JOSH GREEN, M.D.
GOVERNOR | KE KIAʻĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIAʻĀINA

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

RYAN K.P. KANAKAʻOLE
FIRST DEPUTY

CIARA W.K. KAHAHANE
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF: OCCL: KS

COR: OA 25-150

Mar 11, 2025

To: Mary Alice Evans, Acting Director
Office of Planning and Sustainable Development
Environmental Review Program

From: Dawn N.S. Chang, Chairperson
Board of Land and Natural Resources

SUBJECT: Draft Environmental Assessment (DEA) for the Hawaiki Cable Landing Expansion Project
Located at 92-301 Farrington Highway, Kahe Beach Park
Honouliuli, Ewa, Oahu
Tax Map Key (TMK): (1) 9-2-051:010 (seaward)

The Department of Land and Natural Resources has reviewed the subject Draft EA and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish notice of availability for this project in the March 23, 2025, issue of The Environmental Notice.

If you have any questions, please contact Kariann Stark of our Office of Conservation and Coastal Lands at (808) 587-0380 or kariann.stark@hawaii.gov.

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Tuesday, March 11, 2025 8:26:52 AM

Action Name

Hawaiki Cable Landing Expansion Project

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

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
- (3) Propose any use within a shoreline area

Judicial district

ʻEwa, Oʻahu

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

(1) 9-2-049:001, (1) 9-2-049:002, and (1) 9-2-049:005, (1) 9-2-051:001; (1) 9-2-051:010; (1) 9-2-051:011

Action type

Applicant

Other required permits and approvals

Federal Endangered Species Act Section 7 Consultation, Magnuson-Stevens Fishery Conservation and Management Act Consultation, National Historic Preservation Act Section 106 Consultation, US Army Corps of Engineers Clean Water Act Section 404 nationwide Permit, Right of Entry and Grand of Submarine Easement within State Waters, Coastal Zone Management Consistency Certification, Clean Water Act Section 401 Water Quality Certification, Hawaii Department of Transportation Use and Occupancy Agreement, Construction and Building Permits

Discretionary consent required

Conservation District Use Permit Special Management Area Use Permit, Shoreline Setback Variance

Agency jurisdiction

State of Hawaiʻi

Approving agency

DLNR-OCCL

Agency contact name

Kariann Stark

Agency contact email (for info about the action)

kariann.stark@hawaii.gov

Email address for receiving comments

genevieve.rozhon@erm.com

Agency contact phone

(808) 587-0380

Agency address

P.O. Box 621
Honolulu, Hawaii 96809
United States
Map It

Applicant

Hawaiki Submarine Cable USA

Applicant contact name

David Slessor

Applicant contact email

davisl@bw-digital.com

Applicant contact phone

(913) 999-8954

Applicant address

16192 Coastal Highway
Lewes, Delaware 19958
United States
Map It

Is there a consultant for this action?

Yes

Consultant

Environmental Resources Management (ERM)

Consultant contact name

Genevieve Rozhon

Consultant contact email

genevieve.rozhon@erm.com

Consultant contact phone

(913) 999-8954

Consultant address

500 Ala Moana Blvd
Honolulu, Hawaii 96813
United States
Map It

Action summary

Hawaiki Submarine Cable USA LLC proposes to expand telecommunications infrastructure at their existing Hawaiki Cable Landing Station (CLS) in Kapolei (Project), providing additional carrier-neutral connections for future subsea cables. The Project includes installation of up to six subterranean horizontal directionally drilled

(HDD) bores extending from three beach manholes (BMHs) on land and extending seaward to subsea punch-out exit points approximately 2,500 feet to 3,000 feet (762 to 914 meters) from the entry point. The subsea punch-out locations would be at a water depth of approximately 50 to 65 feet (15 to 20 meters). Onshore infrastructure would be located mauka (inland) of Farrington Highway and would include the BMHs and up to six fronthaul conduits directly connecting them to the
existing Hawaiki CLS. Installation of subsea cables is not part of the proposed Project. The subsea cable systems that would terminate at the CLS have yet to be determined; however, they could be domestic cables linking islands in the Hawaiian archipelago, interstate cables linking Hawai'i to the continental United States (CONUS), or international cables providing connect

Reasons supporting determination

The Anticipated Finding of No Significant Impact is based on the analysis of significance criteria provided in Chapter 5 of the DEA/AFONSI

Attached documents (signed agency letter & EA/EIS)

- Hawaiki-Submarine-Cable-Landing-Expansion-Project-Draft-EA.pdf
- COR-OA-25-150-ERP-Publication-for-FONSI.PDF-part-1-signed.pdf

ADA Compliance certification

- This is to certify that documents submitted are unlocked, searchable, and ADA compliant.

Action location map

- Hawaiki-Submarine-Cable-USA-LLC-Landing-Station-Expansion-Project1.zip

Authorized individual

Kariann Stark

Authorization

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

Draft Environmental Assessment

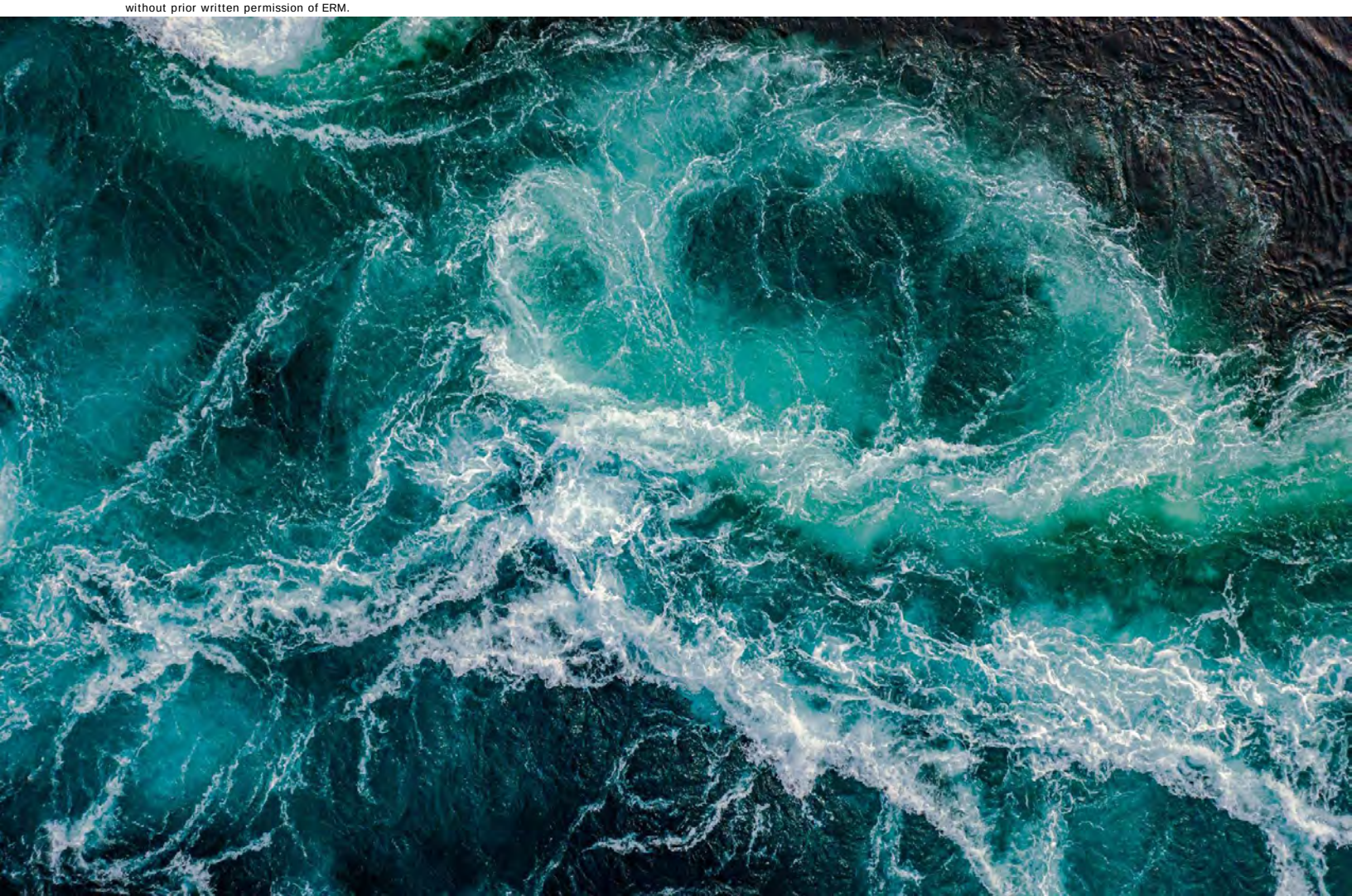
Hawaiki Cable Landing Expansion Project

PREPARED FOR
Hawaiki Submarine Cable USA LLC

DATE
27 November 2024

REFERENCE
0736633

© Copyright 2024 by The ERM International Group Limited and/or its affiliates ('ERM'). All Rights Reserved. No part of this work may be reproduced or transmitted in any form or by any means, without prior written permission of ERM.



APPENDICES

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

Acronym	Description
°F	Degrees Fahrenheit
AG-2	General Agriculture
AIS	Archaeological Inventory Survey
AIS	Archaeological Inventory Survey
APE	Area of Potential Effect
BEAD	Broadband Equity, Access, and Deployment
BMH	Beach Manhole
BMP	Best Management Practice
CFR	Code of Federal Regulations
CIA	Cultural Impact Assessment
CLF	Cable Landing Facilities
CLS	Cable Landing Station
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CWA	Clean Water Act
CWB	HDOH Clean Water Branch
CWRM	State of Hawai‘i Commission on Water Resource Management
CZMA	Federal Coastal Zone Management Act
dB	Decibel
dBA	A-weighted Decibel
DLNR	State of Hawai‘i Department of Land and Natural Resources
DOD	United States Department of Defense
DP	Development Plan
DPP	City and County of Honolulu Department of Planning and Permitting
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map

Acronym	Description
GANDA	Garcia and Associates
GHG	Greenhouse Gas
HAR	Hawai‘i Administrative Rules
Hawaiki	Hawaiki Submarine Cable USA
HDD	Horizontal Directionally Drilled
HDOH	State of Hawai‘i Department of Health
HDOT	State of Hawai‘i Department of Transportation
HECO	Hawai‘i Electric Company
HRS	Hawai‘i Revised Statutes
IDFR	Inadvertent Drilling Fluid Release
kph	Kilometer per hour
LCA	Land Commission Award
LCM	Lost Circulation Material
LSB	Land Study Bureau
LUO	City and County of Honolulu Land Use Ordinance
MBTA	Migratory Bird Treaty Act
MEC	Munitions and explosives of concern
mg/L Cl	Milligram per liter chlorine
MMPA	Marine Mammal Protection Act
mph	Miles per hour
NAAQS	National Ambient Air Quality Standards
NCore	National Core
NHPA	National Historic Preservation Act
NMFS	NOAA National Marine Fisheries Service
NO_2	Nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NWP	Nationwide Permit
OCCL	DLNR Office of Conservation and Coastal Lands
OR&L	O‘ahu Railway and Land Company
P-2	General Preservation
PM_{10}	Particulate matter with a diameter less than 10 microns

Acronym	Description
$PM_{2.5}$	Particulate matter with a diameter less than 2.5 microns
ROH	Revised Ordinances of Hawai‘i
SHPD	State Historic Preservation Division
SLAMS	State and Local Air Monitoring Stations
SMA	Special Management Area
SO_2	Sulfur Dioxide
SSV	Shoreline Setback Variance
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TMK	Tax Map Key
U.S.	United States
U.S.C.	United States Code
UBC	Uniform Building Code
USACE	United States Army Corps of Engineers
USFWS	United States. Fish and Wildlife Service
WOTUS	Waters of the United States
WPRFMC	Western Pacific Regional Fishery Management Council
WQC	Water Quality Certification

APPLICANT
PUBLICATION FORM

	Hawaiki Cable Landing Expansion Project
Project Short Name:	Hawaiki Cable Landing Expansion Project
HRS §343-5 Trigger(s):	Use of state lands; use of county lands; use in the conservation district; use within the shoreline setback area
Island(s):	Oʻahu
Judicial District(s):	'Ewa District
TMK(s):	TMKs (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:011, and (1) 9-2-051:010
Permit(s)/Approval(s):	1. Federal Endangered Species Act Section 7 Consultation 2. Magnuson-Stevens Fishery Conservation and Management Act Consultation 3. National Historic Preservation Act Section 106 Consultation 4. U.S. Army Corps of Engineers Clean Water Act Section 404 Nationwide Permit 5. Conservation District Use Permit 6. Right-of-Entry and Grant of Submarine Easement within State Waters 7. Coastal Zone Management Consistency Certification 8. Clean Water Act Section 401 Water Quality Certification 9. Hawaiʻi Department of Transportation Use and Occupancy Agreement 10. Special Management Area Use Permit (Major) 11. Shoreline Setback Variance 12. Construction and Building Permits from City and County of Honolulu
Approving Agency:	**Department of Natural Resources, Office of Conservation and Coastal Lands**
Contact Name, Email, Telephone, Address	Trevor Fitzpatrick Michael Cain Kariann Stark Office of Conservation and Coastal Lands State of Hawaiʻi Kalanimoku Building 1151 Punchbowl St. Rm 131 P.O. Box 621 Honolulu, HI 96809-0621 (808) 587-0377 trevor.j.fitzpatrick@hawaii.gov michael.cain@hawaii.gov kariann.stark@hawaii.gov
Applicant:	**Hawaiki Submarine Cable USA**
Contact Name, Email, Telephone, Address	Hawaiki Submarine Cable USA LLC 16192 Coastal Highway Lewes, Delaware 19958 Attention: David Slessor davisl@bw-digital.com
Consultant:	**Environmental Resources Management (ERM)**
Contact Name, Email, Telephone, Address	Genevieve Rozhon 500 Ala Moana Blvd Honolulu, HI 96813 (913) 999-8954 genevieve.rozhon@erm.com

Status {select one}	Submittal Requirements
_X_ DEA-AFNSI	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.

EXECUTIVE SUMMARY

Project Name:	Hawaiki Cable Landing Expansion Project
Location:	Kapolei, Island of O‘ahu, City and County of Honolulu
Judicial District:	‘Ewa District
Tax Map Key (TMK):	Cable landing facility: TMK (1) 9-2-051:011 Horizontal directional drilling for shore crossing under: TMKs (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001 Temporary parking/equipment staging: TMKs (1) 9-2-051:001 and (1) 9-2-051:011 Truck driveway access: TMK (1) 9-2-051:010
Land Area:	Approximately 2.5 acres (does not include subsurface borings)
Applicants:	Hawaiki Submarine Cable USA LLC 16192 Coastal Highway Lewes, Delaware 19958 Attention: David Slessor
Accepting Authority:	Office of Conservation and Coastal Lands State of Hawai‘i Department of Land and Natural Resources
Landowner:	Hawaiki Submarine Cable USA: TMK (1) 9-2-051:011 and TMK (1) 9-2-051:001 State of Hawai‘i: TMK (1) 9-2-049:002 Farrington Highway: State of Hawai‘i; no TMK O‘ahu Railway and Land Company right-of-way: TMK (1) 9-2-049:005 City and County of Honolulu: TMK (1) 9-2-049:001 Joel & Yolanda Ballesteros: TMK (1) 9-2-051:010
Existing Use:	Vacant; public highway; historic railroad; private residence
Current Land Use Designations:	<u>State Land Use</u> Agriculture: TMKs (1) 9-2-051-001, (1) 9-2-051:011, (1) 9-2-051:010, (1) 9-2-051:001, (1) 9-2-049:001, (1) 9-2-049:002, and (1) 9-2-049:005 Conservation District: submerged lands <u>County Zoning</u> C—Country District: TMK (1) 9-2-051:011, (1) 9-2-051:010 AG-2—General Agriculture District: TMKs (1) 9-2-051:001, Farrington Hwy P-2—General Preservation District: TMKs (1) 9-2-049:005, (1) 9-2-049:002, (1) 9-1-049:001

Proposed Action:

Special Management Area (SMA): Within SMA

Hawaiki Submarine Cable USA LLC proposes to expand telecommunications infrastructure at their existing Hawaiki Cable Landing Station (CLS) in Kapolei (Project), providing additional carrier-neutral connections for future subsea cables. The Project includes installation of up to six subterranean horizontal directionally drilled (HDD) bores extending from three beach manholes (BMHs) on land and extending seaward to subsea punch-out exit points approximately 2,500 feet to 3,000 feet (762 to 914 meters) from the entry point. The subsea punch-out locations would be at a water depth of approximately 50 to 65 feet (15 to 20 meters). Onshore infrastructure would be located mauka (inland) of Farrington Highway and would include the BMHs and up to six fronthaul conduits directly connecting them to the existing Hawaiki CLS. Installation of subsea cables is not part of the proposed Project. The subsea cable systems that would terminate at the CLS have yet to be determined; however, they could be domestic cables linking islands in the Hawai'ian archipelago, interstate cables linking Hawai'i to the continental United States (CONUS), or international cables providing connectivity from Hawai'i/CONUS across the Pacific Ocean.

Alternatives Considered:

The following alternatives were considered:

- No Action: The Project would not be constructed, thus avoiding potential impacts associated with the Project; however, if no action were taken, the Project objective of providing capacity for subsea cables to terminate at the existing Hawaiki CLS via new, carrier-neutral cable landing facilities would not be achieved.

Potential Impacts and Mitigation Measures:

The Project proposes to expand telecommunications infrastructure at the Hawaiki Cable Landing Station (CLS) in Kapolei, providing additional carrier-neutral connections for future subsea cables. It would respond to the needs identified in the Hawai'i Broadband Initiative and would benefit the state by providing up to six, carrier-neutral cable landings connected to the existing Hawaiki CLS. The following potential adverse effects would be mitigated:

- Temporary construction impacts to soils, noise, air quality, and water resources would be mitigated through the use of Best Management Practices (e.g., Stormwater Pollution Prevention Plan, Temporary Erosion and Sediment Control Plan, Spill Prevention, Containment, Countermeasures Plan, noise minimization measures, and dust control plan).
- Marine mammals, sea turtles, manta rays, and coral could be exposed to minor, temporary noise and sediment disturbance at HDD punch out locations. There is also a potential for an inadvertent drilling fluid release during HDD. Potential effects will be minimized via HDD micrositing (outside sensitive habitat such as coral), drilling best practices including use of naturally occurring (non-hydrocarbon) clay & water mix as drilling fluid, continuous monitoring of fluid returns for any volume losses, transition from mud to water prior to daylighting through the seabed, preparation of an Inadvertent Release Contingency Plan for HDD, preparation of a spill contingency and hazardous materials management plan. The Project will require the use of one small dive boat (36 feet or less in size); the potential for vessel strikes will be avoided with implementation of the State of Hawai'i Department of Land and Natural Resources (DLNR) boating Best Management Practices (BMPs) for protecting marine species.
- There are no known plant or wildlife species within the terrestrial Project area currently listed as endangered, threatened, or proposed for listing. However, there is a low potential for the Hawai'ian hoary bat to occur in the Project vicinity. In addition, migratory birds could occur on site, and seabirds could fly over the Project area. The use of down-shielded lighting during nighttime construction and seasonal vegetation clearing would minimize potential impacts to any terrestrial wildlife species.

Anticipated Determination: Finding of No Significant Impact

1. INTRODUCTION

Hawaiki Submarine Cable USA, LLC (subsidiary of BW Digital, or the Applicant) owns and operates the Hawaiki Cable Landing Station (CLS) in Kapolei, Oʻahu. The Applicant owns the land adjacent to the Hawaiki CLS and proposes to expand their existing facility by constructing additional carrier-neutral Cable Landing Facilities (CLF)[1] for up to six new subsea cable systems that would terminate at the Hawaiki CLS (Figure 1-1). The Hawaiki Cable Landing Expansion Project (Project) would install new telecommunications infrastructure consisting of:

- Up to six steel bore pipes up to 8 inches in diameter installed via horizontal directionally drilled (HDD)[2] bores extending under the shoreline into the Pacific Ocean,
- Up to three associated beach manholes (BMHs),
- An onshore subsurface fronthaul conduit system[3] connecting the new subsurface infrastructure to the existing Hawaiki CLS on the adjacent parcel; and
- A gravel access road (Figure 1-2).

Installation of subsea cables is not part of the proposed Project.

The subsea cable systems that would use the new CLF have yet to be determined; however, they could be domestic cables linking islands in the Hawaiʻian archipelago, interstate cables linking Hawaiʻi to the continental United States (CONUS), or international cables providing connectivity from Hawaiʻi/CONUS across the Pacific Ocean.

The proposed Project occurs within the State of Hawaiʻi marine waters under the jurisdiction of the State of Hawaiʻi Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL), and is also within the Special Management Area (SMA) of the shoreline. Therefore, the Project is subject to environmental review in compliance with Hawaiʻi Revised Statute (HRS), Chapter 343, also known as the Hawaiʻi Environmental Policy Act (HEPA), prior to issuance of a submerged lands easement and other Project approvals (permits). OCCL is the accepting authority for the Environmental Assessment (EA).

1.1 PROJECT DESCRIPTION

1.1.1 PROJECT LOCATION AND LAND OWNERSHIP

The Project would be located in Kapolei, approximately 20 miles west of Honolulu on the island of Oʻahu, Hawaiʻi. The 22-acre Project parcel, Tax Map Key (TMK) number (1) 9-2-051:001, is owned by the Applicant and is located immediately north and adjacent to the existing Hawaiki CLS at (1) 9-2-384 Farrington Highway (TMK (1) 9-2-051:011), also owned by the Applicant.

All terrestrial construction activities would occur on approximately 2.5 acres (the Project Site) on the west end of parcel TMK (1) 9-2-051:001 and would include an approximate 16,000-square-

[1] Carrier-neutral Cable Landing Facilities (CLF) are designed to be accessible to multiple network operators and carriers and not intentionally restricted to a specific provider or operator.
[2] Horizontal directional drilling is a trenchless method of installing a pipe underground along a prescribed radius (arc) using a drilling rig.
[3] Fronthaul refers to infrastructure leading up to the CLS. Backhaul infrastructure connects the CLS to data centers further inland.

foot (0.4-acre) HDD staging area, the BMHs, the subsurface fronthaul conduit systems, and a gravel access road between the HDD staging area and the access road serving the adjacent Hawaiki CLS. The HDD bore entries would be located within the HDD staging area and the bores would extend west under Farrington Highway and the Oʻahu Railway and Land Company (OR&L) rights-of-way (TMK (1) 9-2-049:005 and TMK (1) 9-2-049:002, respectively, both owned by the State of Hawaiʻi), and Kahe Beach Park (TMK (1) 9-2-049:001 owned by the City and County of Honolulu) (Figure 1-2). Offshore, the bores would extend under the submerged lands of the State of Hawaiʻi before exiting approximately 2,500 to 3,000 feet (762 to 914 meters) offshore in State of Hawaiʻi waters. Together, the onshore Project Site and the bores extending offshore comprise the Project Area.

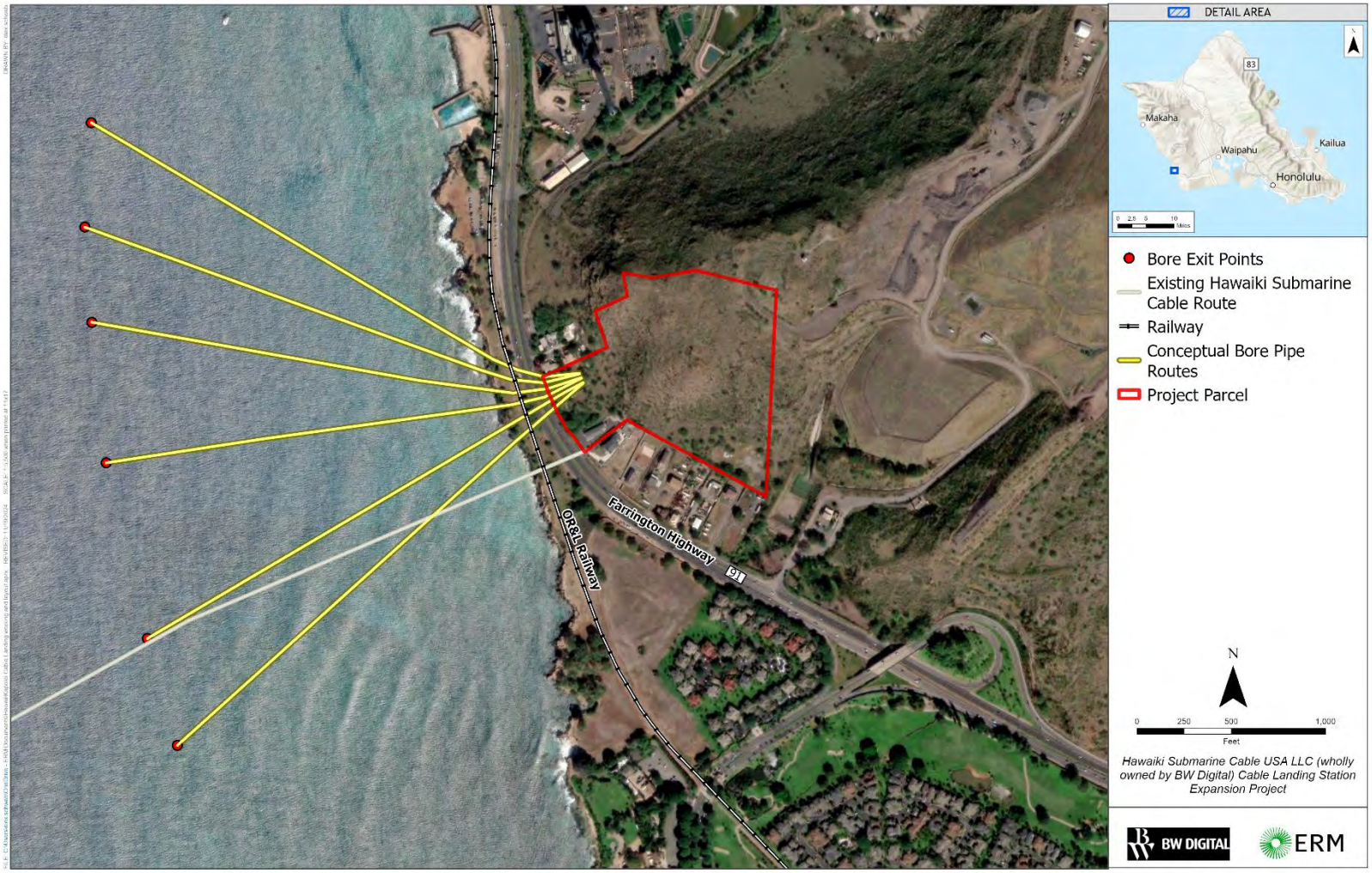


FIGURE 1-1: PROJECT VICINITY

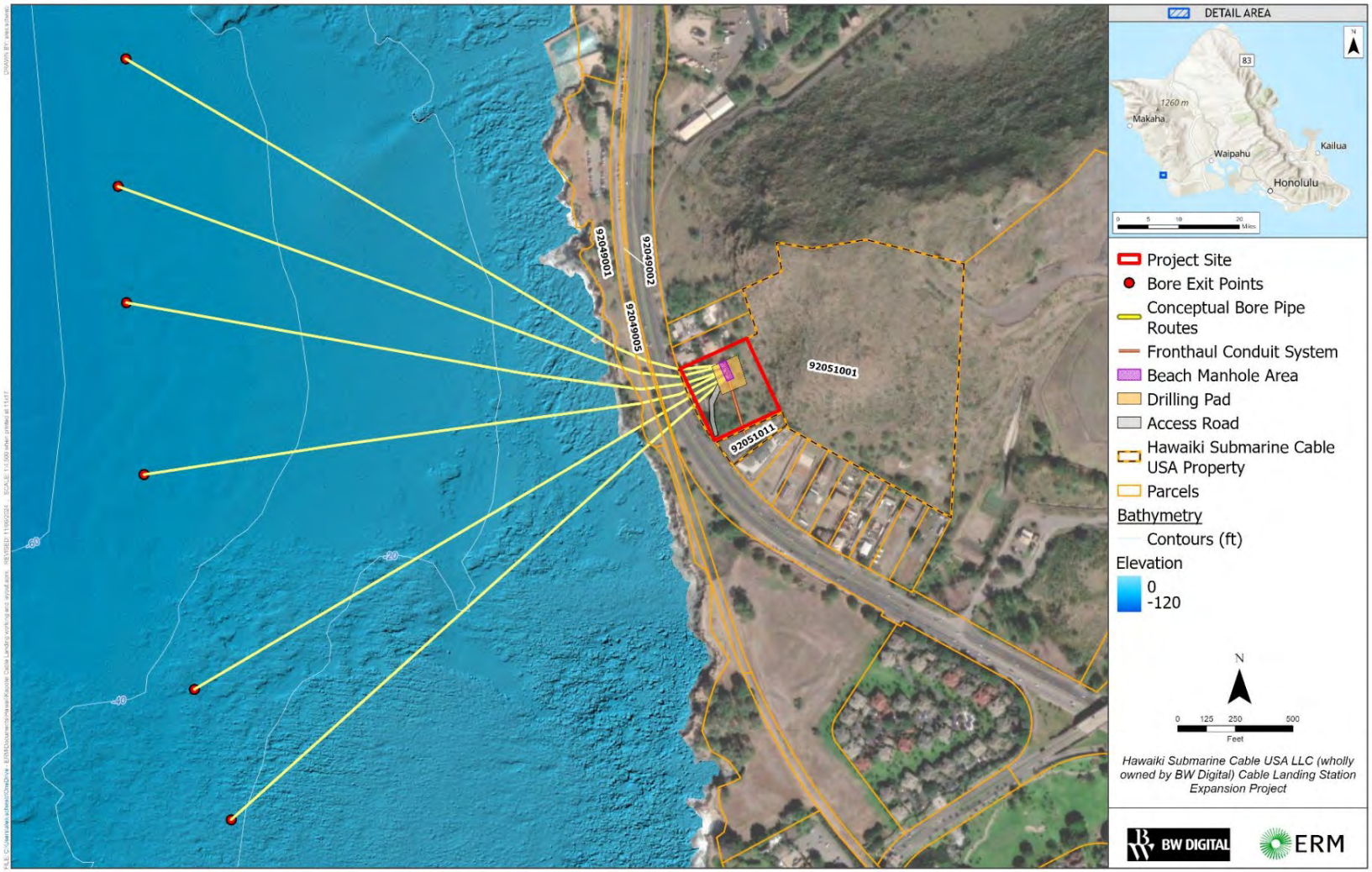


FIGURE 1-2: PROJECT LAYOUT

1.1.2 PROPERTY DESCRIPTION AND SURROUNDING LAND USES

The Project Site is zoned as General Agricultural (AG-2) by the City and County of Honolulu and is in the State Land Use Agricultural District (Figure 1-3). The bore pipes would be installed via HDD beneath land zoned as General Preservation (P-2) (Figure 1-4). The subsurface fronthaul conduits connecting the new subsurface infrastructure to the adjacent Hawaiki CLS would also be partially located on the adjacent Hawaiki CLS parcel (TMK (1) 9-2-051:011), zoned as Country. The HDD bore pipes would emerge from the seabed within the State Conservation District, which encompasses all submerged lands around the Hawai'ian Islands and extends out to the territorial limits of the State of Hawai'i.

