
Lot 12	Lease	Location of water well.	0.026
		Water Well Total Leases	**0.29**

List and Description of Leases at Miloliʻi Ridge

Table D.1-4 includes a list of activities or operational elements for leases at Miloliʻi Ridge.

Table D.1-4 Navy Leases on State Land at Miloliʻi Ridge

Name	Grant Type	Activity/Operational Element	Size (ac)
Miloliʻi Ridge No. 1 Miloliʻi Ridge No. 2 Miloliʻi Ridge No. 3	Lease	Location of frequency shift reflector used with radar and telemetry stations.	0.005 0.005 0.005
		Miloliʻi Ridge Total Leases	**0.015**

List and Description of Leases and Easements at Mākaha Ridge

Table D.1-5 includes a list of activities or operational elements for leases and easements at Mākaha Ridge.

Table D.1-5 Navy Leases and Easements on State Land at Mākaha Ridge

Name	Grant Type	Activity/Operational Element	Size
Parcel A – Mākaha Parcel B – Mākaha	Lease	The location has a guarded, secured entrance, a Frequency Interference Control Building, Maintenance Facility, Telemetry Building, a boresight tower, telemetry antennas, water tanks, a laboratory, radar sites, communications, a small power plant, antennas, and a helicopter landing pad. Most of these structures are on the top of the ridgeline and are in the line of sight of the Main Base. Unique location due to geography allowing coverage of both the base and ocean range.	35.04 167.05
Bore Site	Lease	Used to locate bore site targets for use with radar and telemetry stations.	1.012
		Mākaha Ridge Lease Subtotal	**203.102**
Parcel E Road	Easement	Includes Non-exclusive Roadway Access Easement.	4.53
Parcel D Road Parcel C Road	Easement	Includes Non-exclusive Roadway Access Easement.	26.25 10.82
Bore Site Access Road	Easement	Includes Non-exclusive Roadway Access Easement.	0.613
		Mākaha Ridge Easement Subtotal	**42.213**
		Mākaha Ridge Total Leases and Easements	**245.315**

D.2 List and Description of NASA Leaseholds

Table D.2-1 includes a list of activities or operational elements for leaseholds and easements at Kōkeʻe Park Geophysical Observatory (KPGO).

Table D.2-1 Navy Leases and Easements on DLNR Land at KPGO

Name	Grant Type	Activity/Operational Element	Size
Sites A – E (6 parcels)	Lease	Facility housing radar antenna. Unique location due to geography allowing coverage of both the base and ocean range.	22.900

D.3 General Description of Navy and NASA Real Estate Agreements with DLNR

Tables D.3-1 and **D.3-2** provide the location, number, size, type, expiration, and general type of associated actions for the existing leaseholds and easements. *Note to reviewer: This table, including acreages, will be updated when the Report to Congress is updated.*

Table D.3-1 Navy Leases on Kauaʻi with State of Hawaiʻi

Site Name	City	Size (acres)	Type	Lessor	Expiration Fiscal Year	Renewal Fiscal Year
PMRF Lease S-3852	Kekaha	480.78	LEASE	State of HI	2029	2029
PMRF Lease S-3852	Kekaha	10.18	EASEMENT	State of HI	2029	2029
PMRF Mākaha Ridge Lease S-3952	Kekaha	203.10	LEASE	State of HI	2030	2030
PMRF Mākaha Ridge Lease S-3952	Kekaha	7722.21	EASEMENT	State of HI	2030	2030
PMRF Miloliʻi Ridge Easement S-5352	Kekaha	2108.75	EASEMENT	State of HI	2030	2030
PMRF Miloliʻi Ridge Easement S-5804	Kekaha	5326.23	EASEMENT	State of HI	2029	2029
PMRF Easement S-5604	Kekaha	176.37	EASEMENT	State of HI	2029	2029

Source: Draft Report to Congress on the Department's Efforts to Renew Department of Defense Leases and Easements in Hawaiʻi, September 2023.