The proposed Project Site is undeveloped and bordered to the north by residences, to the south by the Hawaiki CLS with residences beyond, and to the west by the Farrington Highway and the OR&L. The Waimānalo Gulch Sanitary Landfill is approximately 0.3 mile east of the proposed BMH locations and the Hawai'ian Electric Company (HECO) Kahe Electric Power Plant is approximately 0.4 mile to the north. The greater area surrounding the Project Site consists of residential areas, a resort (Ko 'Olina Resort and Marina), recreational areas (Makaīwa and Kahe beach parks), and areas zoned for industrial use. The primary access to the Project Site would be from Farrington Highway, which is a State of Hawai'i Department of Transportation (HDOT) four-lane divided highway. The HDD bores would be installed under the Farrington Highway and the OR&L right-of-way, both of which are listed on the State and National Registers of Historic Places (NRHP)[4], see Figure 1-1.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Project would be to provide capacity for up to six future subsea cable systems to be terminated at the existing Hawaiki CLS, based on market demand. These could be either domestic cables linking islands in the Hawai'ian archipelago, interstate cables linking Hawai'i to the CONUS, or international cables providing connectivity from Hawai'i/CONUS across the Pacific Ocean. The Applicant's latest investment in Hawai'i demonstrates their continued commitment to the state as it further expands the Hawai'i Connect Kākou initiative. The Project would provide new, carrier-neutral, subsea infrastructure capability on O'ahu, aligning with the National Telecommunications and Information Administration Broadband Equity, Access, and Deployment (BEAD) Program, that provides funding to support expansion of high-speed internet access and use in underserved locations.

[4] The Oahu Railway & Land Company operated a narrow-gage railroad on Oahu from 1880 to 1947. The tracks are currently owned by the State of Hawaii under the care of the Hawai'i Railway Society (HRS). The HRS operates the line for historical rail tours.

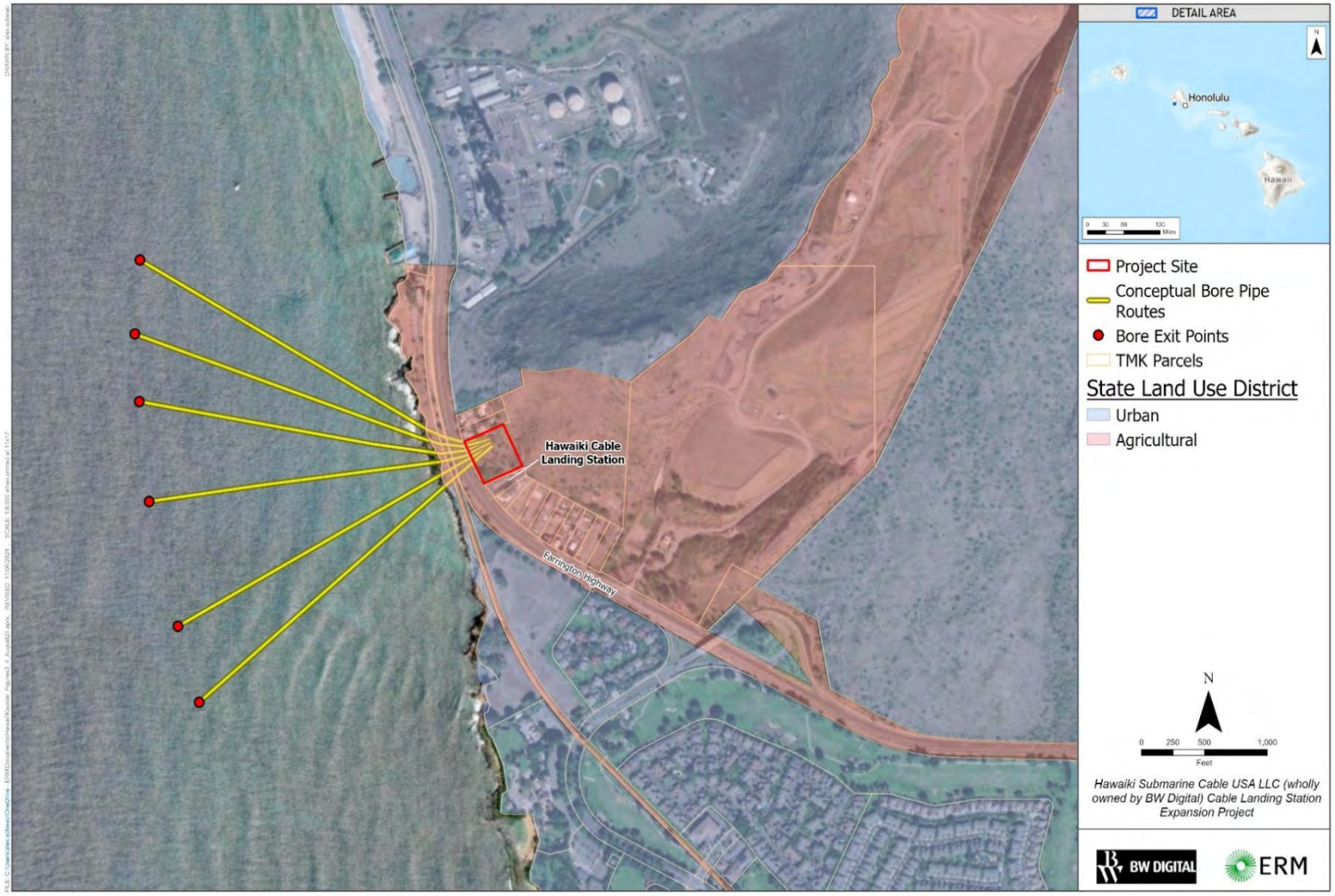


FIGURE 1-3: STATE LANDS AND LAND USE DISTRICTS

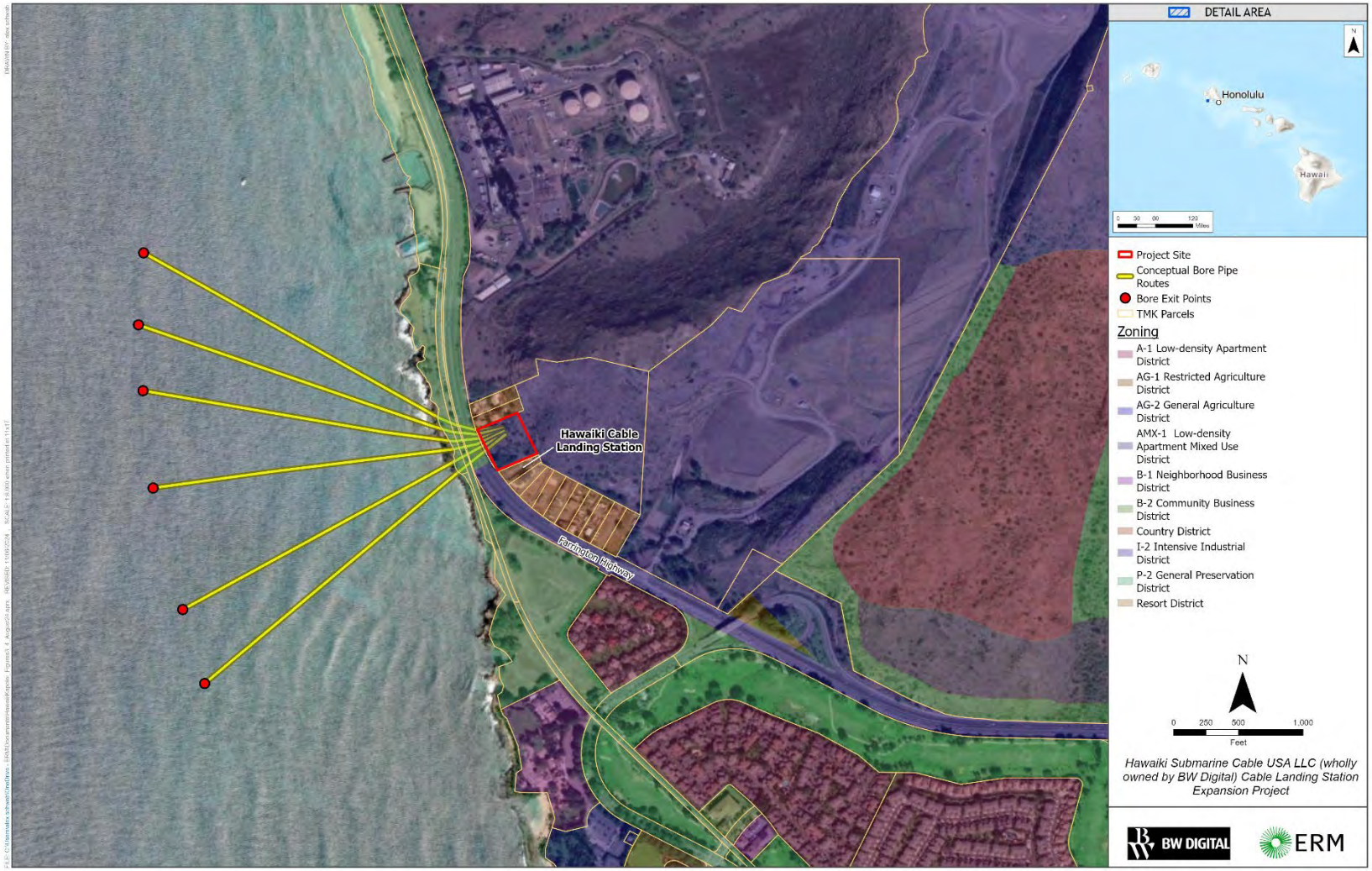


FIGURE 1-4: ZONING

1.3 PROPOSED ACTION AND ALTERNATIVES

The following section describes the alternatives evaluated in this document. The alternatives evaluated in detail consist of the No Action Alternative (Alternative 1) and the Proposed Action (Alternative 2). Chapter 4 discusses all alternatives that were considered but not evaluated.

1.3.1 NO ACTION ALTERNATIVE (ALTERNATIVE 1)

Under the No Action Alternative, the Project would not be constructed and any future submarine cables would be responsible for identifying their own cable landing location, design, and associated permits. Furthermore, the Hawai'i Connect Kākou initiative in association with the National Telecommunications and Information Administration BEAD Program would not be expanded upon.

1.3.2 PROPOSED ACTION (ALTERNATIVE 2)

The Proposed Action would entail the expansion of the existing Hawaiki CLS to support the landing of up to six new future submarine cable systems (separate from the Project). Project components would include:

- The construction of new telecommunication infrastructure on approximately 2.5 acres which would include up to six new HDD bores extending into the Pacific Ocean, up to three BMHs, up to six subsurface fronthaul conduits connecting the new subsurface infrastructure to the existing Hawaiki CLS on the adjacent property, and a gravel access road. All onshore Project components would be located adjacent to Farrington Highway on parcel TMK (1)9-2-051:001 in Kapolei, Hawai'i, and owned by the Applicant, Hawaiki Submarine Cable USA, LLC. The only exception to this would be the fronthaul conduit system which would connect the Project with the existing adjacent Hawaiki CLS and entail approximately 40 feet of trench extending into the adjacent property (TMK (1)9-2-051:011, also owned by the Applicant). More information on the fronthaul conduit system is provided in Section 1.3.8.
- Up to six steel bore pipes would be installed via HDD below the shoreline from the onshore Project Site to approximately 2,500 to 3,000 feet (762 to 914 meters) offshore as landing point for future subsea cable systems. The HDD bore pipes would daylight (exit) in State of Hawai'i waters at a depth of approximately 50 to 65 feet (15 to 20 meters). The HDD bore pipes would cross under Farrington Highway and the OR&L right-of-way (TMK (1)9-2-049:005 and TMK (1)9-2-049:002, owned by the State of Hawai'i), and Kahe Beach Park (TMK (1)9-2-049:001, owned by the City and County of Honolulu). Offshore, the bore pipes would be installed under the submerged lands of the State of Hawai'i before exiting.

The following sections provide more details on each of the major Project components.

1.3.3 LAND SURVEY AND BORE DESIGN

Prior to construction activities commencing and to prepare for HDD bores, a detailed engineering plan and profile would be generated based on an onshore topographic survey and offshore bathymetric and geophysical surveys.

The correct depths, drilling fluid mixtures[5], and HDD drill head types would be determined based on soil boring samples and the geophysical analyses. The seabed profile would be used to establish a true running elevation for the HDD drill path and the offshore drill exit locations, will be verified by a marine support crew to calculate the drill length.

1.3.4 BORE SITE PREPARATION

Onshore, HDD activities would require the creation of a temporary staging area to support drilling operations. The staging area and active HDD work area within it would be approximately 16,000 square feet in size and would require the installation of an access road approximately 240 feet long by 20 feet wide, connected to the adjacent Applicant-owned property (Figure 1-5). Creation of the access road and staging area would require clearing of vegetation, grading, and leveling, and both the road and the staging area would be covered in gravel (crushed rock). The HDD rig and associated equipment would be contained within the staging area, and a crane would be used for setup and demobilization of the work site and for HDD operations. The exact location of the staging area for the HDD rig and supporting equipment may change within the Project Site boundaries provided. With agreement of the neighbor to the south of the Hawaiki CLS (TMK (1) 9-2-051:010), minor modifications to their driveway may be made to facilitate tractor trailer egress onto Farrington Hwy northbound west lane without impacting the left-hand lane.

A drill entry pit would be excavated in line with the HDD rig to contain the drilling fluid returning from the bore during drilling. A slurry sump pump would be set in place in the entry pit to pump out the returning fluid, feeding it to the recycling unit for further treatment, adjustment, and reuse. A small crane would likely be used during set up and to load pipes. Water supply for the above activities would be provided from the water main on the adjacent Hawaiki property (subject to agreement with the local water authority) or by a water truck.

1.3.5 HDD BORE PIPES

HDD operations would begin after mobilization and preparation of the drill rig and other support equipment, and the placement of the required terrestrial wire tracking grid(s). The drill rig would operate on a carriage assembly that travels by hydraulic power along the frame of the bore rig. Directional bores would be steered by a drill head fitted with a wireline guidance tool initially in conjunction with a terrestrial energized wire tracking grid to track the direction of advance, horizontally and vertically, and to determine the exact location of the bore pipe placement. Once beyond the terrestrial wire tracking grid, the tracking system would be continuously maintained to verify the drill position and path.

[5] Drilling fluid is a mixture of bentonite clay and water used to drive and lubricate the drill bit, stabilize the bore hole, and carry the cuttings back to the entry pit. Bentonite clay is a naturally occurring biodegradable non-toxic substance. Sometimes polymers are added to the drilling fluid in negligible amounts to increase viscosity and enhance the bore stability.

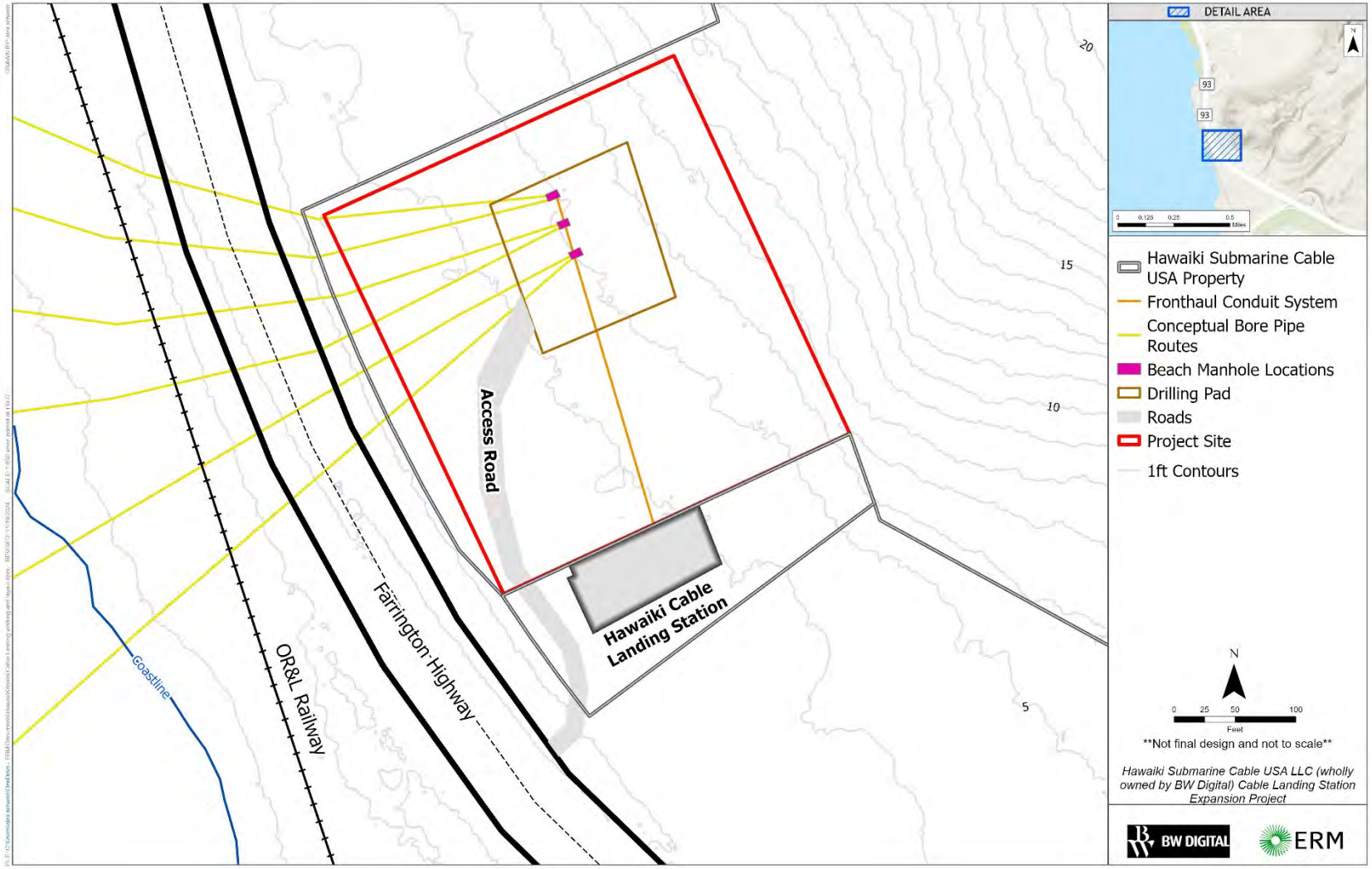


FIGURE 1-5: HDD SCHEMATIC

Six bore pipes, up to 8 inches in diameter, would be installed to provide shore crossings for six future subsea fiber-optic cables. The bore pipe would be advanced along the pre-determined drill path while the drilling fluid (containing bentonite[6]) is pumped down the inside of the bore pipe and exited through the drill head. As drilling proceeds, pipe segments would be added, forming the steel conduit used to house the fiber-optic cable. Drilling fluid carrying hole cuttings would then return to the entry point through the annulus between the outside of the bore pipe and the bore hole.

The bore depth profile would start approximately 3 feet below ground level (1 meter) at the onshore entry point to a maximum depth of approximately 130 to 150 feet (40 to 45 meters) along the profile. Once the appropriate distance offshore is reached with the bore pipe, the drill head would be guided to the surface to complete the bore. The bore would “daylight” (exit) beyond the surf zone approximately 2,500 to 3,000 feet (762 to 914 meters) from the entry point, in water depths of about 50 to 65 feet (15 to 20 meters).

The last 100 to 130 feet (30 to 40 meters) of the pilot bore would be drilled with fresh water, flushing drilling fluid back to the entry pit. This would prevent drilling fluid escaping to the sea when the bore pipe exits the seabed. The exact length of flushing would be decided on site, depending on the drilling findings and the actual drilled material at the end of the pilot bore.

Once the HDD has advanced significantly towards the bore exit point, marine support of directional bore operations would commence. A vessel (not anticipated to be larger than 36 feet in length) would establish its location and hold position, without anchoring, approximately 50 feet (15 meters) seaward of the bore exit point to serve as a marine dive platform. Marine support for HDD activities is expected to be needed for one to two days per bore pipe (i.e. approximately 12 days in total) during daytime hours only.

The marine support team would visually monitor the seafloor as the drill head approaches the exit point. Once the HDD drill head assembly has exited the seafloor, the support dive crew would be deployed to verify the bore pipe exit point. If necessary, divers would then excavate sediment around the bore pipe exit point by hand to help remove the drill head assembly; this would be returned to shore by the support boat. The divers would then support the mandrel process to prove the internal diameter of the bore is smooth and continuous. This process also allows installation of a hauling line inside the bore pipe, which would ultimately be used to haul the future fiber-optic cable from the seabed to land. A check valve would be installed at the offshore end of the pipe to keep sand and seabed debris from entering the bore pipe. A locater ball would also be installed and buried at the offshore end of the pipe to allow for easy relocation. Once each of the HDD bore pipe installations are complete, the new infrastructure would be left subsurface of the seabed.

1.3.6 DRILLING FLUID MANAGEMENT

Drilling fluid used to hydraulically drive the drill cutting head for the HDD requires water, a bentonite drilling additive, and a mixing unit. If required, a polymer additive would be added to the drilling fluid in negligible concentration to enhance the bore stability by strengthening the

[6] Bentonite clay is a naturally occurring biodegradable, non-toxic substance.

filter-cake being formed on the bore walls during the drilling operation. Drilling fluid that returns to the Project Site via the onshore entry pit would be recycled to the extent feasible by pumping the returns to a recycling unit. Solid and liquid materials that cannot be recycled further would be transported off-site by a vacuum truck and disposed of at an approved location. Trucks are expected to use the Hawaiki CLS and neighboring parcel's (TMK (1) 9-2-051:010) shared driveway to back up and avoid a U-turn on Farrington Highway.

If significant cracks or fissures exist in the bore hole substrate, there is a possibility that drilling fluid could move through the cracks and find a way to the surface, in this case along the terrestrial route or into the sea offshore of the landing site. This is known as an inadvertent drilling fluid release. The drilling fluid system operator would implement a series of monitoring and management measures during HDD to detect and respond to a potential drilling fluid release. While drilling is taking place, the drilling fluid system operator would monitor drilling fluid volumes from the pumps and return flows from the borehole and alert personnel if there is a significant change in the return volume. This is the most effective and efficient way to detect a drilling fluid release. Detailed planning and management measures, as well as corrective actions to be taken in the event of a drilling fluid release, would be included in an Inadvertent Release Contingency Plan, to be provided to agencies in advance of starting construction.

1.3.7 BEACH MANHOLES

Upon completion of the HDD operations, the bore pipes would be capped, and the drilling equipment would be demobilized and the site prepared for installation of the BMHs. Up to three pre-cast concrete or cast-in-situ BMHs would be installed at the landward end of the bore pipes. Each BMH would serve as the terminus point for up to two directional bore pipes. The BMHs would be buried and capped with a cast-iron manhole cover at grade level or buried just below grade. Manholes can typically be installed within the excavated HDD entry pits for selected bore pipes; however, additional minor excavation may be required to accommodate the BMH. Installation of the manholes would then require putting the manhole in place on an aggregate base material (e.g., crusher run) and backfilling around the manhole with the native soils. Exact locations for the BMHs would be determined following completion of the HDDs; locations would be within the 16,000 square-foot work area footprint. Once construction is complete, the BMHs would be at grade or buried just below grade and the site would be restored.

1.3.8 FRONTHAUL CONDUIT SYSTEM

Subsurface fronthaul conduits would be installed between the proposed BMHs and the existing CLS located on the adjacent land at 92-384 Farrington Highway in Kapolei. Approximately 295 feet of the conduit system would be installed within parcel TMK (1)9-2-051:001, and approximately 20 feet would be installed on the adjacent property (parcel TMK (1)9-2-051:011) in order to connect with the adjacent CLS. It is anticipated that the conduit system would be installed via open trenching. A single trench would be excavated from the furthest BMH location with a backhoe or similar excavating equipment. The trench would be an estimated 20 inches (50 centimeters) wide at its base and 48 inches (120 centimeters) deep, depending on underground utilities encountered. Native soils/sands would be side cast during trenching and either replaced as backfill or tested and moved

off-site as required. The conduit system would be installed within the trench to allow for conduit connections between the BMH and CLS.

The fronthaul conduit system would include up to six PVC 100mm ducts (one for each bore pipe and future cable). Each duct would be fitted with three 32mm sub-ducts needed to house the fiber-optic, power, and ground cables of each future cable, respectively. A group of three sub-ducts within a single P100 outer duct constitutes one cable system. All six ducts to the CLS would remain vacant until the future subsea cable systems are installed (outside the scope of this Project).

1.3.9 SITE RESTORATION

The Project Site would be restored to a suitable condition, as required by the local authorities. Trench and drill pit backfilling would begin immediately after the conduits or manholes are installed, using a backhoe or similar equipment. Backfill material would likely consist of sand-cement slurry and/or native sand/soil compacted to eliminate erosion and soil settlement in conformance with specifications of the local authority. Any material to be removed permanently following excavation would be disposed of at locations approved to receive clean fill. Compaction of the backfill would be accomplished with a pneumatic-drum roller or vibratory compactor, using water to achieve the required density.

Materials and equipment would be retrieved and the Project Site would be cleared of rubbish. This generally includes removal of the following:

- Excess drilling fluid and sediment excavated during drilling operations and transport to an approved disposal site;
- Removal of drill rig anchoring system;
- Removal of debris and Project-generated material, supplies, and equipment from the site at the completion of the work; and
- Removal of evidence of machinery presence, including track marks in the soil and any oil marks or tire tracks.

Restoration would occur following the completion of the Project infrastructure installation.

1.4 PROJECT SCHEDULE

Construction is expected to begin mid- 2025 and end mid to late 2026. Subtasks are expected to have the following duration contingent on good weather conditions and no equipment malfunctions (unforeseen circumstances such as these could extend the total number of working days):

- Site Preparation: two months
- Mobilization: one month
- HDD boring: Four to six weeks per HDD bore, five and a half day working week, between 7:00 am to 6:00 pm weekdays, and between 9:00 am and 6:00 pm on Saturdays.
- BMH installation: two weeks

- Trenching from BMH to CLS conduits: three weeks.
- Equipment Demobilization: two weeks
- Restoration: three to six weeks

2. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

The following impact analysis is primarily focused on construction of the Project as the CLF would not be staffed, the infrastructure consists of underground bore pipes and conduit, and installation and maintenance of a subsea cable is not part of the Project.

2.1 CLIMATE

2.1.1 EXISTING CONDITIONS

The Hawai'ian Islands have a tropical climate with near-constant trade winds blowing from the east. There are two seasons: the dry season from May to October, and the wet season from October to April. Summer highs are usually in the upper 80s°F (around 31°C) during the day, and mid 70s (around 24 °C) at night (Pacific RISA 2024).

The ocean supplies moisture to the air and acts as a giant thermostat, since its own temperature varies little compared with that of large land masses. The seasonal range of sea surface temperatures near the Hawai'ian Islands is only about 6 degrees, from a low of 73 or 74 degrees between late February and March to a high near 80 degrees in late September or early October (Price 1983).

O'ahu is generally drier on the Leeward Coast (west) and wetter and greener on the Windward Coast (east), with annual rainfall on the leeward coast ranging between 21 and 33 inches, and on the windward coast ranging between 48 and 279 inches (Hawai'i Tourism Authority 2024). Average air temperature ranges from 88°F (31 degrees C) to 74°F (23 degrees C) with moderate humidity of 53 percent during the day (WeatherGuy 2024).

Within the last century, air temperatures have increased between 0.9° to 1.8°C (0.5° and 1°F). As the oceans absorb increased heat energy from the atmosphere, sea water temperatures rise (California Office of Environmental Health Hazard Assessment 2024). As ocean temperatures rise, oceans can hold more carbon dioxide from the atmosphere, which makes the water more acidic. Warming in the oceans around Hawai'i has damaged coral reefs and increased ocean acidity has threatened reefs and other marine ecosystems. Average precipitation decreased in the last century, reducing freshwater availability on some islands and affecting delicate land-based ecosystems, often harming native species. In the last 50 years, sea level has risen along Hawai'i's shores, increasing erosion and threatening coastal communities and infrastructure (U.S. Environmental Protection Agency [EPA] 2016).

The State of Hawai'i recognizes the potential risks associated with climate change and has established a policy to address greenhouse gas (GHG) emissions via Act 234.[7] Interdisciplinary stakeholders have also provided the State of Hawai'i with additional recommendations regarding how Hawai'i can adapt to the projected effects of climate change (ORMP 2020).

[7] A Bill for an Act Relating to Greenhouse Gas Emissions (Act 234) HB226 SD2 HD2 CD1, 30 June 2007.

2.1.2 ENVIRONMENTAL IMPACTS

2.1.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on the climate.

2.1.2.2 ALTERNATIVE 2—PROPOSED ACTION

Impacts to Climate Change

Construction of the Project would not result in direct or indirect effects to local climate conditions including temperature, rainfall, humidity, or wind patterns. Construction of the Project would contribute a minor amount of GHG to the environment in the form of exhaust from construction equipment and vehicles; however, emissions would be temporary and localized and would not measurably contribute to regional or global GHG levels (see Section 2.11). Therefore, the Project would not result in significant adverse impacts to the regional climate or climate change.

Impacts from Climate Change

Given the location of the Project along the coastline, the anticipated effects of climate change such as ocean acidification, storm severity, and sea level rise/shoreline erosion have the potential to impact the Project. Ocean acidification can compromise structural integrity and accelerate the degradation of materials (Leadvent Group 2024). Natural hazards, including storm surges, waves, cyclones, earthquakes, floods, volcanic eruptions, and submarine landslides, are all increasing in frequency and severity due to climate change (Clare et al. 2023). The location of the cable landing site is 50 feet (15 meters) above the current sea level, thereby protecting it from the anticipated up to 6-foot (1.8-meter) rise in sea level (Romine et al. 2020), and the Project would be designed and engineered in compliance with industry standards.

2.1.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Project components such as vessels, vehicles, and equipment would be properly maintained and in compliance with state and federal emission standards. This would facilitate the Project emitting negligible GHGs and no significant impacts to climate change are anticipated. Therefore, no mitigation is proposed.

2.2 GEOLOGY, TOPOGRAPHY, AND SOILS

2.2.1 EXISTING CONDITIONS

O‘ahu is the third largest of the Hawai‘ian islands, formed by two inactive shield volcanoes, Wai’anae and Ko’olau. These volcanoes have been modified by other ongoing geologic processes such as subsidence, landslides, slumping, erosion, sedimentation, and reactivated volcanism. Both of the volcanoes have experienced a series of submarine landslides and slumps on their respective sides of the island (Hunt 1996) (Figure 2-1). Erosion processes have advanced the formation of steep sided ridges, gullies, and valleys that make up the Wai’anae and Ko’olau mountains (Tetra Tech, Inc. 2017).

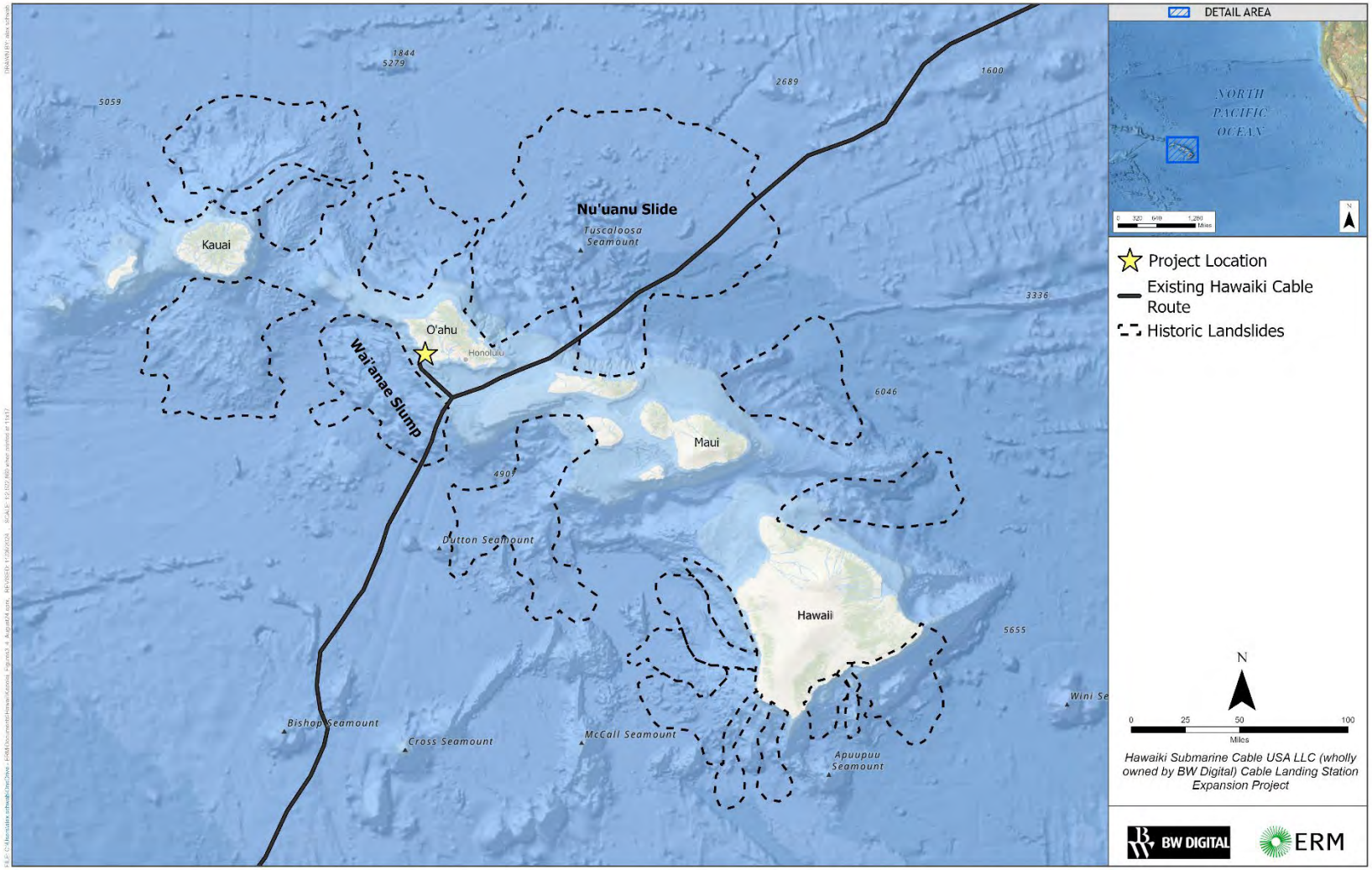


FIGURE 2-1: HISTORICAL LANDSLIDES IN THE HAWAIIAN ISLANDS

The Project is on the southwest side of the island of O'ahu along the Waimānalo Gulch at the base of the Wai'anae mountain range, which rises to over 2,000 feet. The Project Site has an elevation ranging from 40 to 85 feet above mean sea level with a slope ranging from 5 to 10 percent.

2.2.1.1 ONSHORE SETTING

The Project Site and existing Hawaiki CLS are underlain by volcanic and unconsolidated sediment materials including lagoon and reef deposits comprised of limestone, mudstone, estuarine sediment (Qcrs), and some Holocene age alluvium (Qa). These sediments come from landslides and erosional events at the base of the Wai'anae Range and well sorted sand and gravel beach deposits (Qbd) along the shoreline. Additionally, there are Wai'anae volcanic basalts from the nearby shield volcano (Takl) (Sherrod et al. 2007) (Figure 2-2 and Figure 2-3). These geologic features lead to gentle to moderate slopes and localized, very steep rocky ridges.

A geotechnical investigation was conducted on 31 August and 1 September 2016 by Hirata & Associates for construction of the Hawaiki CLS. While the investigation did not include the Project Site, similar geotechnical conditions are assumed due to the close proximity (the Hawaiki CLS being adjacent to the Project Site). Based on coring data, surface soil from 0 to 4 feet below ground surface was classified as stiff, grayish brown silty clay. Below, was silty clay, medium dense to dense, tan, silty sand to a depth of about 18 feet with coralline gravels starting at a depth of 10 feet. Underlaying that was 27 feet of dense grayish-brown highly weathered basalt on top of medium hard gray moderately weathered basalt extending to the bottom of the core (50 feet). Groundwater was encountered at a depth of about 29.5 feet and is expected to fluctuate with tidal variations (Hirata & Associates. 2016 in Tetra Tech, Inc. 2017).

2.2.1.2 OFFSHORE SETTING

The seafloor in this region is comprised of volcanic reef bearing material overlain by sporadic, fine grained sand beds (Sherrod et al. 2007). These areas of sedimentary deposits are shallow and infrequent. The Project Site and bore alignments would pass through these volcanic and unconsolidated sedimentary environments.

2.2.2 ENVIRONMENTAL IMPACTS

2.2.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would therefore have no effect on geology, topography, or soils.

2.2.2.2 ALTERNATIVE 2—PROPOSED ACTION

The Project is expected to take up to 12 months to complete. The short-term impacts to soils and geologic features by construction of the cable landing infrastructure would be restricted to the small area of the Project Site and include minimal removal of materials. Soil disturbance in the work area would include access road and staging area construction and localized trenching. Disturbed areas would be backfilled, recontoured to match the surrounding area, and restored to suitable conditions as determined by local authorities. Potential geologic impacts would be temporary and would not unduly impact the local topography or geology of the area.

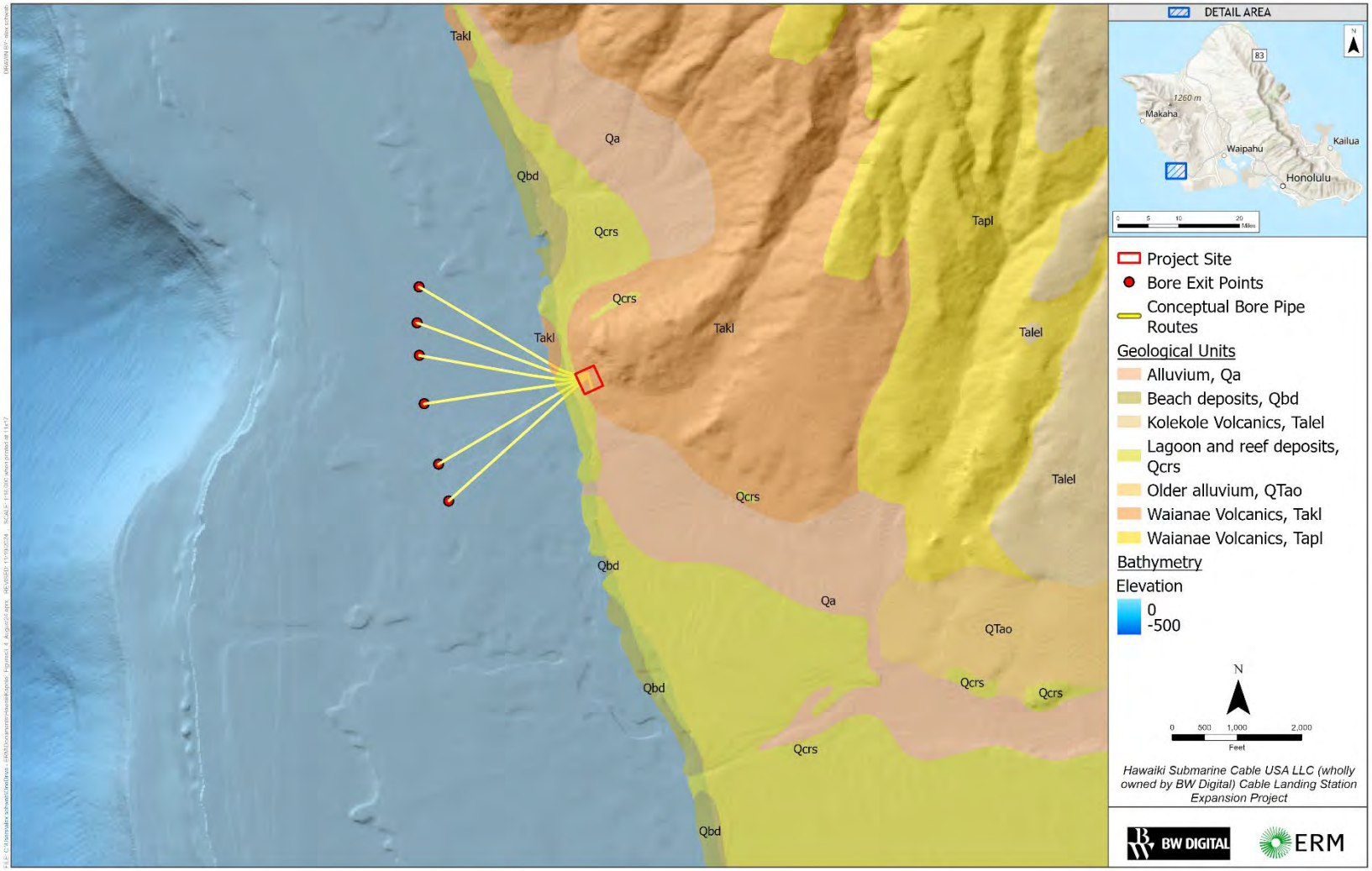


FIGURE 2-2: EXISTING GEOLOGY NEAR THE PROJECT SITE

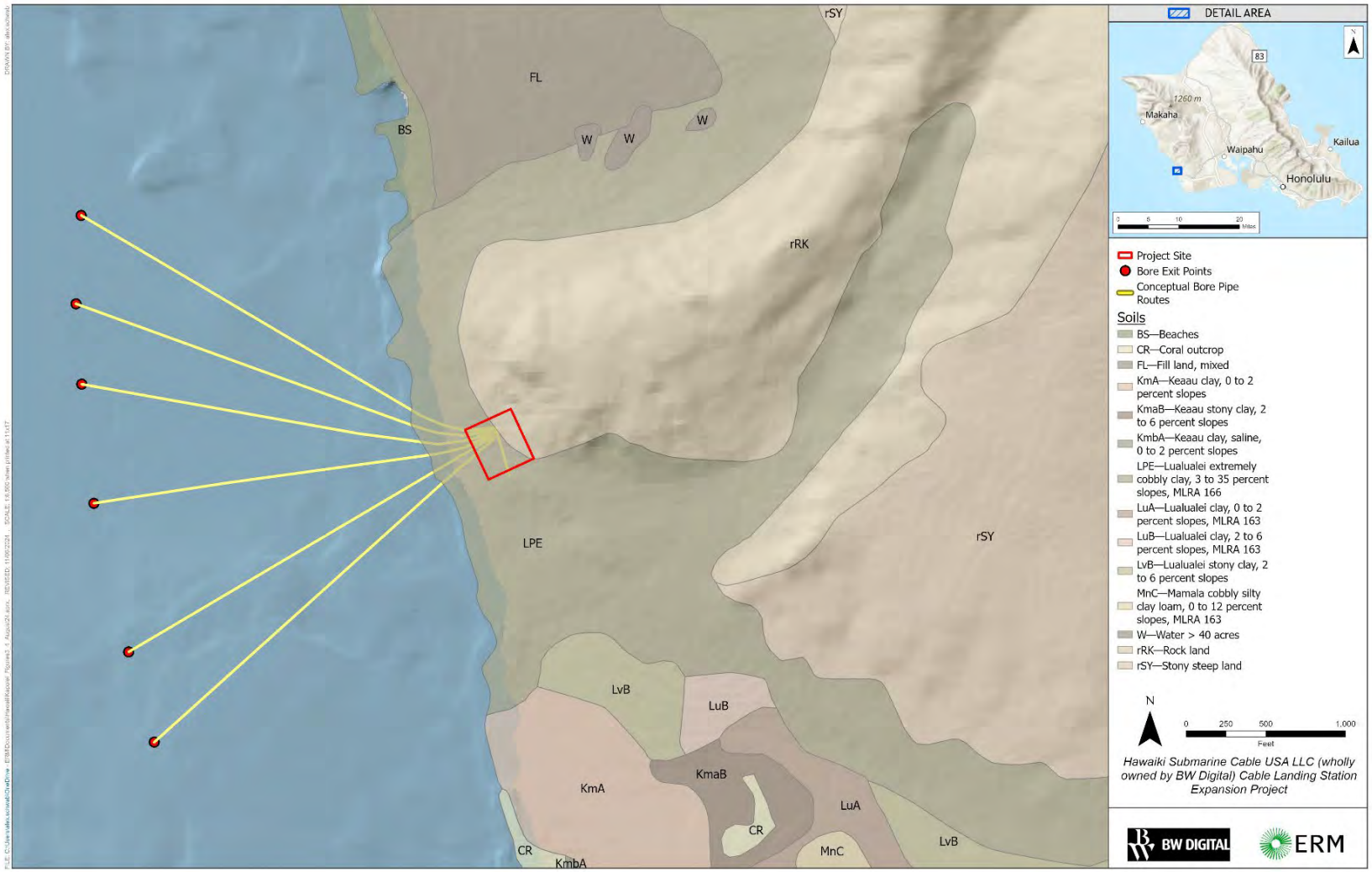


FIGURE 2-3: EXISTING SOILS

2.2.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Best Management Practices (BMPs) would include restoration to return the Project Site as close as possible to its pre-existing conditions to the satisfaction of local authorities. Sediment excavated in the process of construction activities would be reused in the construction of the CLF or disposed of offsite at a state-approved location. Therefore, the Project would not result in significant impacts to the geology, topography, or soils.

2.3 NATURAL HAZARDS

A natural hazard is a naturally occurring event that could negatively affect people, infrastructure, and/or the environment. One natural hazard may trigger another; for example, an earthquake can trigger a tsunami, sometimes in an entirely different geographic area. Flooding, tsunamis, hurricanes and tropical storms, and earthquakes are natural hazards that have the potential to occur in the Hawai‘ian Islands and could impact the proposed Project.

2.3.1 EXISTING CONDITIONS

2.3.1.1 FLOOD

Potential flood hazards are identified by the Federal Emergency Management Agency (FEMA) through the National Flood Insurance Program and are represented on Flood Insurance Rate Maps (FIRM). These maps categorize land into zones based on the likelihood of flooding. As illustrated on Figure 2-4, the Project Site is situated in Zones D and VE (FEMA 2024). The onshore cable landing site falls within Zone D, which consists of unstudied areas where flood risks are unknown but possible (FEMA 2024). The HDD bores span both Zone D and Zone VE. Zone VE represents areas at risk of flooding from a 1-percent annual chance event, along with additional hazards from storm-driven wave action. Base flood elevations for Zone VE have been established based on detailed hydraulic analyses (FEMA 2024).

2.3.1.2 TSUNAMI

Tsunamis are powerful, fast-moving ocean waves that are typically triggered by disturbances along the Pacific Rim. Localized disturbances such as earthquakes, underwater landslides, and occasionally volcanic eruptions can also cause tsunamis (USGS 2020). The hazards associated with tsunamis include not only the massive waves themselves, but also debris carried by the waves and flooding in low-lying areas (USGS 2020). A total of 26 tsunamis with flood elevations exceeding 3.3 feet (1 meter) have struck the Hawai‘ian Islands since 2002, 10 of which resulted in adverse impacts on the Island of O‘ahu (USGS 2020). The HDD bores are situated within the tsunami evacuation zone, while the Project Site falls within the extreme tsunami evacuation zone. The "Tsunami Evacuation Zone" designates areas to be evacuated during any tsunami warning, while the "Extreme Tsunami Evacuation Zone" indicates regions to be evacuated during severe tsunami warnings, where waves may reach significantly inland (City and County of Honolulu, Department of Emergency Management 2024).

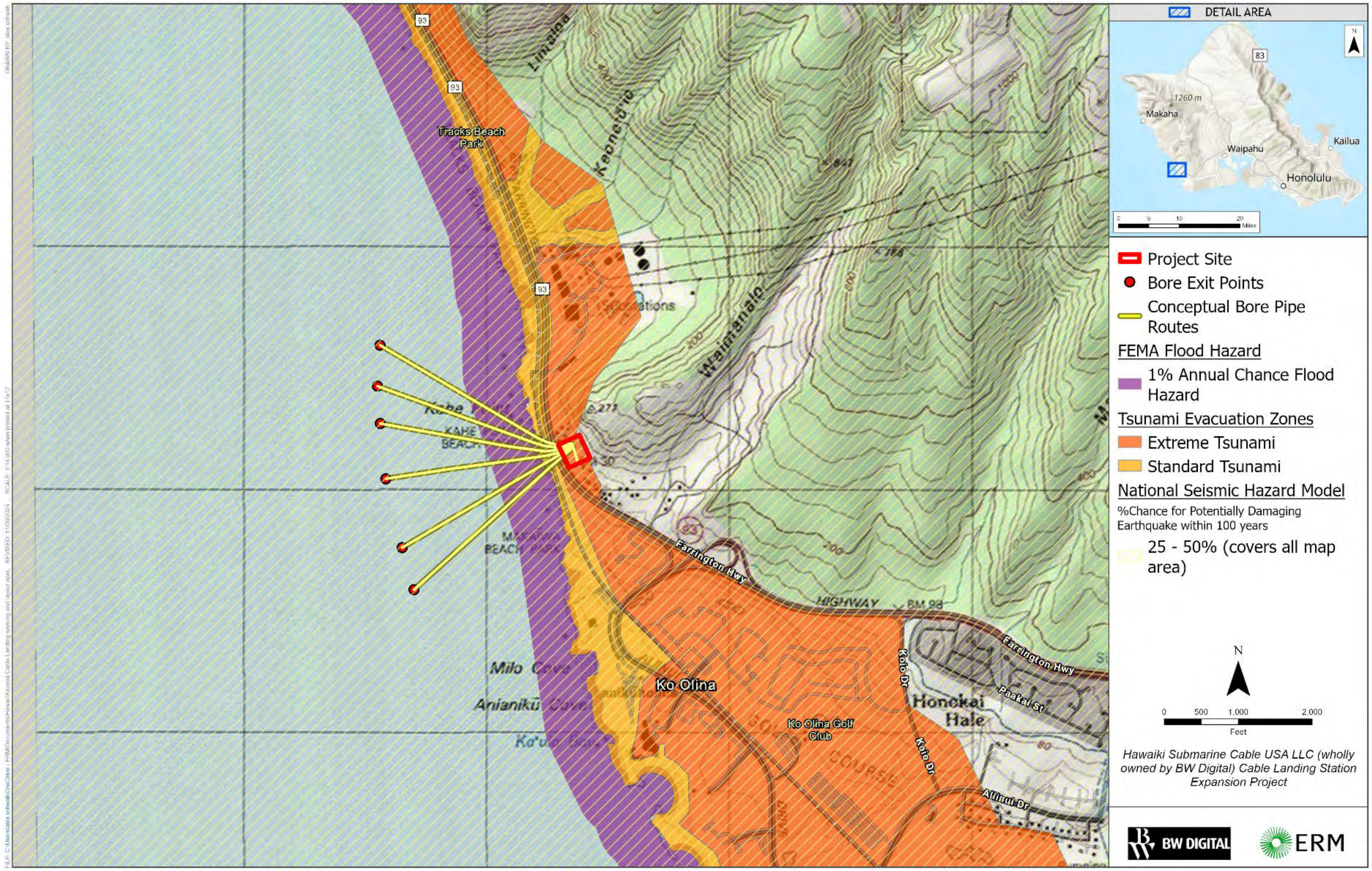


FIGURE 2-4: EXISTING NATURAL HAZARDS

2.3.1.3 HURRICANES AND TROPICAL STORMS

Warm ocean waters can create hurricanes with sustained winds exceeding 74 miles per hour (mph; 119 kilometers per hour [kph]). These storms can cause significant damage due to their strong winds, heavy rainfall, and unusually high waves and storm surges (Businger 1998). The Central Pacific Hurricane season lasts from 1 June to 30 November. Recent hurricanes impacting the Hawai'ian Islands include Iniki (1992), which primarily affected Kaua'i, and Iselle (2014) which mostly impacted the Island of Hawai'i (NEC 2016). Hurricanes are relatively uncommon in Hawai'i. Between 1950 and 1998, only five hurricanes (excluding Iselle, which made landfall as a tropical storm in 2014) caused major damage (Businger 1998). No documented hurricanes have made landfall on the Island of O'ahu.

Tropical storms are like hurricanes but have sustained winds below 74 mph (119 kph). These storms can bring heavy rainfall and occur more frequently in Hawai'i than hurricanes. Tropical storms typically pass close enough every 1 to 2 years to influence the weather on some parts of the Hawai'ian Islands (WRCC 2024).

2.3.1.4 EARTHQUAKES AND SEISMICITY

Earthquakes in Hawai'i are frequently associated with volcanic activity. Each year, numerous small volcanic earthquakes occur, mainly beneath the Island of Hawai'i, triggered by eruptions and the movement of magma in the active volcanoes Kīlauea, Hualalai, and Mauna Loa, as well as Lō'ihi offshore. Seismicity refers to the geographic and historical distribution of earthquakes (USGS 2017a). The estimated risk for O'ahu having a damaging earthquake within 100 years is 25 to 30 percent.

The Uniform Building Code (UBC) was created to establish building regulations that address seismic hazards. It provides minimum design standards to mitigate potential damage from seismic disturbances. Hawai'i is divided into four UBC seismic hazard zones. According to the United States Geological Service, Zone 0 indicates "no chance of severe ground shaking," while a seismic hazard rating of 4 corresponds to a "10 percent chance of severe shaking within a 50-year period" (USGS 2017b). Currently, O'ahu is classified as a UBC seismic risk zone 2A, which denotes a low level of seismic risk (City and County of Honolulu 2008).