Table D.3-2 NASA Leases on Kauaʻi with State of Hawaiʻi

Site Name	City	Size (acres)	Type	Lessor	Expiration Fiscal Year	Purpose and Associated Actions
Kōkeʻe Park Geophysical Observatory (6 parcels)	Waimea	23	LEASE, EASEMENT	State of HI	2030	Collect geodetic data, contribute to daily measurements of the Earth's orientation in space and rotation.

Appendix E
No Action Alternative: Detailed List of Activities/Operations

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Table E-1 lists the operational impacts by lease and easement if succeeding agreements are not secured.

Table E-1 No Action Alternative: Operational Impacts

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Main Base			
Tract E-1	L	Contains ordnance related facilities, and lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	Leased area contains ordnance related facilities critical to the support of the PMRF mission. Inability to perform launch operations would result in lack of ability to support various Navy missions. Also, reduction in security posture and increased costs to meet ATFP requirements. Due to land limitations, there is nowhere else to relocate the buildings on Navy fee simple lands.
Tract E-2 Tract E-2-A	L	Operations. Includes lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	Reduction in security posture and increased costs to meet ATFP requirements.
Lot B	L	Encroachment.	Reduction in security posture and increased costs to meet ATFP requirements.
Lot 1	L	Drainage.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State of Hawai'i would take over management of the drainage.
Lot 9	L	Drainage.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State of Hawai'i would take over management of the drainage.
Lot 3	L	Access.	Used as secondary entrance to the base and is the ordnance gate (for transport of ordnance from main base to Kamokalā Ridge). There would be impacts to public safety if ordnance transport went through the main gate.
Lot 10	L	Drainage. Includes lands required to facilitate the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State would take over management of the drainage.
Lot 13	L	Access. Includes lands required to facilitate access in support of the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State would take over management of the drainage.

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Lot 7	L	Access. Includes Exclusive Roadway Access Easement.	Operations gate, which is open in the morning and afternoon, and provides secondary entrance to the base. Without this access, there would be no other entrance if the primary entrance were to be temporarily shut down, and this would impact access to critical PMRF facilities.
Lot A-1	L	Encroachment/Drainage. Includes Non-Exclusive Drainage Easement and Roadway Access Easement.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State would take over management of the drainage. Also, would impact access to critical PMRF facilities.
Easement 100 Easement 101 Easement 102 Easement 103 Easement 104 Easement 105	E	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH events. 100-103 within GHA and ESQD arcs, 104-105 to prevent encroachment.
Easement 107 Easement B Easement B-1 Easement B-2 Easement B-3 Easement B-4	E	Includes Non-Exclusive Roadway Access Easement.	This would impact access to critical PMRF facilities, and impact access to the base's main source of potable water.
Easement D	E	Electrical.	Lack of access to critical PMRF facilities.
Easement E	E	Roadway.	Lack of access to critical PMRF facilities.
Easement F	E	Cable.	Lack of electrical service to critical PMRF facilities.
Easement G Part 1	E	Water.	Lack of communication service to critical PMRF facilities.
Easement G Part 2	E	Water.	Lack of water service to critical PMRF facilities.
Easement H	E	Roadway.	Lack of access to critical PMRF facilities.
Easement A Part 1	E	Access.	Lack of access to critical PMRF facilities.
GHA Easement 1 GHA Easement 2	E	The GHA for many of the ballistic and hypersonic missiles launched from PMRF extends into the Mānā Plain.	Restriction of the GHA to only federal property will mean no ballistic or hypersonic missiles can be safely launched from PMRF.
Kamokalā Ridge			
Tract E-3 Parcel 1 Tract E-3 Parcel 2	L	Magazines 1-12 are utilized for proper storage of explosives with effective flexibility to separate incompatible explosives.	Inability to meet ordnance safety storage requirements would result in lack of ability to support aerial target and ballistic and hypersonic missile missions.
Kamokalā Ridge Add	L	Magazines 12-13 are required for proper storage of explosives with effective flexibility to separate incompatible explosives.	Inability to meet explosive safety storage requirements resulting in lack of ability to support various missions at PMRF.
Easement 106	E	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	Potential for encroachment due to development and incompatible uses to current Navy operations to include RF spectrum interference, lighting that may impact NVG training, AICUZ concerns, etc.