2.3.2 ENVIRONMENTAL IMPACTS

2.3.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on natural hazards.

2.3.2.2 ALTERNATIVE 2—PROPOSED ACTION

Floods

The Project Site is situated in Flood Zone D, which identifies areas where flood hazard analyses have not been carried out and the flood risks are undetermined. However, due to its proximity to the shoreline, it is anticipated that any flooding would primarily stem from sea level rise; however, as the Project Site is 40 to 80 feet above sea level, the likelihood of flooding is very low. The

National Flood Insurance Program does not impose any development regulations for Zone D. In contrast, the HDD bores fall within Zone VE, classified as a special flood hazard area with high risk, corresponding to the 1-percent annual chance (or 100-year) floodplain (Low and Mahadevia 2013). Since the bore pipe would be installed underground, the risk of flooding impacting construction activities is minimal. The Project would not modify existing drainage patterns and would comply with the construction guidelines and standards set by the state, and City and County of Honolulu. During the detailed design phase, an engineer would verify stormwater runoff requirements and recommend stormwater control measures as needed, thereby reducing the potential for flood events.

If a flood event were to occur, the site construction safety manager would follow the procedures discussed during site safety training to facilitate staff safety.

Tsunami

The HDD bores are situated within the tsunami evacuation zone; however, the bore pipe would not be affected by a tsunami due to the fact that it would be installed underground. The onshore CLS is located within the extreme tsunami evacuation zone, where evacuation is advised only during an extreme tsunami warning triggered by a significant earthquake of a magnitude of 9 or more (USGS 2020). The likelihood of an extreme tsunami event affecting the Project is minimal. Therefore, the probability of impacts to the Project resulting from tsunamis is low. Currently, no land use restrictions or building restrictions are associated with areas within the extreme tsunami evacuation zone.

Hurricanes and Tropical Storms

No impacts from hurricanes or tropical storms are expected for the Project. Project facilities would be designed to meet or exceed the minimum requirements set by the state and the City and County of Honolulu, providing protection against potential effects in the event of a hurricane.

Earthquakes and Seismicity

The Island of O‘ahu is classified in UBC seismic risk zone 2A (City and County of Honolulu 2008), indicating a low level of seismic risk. As a result, no impacts to the Project from earthquakes or seismic activity are expected. To further minimize the risk of earthquake damage, all structures related to the proposed Project would comply with or surpass current building code requirements.

2.3.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

All on site workers will receive safety training prior to commencement of work. The training will include lines of communication and actions to be undertaken in the event of natural hazards. Impacts associated with natural hazards, should one occur, would be minimal; therefore, no additional mitigation is required.

2.4 ONSHORE WATER RESOURCES AND HYDROLOGY

Onshore water resources include both groundwater and surface water. Groundwater refers to any subsurface water resource occurring in subsurface geological formations (aquifers). Surface water refers to surface water features such as rivers, streams, lakes, ponds, springs, or wetlands. Both

groundwater and surface water volumes can be influenced by existing precipitation and drought patterns.

2.4.1 EXISTING CONDITIONS

The Project is located in the Makaiwa Watershed, a sub-basin of the larger ‘Ewa Watershed. The Makaiwa Watershed covers an area of approximately 11.9 square miles in the southwest region of O‘ahu (CWRM 2024). The region is characterized by low rainfall and high evapotranspiration rates as compared to the rest of the island of O‘ahu. Mean annual rainfall in the region from 1991-2020 is approximately 29 inches (723 mm) (NWS 2024). Rainfall is historically highest in November through January and lowest in May through July (Frazier et. al. 2016). Severe drought (time periods with 12-month average Standardized Precipitation Evapotranspiration Index (SPEI) value less than -1.5) have occurred in the region from 1950 to 2024 (2000, 2001, 2003, 2010, 2012, 2013, and 2022), with drought occurring more frequently in recent years (Beguería 2022).

2.4.1.1 GROUNDWATER

Groundwater hydrologic units were established by the Hawai‘i Commission on Water Resource Management (CWRM) to allow for the consistent management of groundwater resources in the state. Each island was divided into several Aquifer Sector Areas based on hydrological similarities, hydrographic, topographic, and historical boundaries. Aquifer Sector Areas were then further sub-divided into Aquifer System Areas based on hydraulic continuity and related characteristics (CWRM 2019). The Project is located within the Pearl Harbor Aquifer Sector Area and the Makaiwa Aquifer System (CRWM 2019). As of the 2019 Update to the State Water Plan, the CRWM calculated the sustainable yield of the Makaiwa Aquifer System to be approximately 0.5 million gallons per day (MGD) (CRWM 2019).

In addition to the CWRM Aquifer classification system, which is administrative in nature, groundwater resources in Hawai‘i are also classified by the Department of Health (DOH) based on geology and status (DOH 2011). The Project is underlain by two DOH Aquifer systems. The Project’s terrestrial components overlay DOH Aquifer 165 and the HDD borings extending into the ocean overlay DOH Aquifer 176. Aquifer system 165 is a basal (freshwater in contact with seawater), unconfined (water table is upper surface of saturated aquifer), with Flank geology (horizontally extensive lava). The status attributes of Aquifer 165 are: currently used for drinking, freshwater salinity (<250 milligrams per liter chloride (mg/L Cl)), irreplaceable uniqueness, and highly vulnerable to contamination (DOH 2011). Aquifer 176 can be divided into Upper and Lower zones. Aquifer system 176 Upper zone is a basal (freshwater in contact with seawater), unconfined (water table is upper surface of saturated aquifer) zone, with sedimentary geology (nonvolcanic lithology). The status attributes of Aquifer 176 Upper zone are: currently used but not for drinking or ecological importance, moderate salinity (1,000 to 5,000 mg/L Cl), replaceable uniqueness, and highly vulnerable to contamination (DOH 2011).

Aquifer 176 Lower zone is a basal (freshwater in contact with seawater), confined (Aquifer bounded by impermeable or poorly permeable formations, and top of saturated aquifer is below groundwater surface) zone, with Flank geology (horizontally extensive lava). The status attributes of Aquifer 176 Lower are: currently used but not for drinking or ecological importance, low salinity

(250 to 1,000 mg/L Cl), irreplaceable uniqueness, and low vulnerability to contamination (DOH 2011).

The main groundwater reservoir (compartment of larger volumes of groundwater storage) near the Project occurs in the lower- and middle-member lava flows of the Waianae Volcano System (Takasaki 1971). In this system, lateral flow of groundwater is impeded by the presence of steeply dipping volcanic dikes (Nichols et al. 1997). The groundwater reservoir system is recharged via precipitation and surface runoff. In general, the regional direction of groundwater flow would follow the steeper surface gradient and flow perpendicular to the coast (southwest) (Nichols et al. 1997). However, the Project is adjacent to the ‘Ewa Plain, a low permeability caprock zone whose geology reduces the movement of groundwater; because of the adjacency to this geologic feature, flow directions of groundwater in the region may be directed more west/northwest rather than southwest with the land gradient (Waste Management, Inc./Geosyntec Consultants, Inc. 2006).

Several monitoring wells have been drilled in the vicinity of the Project Site by the CWRM. Although this monitoring well data is not publicly summarized/published by the CWRM, a previous study was conducted by Waste Management, Inc./Geosyntec Consultants, Inc. that summarized the monitoring well depths to groundwater in the Makaiwa Aquifer region. According to this study, depth to groundwater in 2006 ranged from 55 to 200 feet below the surface (Waste Management, Inc./Geosyntec Consultants, Inc. 2006). As part of a 2016 geotechnical study for the Hawaiki CLS, the specific substrate and groundwater conditions adjacent to the Project Site were studied (Hirata & Associates 2016). This study included a 50-foot-deep exploratory borehole to identify the soil strata present at the Hawaiki CLS site. Findings noted stiff silty clay present to a depth of 4 feet, medium dense to dense silty sand present from 4 to 18 feet (mixed with coralline gravel to 10 feet), highly weathered basalt in dense condition present to 27 feet, and moderately weathered basalt in medium hard condition present to 50 feet (Hirata & Associates 2016). Additionally, groundwater in the borehole was met at approximately 29.5 feet below the surface. During Project construction, groundwater levels are expected to fluctuate due to the close proximity of the Project Site to the ocean and the influence of tides. In addition, the proximity of the ocean is expected to influence ground water salinity; groundwater on the site would likely be brackish or saline and unusable as a potable water supply without additional treatment.

2.4.1.2 SURFACE WATER

No National Wetland Inventory or National Hydrography Dataset-mapped wetlands, streams, or other surface water bodies are present within the onshore Project Site. The closest surface water is the Pacific Ocean, located approximately 420 feet west south-west of the Project Site. According to the DLNR Division of Aquatic Resources 2008 Streams Database, the closest fresh surface water feature is the Waimanalo Gulch, a non-perennial water body located approximately 1200 feet south-east of the Project Site (DLNR DAR 2022). The closest freshwater perennial surface water body is the Nanakuli Stream, located approximately 3.3 miles north north-west of the Project Site. An unmapped man-made concrete lined drainage ditch is located between the Project Site and Farrington Highway within the HDOT right of way. This drainage may occasionally carry storm water from uplands areas.

2.4.2 ENVIRONMENTAL IMPACTS

2.4.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on onshore water resources and hydrology.

2.4.2.2 ALTERNATIVE 2—PROPOSED ACTION

Groundwater

The approximate depth to the Waianae Volcanic System (primary groundwater aquifer in the Makaiwa Aquifer System Area) ranges from 55 to 200 feet below the surface (Waste Management, Inc./Geosyntec Consultants, Inc. 2006). The target depth of the HDD bores would be between 130 and 150 feet below surface level. The bores could pass through groundwater; however, based on previous studies, the groundwater is likely be brackish/saline due to the adjacency to the coast and unlikely to be used as a source of drinking water.

During HDD boring activities, there is a possibility that fractures in the underlaying rock substrate could potentially result in the inadvertent release of bentonite clay into the surrounding environment, including groundwater, referred to as an inadvertent drilling fluid release (IDFR), or “frac-out” (see Section 1.3.6). IDFR’s usually occur in soils that are highly fractured or in borehole paths that are very shallow. As part of a 2016 geotechnical study for Hawaiki CLS, the general substrate was determined to be stiff silty clay over medium dense to dense silty sand from 0 to 18 feet, before reaching basalt at 18 feet (Hirata & Associates 2016). The basalt layer extends to at least 50 feet according to Hirata and Associates 2016, and is expected to continue beyond the planned HDD profile based on HDD drilling records for the Hawaiki CLS. The consistency of the clay/sand substrate would be suitable to the low pressure of drilling fluid required during HDD activities. However, these findings would be assessed more by the drilling contractor prior to construction. If required, a polymer additive would be added to the drilling fluid in negligible concentration to enhance the bore stability by strengthening the filter-cake being formed on the bore walls during the drilling operation. The potential for an inadvertent release would be minimized with the implementation of the Project’s Inadvertent Release Contingency Plan.

Surface Water

As no surface water resources were identified at the Project Site beyond the concrete-lined drainage ditch adjacent to and mauka of Farrington highway that the bores would pass below, the Project would not result in any impacts to onshore water resources. The only new impervious surfaces resulting from the Project would be the exposed lids of the BMHs, totaling approximately 21 square feet, should Hawaiki choose not to bury them just below grade. In this case, the increase in stormwater runoff from the 21-square-foot area is expected to have a negligible effect on stormwater runoff to surface waters in the vicinity of the Project.

2.4.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

No adverse effects to groundwater or surface water are anticipated from the Project activities. BMPs and mitigation measures with regard to water resources would be developed during the

Clean Water Act (CWA) Section 404, 401, and 402 permit processes and be incorporated into a Project-specific Temporary Erosion and Sediment Control (TESC) Plan and Stormwater Pollution Prevention Plan (SWPPP). In addition, detailed planning and management measures, as well as corrective actions to be taken in the event of a drilling fluid release, would be included in an Inadvertent Release Contingency Plan, to be provided to agencies in advance of starting construction. Thus, any potential impacts to onshore water resources during construction of the Project would be mitigated to insignificant levels by adherence to federal, state, and county regulations, and BMPs.

2.5 MARINE WATER QUALITY

2.5.1 EXISTING CONDITIONS

The offshore waters within the Project Area are classified as Class A according to the 2015 Hawai'i Department of Health (HDOH) Clean Water Branch (CWB) Water Quality Standards Maps (Clean Water Branch 2024a). According to Hawai'i Administrative Rules (HAR), Chapter 11-54 (Water Quality Standards—2021 Amendments):

> "It is the objective of class A waters that their use for recreational purposes and aesthetic enjoyment be protected. Any other use shall be permitted as long as it is compatible with the protection and propagation of fish, shellfish, and wildlife, and with recreation in and on these waters. These waters shall not act as receiving water for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class."

In addition to the basic water quality criteria applicable to all waters, the state has established specific criteria for coastal and marine waters. The specific criteria for Class A open coastal waters are listed in HAR 11-54-6 and summarized in Table 2-1 below. Only "dry" criteria are listed because the open coastal waters within the area of the Project are expected to receive minimal freshwater discharge (i.e., less than 3 million gallons per day per shoreline mile).

TABLE 2-1: CRITERIA FOR CLASS A OPEN COASTAL WATERS

Parameter	Water Quality Standard
Temperature (°C)	Shall not vary more than 1 degree Celsius from ambient condition
DO (%)	Not less than 75% saturation, determined as a function of ambient water temperature and salinity
Salinity (‰)	Shall not vary more than 10% from natural or seasonal changes considering hydrologic input and oceanographic factors
pH	Shall not deviate more than 0.5 units from a value of 8.1, except at coastal locations where and when freshwater from stream, storm drain or groundwater discharge may depress the pH to a minimum level of 7.0

Parameter	Water Quality Standard
Turbidity (NTU)	Geometric mean not to exceed 0.20 Not to exceed 0.50 more than 10% of the time Not to exceed 1.00 more than 2% of the time
Total Suspended Sediment (mg/L)	n/a
Nitrate + Nitrite Nitrogen (µg [NO3 +NO2] - N/L)	Geometric mean not to exceed 3.5 Not to exceed 10.0 more than 10% of the time Not to exceed 20.0 more than 2% of the time
Ammonia Nitrogen (µg NH4-N/L)	Geometric mean not to exceed 2.0 Not to exceed 5.0 more than 10% of the time Not to exceed 9.0 more than 2% of the time
Total Nitrogen (µg/L)	Geometric mean not to exceed 110.0 Not to exceed 180.0 more than 10% of the time Not to exceed 250.0 more than 2% of the time
Total Phosphorous (µg P/L)	Geometric mean not to exceed 16.0 Not to exceed 30.0 more than 10% of the time Not to exceed 45.0 more than 2% of the time
Light Extinction Coefficient (k units)[8]	Geometric mean not to exceed 0.1 Not to exceed 0.3 more than 10% of the time Not to exceed 0.55 more than 2% of the time
Chlorophyll α (µg/L)	Geometric mean not to exceed 0.15 Not to exceed 0.5 more than 10% of the time Not to exceed 1.0 more than 2% of the time

The HDOH CWB sporadically monitors water quality at sites across the state. The closest sampling site to the Project Site is Kahe (21HI-000309), located approximately 0.27 miles to the north (EPA 2024b). The most recent full year (2023) of microbiology and chemistry water quality data collected from the Kahe site are presented in Table 2-2 below. According to the most recent 2023 303(d) Final List of Impaired Waters in Hawai‘i, waters at Kahe Point Beach Park are listed as in attainment (A) for Enterococci and not in attainment (N) for Turbidity (Clean Water Branch 2024b). According to the most recent 2023 303(d) Final List of Impaired Waters in Hawai‘i, waters at Kahe Point Open Coastal region are listed as in attainment (A) for Total Nitrogen and not in attainment (N) for Nitrate + Nitrite Nitrogen and Ammonia Nitrogen (Clean Water Branch 2024b). Both sites are identified as having low Total Maximum Daily Load priority (priority for initiating Total Maximum Daily Load development within the current monitoring and assessment cycle) (Clean Water Branch 2024b).

[8] Light Extinction Coefficient is only required for dischargers who have obtained a waiver pursuant to Section 301 (h) of the Federal Water Pollution Control Act of 1972, and are required by the EPA to monitor it.

TABLE 2-2: KAHE SITE 2023 MICROBOLOGY AND CHEMISTRY WATER QUALITY DATA

Date	Temp (°C)	Salinity (ppt)	pH	DO (mg/L)	DO saturation (%)	Turbidity (NTU)	Enterococcus (cfu/100 ml)	Clostridium perfringens (cfu/100 ml)
1/4/23	25.00	35.57	8.2	6.49	100.8	3.25	2.3	4
1/18/23	25.70	35.25	8.14	7.23	99.1	5.88	20	49
2/6/23	25.71	35.59	8.17	6.72	100.6	1.67	10	1
2/13/23	25.72	35.28	8.18	6.69	97	2.69	111	9
2/27/23	25.73	35.67	8.21	6.77	97.2	2.32	10	6
3/15/23	25.74	35.12	8.14	6.95	105.5	5.48	2.3	2
3/29/23	25.75	35.44	8.16	6.47	103.3	4.98	2.3	1
4/4/23	25.76	35.08	8.23	6.54	98.2	1.52	2.3	3
4/12/23	25.77	35.8	8.13	6.77	100.3	4.78	20	1
4/18/23	25.78	35.74	8.23	6.83	96.3	2.18	2.3	1
4/24/23	25.79	35.39	8.15	6.78	100.7	4.2	2.3	4
5/2/23	25.80	35.8	8.08	6.55	102.4	5.07	2.3	1
5/9/23	25.81	35.67	8.16	6.54	103.4	2.43	2.3	1
5/16/23	25.82	35.41	8.19	6.43	106.9	1.81	2.3	1
5/23/23	25.83	35.72	8.14	6.83	100.7	4.36	2.3	123
5/31/23	25.84	35.48	8.17	6.48	98.4	1.99	2.3	2
6/6/23	25.85	35.64	8.23	6.44	101.2	5.6	2.3	1
6/13/23	25.86	35.71	8.16	7.05	102.6	5.35	2.3	1
6/20/23	25.87	35.62	8.11	6.61	96.9	1.95	2.3	6
6/27/23	25.88	35.71	8.1	6.77	99.9	4.53	2.3	12
7/5/23	25.89	35.97	7.95	6.23	97.7	2.61	2.3	6

Date	Temp (°C)	Salinity (ppt)	pH	DO (mg/L)	DO saturation (%)	Turbidity (NTU)	Enterococcus (cfu/100 ml)	Clostridium perfringens (cfu/100 ml)
7/11/23	25.90	35.82	8.13	7	102.5	1.52	2.3	1
7/18/23	25.91	35.8	8	6.72	102.3	1.87	2.3	1
7/26/23	25.92	35.81	8.1	6.67	94.7	1.87	2.3	4
8/1/23	25.93	35.72	8.1	6.31	96.5	2.32	2.3	1
8/7/23	25.94	35.7	7.94	6.13	97	3.4	2.3	2
8/14/23	25.95	35.67	8.17	6.28	108.3	2.23	2.3	5
8/22/23	25.96	35.84	8.17	6.68	96.5	1.6	2.3	3
8/28/23	25.97	35.54	8.19	6.03	92.9	2.54	31	5
9/6/23	25.98	36.08	8.15	6.64	97	1.57	2.3	3
9/13/23	25.99	35.93	8.14	5.78	101	1.59	2.3	5
9/18/23	25.10	35.89	7.98	6.22	102.4	3.21	10	1
9/27/23	25.10	35.75	8.14	6.36	89.1	2.8	2.3	1
10/2/23	25.10	36.1	8.05	7.09	108.2	2.58	2.3	18
10/23/23	25.10	36	8.14	6.59	99.9	1.21	2.3	2
10/30/23	25.10	35.85	8.17	6.2	94.5	1.83	2.3	13
11/8/23	25.11	35.97	7.99	6.17	97.5	1.91	10	1
11/15/23	25.11	36.05	8.09	6.59	95.5	3.22	2.3	1
11/20/23	25.11	36.1	8.11	6.36	100.2	1.69	2.3	0

Source: My Waterway EPA Database

°C = degree Celsius; cfu = colony forming units; mg/L = milligram per liter; ml = milliliter; N/A = Not Collected; ND = Not Detected; NTU = nephelometric turbidity unit; ppt = parts per thousand

2.5.2 ENVIRONMENTAL IMPACTS

2.5.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on marine water quality.

2.5.2.2 ALTERNATIVE 2—PROPOSED ACTION

Project construction activities have the potential to cause adverse impacts to marine water quality. However, BMPs would be implemented to avoid and minimize these impacts. The potential impacts of each of these activities and the general BMPs are discussed in detail below.

Cable Landing Station

Construction activities at the Project Site would include soil disturbance, material stockpiling, and the use of fuels and other potentially hazardous materials. These materials or sediments have the potential to be conveyed by stormwater runoff into nearby marine waters. However, the likelihood of activities on the Project Site impacting marine water quality is low due to the small disturbance area (all ground-disturbing activities occurring in the 2.5-acre Project Site) and BMPs that would be incorporated to avoid and minimize adverse impacts.

Prior to construction, site-specific measures would be developed and outlined in the Project's TESC Plan and SWPPP. BMPs to protect water quality may include, but are not limited to, installing and maintaining silt fences, avoiding earthwork during adverse weather conditions, and revegetating or stabilizing disturbed areas as soon as possible. As a result, onshore construction activities are not expected to result in adverse impacts to marine water quality.

HDD Boring and Drilling Fluid

During HDD, temporary impacts to water quality could result from an inadvertent release of drilling fluids into the environment. Drilling fluid used to hydraulically drive the drill cutting head for the HDD requires water, a bentonite drilling additive, and a mixing unit. Bentonite clay is a naturally-occurring biodegradable, non-toxic substance. If required, a polymer additive would be added to the drilling fluid in negligible concentration to enhance the bore stability. Adverse impacts to water quality would be avoided and/or minimized through implementation of BMPs and mitigation measures. An Inadvertent Release Contingency Plan would be produced to describe the BMPs and mitigation measures to be utilized to minimize adverse impacts to water quality in the event of a potential inadvertent release of drilling fluid (See Section 1.3.6). As a result of these measures, offshore construction activities are not expected to result in adverse impacts to marine water quality.

2.5.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Mitigation measures and BMPs would be adhered to avoid adverse impacts to water quality during Project construction. These include, but are not limited to the following:

- An Inadvertent Release Contingency Plan would be produced and its measures implemented to avoid, and/or minimize, potential adverse impacts as a result of potential inadvertent release of drilling fluids.
- Onshore and offshore monitors would be required during drilling operations to identify inadvertent release of drilling fluid.
- Onshore entry pit drilling fluid returns (including solid and liquid materials) would be transported offsite and disposed of at an approved location or recycled to the extent feasible by pumping the returns to a recycling unit.
- A petroleum and chemical product Spill Contingency and Hazardous Materials Management Plan would be developed for both the terrestrial and marine areas.

General BMPs for the HDD activities would be fully described in the Inadvertent Release Contingency Plan, which is partially summarized below. Detailed BMPs and mitigation measures with regard to water quality would be developed during the CWA Section 404, 401, and 402 permit processes, as well as other applicable regulations.

2.5.3.1 INADVERTENT RELEASE CONTINGENCY PLAN SUMMARY

The Project's Inadvertent Release Contingency Plan would outline measures and protocols that would be implemented to identify, prevent, minimize, contain, and properly respond to inadvertent releases of drilling fluids.

The Project's Inadvertent Release Contingency Plan would include the following methods to minimize potential for an IDFR or mitigate impacts:

- Continuous monitoring of drilling fluid return volumes.,
- Flushing bore hole with water prior to daylighting through the seabed,
- Requirements for onshore and offshore monitors to identify signs of an inadvertent release of drilling fluids,
- Abandonment contingency plans in case the HDD operations are forced to be suspended and a partially completed bore hole abandoned,
- Response, containment, and clean-up in the event of an IDFR, which would include ability to cease operations, and
- Procedure for notifying appropriate agencies immediately following an inadvertent release, including appropriate documentation of any incident.

The types of measures to be included in the Inadvertent Release Contingency Plan are described below.

Pre-Construction IDFR Prevention

Drilling Profile Design

The profile of the drill paths will be engineer-designed and certified prior to the start of drilling. The engineered drill profile would be designed to reach stable depths where IDFR is unlikely to occur, while optimized to follow the shortest viable path.

Geotechnical Assessment

A geotechnical survey was completed by Hirata and Associates in 2016 for the Hawaiki CLS. One bore hole was drilled to a depth of about 50 feet, approximately 300 feet south of the proposed Project's HDD entry points. Based on the successful completion of the bores associated with the Hawaiki CLS project and the proximity of the proposed Project, the substrate appears suitable for HDD.

Drilling Fluid Selection

The drilling fluids would predominantly consist of water and a high yield bentonite clay. Bentonite and any other additives would be used in accordance with the manufacturer's specifications and per all applicable regulations.

Construction IDFR Monitoring

Bore Alignment Monitoring

Continuous monitoring of the HDD alignment during drilling is standard practice, with records documented every 30ft or less.

Drilling Fluid Pressure Monitoring and Adjustment

The specialist drilling company would maintain drilling fluid monitoring equipment, including crew members who are proficient in their use, on site to evaluate fluid properties and adjust fluid quality as necessary during drilling operations. Adjustments of the basic drilling fluid properties may be desired in certain circumstances to match actual soil types to achieve a more stable borehole, improve cuttings return, and/or to reduce the IDFR potential during difficult drilling circumstances.

Pump pressures would be monitored continuously with the use of a pressure gauge located on the driller's console. This pressure is commonly referred to as "standpipe pressure" and reflects the pressure through the mud pump(s), surface plumbing, drill pipe, and across the jet nozzle(s) in the bit. These pressures would be logged for each joint drilled in the "Driller's Log." The amount of standpipe pressure generated is generally determined by how much pressure is required to hydraulically erode the formation, using a "jetting bottom hole assembly," or to turn the rotor section of a mud motor. In addition, the drilling company would employ the use of an annular pressure tool to monitor the annular pressure of the fluid returns while drilling the borehole in order to mitigate over-pressurizing weaker formations, thus reducing the chances for an IDFR occurring.

Drilling Fluid Returns Monitoring

Good HDD practices dictate monitoring fluid returns during the progression of work. In many cases the loss of, or sudden changes in, fluid returns provide an early indication that down-hole conditions may be susceptible to the occurrence of an IDFR. Fluid returns are therefore monitored on a continuous, or near continuous, basis.

The drilling company would monitor the drilling fluid pump rate, the solids control tank level, and visually observe the rate of drilling fluid returns to the containment pits and back pressures. As

drilling progresses, the driller would be kept apprised of whether back pressure is present or if high volumes of drilling fluid are being lost downhole, taking into consideration ground conditions and the volume of fluid needed to fill the new hole being drilled. Should the driller feel that fluid circulation is slowing or is about to stop, or back pressure in the string is present, the drilling company would immediately implement the following procedures:

1. Temporarily cease drilling operations and shut off the mud pumps.
2. Dispatch observers to visually inspect the area between the entry point and the bit, along the bore alignment, for evidence of drilling fluid on the ground surface or in the water (often causing discoloration of the water).
3. If no drilling fluids are seen on the ground surface or in the water, the mud pumps would be started and volumes gradually increased as the drill pipe is pulled back, rotating the drill string to wipe the borehole annulus and encourage flow.
4. Depending on the success of this procedure, the properties of the drilling fluid may be altered to aid in restoring circulation.
5. Observers would continuously monitor the area for IDFRs as long as the mud pumps remain on.
6. If circulation is re-established, drilling would proceed as usual and monitoring for IDFRs would become more routine as long as circulation is maintained. If circulation is not re-established, monitoring would continue while the pumps are on.

Punch-out Point Adjustment

At a suitable distance prior to the punch-out point (as defined by the seabed geology), the use of drilling mud would be curtailed. The borehole would be flushed with fresh water to bring all free mud not maintaining the borehole integrity back to the surface. The borehole would be completed to the punch-out point using either fresh water or a biodegradable, non-solids, biopolymer fluid such as xanthan gum to minimize release of bentonite onto the seabed.

IDFR Response

Land-based Release

If IDFRs are observed on the ground surface, at a location other than the bore containment pits, the following procedures would be implemented.

1. Cease drilling operations.
2. Notify all required parties.
3. Document the event with photographs.
4. Contain the drilling fluid with sand or gravel bags, straw bales and/or wattles, or a pre-made containment vessel made of steel so the fluid cannot migrate from the fracture location.
5. If possible, excavate a small sump pit at the fracture location and provide a means of containment of the fluid while it is returned to either the drilling site for cleaning and re-use or to an approved pump site (i.e., vac trucks, pumps or both).

6. Clean up the affected area using vacuum unit, brooms, shovels, etc., once release is contained. Cleanup would include removal of all visible drilling fluid located in accessible areas and removal methods would vary based on the volume of the release and the site-specific conditions. After removal of the released drilling fluid, the release area would be returned as close to the original condition as possible.
7. Document the cleaned-up area with photographs.
8. Adjust drilling fluid properties to inhibit flow through the fracture and wipe the hole by tripping (pulling) out the drill pipe to clean the bore-hole annulus.
9. Determine the suitability of placing lost circulation material (LCM) in the bore hole[9].
10. After tripping the drill string back, allow the formation to "rest" for a suitable period, then continue drilling while monitoring the IDFR location and transferring fluids as necessary.
11. Forward reaming of the borehole up to the IDFR location may be considered to relieve annular pressures.

It should be noted that drill cuttings generated as a result of the drilling process will often naturally bridge and subsequently seal fractures or voids in the formation as drilling progresses, thus providing another means to re-establish lost circulation.

Water Body Release

If an IDFR is observed offshore, the following procedures would be implemented.

1. Cease drilling operations.
2. Notify all required parties.
3. Document the details of the event including date and time stamped photographs, estimates of release durations or amounts, release location and direction.
4. In cases of inadvertent releases to open water, it is usually impractical to contain the release because the release does not necessarily occur on the bore path, and the action of waves and ocean swell quickly disperses the IDFR. Removal by vacuum truck may be attempted at the shoreline if reachable from shore and deemed appropriate.
5. Water sampling equipment would be available for use by site inspectors to evaluate turbidity or other applicable parameters compared to pre-construction levels.
6. Once the release has dissipated, again document the event with date- and time-stamped photographs.
7. Continue monitoring for IDFRs.
8. When drilling operations are resumed, fluid properties would be adjusted to inhibit flow through the fracture and the drill pipe would be tripped back to wipe the borehole annulus in the region of the IDFR.
9. Determine the suitability of placing LCM in the hole.

[9] Lost circulation material is a non-toxic fiber, flake, or granular additive incorporated into the drilling fluid to help seal the fracture in the borehole and stop the IDFR.

10. After tripping the drill string back, allow the formation to “rest” for a suitable period, then continue drilling while monitoring the location and transferring fluids as necessary.
11. Forward reaming of the borehole up to the location may be considered to relieve annular pressures.
12. Continue drilling with minimum fluid, increasing drilling fluid gradually while continuously monitoring for any further IDFR.

It should be noted that drill cuttings generated as a result of the drilling process will often naturally bridge and subsequently seal fractures or voids in the formation as drilling progresses, thus providing another means to re-establish lost circulation. The decision to proceed with the drilling operation would be made mutually between the drilling site supervisor, the on site Client Representative, and other appropriate parties, after all practical methods to seal off the location of the discharge have been attempted.

2.5.3.2 PETROLEUM AND CHEMICAL PRODUCT SPILL CONTINGENCY AND HAZARDOUS MATERIALS MANAGEMENT PLAN

A petroleum and chemical product Spill Contingency and Hazardous Materials Management Plan would be developed for both the terrestrial and marine areas, which would include the following:

Terrestrial

Measures for terrestrial operations must include, but not be limited to, identifying appropriate fueling and maintenance areas for equipment, a daily equipment inspection schedule, and spill response procedures including maintaining spill response supplies on site. The terrestrial plan would identify, at a minimum, the following BMPs related to using hazardous substances:

- Follow manufacturer's recommendations on use, storage, and disposal of chemical products used in construction,
- Avoid overtopping construction equipment fuel gas tanks,
- During routine maintenance of construction equipment, properly contain and remove grease and oils,
- Conduct all equipment fueling at least 100 ft (30 m) from wetlands and other waterbodies if present,
- Properly dispose of discarded containers of fuels and other chemicals, and
- Maintain a complete list of agencies (with their telephone numbers) to be notified of potential hazardous material spills.

Marine

For marine activities involving work vessels, the dive vessel would be required to carry onboard a spill kit appropriate to the size of the vessel to clean up any small hazardous material spill or sheen on the water surface. The marine plan must provide for the immediate call-out of additional spill containment and cleanup resources in the event of an incident that exceeds the rapid cleanup capability of the on site work force.

Conclusion

All potential impacts to water quality during construction of the Project would be mitigated to insignificant levels by adherence to the IRCP, federal, state, and local water quality regulations.

2.6 MARINE AND NEARSHORE BIOLOGICAL RESOURCES

This section covers the marine and nearshore biological resources found in the Project's Action Area. The Action Area is defined as the marine portions of the Project footprint, which is the HDD bore routes to six exit points beyond the surf zone that are approximately 2,500 to 3,000 feet (762-914 meters) from the entry point in water depths of about 50 to 65 feet (15-20 meters), and a 500-foot buffer (Figure 2-5). The buffer was chosen to encompass any potential project effects that could result from sediment disturbances, drilling fluid release, or release of contaminants such as petroleum products. Further discussion addresses coral and reef habitat, essential fish habitat (EFH), fish species, sea turtles, and marine mammals.

2.6.1 EXISTING CONDITIONS

A desktop evaluation indicates the bathymetry of the Action Area is characterized by gradual sloping to the west, as the distance from shore increases. The shoreline adjacent to the Action Area consists of a rocky, bluff shoreline with little to no beach.

A marine habitat survey was conducted as part of the Hawaiki CLS project in 2016 (Tetra Tech, Inc. 2017). The 2016 survey area partially overlapped the Project's offshore HDD bore path. Survey findings characterized the marine habitat in this area as predominantly sand and rubble with small, isolated patches of paddle grass seagrass (*Halophila decipiens*) and sparse patches of relict reef, with most of the survey area at less than 10 percent coral and nearly half survey area at less than 1 percent cover of coral reef (Tetra Tech, Inc. 2017). A nearshore geophysical survey for this Project would be completed prior to the HDD installation to determine exact HDD punch-out locations to avoid any potential impacts to coral reef.

2.6.1.1 BIOLOGICAL RESOURCES

The following summarizing the results of the Project's NMFS Biological Assessment (BA; included as Appendix B). A desktop review of published literature and federal databases indicate that there is potentially suitable habitat in the Action Area for the federally protected species listed below in Table 2-3.

TABLE 2-3: SPECIAL-STATUS MARINE SPECIES WITH POTENTIALLY SUITABLE HABITAT IN THE PROJECT AREA

Common Name	Scientific Name	Status[1]
Fish		
Giant manta ray	*Mobula birostris*	FT
Sea Turtles		

Common Name	Scientific Name	Status[1]
Green sea turtle—Central North Pacific Distinct Population Segment (DPS)	*Chelonia mydas*	FT
Hawksbill sea turtle	*Eretmochelys imbricata*	FE
Corals		
Acropora globiceps coral	*Acropora globiceps*	FT
Marine Mammals		
Bottlenose dolphin—Hawai'ian Islands O'ahu Stock	*Tursiops truncatus truncatus*	MMPA protected
Hawai'ian monk seal	*Neomonachus schauinslandi*	FE, MMPA protected
Humpback whale—Hawai'i Stock DPS	*Megaptera novaeangliae kuzira*	MMPA protected
Pantropical spotted dolphin—Hawai'ian Islands O'ahu Stock	*Stenella attenuata attenuata*	MMPA protected
Spinner dolphin—Hawai'ian Islands O'ahu/4-Islands Stock	*Stenella longirostris longirostris*	MMPA protected

Notes:
Status can be the following: FT = federally threatened; FE = federally endangered; MMPA protected = Marine Mammal Protection Act protected
DPS = distinct population segment

2.6.1.2 ESSENTIAL FISH HABITAT AND CRITICAL HABITAT

The Action Area overlaps mapped NMFS Endangered Species Act (ESA) critical habitat for Hawai'ian monk seal (*Monachus schauinslandi*) and proposed critical habitat for green sea turtle (*Chelonia mydas*) (Figure 2-5). In addition, the Action Area overlaps EFH, as defined by the Magnuson-Stevens Fisher Conservation and Management Act and managed by the Western Pacific Regional Fishery Management Council (WPRFMC). Three Fishery Management Plans overlap the Action Area: Bottomfish and Seamount Groundfish, Pacific Pelagic Species (managed under the Fishery Ecosystem Plan [FEP] for Pelagic Fisheries of the Western Pacific), and Main Hawai'ian Islands Coral Reef Ecosystems (NMFS 2024)(Figure 2-6). The EFH under the Bottomfish and Seamount Groundfish FMP consists of any soft-bottom habitats, rocky reefs, and deep reef slopes located from the shoreline to the U.S. Exclusive Economic Zone down to a depth of 1,312 feet (400 meters) for shallow-water species and deep-water species including giant trevally (*Caranx ignoblis*), thicklip trevally (*Carangoides orthogrammus*), pink snapper (*Pagrus auratus*), blue stripe snapper (*Lutjanus kasmira*), amberjack (*Seriola spp.*), and Kona crab (*Ranina ranina*). EFH for species managed under the Pelagic Species FMP includes soft-bottom habitats and areas where fish may aggregate from the shoreline out to the U.S. Exclusive Economic Zone to a depth of 656 feet (200 meters). The Action Area is considered EFH for all pelagic fisheries from the egg to adult life stages. Designated EFH under the Coral Reef Ecosystem FMP includes coral reefs, rocky reefs, artificial reefs or shipwrecks, and lagoons for all life stages of coral reef.

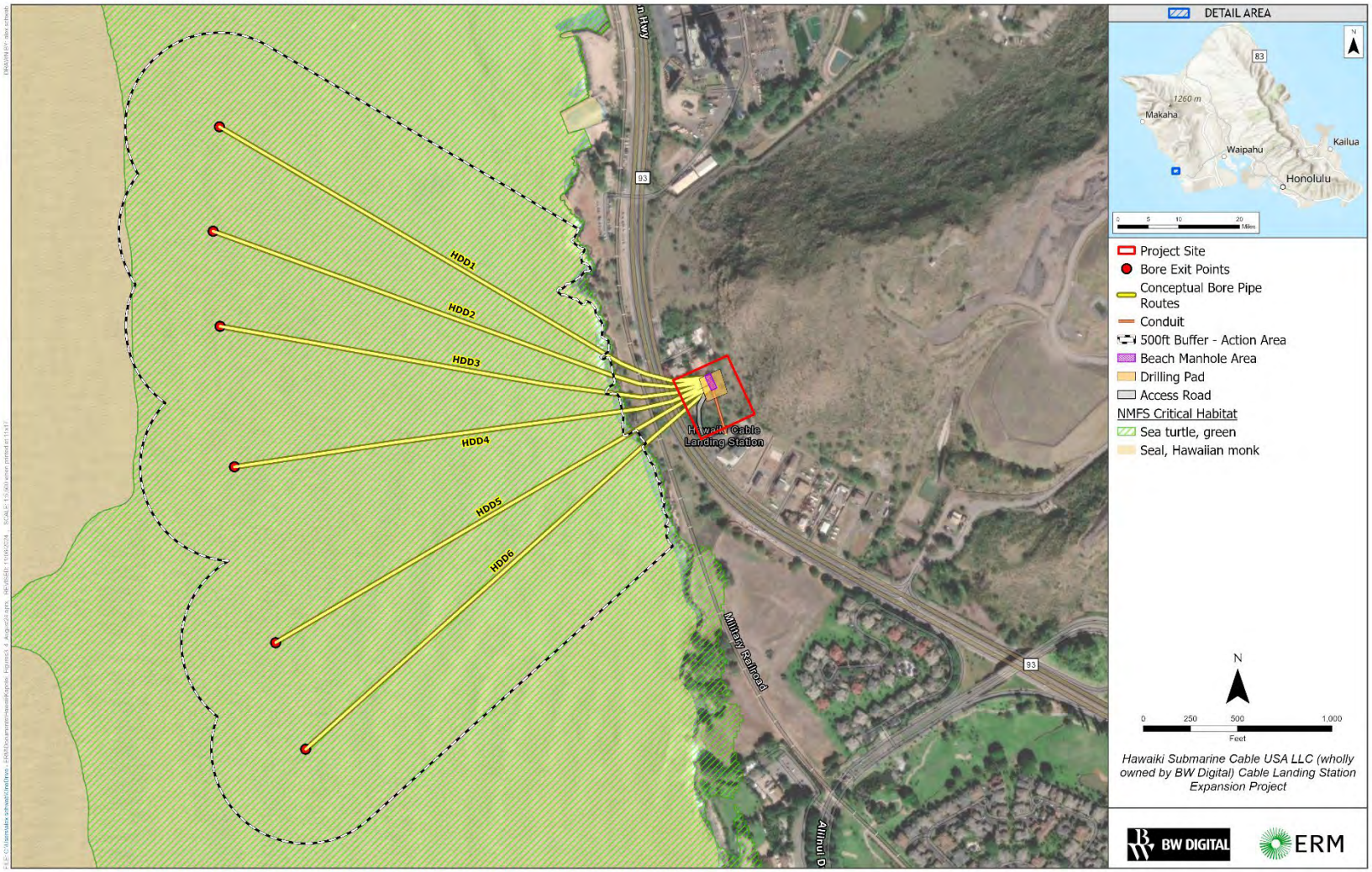


FIGURE 2-5: NATIONAL MARINE FISHERIES SERVICE CRITICAL HABITAT

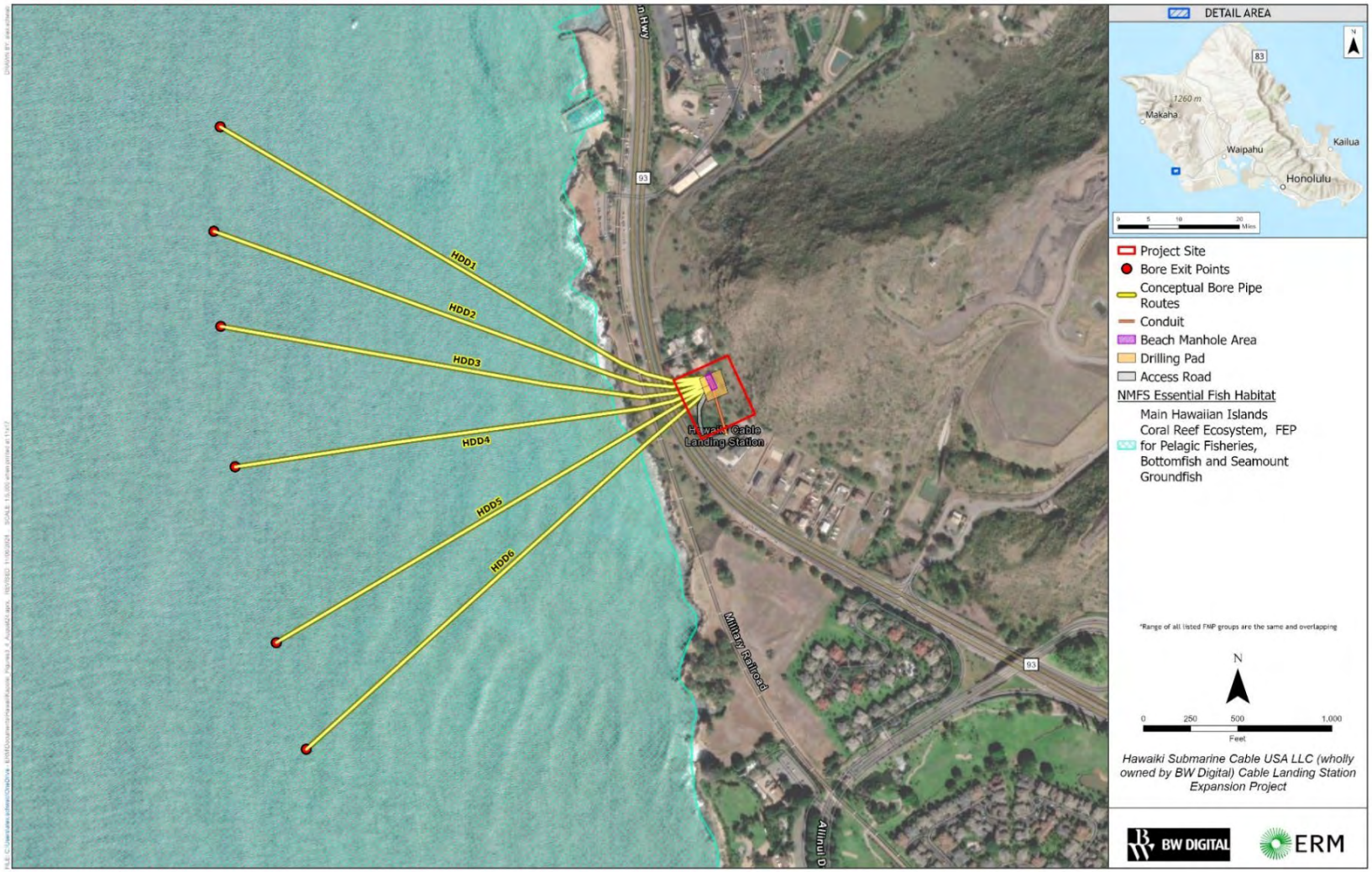


FIGURE 2-6: NATIONAL MARINE FISHERIES SERVICE ESSENTIAL FISH HABITAT

2.6.2 ENVIRONMENTAL IMPACTS

2.6.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on marine and nearshore biological resources.

2.6.2.2 ALTERNATIVE 2—PROPOSED ACTION

Project construction activities have the potential to cause adverse impacts to marine and nearshore biological resources. Construction activities may affect giant manta ray, green sea turtle—Central North Pacific Distinct Population Segment (DPS), hawksbill sea turtle, Hawai'ian monk seal, *Acropora globiceps* coral, and other marine mammals. However, construction activities would be temporary in nature and no permanent alteration of habitat is anticipated. Implementation of BMPs would minimize any potential impacts to protected species potentially present during construction.

2.6.2.3 SEDIMENT AND TURBIDITY

Project activities have the potential to result in the temporary, localized, suspension of sediments during the HDD process. HDD in-water activities involve a bore exit point (location where the bore pipe and drill head exit the seabed) and removal of the drill head assembly by divers. The HDD bores would target sandy areas for the bore pipe exits to the extent feasible, avoiding existing coral structures. The amount of seabed disturbance around each HDD bore exit point would be minimal and consist of an area only slightly larger than the diameter of the bore pipe exiting the seabed.

Any generated turbidity would be localized and expected to dissipate quickly, particularly with the sandy or coarse substrates anticipated at the bore exits. Any resuspended sediments would settle within minutes of the disturbance. Federally listed wildlife species in the vicinity would be expected to avoid the bore exit locations due to temporary construction disturbances.

2.6.2.4 INADVERTENT RELEASES

During the HDD process, it is possible that some bentonite drilling fluid could be released to the seafloor and thus into the water column (although the proposed BMP of changing drilling fluid to water in the latter stages of drilling is designed to minimize this risk). An accidental release of drilling fluid to the seafloor could result in a temporary, localized, negative effect on the marine environment and associated marine biota. The bentonite contained in the drilling fluid could result in short-term burial and smothering of benthic epifauna and infauna, cause localized increased turbidity around the area of release, and potentially clog fish gills (Kerr 1995).

Project activities, specifically the marine support and dive team that would be monitoring the HDD bore exit point, would require the use of one small dive vessel that also has the potential to release fuel, oil, or lubricants into the marine environment. Petroleum product releases into the marine environment have the potential to impact all trophic levels and taxa of marine wildlife at some level depending on the quantity released. Accidental releases affect marine species through

oiling, habitat loss or degradation, effects to food resources, and lethal and sub-lethal physical effects.

2.6.2.5 LIGHT

HDD activities would take place between 7:00 am and 6:00 pm weekdays and between 9:00 am and 6:00 pm on Saturdays for up to 12 months. However, the HDD process would be carried out predominantly from land and no lights would be over the water during this period. A marine support and dive team would be deployed as the drill head approaches the exit point; however, this team would only be active during the day. No effects to listed species from Project lighting are anticipated.

2.6.2.6 UNDERWATER NOISE

The Project-related activities associated with the HDD bore pipe installation and offshore vessel support for the HDD bore exit would generate temporary and non-impulsive continuous noise periodically during the drilling program estimated at between 9 and 12 months. Non-impulsive sounds can be broadband, narrowband, or tonal; brief or prolonged; continuous or intermittent; and typically, do not have a high peak sound pressure with rapid rise and decay time. To assess the effects of Project-generated underwater noise on listed fish, turtle, and marine mammal species (as well as Marine Mammal Protection Act [MMPA] protected species), proxy HDD noise source data was reviewed from other similar projects and input into the NMFS Multi-Species Calculator (NMFS 2022).

The published NMFS threshold criteria for permanent injury or temporary behavioral shifts for fish and turtles would not be exceeded. The threshold criteria for permanent injury for marine mammal hearing groups would not be exceeded during the HDD operations; HDD noise source could exceed the NMFS behavioral disturbance threshold (120 decibel [dB]) within approximately 130 feet of the noise source. However, marine mammals are not expected to occur within this distance of HDD activities for long durations. HDD noise would be very localized and of short duration.

2.6.2.7 VESSEL STRIKES

Vessel strikes are unlikely during Project activities since only one small dive boat (36 feet in length or less) would be operating for short periods of time offshore (one to two days per bore pipe, up to 12 days total), would be transiting to and from each bore exit point at low speeds, and would travel along a predictable path. Implementation of conservation measures would further minimize the potential for a vessel strike.

2.6.2.8 IMPACTS TO ESSENTIAL FISH HABITAT

The proposed Project would not reduce the quality or quantity of EFH for the Bottomfish and Seamount Groundfish, Pacific Pelagic Species, and the Coral Reef Ecosystems FMPs. In-water work would consist of the HDD bores exiting the seabed at finite points (up to six), minor excavation around each bore exit point to remove the drill head, and a marine support vessel with dive support for each bore. As previously discussed, effects to EFH from Project activities could include potential sediment disturbances, noise, and inadvertent releases. All effects are anticipated to be

temporary and localized and would be minimized through the implementation of the BMPs. No measurable alterations would occur to the physical, chemical, or biological properties of the water or substrate in the Action Area.

2.6.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

The following BMPs and mitigation measures would be implemented to minimize the potential for environmental impacts.

2.6.3.1 HDD BORE EXIT POINTS

As part of the HDD process, the following measures would be implemented:

- Micro-siting would be carried out for each bore exit point to avoid or minimize impacts to sensitive benthic habitats such as corals, rocky reefs, or seagrasses.
- The last 100 to 130 feet (30 to 40 meters) of the pilot bore would be drilled with freshwater to flush the drilling fluid back to the entry point. This would prevent drilling fluid from escaping to the sea when the bore pipe exits the seabed.

2.6.3.2 HDD INADVERTENT RELEASE CONTINGENCY PLAN

Prior to HDD operations, the Applicant or their representatives would prepare an Inadvertent Release Contingency Plan. See Section 2.4.3 for further details.

2.6.3.3 SPILL CONTINGENCY AND HAZARDOUS MATERIALS MANAGEMENT PLAN

A petroleum and chemical product Spill Contingency and Hazardous Materials Management Plan would be developed. See Section 2.5.3.2 for further details.

2.6.3.4 VESSEL OPERATIONS

The Project vessel would adhere to the following regulations and BMPs during operation:

- Approach regulations for humpback whales in waters surrounding the Hawai‘ian Islands (50 Code of Federal Regulations [CFR] Part 216) and
- DLNR Division of Boating and Ocean Recreation’s BMPs for operating vessels near protected marine species.

2.6.3.5 VESSEL STRIKES

- Maintain a vigilant watch for marine mammals and sea turtles and slow down or stop the vessel to avoid striking species.
- When whales are sighted, maintain 100 yards or greater from the whale.
- When small cetaceans or sea turtles are sighted, attempt to maintain 50 yards or greater whenever possible.
- When cetaceans or sea turtles are sighted while a vessel is underway, attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.

- Reduce vessel speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised.
- Whales may surface in unpredictable locations or approach slow-moving vessels. When vessel personnel sight animals in the vessel's path or near a moving vessel, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

2.7 TERRESTRIAL BOTANICAL RESOURCES

This section provides a description of the terrestrial botanical resources found at the Project Site and vicinity. A biological reconnaissance level survey of the Project parcel was conducted in May 2024 by Environmental Resources Management, Inc. (ERM). The survey included an assessment of general site conditions, documentation of existing biota, and consideration of site suitability for various listed, protected, or candidate species. A similar survey for the existing Hawaiki CLS facility was referenced in this review (Tetra Tech, Inc. 2017). The desktop review considered all sensitive plant species records and sensitive habitats within a 5-mile search radius of Project Area using applicable databases including:

- U.S. Fish and Wildlife Service's Information, Planning, and Conservation System (IPaC) database
- U.S. Fish and Wildlife Service, Pacific Islands Office Critical Habitat database

Based on a desktop review and biological survey, no threatened, endangered, or state rare plant species have potential to occur within the Project Site and there is no overlapping USFWS designated critical habitat for listed plant species.

2.7.1 EXISTING CONDITIONS

Vegetation within the Project parcel is dominated by non-native and invasive species including Koa haole (white leadtree, *Leucaena leucocephala*), buffelgrass (*Cenchrus ciliarus*), and common kiawe (*Prosopis pallida),* which is on the Federal Noxious Weed List (USDA 2010). Hawai'i State Office of Planning agricultural, ecosystem, and land use GIS data indicate that these conditions have existed for at least the last few decades (Hawai'i State Office of Planning 2024). Plant species diversity is also generally low. It is possible that a recent wildfire on the parcel in 2018 further contributed to the lack of species diversity and dominance of early colonizing invasive plant species (Hawai'iNewsNow 2018).

The western-most side of the parcel (encompassing the Project Site), between the existing Hawaiki CLS building to the south and local residences to the north, is characterized by a dense overstory of common kiawe, with co-occurring Koa haole. No mid-canopy scrub/scrub species are present. The understory is predominately buffelgrass, with smaller areas of Guinea grass.

In areas of volcanic rock and on slopes leading up to the ridge in the central portion of the parcel, vegetation was dominated by buffelgrass and Koa Haole, with patches of Zulu giant (*Stapelia gigantea*) and hoary abutilon (*Abutilon incanum*). A handful of individual 'uhaloa plants were also observed in these areas. The top of the ridge is dominated by buffelgrass and Koa Haole. The

southwest portion of the parcel is characterized by Koa Haole, buffelgrass, and in more open areas (particularly the flat, graveled area where a previous structure foundation is visible), there was low groundcover dominated by swollen fingergrass (*Chloris barbata*), asthma plant (*Euphorbia hirta*), bracted fanpetals (*Sida ciliaris*), and creeping indigo (*Indigofera spicata*).

2.7.1.1 BIOLOGICAL RESOURCES

No plant species considered to be sensitive or listed threatened or endangered, or otherwise considered to be rare or special by the State of Hawai‘i or federal government were observed within the Project parcel and no suitable habitat for these species was present (i.e., habitat was disturbed and dominated by invasive and non-native plant species).

2.7.2 ENVIRONMENTAL IMPACTS

2.7.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on terrestrial botanical resources.

2.7.2.2 ALTERNATIVE 2—PROPOSED ACTION

As no threatened, endangered, or state rare plant species were identified as having potential to occur within the Project parcel and there is no overlapping USFWS designated critical habitat for listed plant species, no impacts to special-status plant species are anticipated.

2.7.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

No mitigation measures are proposed.