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Easement A Part 2 Por. A Easement A Part 2 Por. B Easement A Part 2 Por. C Easement A Part 2 Por. D Easement A Part 3	E	Includes Non-Exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.
Easement G Part 3 Easement G Part 4 Easement G Part 5 Easement G Part 6	E	Water pipeline.	Lack of access to critical PMRF facilities.
ESQD Easement S5604	E	Restrictive Use.	Lack of access to critical PMRF facilities.
Mānā Water Well			
Tract E-4	L	Infrastructure associated with well.	Reduced reliability of potable water source and increased cost of water. Impacts to range operations from loss of water source.
Lot 12	L	Location of water well.	Reduced reliability of potable water source and increased cost of water.
Miloli'i Ridge			
Miloli'i Ridge No. 1 Miloli'i Ridge No. 2 Miloli'i Ridge No. 3	L	Location of frequency shift reflector used with radar and telemetry stations.	Inability to calibrate instrumentation and antennas which would limit effectiveness during data collection and could result in safety issues related to tracking of vehicles on the range.
Mākaha Ridge			
Parcel A – Mākaha Parcel B – Mākaha	L	Facility housing radar antenna. Unique location due to geography allowing coverage of both the base and ocean range. The vast majority of PMRF instrumentation exists at Mākaha Ridge to include radar systems, telemetry, communications, electronic warfare assets, etc.	Without the instrumentation located at Mākaha Ridge, almost all of PMRF's training and testing missions will be unsupportable since loss of the data provided by that instrumentation will make it impossible to provide range safety oversight, management and coordination of air and sea space under the control of PMRF, execution of exercises/tests and collection of customer required data.
Bore Site	L	Used to locate bore site targets for use with radar and telemetry stations.	Loss of this facility would limit PMRF support of Pacific Fleet training operations and national test initiatives. Inability to calibrate instrumentation and antennas which would limit effectiveness during data collection and could result in safety issues related to tracking of vehicles on the range.
Parcel E Road	E	Includes Non-exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.
Parcel D Road Parcel C Road	E	Includes Non-exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.
Bore Site Access Road	E	Includes Non-exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Kōkeʻe Park Geophysical Observatory			
S-3917 6 parcels	L	Includes facilities (buildings, RADAR, antenna, transmitters) that support Navy and NASA operations.	Loss of Navy radar and telemetry systems at KPGO would also limit effectiveness during data collection and could result in safety issues related to tracking on the range. Loss of Site B which includes the back-up plant diesel generator for Sites A, C, D, and E would impact the source of reliable power when systems at KPGO are supporting Navy range operations and NASA SGP activities. Without use of Sites A through E at KPGO, NASA would lose its northern Pacific VLBI and DORIS stations, and two GNSS stations, substantially reducing the capability of NASA's global Space Geodesy Project to support the following: spacecraft tracking; as well as military and civilian terrestrial, airborne, and maritime navigation; and the scientific disciplines that rely on the data produced at KPGO.

Key: AICUZ = Air Installation Compatible Use Zone; ATFP = Antiterrorism and Force Protection; BASH = Bird/Wildlife Aircraft Strike Hazard; DORIS = Doppler Orbitography and Radio-positioning Integrated by Satellite; ESQD = Explosive Safety Quantity Distance; GHA = Ground Hazard Area; GNSS = Global Navigation Satellite System; KPGO = Kōkeʻe Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; NVG = Night Vision Goggles; PMRF = Pacific Missile Range Facility; RADAR=Radio Detecting and Ranging; RF=Radio Frequency; SGP = Space Geodesy Project; VLBI=Very Long Baseline Interferometry.