2.8TERRESTRIAL WILDLIFE RESOURCES

This section provides a description of the terrestrial wildlife resources found in the Project Site and vicinity based on a desktop review and the biological reconnaissance level survey conducted in May 2024 by ERM. The desktop review considered all sensitive wildlife species records and sensitive habitats within a 5-mile search radius of Project Area using applicable databases including:

- U.S. Fish and Wildlife Service’s Information, Planning, and Conservation System (IPaC) database
- U.S. Fish and Wildlife Service, Pacific Islands Office Critical Habitat database

2.8.1 EXISTING CONDITIONS

As noted in Section 2.7.1, the Project parcel and surrounding area is characterized by invasive and nonnative plants species that favor disturbed habitats. The site was recently burned, and vegetation that has recolonized the site does not contain complex microhabitat features required by most listed, rare, or special status wildlife species on O’ahu. During the ERM field survey, wildlife diversity was noted as generally low within the Project parcel and characterized by non-native species. Twelve non-native bird species were observed in or flying over the Project parcel. One of these bird species, Cattle Egret (*Bubulcus ibis*), is protected under the federal Migratory

Bird Treaty Act. There was evidence of nesting bird activity within the parcel; one common waxbill (*Estrilda astrild*; non-native) nest was observed in a common kaiwe on the western portion of the parcel), but no activity was observed at the nest. One non-native amphibian (cane toad, Rhinella marina) and one native insect (globe skimmer, *Pantala flavescens*) were also observed in the parcel. No state or federally listed wildlife species were observed during the survey. Although not observed, based on existing habitat it is expected that non-native mammals such as dogs (*Canis familiaris*), cats (*Felis catus*), mice (*Mus musculus*), mongooses (*Herpestes auropunctatus*), and rats (*Rattus* spp.) may occupy or pass through the Project parcel.

2.8.1.1 BIOLOGIAL RESOURCES

Federal and State Listed Species and Critical Habitat

Based on the literature review, there are no records of listed, protected, or candidate wildlife species, or federally designated critical habitat within the Project Site. However, habitat on site is potentially marginally suitable for the State endangered pueo (Hawaiian Short-eared Owl, *Asio flammeus sandwichensis*) and the Federally endangered ‘ope‘ape‘a (Hawai’ian hoary bat, *Lasiurus cinereus semotus*).

The pueo is known to occupy a variety of natural and urban habitats, including grassy expanses similar to those in the northeastern portion of the parcel (Cotin and Price 2018). In addition, there is a recent pueo eBird record within a mile of the Project parcel (eBird 2024). Incidentally, one of the Hawaiki CLS operators noted observing a large owl recently on the Project parcel (however, the operator was not able to confirm species, and there are also barn owls on the island). The portion of the Project parcel that may be marginally suitable for the Pueo is outside the Project Site and area of direct construction impacts.

The ‘ope‘ape‘a has been documented roosting in common kiawe(DLNR 2015a). This tree species was documented within the Project Site during the ERM survey. In addition, hoary bats have been recently detected within the Project vicinity (WEST 2022). Therefore, the potential for this subspecies to occur within the Project Site cannot be excluded.

Avian Species

Although not observed during the ERM field survey, it is possible that common native bird species, protected under the Migratory Bird Treaty Act, may forage or nest within the parcel. Seabirds also have potential to fly over the parcel.

2.8.2 ENVIRONMENTAL IMPACTS

2.8.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on terrestrial wildlife resources.

2.8.2.2 ALTERNATIVE 2—PROPOSED ACTION

Project terrestrial activities would include vegetation clearing, grading, HDD boring, and minor excavation (associated with burying of BMHs). Due to mobility of most wildlife, the potential for

direct mortality due to collision with equipment or vehicles is expected to be low for any species present. Onshore construction noise is expected to be localized, minimal, and unlikely to significantly disturb wildlife. However, the combination of anthropogenic presence, noise, and night work may temporarily displace species from the site. Wildlife would be expected to return to the area after completion of the construction phase.

No unique or high-quality wildlife habitats occur at the Project Site, and the Project would not result in a substantial loss of wildlife habitat. However, non-native vegetation still may provide suitable roosting habitat for the ʻopeʻapeʻa and nesting habitat for avian species protected under the Migratory Bird Treaty Act and the pueo. In addition, Hawaiʻian seabirds are unlikely to nest at the Project Site but may traverse the area at night during breeding, nesting, and fledging season generally 1 March through 15 December. Outdoor lighting could result in disorientation leading to injury or mortality. BMPs and mitigation measures, such as a nesting bird clearance survey prior to vegetation clearing, removing vegetation outside the ʻopeʻapeʻa pupping period, and downward-shield lighting at night would reduce potential impacts to these species.

2.8.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

The following BMPs and conservations measures would be implemented to minimize the potential for environmental impacts.

2.8.3.1 HAWAIʻIAN HOARY BAT

- Any fences that are erected as part of the Project would have barbless top-strand wire to prevent entanglements of the Hawaiʻian hoary bat on barbed wire. Existing barbed wire should be removed prior to start of work.
- No trees taller than 15 feet (4.6 meters) would be trimmed or removed as a result of this Project between 1 June and 15 September, when juvenile bats that are not yet capable of flying may be roosting in the trees.

2.8.3.2 MIRGATORY BIRDS AND PUEO

A qualified biologist would conduct a pre-construction nesting bird survey not more than 7 days prior to vegetation clearance activities. If an active nest is found, an exclusion zone may be set dependent on species and activity type. The buffer may be removed or reduced once the nest is no longer active.

2.8.3.3 PROTECTED SEABIRDS

- Construction activity will be restricted to between 7:00 am and 6:00 pm, to the extent possible. Any outdoor lights will be shielded or directed downward to prevent upward radiation and reduce the potential for seabird attraction. Outdoor lights shall not be directed to toward property boundaries or toward the shoreline and ocean waters.
- If a protected seabird is observed interacting with the night lighting, stop work and consult with a qualified biologist. Reduction of light intensity may encourage the individual to leave the site on their own. If a protected seabird is injured or killed, consult a qualified biologist immediately.

2.9 ARCHAEOLOGICAL AND HISTORIC RESOURCES

ERM conducted an Archeological Inventory Survey (AIS) on 20 May 2024. The archeological survey area, defined by the Area of Potential Effect (APE), focused on the Project site (Fackler 2024). The results of the AIS are presented in the technical report entitled *Cultural Resources Survey for the Kapolei Submarine Cable Landing Facilities, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i* (included as Appendix A). ERM conducted the survey to comply with Hawai'i Revised Statues §6E-42 and in accordance with the implementing regulations contained in HAR §13-276. Additionally, the Project and future development of the APE could be considered a federal "undertaking" as defined in 36 CFR 800.16(y), triggered by a requirement for U.S. Federal Highways Administration approval as well as permitting required by the U.S. Army Corps of Engineers. Therefore, the study was also conducted to Section 106 standards for compliance with the National Historic Preservation Act of 1966, as amended (NHPA).

Prior to conducting fieldwork, ERM completed a records search and literature review to identify previously recorded sites and cultural resource studies. The records search revealed that 16 cultural resource investigations were performed in the vicinity; however, no cultural resources were encountered during ERM's survey. A marine archaeological survey of the HDD bore corridor from the BMH to the punch-out exit point in the nearshore area was not conducted as the HDD bore pipes would be below the seafloor and is highly unlikely to affect archaeological or historic resources.

As no archaeological sites or features were identified during fieldwork, ERM's survey is documented as an archaeological assessment pursuant to Chapter 13-284-5(5A) under State of Hawai'i rules and a "no historic properties affected" finding under 36 CFR §800.4.d., the implementing regulations of the NHPA is appropriate. No further cultural resources work is recommended.

2.9.1 EXISTING CONDITIONS

2.9.1.1 GEOLOGY

The APE is at an elevation of 50 feet above sea level, at the base of the southern Waianae Mountain range. The 22-mile-long mountain range derived from Wai'anae Volcano comprises the western and older part of the island of O'ahu, Hawai'i (Macdonald et al. 1983).

The soil within the APE consists of Lualualei extremely cobbly clay (LPE) found on 3 to 35 percent slopes, derived from alluvial parent materials. It is classified as "not prime farmland" (U.S. Department of Agriculture-Natural Resources Conservation Service [USDA-NRCS] 2024). The mauka portion of the APEs is within rock land (rRK), derived from pahoehoe lava with basalt parent material on 5 to 70 percent slopes. Lavas of Waianae volcano span compositions ranging from Tholeiitic and alkalic basalt through to evolved compositions such as icelandite, rhyodacite, hawaiite, and mugearite (Macdonald et al. 1983:420-452).

2.9.1.2 CLIMATE

The Waianae Mountains are largely shielded from the rains brought into the islands by the Northeasterly bearing trade winds by its neighbor, Koolau Volcano. This makes Waianae Mountains

much drier, particularly on its westward (leeward slopes). This dryness keeps runoff to a minimum. Average rainfall in the APE is between 750 to 1,000 millimeters (Giambelluca et al. 2013).

2.9.1.3 VEGETATION

The indirect APE is largely covered in invasive buffelgrass (*Pennisetum ciliare*) and mature kiawe (*Prosopis pallida*) trees. Endemic species might have included ʻōhiʻa (*Metrosideros polymorpha)*, lama (*Diospyros sandwicensis*), and ʻaʻaliʻi (*Dodonaea viscosa*).

2.9.1.4 CULTURAL CONTEXT

Previous archaeological and ethnographic research conducted in the Honouliuli Ahupuaʻa helped provide a cultural overview for this study (Byerly and O'Day 2017; Fackler 2021a, 2021b; Gill et al. 2015; Hammatt and Shideler 1989, 1999; Handy and Handy 1972; Haun and Kelly 1984; Monahan and Thurman 2013; O'Day 2017; Sterling and Summers 1978). See Section 2.10 for further details.

2.9.2 ENVIRONMENTAL IMPACTS

2.9.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on archeological or historic resources.

2.9.2.2 ALTERNATIVE 2—PROPOSED ACTION

Based upon the AIS finding of "no historic properties affected," construction of the proposed Project would result in no impacts to onshore or offshore archaeological or historic resources.

2.9.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

An Unanticipated Discoveries Plan would be developed prior to the start of construction to outline procedures to be followed in the event unexpected archaeological or historic resources are encountered.

2.10 CULTURAL RESOURCES

Under Chapter 343 HRS, a Cultural Impact Assessment (CIA) is required as part of Hawaiʻi's environmental review process. Session Laws of Hawaiʻi Act 50, which amends HRS 343, requires consideration of the effects of a proposed action on "cultural practices." A Cultural Impact Assessment (CIA) was conducted for the adjacent Hawaiki CLS in 2017 by Garcia and Associates (GANDA) and the results are presented in the technical report entitled *Cultural Impact Assessment Hawaiʻi Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupuaʻa, Ewa District, Island of Oʻahu, Hawaiʻi* (O'Day 2017. The methods, protocols, and the content of the CIA conform to the *Guidelines for Assessing Cultural Impacts*, adopted by the State of Hawaiʻi Environmental Council on 19 November 1997. The purpose of the CIA was to identify any traditional cultural practices, beliefs, or places within the Hawaiki CLS vicinity, and assess any potential adverse effects of the Hawaiki CLS on such resources. The assessment involved

background research (e.g., Pre-Contact and Post-Contact information, previous archaeology studies) and interviews with members of the community knowledgeable about the area (O'Day 2016). As the proposed Project is within 300 feet of the CLS project, the following Section (2.10.1) is duplicated from the 2017 Hawaiki Submarine Cable Kapolei Landing Final EA.

2.10.1 EXISTING CONDITIONS

After the Great Mahele, the Hawai'ian land redistribution proposed by King Kamehameha III, O'ahu was divided into six moku (districts)—'Ewa, Kona, Ko'olau Loa, Ko'olau Poko, Waialua, and Wai'anae—representing six chiefdoms. The Project is located within the moku of 'Ewa. Within the moku districts are smaller land divisions called ahupua'a, with the Project Site situated within the ahupua'a of Honouliuli. Honouliuli Ahupua'a is the largest ahupua'a on O'ahu and its boundaries extend from a place called Pili o Kahe (at the boundary between Waia'nae and 'Ewa, 1.5 miles (2.4 kilometers) north of the Project Area) to Pearl Harbor's West Loch, and upland to the top of the Wai'anae Mountains near Schofield Barracks Military Reservation (Hawaiki Submarine Cable Kapolei Landing, Final EA, 2016).

2.10.1.1 BACKGROUND RESEARCH

Pre-Contact

Pre-Contact and ethno-historical information specifically related to the Project Area is sparse to non-existent. This speaks to the remote and generally uninhabited nature of the arid landscape in the vicinity of the Project. Because of this, reports written for previous investigations conducted near the Project generally present broad contextual backgrounds that discuss events and places within the broader Honouliuli Ahupua'a. These include various traditions, noted places, and references to Late Pre-Contact Period Hawai'ian political consolidation associated with the 'Ewa plain and Pearl Harbor regions, which are quite distant from the Project.

Mo'olelo[10] specific to the Project Area and its immediate surroundings could not be found. Within Honouliuli, most Hawai'ian myths or references to famous places are associated with the eastern portion of the Ahupua'a. The nearest place to the Project Area mentioned in ancient legend is Pili-o Kahe and is approximately 1.6 miles (2.5 kilometers) north of the Project Area. Pili means "to cling to" and Kahe means "to flow." According to legend, when the gods Kāne and Kanaloa first observed the ʻEwa Plain from Kapūkakī (now known as Red Hill) they played a game of ʻulu maika. During this game, they cast their stones to determine the boundaries of 'Ewa District. In an effort to include as much of the level 'Ewa Plain as possible, the gods hurled a stone as far as the Wai'anae Range where it landed in Waimānalo near the Project Area. It followed a crooked path, however, and was subsequently lost. After Kāne and Kanaloa failed to find the lost stone, the area was called 'Ewa, literally translating to "crooked" or "strayed" (Sterling and Summers 1978; Rasmussen and Tomonari-Tuggle 2006; Pukui et al. 1974).

Post-Contact

Very little evidence of Pre-Contact and early Post-Contact occupation or use of lands near the Project Area exists and a significant tract of undeveloped land still borders the Project Area on the

[10] Traditional, legendary, and/or mythological accounts.

northeast. This is likely due to the Project Area's remote location, far from known centers of pre-Contact chiefly power, as well as its arid climate. The lack of villages, hamlets, or place names on early historical maps suggests that the area changed little between the late Pre-Contact and early Post-Contact periods. It was not until large tracts of land were acquired by foreigners following the Great Māhele[11] that significant changes to the landscape occurred. According to historical maps and photographs, these changes are specifically associated with the development of ranching, sugarcane agriculture, and the Oʻahu Railway.

During the Māhele, Hawaiʻian chiefs and konohiki[12] were required to present their claims to the Land Commission to receive quit-claimed awards from Kamehameha III. Land titles were held by the government until awards were issued and a land commission award (LCA) gave complete title to the lands with the exception of the government's right to commutation. Within Honouliuli Ahupuaʻa, 72 individual land claims were registered and awarded to commoners by King Kamehameha III (Tuggle and Tomonari-Tuggle 1997). These were all situated in the southern portion of Honouliuli near Pearl Harbor. It appears the dry coastal conditions of the western portion of the ahupuaʻa near the Project Area could not support permanent or more intensive modes of traditional Hawaiʻian occupation or agriculture. Therefore, no awards were granted to commoners within or near the Project Area.

All unclaimed lands in Honouliuli Ahupuaʻa were acquired by Kekauʻonohi (LCA 11216, Royal Patent 6971), the granddaughter of Kamehameha I and one of Kamehameha II's wives (Jayatilaka et al. 1992). This consisted of 43,250 acres (17,503 hectares) of land including the Hawaiki CLS parcel. After Kamehameha II's death, Kekauʻonohi married Chief Levi Haʻalelea. Following Kekauʻonohi's death in 1851, all of her land holdings passed to her husband and his heirs. In 1863, the owners of kuleana[13] lands gave their land to Haʻalelea to settle debts. After Levi Haʻalelea passed, his second wife, Amoe Ena, inherited the land in 1864. In 1871, the land was leased to James Dowsett and John Meek to graze cattle. In 1875, Amoe Ena then sold Honouliuli to her brother-in law, John Harvey Coney, who then sold it to James Campbell in 1877 (Frierson 1972).

After acquiring Honouliuli Ahupuaʻa, James Campbell began developing the expansive Honouliuli Ranch. The ranch included most of Honouliuli Ahupuaʻa and was primarily used for grazing cattle. Ranch lands extended from the coastal areas of the ʻEwa Plain from Barber's Point to Pearl Harbor and into upland areas in Wahiawa near the boundary of Waiʻanae Uka. By 1880–1881 Honouliuli Ranch included 43,250 acres (17,503 hectares) of pasture land and was 18 miles (29 kilometers) long at its widest point (Bowser 1880).

In 1879, Campbell drilled an artesian well on the ʻEwa Plain. This was the first of its kind in Hawaiʻi and facilitated the development of large-scale irrigation and sugarcane production on marginal lands. The OR&L Company expanded into Honouliuli in 1890, further expanding large-scale sugarcane cultivation in the central plains of Oʻahu. Honouliuli lands below 200 feet (61 meters) elevation were leased to Wouldiam Castle by B.F. Dillingham who then subleased the land to the

[11] The Mahele or division of lands occurred in 1848 when King Kamehameha III transformed the traditional Hawaiian system of land tenure into a westernized system based on fee-simple ownership.
[12] Head of ahupuaʻa who administers land under the chief.
[13] Kuleana lands are those parcels granted to commoners under the Kuleana Act of 1850.

‘Ewa Plantation Company. Lands within Honouliuli Ahupua‘a above 200 feet were leased to the O‘ahu Sugar Company.

The ‘Ewa Plantation Company was the first to irrigate its crops using water from an artesian well (Kuykendall 1967). The plantation also built ditches that extended from the slopes of the mountains to lowland areas. This was done to increase soil deposition on the coral plain and expand arable land. The mountain slopes were plowed during the rainy season so that soil was washed down the ditches and deposited onto the lowland plains. The ‘Ewa Plantation Company continued to operate until 1970, when the O‘ahu Sugar Company took control of the ‘Ewa Plantation lands.

The O‘ahu Sugar Company was established in Waipahu in 1897 and started leasing vast tracts of land in Honouliuli for sugarcane cultivation. Water supply was a major obstacle as the company initially pumped water from the Pearl Harbor aquifer to irrigate upland fields. In 1911 plans were made to divert water from the Ko‘olau Mountains to Honouliuli because pumping water proved too costly (Wilcox 1997). The Waiahole Irrigation Company was established and in 1912 started the ambitious task of building an irrigation system of ditches, tunnels, and pipes to divert water from Kahana Valley on the windward side of O‘ahu, through the Ko‘olau Mountains, and onto the central plain at Honouliuli. Commercial agriculture in Honouliuli is still largely dependent on water supplied by the Waiahole irrigation system. The O‘ahu Sugar Company continued operations until 1995 when competition from emerging overseas markets, high operational cost, and slumping sugar prices forced the company to shut down (Dorrance and Morgan 2000).

A 1906 map showing the distribution of ranch grazing land and sugarcane fields in the area indicates that the Project Area is located on historic grazing lands. Aside from a small strip of sugarcane land that extended to a point southeast of the Project Area, most of the land within the western portion of Honouliuli Ahupua‘a was used for grazing.

B.F Dillingham financed construction of the OR&L to solve the logistics of the transportation of goods from plantation to market. By 1895, the railway extended from Honolulu to Wai‘anae (Kuykendall 1967). After the Japanese attack on O‘ahu on 7 December 1941, the U.S. military made extensive use of the OR&L lines to transport building materials, war supplies, and personnel from Honolulu to their destined military bases. The OR&L line operated 24-hours a day until the end of World War II in August 1945 (Chiddix and Simpson 2004).

Shortly after the war, OR&L was forced to cease operations as it could not compete with increased competition from trucking (Chiddix and Simpson 2004). Most of the main line was disassembled and sold. In 1947, the U.S. Navy assumed control of portions of the OR&L line and used it to transport ammunition and torpedoes between its Lualualei magazine and Pearl Harbor until 1968.

The Hawai‘ian Railway Society was formed in 1970 in an effort to save and restore the remaining railways in Hawai‘i. In 1974, the federal government donated the tracks and the right-of-way to the State of Hawai‘i. The Hawai‘ian Railway Society was able to replace the segment of the OR&L line running between the U.S. Navy’s Pearl Harbor and Lualualei on the NRHP in 1975 (The Oahu Railway & Land Company 2020). The segment of OR&L line between Honouliuli and Nānākuli was also listed on the Hawai‘i State Register of Historic Places as Site 50-80-12-9714. A segment of

this OR&L track is located approximately 181 feet (55 meters) from the Project Area and is currently used for tourist rides that run from ʻEwa to Kahe Point.

2.10.1.2 COMMUNITY CONSULTATION

As part of the CIA process undertaken for the initial Hawaiki CLS project in 2016-2017, individuals who might have knowledge of or concerns about traditional cultural practices in the vicinity were contacted for interviews. These relevant community members were also selected based on their past experience providing cultural resource consultation on federal and private projects in the area of concern. In an effort to acquire three consultations, GANDA made multiple efforts to request and arrange interviews with the following five individuals: Shad Kane; Thurston “Aliʻi” Kamealoha; Ginger Burch; Eric Burch; Hoʻohuli, Josiah “Black.” This was determined to be an appropriately sized sample given the Hawaiki CLS was relatively small in scale covering a minimal footprint (as is the proposed Project). Mr. Shad Kane and Mrs. Ginger Burch were the only consultants to respond to repeated requests for an interview. The results b elow are derived from the discussion with Mr. Kane. As the founder of the Kalaeloa Heritage & Legacy Foundation, caretaker of Kalaeloa Heritage Park, chair of the ʻEwa moku on the Committee on the Preservation of Historic Sites and Cultural Properties in the Oʻahu Council of Hawaiʻian Civic Clubs, Mr. Shad Kane serves as a knowledgeable consultant of the traditional cultural practices at the Project Area and its vicinity.

Mr. Kane was not aware of any on-going cultural places and practices occurring within or nearby the Project Area. During the interview, Mr. Kane did discuss one culturally significant site, a traditional Hawaiʻian fishing shrine possibly dating to the pre-Contact period and located approximately 259 feet (90 meters) south-southwest of the Project Area (SIHP Site No. 50-80-12-1433). Mr. Kane indicated that although the site is important to Hawaiʻians, no cultural practices are known to be currently performed at the site. Due to its distance from Project Area, Mr. Kane did not feel that the site or its potential future use by Hawaiʻians would be affected by the Hawaiki CLS.

Ongoing community consultation specific to this current Project has so far not identified any further cultural practices or sites.

2.10.2 ENVIRONMENTAL IMPACTS

2.10.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on cultural resources.

2.10.2.2 ALTERNATIVE 2—PROPOSED ACTION

The result of the CIA concluded that there are no specific traditional cultural properties, valued resources, or any traditional and customary practices identified that would be impacted by the Proposed Action.

2.10.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

No impacts to cultural resources are anticipated, therefore, no BMPs or mitigation measures are proposed.

2.10.4 MUNITIONS AND EXPLOSIVES OF CONCERN

Across Hawai‘i, there is potential for both onshore and offshore unexploded ordnance and discarded military munitions to be present. These items are collectively known as munitions and explosives of concern (MEC). MEC include explosive ordnance (bombs, bullets, shells, mines, etc.) that did not detonate when they were employed and still pose a risk of detonation. Ocean disposal of munitions was also acceptable until 1970 (OCM 2024).

These dangers stem from the Hawai‘ian Islands being used by various branches of the United States Department of Defense (DOD) for live training exercises at onshore and offshore military ranges, use and impacts from World War II, as well as munition items being loaded and unloaded, and transferred and transported to offshore dumping areas and spoil grounds.

Now, the DOD is responsible for clearing and cleaning the properties that were once used for military training and testing. The Defense Environmental Restoration Program for Formerly Used Defense Sites is managed by the U.S. Army Corps of Engineers (USACE) on behalf of the DOD (USACE 2024).

The formerly used defense sites located on O‘ahu, as well as charted Dumping Grounds and Explosives Dumping Grounds where MEC might be located, are shown below on Figure 2-7. The nearest DOD dumping site is a Sea Disposal Site, Ordnance Reef (HI-06), approximately 5.5 miles northwest of the Project Area. HI-06, a deepwater dumping site, is located approximately 11 miles offshore at a depth of 5,300 to 8,500 feet (DENIX 2022b).

2.10.5 EXISTING CONDITIONS

The Project Area does not fall within any Dumping Areas or Explosive Dumping Areas. Encountering MEC during construction is not anticipated. This section is included in this EA to acknowledge an awareness of the potential for the presence of MEC that could affect the Project Area.

2.10.6 ENVIRONMENTAL IMPACTS

The following sections describe possible impacts resulting from the proposed Project encountering MEC within the Project Area.

2.10.6.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect related to unexploded ordnance.

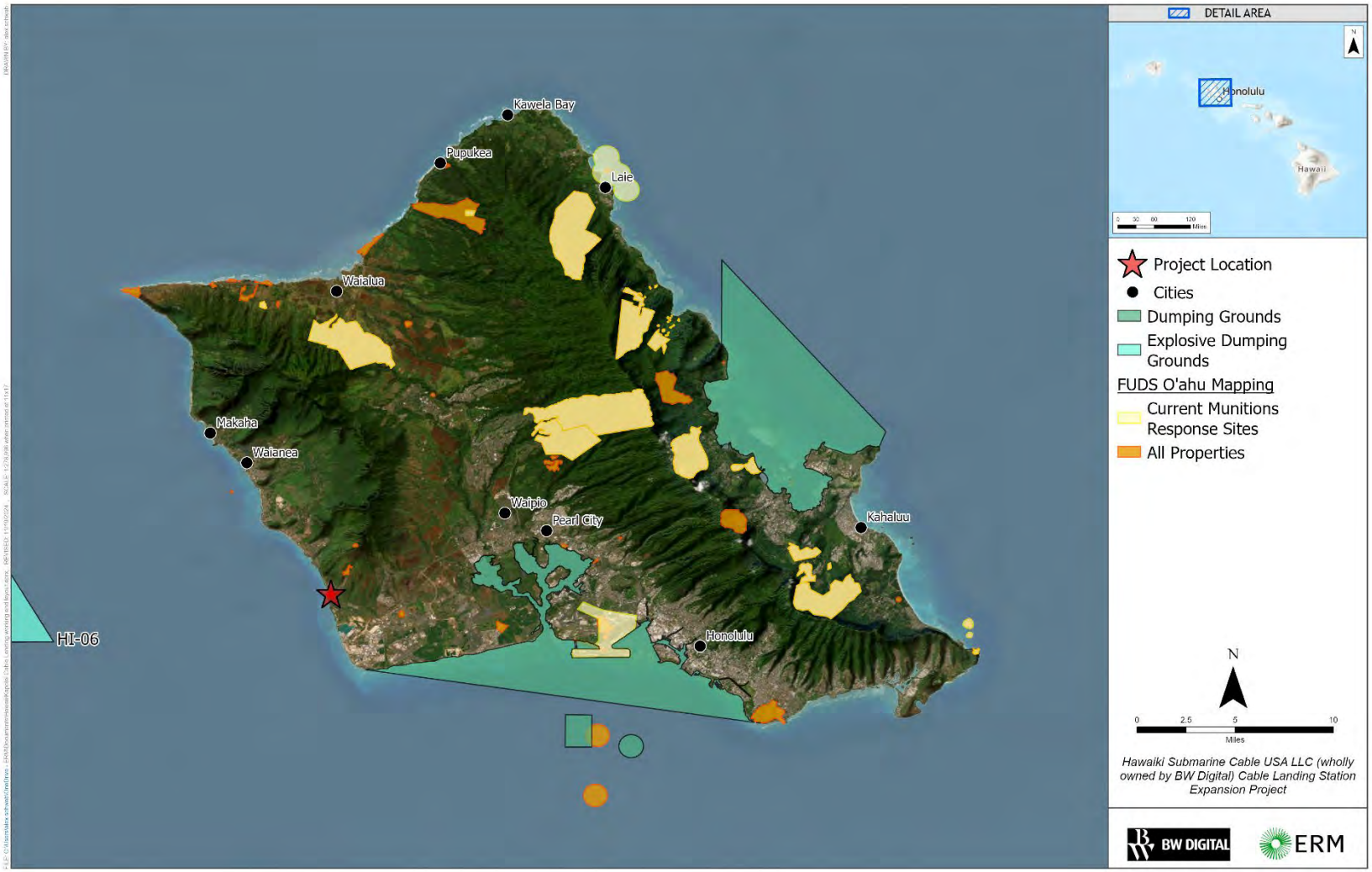


FIGURE 2-7: FORMERLY USED DEFENSE SITE (FUDS) PROPERTIES AND DUMPING GROUNDS

2.10.6.2 ALTERNATIVE 2—PROPOSED ACTION

There is no history of live-fire training exercises or dumping activities within the Project Area. However, the Island of O'ahu has been the site of military actions and training throughout the last century and it is possible that an unknown MEC item could be encountered during construction.

There is a slight risk of encountering MEC on the seabed during HDD activities; specifically, divers checking locations where the HDD bore pipes would exit the seabed. The risk to divers would be minimal and limited to the removal of the drill head assembly. The divers will be trained to recognize MEC.

An explosion of a MEC item on land could cause significant injury to on-site workers and damage equipment and infrastructure. However, as noted above, it is unlikely that an MEC would be encountered on land.

2.10.7 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

MEC are dangerous and can explode if approached, touched, moved or disturbed. Construction personnel would receive training on the 3R's (Recognize, Retreat, Report) of Explosives Safety (DENIX 2022a).

- Recognize—when you may have encountered a munition and that munitions are dangerous.
- Retreat—Do not approach, touch, move, or disturb it, but carefully leave the area.
- Report—Call 911 and advise the police of what you saw and where you saw it.

2.11 AIR QUALITY

Under the authority of the federal Clean Air Act, the EPA has established nationwide air quality standards to protect public health and welfare. These federal standards, known as National Ambient Air Quality Standards (NAAQS), represent the maximum allowable atmospheric concentrations for criteria pollutants: particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb). These standards are reviewed periodically and are subject to revision. Additionally, there is a Hawai'i state standard for hydrogen sulfide that was established primarily to monitor the ambient air effects of geothermal energy production and exploration activities on the Island of Hawai'i. The Clean Air Branch of the HDOH is responsible for implementing air pollution control in the state and operates and maintains the statewide ambient air quality monitoring network. Ambient air monitoring data is submitted to an EPA database which reports air quality using the Air Quality Index. This data is used to determine compliance with NAAQS, to track and characterize air quality trends, evaluate emission control strategies, and to support health studies (HDOH 2024).

2.11.1 EXISTING CONDITIONS

The Hawai'ian archipelago is one of the most isolated populated areas in the world. The closest landmass is California, approximately 2,400 miles to the northeast. The climate is predominantly influenced by the surrounding ocean and its tropical latitude location producing relatively mild temperatures and moderate humidity. The air quality in the State of Hawai'i is ranked as one of the best in the U.S., primarily because of the consistent trade-winds (or northeasterly winds) that

pass over the islands thus dispersing air pollutants and allowing for the normally clean air. The most significant factor influencing the Island of O‘ahu’s environment is the urban Honolulu area, however the impact of city pollution is minimized by the trade-winds that normally blow them out to sea (HDOH 2020).

The HDOH currently operates a network of approximately 16 ambient air quality monitoring stations throughout the four major Hawai‘i islands (HDOH 2024). The majority of the monitoring stations are located on the downwind side of the islands where most of the air pollution is expected (HDOH 2020). The Clean Air Branch is responsible for ensuring that the network meets or exceeds the minimum EPA monitoring requirements and locating stations to adequately address the purposes and objectives. The State of Hawai‘i’s monitoring network consists of three major categories of monitoring stations: State and Local Air Monitoring Stations (SLAMS), National Core (NCore), and Special Purpose Monitoring Stations. The primary pollutants of concern for the state remain $PM_{2.5}$ and SO_2, mainly due to possible future volcanic events (HDOH 2020). Pb monitoring was discontinued in Hawai‘i on 31 December 2018 with EPA approval. The closest air quality monitoring station to the Project Area is the Kapolei Station, which is located approximately 3 miles (5 kilometers) from the Project Area in the Kapolei Business Park in the city of Kapolei (HDOH 2024). The station has been operating as a SLAMS station since 2002 and monitors for CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$ (HDOH 2020). On 30 October 2009, EPA approved the Kapolei station as the state’s required NCore site, and in addition to the SLAMS parameters, the station began collecting the required NCore parameters on 1 January 2011, which include CO (trace), SO_2 (trace), NO/NOy, O_3, $PM_{10-2.5}$, $PM_{2.5}$ speciation and the meteorological parameters wind speed, wind direction, temperature, relative humidity and Pb (2012-2018) (HDOH 2024). The most recent publicly available air quality monitoring records from the Kapolei Station/NCore Station shows that the Project Area is in attainment of all NAAQS (HDOH 2024). Other air quality monitoring stations on the Island of O‘ahu include the Honolulu and Sand Island stations, both located near downtown Honolulu (HDOH 2024). Data collected from these monitoring stations indicate that criteria pollutant levels consistently remain well below NAAQS on the Island of O‘ahu (HDOH 2024).

2.11.2 ENVIRONMENTAL IMPACTS

2.11.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on air quality.

2.11.2.2 ALTERNATIVE 2—PROPOSED ACTION

Heavy equipment and vehicles such as drill rigs, cranes, and backhoes or similar excavating equipment would be required to construct the Project, and the internal combustion of fuels to power these equipment/vehicles would result in the release of some air pollutants (e.g., CO, NO_2, and SO_2). In addition, construction activities (e.g., clearing and excavating lands, vehicles traveling to and from the Project Area, open trenching, removal of materials from work areas) could result in the generation of fugitive dust (PM_{10} and $PM_{2.5}$). Air pollutants and fugitive dust

levels would be highest near the Project Area; however, lower levels may also be present along the gravel road and travel routes to and from the Project Area.

Although the Project would result in some pollutants and dust, the elevated air pollutant and fugitive dust levels would occur at relatively low levels compared to the NAAQS, the highest levels would be temporary (i.e., most would occur only during construction), and BMPs would be implemented to minimize the magnitude and extent of these emissions. Therefore, the Project is not expected to result in the air quality of the region exceeding the NAAQS.

2.11.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

All Project vehicles and equipment would be maintained in proper working order and in compliance with state and federal vehicle and emission standards. BMPs, including identifying appropriate fueling and maintenance areas for equipment, a daily equipment inspection schedule, and spill response procedures would be employed by the construction team. This would confirm that the volume of pollutants emitted by the Project would comply with established standards.

Hawai‘i Administrative Rules Section 11-60.1-33 Fugitive Dust states in part, “No person shall cause or permit visible fugitive dust to become airborne without taking reasonable precautions” and “no person shall cause or permit the discharge of visible fugitive dust beyond the property lot line on which the fugitive dust originates.” Therefore, the Project would evaluate weather conditions and activities to implement reasonable precautions to control fugitive dust. This could include limiting the number of exposed areas through planning and timing of project phases, watering the area to reduce dust movement, using wind screens, keeping adjacent roads clean, using gravel as a temporary travel-path surface in the Project area instead of dirt, reducing vehicle speed, and covering “open-bodied” trucks. Additionally, any debris and Project-generated material, supplies, and equipment would be removed from the site at the completion of the work.

2.12 NOISE

The State of Hawai‘i regulates noise through HAR, Title 11, Chapter 46, “Community Noise Control,” and provides for the prevention, control, and abatement of noise pollution in the state. Per the HAR regulation, ‘Noise’ is defined as follows:

> ‘Noise’ means any sound that may produce adverse physiological or psychological effects or interfere with individual or group activities, including but not limited to communication, work, rest, recreation and sleep.” Under certain conditions, noise can interfere with human activities at home or work and affect human health and well-being (HAR §11-46.2).

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although prolonged exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual. Airborne sound is the fluctuation of

air pressure above and below atmospheric pressure. Several ways exist to measure sound, depending on the source, receiver, and reason for the measurement.

Community sound levels are generally presented in terms of A-weighted decibels (dBA). The A-weighting network measures sound in a similar fashion to how a person perceives or hears sound, thus achieving a strong correlation with how people perceive acceptable and unacceptable sound levels. Table 2-4 presents typical A-weighted sound levels and the general subjective responses associated with common sources of noise in the physical environment.

A-weighted sound levels are typically measured or presented as the equivalent sound pressure level (L_{eq}), which is defined as the average noise level on an equal-energy basis for a stated period of time and is commonly used to measure steady-state sound that is usually dominant.

Another metric used in determining the impact of environmental noise is the differences in response that people have to daytime and nighttime noise levels. During the evening and at night, exterior background noises are generally lower than daytime levels; however, most household noise also decreases at night, and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises.

TABLE 2-4: TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

Noise Source at a Given Distance	Sound Level (dBA)	Qualitative Description
Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1,000 feet) Shout (0.5 foot)	100	
Heavy truck (50 feet)	90	Very annoying; Hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70 to 80 70	Intrusive (telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft whisper (5 feet)	30	Very quiet
Broadcasting/Recording studio	20	

Noise Source at a Given Distance	Sound Level (dBA)	Qualitative Description
	10	Just audible

Source: Adapted from Table E, "Assessing and Mitigating Noise Impacts" (New York Department of Environmental Conservation 2001).

The general human response to changes in noise levels that are similar in frequency content (such as comparing increases in continuous (L_{eq}) traffic noise levels) are summarized as follows:

- A 3-dB change in sound level is considered to be a barely noticeable difference;
- A 5-dB change in sound level is typically noticeable; and
- A 10-dB increase is considered to be a doubling in loudness.

Community noise levels are generally closely related to the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate between 45 to 60 dBA, and high above 60 dBA. Surrounding land uses affect what noise levels are considered acceptable or unacceptable. Lower noise levels are expected in low-density rural and suburban residential areas than what would be expected for commercial, industrial, manufacturing, and agricultural zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less, with the exception of ongoing agricultural activities.

The Hawai'i noise limits (see Table 2-5) are absolute, meaning they are not relative to ambient conditions. Limits are prescribed by receiving zoning class and time period and are enforceable at the property boundaries of the affected receiver. The Rule states that zoning districts are determined by ordinances adopted by the applicable local, county or state government agencies (i.e., Honolulu City and County). The zoning districts prescribed by such ordinances are then interpreted relative to the receiving zoning class districts given in Table 2-5. For instance, Class A zoning districts include all areas equivalent to land zoned residential, conservation, preservation, public space, or similar type. For mixed zoning districts, the primary land use designation is used to determine the applicable zoning district class and maximum permissible sound level. For instance, if a residential structure is surrounded by agricultural land, it may be considered Class A use on Class C land.

TABLE 2-5: HAWAI'I MAXIMUM PERMISSIBLE SOUND LEVELS BY ZONING DISTRICT

Receiving Zoning Class District	Maximum Permissible Sound Level (dBA)	
	Daytime (7:00 AM–10:00 PM)	Nighttime (10:00 PM—7:00 AM)
Class A Zoning districts include all areas equivalent to land zoned residential, conservation, preservation, public space, or similar type.	55	45
Class B Zoning districts include all areas equivalent to lands zoned for multi-family	60	50

Receiving Zoning Class District	Maximum Permissible Sound Level (dBA)	
	Daytime (7:00 AM–10:00 PM)	Nighttime (10:00 PM—7:00 AM)
dwellings, apartment, business, commercial, hotel, resort, or similar type.		
Class C Zoning districts include all areas equivalent to lands zoned agriculture, county, industrial, or similar type.	70	70

Source: HAR § 11-46, "Community Noise Control"

While the Hawai'i noise ordinance does not specifically exempt construction noise, ordinances of this type typically address permanent sources of noise. Noise levels may exceed the prescribed limits up to 10 percent of the time within any 20-minute period. The maximum permissible sound level for impulsive noise, as measured with a fast meter response, is 10 dBA above the maximum permissible sound levels for the given receiving zoning class district. HAR § 11-46-5 provides further exemptions to these limits. Pursuant to HAR § 11 46-7 and HAR § 11-48-8 a permit or variance may be obtained for operation of an excessive noise source, including construction activity, beyond the maximum permissible sound levels. Factors that are considered in granting of such permits and variances include whether the activity is in the public interest and whether the best available noise control technology is being employed.

Zoning in the vicinity of the Project includes AG-2, P-2, and Country District (considered rural residential land use). Both the P-2 and Country District would be considered Class A land use according to HAR § 11-46 and, therefore, the most stringent daytime and nighttime limits of 55 dBA and 45 dBA apply.

With a variance (HAR § 11-46-7), construction activities emitting noise above limits are allowed but restricted to the hours of 7:00 AM to 6:00 PM during weekdays and 9:00 AM to 6:00 PM on Saturdays. No permit allows for noise above limits on Sundays or holidays.

2.12.1 EXISTING CONDITIONS

HAR defines "[a]mbient or background noise" as the totality of sounds in a given place and time, independent of sound contribution of the specific source being measured. The existing ambient noise in the Project Area consists of a mixture of natural and man-made sources. Ambient noise sources in the nearshore Project Area include local vehicular traffic on Farrington Highway, ocean surf, and residential, light commercial, and recreational uses.

2.12.2 ENVIRONMENTAL IMPACTS

Project construction may result in temporary adverse noise impacts at nearby noise sensitive receptors depending on distance between sound sources and receivers. HDD activity may generate elevated sound levels.

2.12.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on the environment related to noise.

2.12.2.2 ALTERNATIVE 2—PROPOSED ACTION

Project-related construction activities would create noise that could affect nearby areas, including residences. The Project Site is bordered to the north by multiple residences, the closest of which is approximately 80 feet from the nearest anticipated drill entry point. The closest residence to the south is on the south side of the CLF and is approximately 300 feet from the nearest anticipated drill entry point. During the construction phase of this Project, grading, and HDD equipment would be used, which would be sources of increased noise. Noise levels of diesel-powered construction equipment typically range from 80 to 90 dBA at 50 feet (15 meters). The actual noise levels produced are dependent on the construction methods employed during each phase of the construction process. It is expected that HDD activity would create the most noise during construction. The equipment would consist of an HDD drilling rig and auxiliary support equipment including electric mud pumps, portable generators, mud mixing and cleaning equipment, forklifts, loaders, trucks, and portable light sets. Of these, the HDD drill rig and the mud shakers would be the dominant sound sources. Sound barriers may be employed to minimize noise levels. Based on the above, we assume a permit or variance for operation of an excessive noise source beyond the maximum permissible sound levels is anticipated.

2.12.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

The Applicant would coordinate with the HDOH to address noise concerns prior to the start of Project construction. The Applicant would employ BMPs to minimize noise impacts during construction such as:

- Optimizing hours of operation for loud procedures to minimize noise impact and/or restricting operation, as feasible;
- Construction site and access road speed limits would be established and enforced during the construction period;
- Electrically powered equipment would be used instead of pneumatic or internal combustion powered equipment, where feasible;
- Material stockpiles and mobile equipment staging, parking, and maintenance areas would be located as far as practicable from noise-sensitive receptors;
- The use of noise-producing signals, including horns, whistles, alarms, and bells, would be for safety warning purposes only;
- No Project-related public address or music system would be audible at any adjacent receptor;
- All noise-producing construction equipment and vehicles using internal combustion engines would be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed “package” equipment (e.g., arc-welders, air compressors) would be equipped with shrouds and noise control features that are readily available for that type of equipment; and
- Portable sound barriers for construction activity, including HDD, may be employed.

2.13 INFRASTRUCTURE AND UTILITIES

2.13.1 EXISTING CONDITIONS

HECO provides all electrical service for the Island of Oʻahu. HECO joint-utility overhead pole lines are located on the mauka side of Farrington near the Project Site. Additionally, Hawaiʻian Telcom and Oceanic Time Warner Cable also have overhead communication lines on the mauka side of Farrington Highway, and AT&T has underground communication lines on the makai side of Farrington Highway. Hawaiʻian Telcom has facilities in the vicinity of the Project and provides telecommunications service to the CLS via an underground line (Hawaiʻian Telcom 2024).

2.13.1.1 POTABLE WATER

The Honolulu Board of Water Supply supplies potable water to various parts of Oʻahu, including the areas near the Project Site. A 24-inch water pipeline is located within Farrington Highway, approximately 35 feet west of the Project Site. There is no water service to the Project Site (Belt Collins Hawaiʻi LLC 2017).

2.13.1.2 WASTEWATER

There are no sewers or sewer service in the immediate vicinity of the Project Site. Per Section 713.4 of the 1997 Uniform Plumbing Code, in Chapter 19 of the Revised Ordinances of Honolulu, connection to a public sewer is not required if the nearest public sewer is located more than 200 feet away. The closest sewer is approximately 0.5 mile from the Project Site.

2.13.1.3 STORMWATER DRAINAGE

There is no stormwater infrastructure within the proposed Project Area. If infiltration capacity of the pervious ground is exceeded, runoff flows generally west via sheet flow to discharge into a large concrete ditch on the makai side of the Project Site (Belt Collins Hawaiʻi LLC 2017). The ditch is in the HDOT right-of-way.

2.13.1.4 SOLID WASTE

There are two existing solid waste facilities in the vicinity of the Project. They include the City and County of Honolulu's Waimānalo Gulch landfill managed by Waste Management and the privately owned PVT landfill, which is authorized specifically to receive construction and demolition waste.

2.13.2 ENVIRONMENTAL IMPACTS

2.13.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on existing infrastructure and utilities.

2.13.2.2 ALTERNATIVE 2—PROPOSED ACTION

Electric and communications

The Project would not affect electric and communication infrastructure and utilities as it is limited to installing bore pipe under the shoreline and a fronthaul conduit system connecting to an existing CLS; no cable would be installed as part of the Project.

Potable Water

Construction of the proposed Project would not affect public potable water supplies or infrastructure systems. If needed, water from an existing fire hydrant on the Hawaiki CLS is available for temporary use during construction for drilling fluid and dust control; the Honolulu Board of Water Supply provides temporary metering for construction activities.

Wastewater

Portable toilets would be on site during construction for construction crew and Project-related personnel use. Portable toilets would generate a minimal amount of wastewater. Portable toilets would be maintained by the contractor in accordance with HDOH and City and County of Honolulu health regulations. The Project would not generate any wastewater during operation as no facilities are being installed that require or use water. See Section 1.3.6 for description of wastewater from drilling activities.

Stormwater Drainage

The Project may result in a temporary increase in stormwater flow during rain events due to construction of the gravel road and staging area. A SWPPP would be developed and implemented during construction to minimize potential for stormwater impacts. Following construction activities, stormwater runoff from the Project would be negligible as the area would be revegetated apart from the BMHs.

Solid Waste

Solid waste is expected to be generated during construction of the Project. Generated waste would include green waste and construction waste, including drill cuttings. Solid waste produced during the Project's construction could be transported to the Waimānalo Gulch landfill in the City and County of Honolulu, managed by Waste Management, the privately-owned PVT landfill, or another location certified to accept the solid waste. The solid waste generated during the construction of the Project is anticipated to have no negative impact on existing waste management services or facility capacity. Additionally, all waste would be disposed of in compliance with state and City and County of Honolulu regulations.

2.13.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

The Project is not expected to significantly affect existing infrastructure and utilities, including electric and communications systems, potable water, wastewater, stormwater drainage, or solid waste. As such, no mitigation measures are necessary. However, the Project construction may lead to a temporary increase in stormwater runoff during rain events. To address this, a TESC Plan and a SWPPP, incorporating these measures, would be developed to minimize stormwater impacts.

2.14 SOCIOECONOMIC RESOURCES

2.14.1 EXISTING CONDITIONS

The Project Site is located near Kahe Point in the ʻEwa District on the southwestern shore of Oʻahu. The closest communities to the Project Site are Koʻolina Resort, approximately 0.7 mile (1.1 kilometers) to the south-east, Nanakuli, approximately 2.0 miles (3.2 kilometers) to the northwest, and Kapolei, about 5 miles (8 kilometers) to the southeast.

According to the 2022 American Community Survey, Kapolei has a resident population of approximately 21,411 people (U.S. Census Bureau 2022). This population represents roughly 2.5 percent of the total population of Oʻahu, which is now estimated at around 1,015,000 (U.S. Census Bureau 2022). There is no specific census data available for Barbers Point. In 2020, the population of Nanakuli was 12,195. The EPA Environmental Justice screening tool (EPA 2024a) indicates that the Project Area does not fall within minority or low-income environmental justice populations.

The Project would be situated within the western portion of an approximately 22-acre private parcel owned by the Applicant. The parcel is currently vacant, with no occupied structures present. The 2.5-acre Project Site is bordered to the west by Farrington Highway (State Route 93), to the north by residences, to the east by undeveloped land, and to the south by the Hawaiki CLS. The Kahe Electric Power Plant, operated by HECO, is located approximately 0.4 mile (650 meters) directly to the north, and the Waimānalo Gulch Sanitary Landfill, managed by Waste Management Inc. for the City and County of Honolulu, is situated approximately 1,300 feet (400 meters) to the southeast. The surrounding area features residential, resort (Ko ʻOlina Resort and Marina), recreational (Makaīwa and Kahe Beach Parks), and industrial uses. The bore pipe would pass beneath Farrington Highway (a divided highway managed by HDOT), Kahe Beach Park, and the OR&L right-of-way.

The Project is within the State Land Use Agricultural District. The City and County of Honolulu Land Use Ordinance (LUO) designates the Project Site as Country, while the HDD bores would pass under land zoned as General Agriculture and General Preservation (refer to Section 1.1.2). Additionally, all the Project Site is within the SMA. Surrounding submerged lands are classified under the state conservation district, extending to the territorial limits of the State of Hawaiʻi.

Access to the Project Site would be from the mauka side of Farrington Highway, requiring a right turn off the highway. Due to a concrete median, all vehicles exiting the site must also turn right. Farrington Highway is a four-lane divided state highway providing the main route around the west side of Oʻahu, from Kapolei to Mākaha. Recent traffic volume data from HDOT's traffic count station near the Keoneʻōʻio Bridge shows that the most recent count, conducted on 17 February 2023, indicated that the annual average daily traffic is 48,805 vehicles. Historical traffic volume data from HDOT reveals that the 2024 data is consistent with recent years, showing a slight increase in traffic volume (HDOT 2024).

2.14.2 ENVIRONMENTAL IMPACTS

2.14.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on socioeconomic resources.

2.14.2.2 ALTERNATIVE 2—PROPOSED ACTION

The Proposed Action is not expected to negatively affect the existing population of Kapolei or the surrounding area, and no individuals would be displaced. During construction, temporary job opportunities would be created.

A traffic impact analysis by a traffic engineer assessed potential traffic effects from construction of the Hawaiki CLS (Belt Collins Hawai‘i LLC 2017). The analysis concluded that construction would have minor, temporary impacts on traffic along Farrington Highway, with no significant increase in peak hour traffic since it remains well below the 100 new peak hour trips threshold set by HDOT’s Best Practices for Traffic Impact Reports (Belt Collins Hawai‘i LLC 2017). Temporary lane restrictions may be required, but these would be brief. Construction of the proposed Project would generate less traffic, and therefore would likewise have minor temporary impacts on traffic along Farrington Highway. Furthermore, traffic flows along the Farrington Highway are well understood by the Applicant; to minimize the impact of heavy traffic on commuters, site access would be scheduled during nonpeak times when possible, and traffic management personnel would be provided. No road closures are proposed.

2.14.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

No mitigation is required. Impacts to socioeconomic resources from the proposed Project would be less than significant.

2.15 PUBLIC SERVICES AND FACILITIES

2.15.1 EXISTING CONDITIONS

2.15.1.1 POLICE AND FIRE

Police and fire services on O‘ahu are provided by the City and County of Honolulu. The Project Area falls within District 8, Kapolei/Wai‘anae, of the Honolulu Police Department. The nearest police station is the Kapolei Police Station, located at 1100 Kamokila Boulevard, Kapolei, Hawai‘i, approximately 5.4 miles (8.7 kilometers) southeast of the Project Area. Additionally, the Wai‘anae Substation, a police substation, is about 8.1 miles (13.0 kilometers) to the north. The closest fire stations are Makakilo Fire Station No. 35 at 92-885 Makakilo Drive, Kapolei, Hawai‘i, and East Kapolei Fire Station No. 43 at 85-645 Farrington Highway, Kapolei, Hawai‘i, each situated approximately 7.1 miles (11.4 kilometers) southeast of the Project Area.

2.15.1.2 MEDICAL SERVICES

The primary healthcare provider near the Project is Queen’s Medical Center-West O‘ahu, located at 91-2141 Fort Weaver Road, ‘Ewa Beach, Hawai‘i, roughly 10.9 miles (17.5 kilometers) east of the Project Site. Other nearby medical facilities include Kapolei Health Care Center and Kaiser

Permanente Kapolei Clinic in Kapolei, as well as Waiʻanae Coast Comprehensive Health Center and Kaiser Permanente Nanaikeola Clinic in Nānākuli. Honolulu Emergency Medical Services operates 20 advanced life support ambulances, with one stationed at East Kapolei Fire Station, about 7.1 miles (11.4 kilometers) southeast, and another at the Waiʻanae Fire Station, approximately 10.8 miles (17.4 kilometers) north of the Project Site (City and County of Honolulu, HESD 2024a). Additionally, a Rapid Response Paramedic unit serves West Oʻahu and operates 16 hours a day, from 7 AM to 11 PM (City and County of Honolulu, HESD 2024b).

2.15.2 ENVIRONMENTAL IMPACTS

2.15.2.1 ALTERNATIVE—NO ACTION

Under the No Action Alternative, the Project would not be constructed. As a result, Alternative 1 would not affect public services and facilities.

2.15.2.2 ALTERNATIVE 2—PROPOSED ACTION

Police and Fire

The Proposed Action is not anticipated to increase the demand for police. However, the construction of the Project could temporarily elevate the fire risk due to vehicle use, electrical equipment, and human activity.

Medical Services

The construction of the Project is not expected to directly impact existing healthcare facilities or emergency services, nor would they place substantial additional demands on these services. The Project Site and its surroundings are well-served by a community hospital and emergency medical services. In the event of an incident during construction, response times are expected to be prompt. The adherence to safe working practices is anticipated to significantly reduce the risk of serious accidents, thereby minimizing the potential burden on local healthcare facilities and emergency services.

2.15.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

The adherence to safe working practices is expected to substantially reduce the risk of serious accidents that could place an undue burden on local healthcare facilities and emergency services. With these measures in place, impacts on public services and facilities from the construction of the Project are anticipated to be negligible; therefore, no mitigation measures are required.

2.16 RECREATIONAL RESOURCES

2.16.1 EXISTING CONDITIONS

Recreational resources near the Project Site include both publicly and privately owned facilities. Publicly owned recreational areas include Makaīwa Beach Park, located directly south of the Project, and Kahe Beach Park, situated at the southern end of the Project Site. Additionally, seven other beach parks are located within a 5.0-mile (8-kilometer) radius of the Project Site. The Nānākuli Forest Reserve, a publicly owned forest reserve, is located 3.8 miles (6.1 kilometers)

northwest of the Project Site. This 5.0-mile (8.0-kilometer) radius also includes ten regional, community, and neighborhood parks, including Kapolei and Kalaeloa regional parks; Kamokila, Kapolei, Maili Kai, and Makakilo community parks; Makakilo, Makakilo Heights, Maukalani, and Kapolei neighborhood parks; and one public golf course, Kapolei Golf Course, approximately 4.4 miles (7.1 kilometers) east of the Project Site (City of County of Honolulu).

Privately owned recreational resources include the Ko ʻOlina Resort and Ko ʻOlina Golf Club, located about 0.8 miles (1.3 kilometers) southeast of the Project Site, Hoakalei Country Club, approximately 6.1 miles (9.8 kilometers) southeast, and Barbers Point Golf Course, around 6.0 miles (9.7 kilometers) southeast of the Project Site (City and County of Honolulu, Department of Parks and Recreation 2024).

2.16.2 ENVIRONMENTAL IMPACTS

2.16.2.1 ALTERNATIVE 1- NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on recreational resources.

2.16.2.2 ALTERNATIVE 2—PROPOSED ACTION

The construction of the Project is not expected to have an impact on recreational resources, nor would it result in a direct loss of access to any recreational areas. No Project infrastructure would be placed within existing recreational areas, and the HDD would be installed underground through boreholes, which would not disturb or impact surface areas.

During construction, some minor and temporary indirect impacts to recreational resources along Farrington Highway may occur due to Project-related traffic. Additionally, construction activities may produce elevated noise levels. However, this noise would be temporary, intermittent, and is expected to have a minor to negligible effect on nearby recreational resources.

Temporary impacts may also occur to recreational users of offshore waters when HDD construction reaches the nearshore punch-out location, approximately 2,500 feet to 3,000 feet (762 meters to 914 meters) from the shoreline. Although ocean waters would remain open to activities such as boating, surfing, diving, and swimming, the area around the punch-out location would be monitored a dive boat during construction. A notice of construction activity would be issued to inform mariners and advise them to avoid this area (see Section 5.2.4.1 for further details). Once installation is complete, there would be no further disruption to the area's recreational resources.

2.16.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Impacts on recreational resources from the construction of the proposed Project are anticipated to be negligible. Therefore, no mitigation measures are proposed.

2.17 SCENIC AND AESTHETIC RESOURCES

2.17.1 EXISTING CONDITIONS

The Project is in Kapolei, approximately 20 miles west of Honolulu. The shoreline by the Project Site is rocky with little to no beach. Nominally 100 feet mauka from the shoreline is the OR&L rail line followed by Highway 93 (Farrington Highway) (ERM NMFS BA). Elevations within the Project Site range from 10 to 200 feet above sea level (Google Earth 2024). The Project Site is bordered on the west by Farrington Highway, on the north by private residences, on the east by privately owned agricultural land, and to the south the by the Hawaiki CLS.

Existing infrastructure visible from the Project Site include the Farrington Highway, powerlines along the highway, and the Hawaiki CLS and associated parking area, residential homes, the Ko'Olina developments, and parts of the HECO power plant. The 'Ewa Development Plan states that "...public views which include views along streets and highways, *mauka-makai* view corridors, panoramic and significant landmark views from public places, views of natural features, heritage resources, and other landmarks, and view corridors between significant landmarks, can be important cultural resources" (City and County of Honolulu, Department of Planning and Permitting 2020). Additionally, the Plan includes "views of the ocean from Farrington Highway between Kahe Point and the boundary of the Wai'anae Development Plan Area" in its list of 'Ewa's significant historic and cultural resources (City and County of Honolulu, Department of Planning and Permitting 2020). Further, the shoreline to the west of the Project Site is also shown in the Open Space map of the Plan as an area of important Panoramic Views (City and County of Honolulu, Department of Planning and Permitting 2020).

2.17.2 ENVIRONMENTAL IMPACTS

2.17.2.1 ALTERNATIVE 1—NO ACTION

The Project would not be constructed under the No Action Alternative (Alternative 1). Therefore, Alternative 1 would have no effect on scenic and aesthetic resources.

2.17.2.2 ALTERNATIVE 2—PROPOSED ACTION

A visual impact analysis was not conducted as no new buildings would be built under the Proposed Action.

As stated above, the 'Ewa Development Plan lists views of the ocean from Farrington Highway between Kahe Point and the boundary of the Wai'anae Development Plan area as a significant view and vista that should be preserved. In addition, under Reserve Ordinances of Hawai'i (ROH) Section 25-3.2(c)(4), any obstruction of the line of sight towards the sea from Farrington Highway should be minimized where reasonable. The Proposed Action would not obstruct views toward the sea from Farrington Highway.

During construction of the proposed Project, there would be temporary impacts on views mauka of Farrington Highway due to the use of an HDD drilling rig located within the Project Site; however, views would be partially shielded by vegetation as the vegetation (trees) adjacent to the highway would not be removed. In addition, one dive boat would be visible offshore during the HDD bore

pipes exiting the seafloor. Once construction is completed, all construction equipment would be removed and there would be no longer-term disturbances to the scenic resources of the area as all Project infrastructure would be subsurface.

2.17.3 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Restoration of the Project Site would occur following the completion of the Project infrastructure installation to mitigate any visual impacts. As discussed in Section 1.3.9, the Project Site would be restored to a suitable condition, as required by the local authorities. Any areas of excavation would be backfilled and bare ground areas revegetated.

No structures would be built so no color or building consistency is needed. Impacts to scenic and aesthetic resources from the Proposed Action would be less than significant; therefore, no mitigation is required.

3. CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts refer to “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions” and secondary impacts refer to “effects which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable” (HAR § 11-200-2). The cumulative impacts considered in this section are those that would result from other projects and activities that may occur at the same time in the same area as the proposed Project, such as vessel traffic, recreation activities, and other local construction activities. Based on a review of the City and County of Honolulu Department of Planning and Permitting (DPP) website for projects open for public input and the State of Hawaii Office of Planning and Sustainable Development Environmental Review Program's EAs and Environmental Impact Statements open for public comment, there are no known projects within the vicinity of the Project that would contribute to cumulative impacts. Therefore, no cumulative impacts are expected.

As discussed in Section 2, the Project has the potential to cause temporary, localized impacts to the following resources and existing conditions: climate (specifically GHG emissions), geology (including topography and soils), natural hazards, onshore water resources and hydrology, marine water quality, marine and nearshore biological resources, terrestrial wildlife resources, MEC, air quality, noise, infrastructure and utilities, public services, recreation, and scenic and aesthetic resources. However, with the implementation of BMPs and mitigation measures (see each section for specific BMPs), any impacts to natural resources are expected to be less than significant and limited to the short duration of Project construction activities. Therefore, the Project is not expected to contribute any cumulative effects on these resources.

Nearby ongoing activities such as marine recreation, vessel traffic, and other construction and maintenance projects are likely to only result in minor contributions to GHG emissions. Given that the proposed Project is also only anticipated to emit minor quantities of GHG emissions (Section 2.11), the cumulative emissions of GHG is expected to be minimal and the impacts to the climate would be less than significant.

Recreational marine resources may be temporarily limited during the installation of horizontal directional drill (HDD) bores, as there would be a small boat patrolling the area surrounding the punch-out point to limit the public from entering the Project Area. However, any localized reduction of access would be short in duration. There would be no long-term impacts to recreational resources and public access. As such, the Project would not result in cumulative or secondary impacts on recreational resources.

A biological survey and desktop review determined that there is potential for nine protected marine species and two protected terrestrial wildlife species (as well as migratory birds and seabirds) to occur in the Project Area. Additionally, the Project overlaps EFH, federally designated critical habitat, and proposed critical habitat. Potential impacts to protected species and their habitats include sediment and turbidity, IDFR, light, underwater noise, and vessel strikes. However, these construction-related impacts would be unlikely to occur, temporary, and/or localized with the implementation of BMPs identified in Sections 2.6.3 and 2.8.3. Non-construction related impacts from other nearby activities may include sensitive species getting tangled in fishing gear from recreational and commercial fishing or being disturbed by human activity and habitat degradation. However, these impacts would not be exacerbated by Project activities. As such, potential impacts to natural marine and terrestrial ecosystems would be less than significant and would not contribute to cumulative or secondary impacts.

The Project involves the construction of subsurface infrastructure, including HDD conduits, that would provide additional capacity for future subsea cable systems and improve the reliability and speed of telecommunications services for citizens of Hawai‘i. However, the proposed Project is not intended to promote or support population growth and would only provide temporary job opportunities during the construction phase. Temporary lane restrictions associated with the Project would be brief and would not significantly increase traffic along Farrington Highway (Section 2.14.1). Additionally, post-construction, the installed subsurface infrastructure would not result in increased traffic and would not be staffed. Therefore, the project is not expected to result in secondary impacts such as permanent increases in population or traffic.

Although the Project has the potential to result in minor impacts to resources and existing conditions, impacts would be localized and limited to the duration of work, and the implementation of BMPs would help minimize any potential impacts. As such, the Project would not result in cumulative or secondary impacts.

4. ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

4.1 NO ACTION

The “No Action” Alternative is the only alternative considered for this Project because the Applicant owns the land at the Project Site. Critically, the Applicant also owns and operates the existing Hawaiki CLS on the adjacent land parcel where the proposed Project terminates and that physical proximity limits potential siting at other locations. The proposed Project is the only viable approach due to the Applicant’s site control and proximity to the existing Hawaiki CLS. Additionally, the Applicant’s experience with the existing Hawaiki CLS also demonstrates the feasibility of construction for the Project as proposed utilizing installation of bore pipes via HDD.

The No Action Alternative is not considered a viable alternative. The proposed Project would provide O‘ahu with additional carrier-neutral submarine telecommunication cable landing facilities, which would greatly reduce financial and schedule risk for future inter-island or trans-Pacific cable systems. Under a “No Action" Alternative, the Project would not be constructed and there would be no contributions to increasing access to additional telecommunications cable landing facilities that would improve the diversity and security of network connectivity. Therefore, no action would be taken to help achieve the objectives of the Hawai‘i Connect Kākou Initiative, which identifies advance permitting for seaward and landing access for cable landings as the single greatest risk hurdle for new trans-Pacific landings.

5. LAND USE PLAN AND POLICY CONFORMANCE

5.1 FEDERAL

The following sections discuss the applicable Federally established ordinances, plans, and policies.

5.1.1 RIVERS AND HARBORS ACT SECTION 10

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 401 et seq.) requires that a permit is obtained from the USACE prior to the construction of any structure within or over any navigable waters of the United States. The Project involves the installation of subsurface HDD bores, therefore a permit from the USACE Honolulu District must be obtained.

The applicant has submitted their pre-construction notification for Nationwide Permit (NWP) 57 coverage under Section 10 of the Rivers and Harbors Act of 1899. NWP 57 is a Clean Water Act general permit, which may be used to authorize smaller projects that are not expected to have significant impacts. NWP 57—Electric Utility Line and Telecommunications Activities authorize the construction, maintenance, repair, and removal of electric utility lines, telecommunication lines, and associated facilities, including fiber optic cables and HDD routes, in Waters of the United States (WOTUS). The definition of an “electric utility line and telecommunication line” includes “any cable, line, fiber optic line, or wire for the transmission for any purpose of electrical energy, telephone, and telegraph messages, and internet, radio, and television communication” (USACE Wilmington District 2021). The USACE is the lead approving agency for NWP-57 permits, however, consultation with other relevant federal agencies is required per the permit review process. A pre-construction notification is required for all NWPs to determine whether the proposed construction activities would have no more than minimal individual and cumulative impacts to critical resource waters. NWP general conditions are applicable to all projects requiring an NWP; the USACE Honolulu District has additional regional conditions that may be applicable.

5.1.2 CLEAN WATER ACT

The Clean Water Act (33 U.S.C. §1251 et seq.) was established in 1972 to regulate the discharge of pollutants into WOTUS and regulate water quality standards.

5.1.2.1 SECTION 401, WATER QUALITY CERTIFICATION AND SECTION 402, NPDES PERMIT

For projects that may result in wastewater discharge or discharge of dredged or fill material into WOTUS, a Water Quality Certification (WQC) is required per Section 401 of the CWA and a National Pollution Discharge Elimination Permit (NPDES) Permit is required per Section 402 of the CWA. Project construction activities have the potential to result in inadvertent discharges into WOTUS, therefore a WQC and NPDES Permit coverage must be obtained prior to the start of construction activities. The HDOH CWB is responsible for issuing a Section 401 WQC and Section 402 NPDES Permit.

A Section 401 WQC is required because there is a small possibility for inadvertent release of drilling fluid into WOTUS during the installation of HDD routes. Additionally, a Section 402 NPDES Permit is required due to the potential for stormwater run-off related to construction activities. BMPs proposed in Section 2.5.3 would be implemented to reduce potential impacts to water

quality from construction-related activities. Based on communications with the USACE Honolulu District, which has blanket 401 coverage from the HDOH CWB for certain Nationwide Permit (NWP) activities, the Project anticipates coverage under the Blanket Section 401 WQC for Certain 2021 Department of the Army (DA) Nationwide Permits (NWP) and Activities, File No. WQC1092. NPDES coverage is anticipated under the HDOH Construction General Permit.

5.1.3 ENDANGERED SPECIES ACT AND MIGRATORY BIRD TREATY ACT

The ESA of 1973 is administered by the USFWS and NMFS. The ESA was established to conserve and protect endangered and threatened species and their habitats. The ESA prohibits the take of federally threatened or endangered fish or wildlife species unless prior approval has been granted through Section 7 or Section 10 of the ESA.

According to Section 7.a.2 of the ESA each federal agency shall ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of endangered or threatened species (16 U.S.C. 1536(a)(2)). Section 7 requires that federal agencies consult with NMFS and USFWS prior to the start of project activities that have the potential to negatively impact endangered or threatened species. Following review of the project, NMFS and the USFWS would develop a BA which determines whether it is likely for the Project to have adverse impacts on a threatened or endangered species. If the BA determines that the Project has the potential to adversely affect a federally threatened or endangered species, then an Incidental Take Permit would need to be issued prior to the start of project activities. ESA reviews for species and critical habitat under USFWS and NMFS jurisdiction were submitted as part of the NWP package to facilitate ESA consultation (See Appendix B NMFS BA).

The Migratory Bird Treaty Act (MBTA) of 1918 also applies to the proposed Project. The MBTA was established to facilitate the sustainability of all protected migratory bird species populations and prohibits the “take” of any protected migratory species without prior authorization from the USFWS. Under the MBTA, “take” is defined as pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting of any migratory bird species or attempts to do so (50 CFR 10.12). BMPs such as implementation of a nesting bird survey prior to vegetation clearing at the Project Site and down-shielded lighting are proposed to minimize any potential impacts.

Refer to Sections 2.6 through 2.8 for a detailed discussion of existing conditions and potential impacts. Overall, the biological impacts related to Project activities would be considered less than significant and the proposed project is not expected to result in the “take” of any federally listed plant or wildlife species or migratory birds. Therefore, the Project would be in compliance with the ESA and MMPA.

5.1.4 NATIONAL HISTORIC PRESERVATION ACT, SECTION 106 CONSULTATION

The NHPA of 1966 establishes “a national preservation program and a system of procedural protections, which encourage both the identification and protection of historic resources” (NPS 2023). Section 106 of the NHPA requires that federal agencies consider the effects of federal undertakings on historic properties, where “historic properties” is defined as a prehistoric and historic sites, buildings, structures, districts, or objects included in the NRHP. Federal undertaking

is defined as “project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license or approval” (36 CFR 800.16(y)). Activities in the offshore portion of the Project Area require a federal permit and are therefore considered a federal undertaking which must be reviewed by federal agencies to determine potential impacts on historic properties.

As discussed in Section 2.9, an AIS was conducted by ERM on 20 May 2024 on the onshore Project Site. The AIS was conducted in compliance with HRS §6E-42, HAR §13-276, and NHPA Section 106. A desktop literature review was also conducted. Given that offshore Project construction would occur below the seafloor, a marine archaeological study was not conducted as it is unlikely that any archaeological or historical resources would be encountered. As no archaeological sites or features were identified during the study, it was determined that the Project would not have an effect on historic properties (see Appendix A for the full survey report). However, in the case of an inadvertent discovery, work would immediately be stopped until further guidance is provided by the DLNR-State Historic Preservation Division (SHPD).

The Project Site is located within 181 feet (55 meters) of a segment of the OR&L track, a portion of which is listed in the Hawai‘i State Register of Historic Places (Site 50-80-12-9714). The HDD bores would be installed below the ground and would not impact the historic resource. Although no impacts are expected, the Project would pass through the right-of-way and would therefore require a Use and Occupancy Permit from the HDOT and Federal Highways Administration (FHWA).

A CIA was conducted by GANDA in compliance with HRS §343. As part of this process, individuals who may know of local traditional cultural practices were contacted to provide input. A consultant, Mr. Shad Kane, in 2016 identified a culturally significant site 90 meters south-southwest of the Project but also stated that it is not currently used for cultural practices, nor do they believe the Project would have an impact on the site. As such, no impacts to cultural or historic resources are anticipated. Consultation with the SHPD has been initiated per NHPA Section 106 and HRS Chapter 6E-42.

5.1.5 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation Management (MSA; 16 U.S.C. 1801), established in 1976 and amended in 2007, was developed to aid in the conservation and management of fisheries in U.S. federal waters by fostering the long-term biological and economic sustainability of fisheries. The jurisdiction of the MSA extends out to 200 nautical miles from the shore. The MSA created eight regional fishery management councils responsible for conservation of the fisheries in their regions to promote long-term biological and economic sustainability of the fisheries in the U.S. Exclusive Economic Zone (EEZ).

Fisheries within the Hawai'ian Islands are managed by the Western Pacific Regional Fishery Management Council (WPRFMC). The WPRFMC is required to identify EFH in Fishery Management Plans (FMPs) for all federally managed species. The MSA defines EFH as “those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity” (50 CFR 600). For the purposes of this definition, “waters” means aquatic areas and their associated physical, chemical, and biological properties; “substrate” includes sediment, hard bottom,

structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and healthy ecosystem; and “spawning, feeding, and breeding” is meant to encompass the complete lifecycle of species (50 CFR 600).

Project activities could include potential sediment disturbances, noise, and inadvertent releases. All effects are anticipated to be temporary and localized and would be minimized through the implementation of the conservation measures discussed in Section 2.6.3. No measurable alterations would occur to the physical, chemical, or biological properties of the water or substrate in the Action Area. The Project would have no effect on EFH or fisheries and therefore would be in compliance with the MSA. A detailed analysis of EFH was included in the Project’s NMFS BA (Appendix B) and submitted to the USACE as part of the NWP permit package.

5.2 STATE OF HAWAIʻI

The following sections discuss the ordinances, plans, and policies established by the State of Hawaiʻi.

5.2.1 ENVIRONMENTAL IMPACT STATEMENT LAW, CHAPTER 343, HAWAIʻI REVISED STATUTES

Chapter 343 of the HRS provides standards for an environmental review process that aims to properly address environmental concerns, in addition to economic and technical considerations, associated with development projects. HRS §343-5 outlines the actions that require an EA. An EA is required for the proposed Project because the site is located within the designated shoreline setback area, within state owned lands, including submerged lands under the jurisdiction of the DLNR OCCL, land within the state’s right-of way associated with OR&L and Farrington Highway, and land under the jurisdiction of the City and County of Honolulu. Prior to preparing this EA, pre-consultation was conducted with various agencies and stakeholders (see Section 9: Consultation).

The OCCL receives and reviews the draft EA, and submits the draft EA to the Environmental Review Program the Office of Environmental Quality Control who publish the draft EA in “The Environmental Notice”. This would prompt a 30-day public review period during which agencies and community members would have the opportunity to provide comments or questions which would need to be addressed in the final EA.

5.2.2 STATE LAND USE LAW, CHAPTER 205, HAWAIʻI REVISED STATUTES

The State Land Use Law (HRS §205) was adopted in 1961 and is administered by the Land Use Commission. The State Land Use Law established four major Land Use Districts (Rural, Agricultural, Urban, and Conservation) and a framework for managing land use within each district.

The Project’s BMHs and fronthaul conduit system would be located within the Agricultural Land Use District; however, some of the bore pipe routes would be located within the Agricultural Land Use District and the Conservation Land Use District. A portion of the HDD1 and HDD2 conduits would run through a mapped offshore Conservation District Protective Subzone (Marine District) (Hawaiʻi Statewide GIS Program 2024). All remaining HDD bores are within the Conservation District Resource Subzone. Per HAR §13-5-13, the purpose of the Resource Subzone is to facilitate

"the sustainable use of the natural resources of those areas" and per HAR §13-5-11, the purpose of Protective subzones is to protect "valuable resources in designated areas such as restricted watersheds, marine, plant, and wildlife sanctuaries, significant historic, archaeological, geological, and volcanological features and sites, and other designated unique areas". The City and County of Honolulu also has designated zoning districts, as would be further discussed in Section 5.3.3 City and County of Honolulu Zoning.

The Agriculture Land Use District was designated to protect land for crop and timber cultivation, aquaculture, livestock, and wind energy (State of Hawai'i Land Use Commission n.d.) The soils within the Agricultural Land Use District are designated as Class E, the least productive soil type (Hawai'i Statewide GIS Program 2013). Permissible uses for land within Agricultural Land Use Districts with Class E soil are provided in HRS §205.2 and §205-4.5. The Project would be considered a permitted use, as §205-4.5.a.7 states that one permissible use within the Agricultural Land Use District is "Public, private, and quasi-public utility lines and roadways, transformer stations, communications equipment buildings, solid waste transfer stations, major water storage tanks, and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, treatment plants, corporation yards, or other similar structures."

The OCCL retains jurisdiction over land within the Conservation Land Use Districts and approval from the OCCL must be obtained prior to the start of Project activities. A portion of the HDD1 and HDD2 conduits would intersect a Protective Subzone, however all HDD conduits intersect a Resource Subzone.

For the segment within the Protective Subzone, the most applicable permitted land use identified is in §13-5-22 (P-14 Telecommunications, D-1): "New telecommunications facility. A management plan approved simultaneously with the permit, is also required." For the segment within the Resource Subzone, the most applicable permitted land use identified is in §13-5-24 (R-5 Marine Construction, D-1) "Dredging, filling, or construction on submerged lands, including construction of harbors, piers, marinas, and artificial reefs." Land uses beginning with the letter D would also require a Conservation District Use Permit from the Board of Land and Natural Resources. With the approval of the Conservation District Use Permit, the Project would be determined consistent with the State Land Use Law. A right-of entry permit application would also be submitted to the Board of Land and Natural Resources to construct the bore pipes in submerged lands owned by the state.

5.2.3 STATE ENVIRONMENTAL POLICY, CHAPTER 344, HAWAI'I REVISED STATUTES

The purpose of HRS §344 State Environmental Policy is to encourage harmony between people and the environment while preventing damage to the environment. Guidelines are established in §344-4. The following sections includes a discussion of Project compliance with relevant policies.

(3) Flora and fauna

> *(3)(A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard; and*

(3)(B) Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.

Project impacts to any protected plant and wildlife species, if present, will be minimized through the implementation of BMPs listed in Sections 2.6 through 2.8. Areas that were cleared for construction staging will be allowed to naturally revegetate following the completion of construction activities and/or augmented with native vegetation. Additionally, the Project does not involve the introduction of new plants or animals. As such, any impacts to indigenous flora and fauna will be temporary and minimal.

(4) Parks, recreation, and open space

(4)(A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses.

The Project is not expected to significantly impact scenic, historic, cultural, or park and recreation areas. As discussed in Sections 2.9 and 2.10, archaeological surveys and desktop reviews determined that it is unlikely that any historic or cultural resources would be encountered within the Project Area. Additionally, any scenic impacts during construction are expected to be minor and temporary. Ultimately, all Project infrastructure would be subsurface and not impact the viewshed. Localized offshore recreation would only be temporarily limited while the HDD bores are being constructed.

(4)(B) Protect the shorelines of the State from encroachment of artificial improvements, structures, and activities.

Boring at the Project Site would start at a depth of approximately 3 feet below ground level but would extend to a maximum depth of approximately 130 to 150 feet below ground level. Therefore, no construction would occur within the shoreline area itself.

(5) Economic development

(5)(A) Encourage industries in Hawai'i which would be in harmony with our environment.

The Project involves the construction of infrastructure to increase the capacity, reliability, and speed of internet access. Increased internet service may benefit numerous sectors and the economy by potentially improving productivity. Additionally, as discussed in Section 2, any impacts to the environment would be minor and temporary with the implementation of BMPs. As such, the Project's outcomes and objectives are consistent with the State of Hawai'i's economic development and environmental plans.

(9) Education and culture

(9)(B) Encourage both formal and informal environmental education to all age groups.

More reliable, high speed internet access would benefit education for all age groups through improved access to online information and educational programs both at home and at school. The Hawaiki CLS acts as an on-ramp to wholesale inter-state and international bandwidth services which local telecommunications service providers – including the University of Hawai'i, use to enhance the State's connectedness and online collaboration opportunities. Therefore, the Project would help to encourage both formal and informal environmental education to all age groups.

5.2.4 COASTAL ZONE MANAGEMENT ACT, CHAPTER 205A, HAWAIʻI REVISED STATUTES

The Hawaiʻi Coastal Zone Management Act (CZMA) (HRS §205) was established in 1977 to comply with the federal Coastal Zone Management Act enacted in 1972. The Hawaiʻi CZMA is administered by the State of Hawaiʻi Office of Planning and Sustainable Development with the objective of managing development within coastal areas to protect coastal resources. The marine portion of the Project lies within the CZMA area; therefore, the Project must comply with the policies and objectives outlined in §205A-2 of the CZMA act.

The CZMA has 10 main objective areas: Recreational Resources, Historic Resources, Scenic and Open Space Resources, Coastal Ecosystems, Economic Uses, Coastal Hazards, Managing Development, Public Participation in Coastal Management, Beach Protection, and Marine Resources. Notably, based on communications with the USACE Honolulu District, the Project anticipates coverage under the Hawaii Coastal Zone Management Program Federal Consistency Review for the 2020 Nationwide Permits Reissuance. The following section discusses the Project's compliance with relevant policies of the CZMA.

5.2.4.1 RECREATIONAL RESOURCES

Objective

Provide coastal recreational opportunities to the public.

Policies

Improve coordination and funding of coastal recreational planning and management; and provide adequate, accessible, and diverse recreational opportunities in the CZMA area by:

- Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
- Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources would be unavoidably damaged by development; or requiring reasonable monetary compensation to the state for recreation when replacement is not feasible or desirable;
- Providing and managing adequate public access, consistent with conservation of natural resources to and along shorelines with recreational value;
- Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;
- Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
- Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;
- Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

- Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of Section 46-6.

Discussion

Project construction is not expected to impact ongoing and continued use of the shoreline and nearby recreational areas. The Project would utilize HDD for bore pipe installation, which would be located from approximately 3 feet (1 meter) below ground level at the onshore entry point to a maximum depth of approximately 130 to 150 feet (40 to 45 meters) along the boring profile to where they would exit beyond the surf zone approximately 2,500 to 3,000 feet (762 to 914 meters) from the entry point, in water depths of about 50 to 65 feet (15 to 20 meters). Therefore, the Project would not impact the beach and/or shoreline. When the HDD drill head exits the seafloor at the conclusion of the borings, access to the work area and around the dive vessel would be controlled to maintain safe distances between the marine recreational public and the active area of work. However, access would only be temporarily controlled offshore during installation. A public notice would be published prior to the start of construction to advise mariners, beach goers, and tour boat operators that access would be temporarily restricted for a short period of time. The Project will not impact use of Makaīwa Beach Park, located directly south of the Project Area, or Kahe Point Beach Park located over the HDD corridors and to the north. Therefore, impacts to coastal recreational resources would be temporary and minimal. No long-term impacts to use of coastal recreational resources are anticipated.

5.2.4.2 HISTORIC RESOURCES

Objectives

Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawai‘ian and American history and culture.

Policies

- Identify and analyze significant archaeological resources;
- Maximize information retention through preservation of remains and artifacts or salvage operations; and
- Support state goals for protection, restoration, interpretation, and display of historic resources

Discussion

As discussed in Section 2.9, two AIS and a literature review were conducted, and no cultural resources were identified. Therefore, there are no known historic resources within the Project Area and the Project would not have an impact on historic resources. There is a culturally significant site approximately 90 meters south-southwest of the Project Site, however consultation with a local expert determined that the site is not currently used for cultural practices and that the Project is unlikely to result in any impacts to the culturally significant site. Nevertheless, an

Unanticipated Discovery Plan would be developed prior to construction. All Project construction activities would immediately be stopped, and an Inadvertent Discovery Protocol would be implemented in the case of an inadvertent discovery. Therefore, no impacts to Historic Resources are anticipated.

5.2.4.3 SCENIC AND OPEN SPACE RESOURCES

Objectives

Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies

- Identify valued scenic resources in the coastal zone management area;
- Keep new developments compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
- Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and
- Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion

The ‘Ewa Development Plan identifies the views of the ocean along the Farrington Highway between Kahe Point and the Wai‘anae Development Plan Area as a significant public view. Although south of Kahe Point and outside the ‘significant public view’ area, all Project construction would occur at grade or below ground. Additionally, the Project Site would be constructed inland of Farrington Highway. Use of HDD for the bore pipes avoids the alteration of any coastal landforms and open space resources, and the Project would not impact public views toward the ocean or along the shoreline. The completed Project would not diminish the quality of scenic views and coastal resources in the area in which it is located. Therefore, the completed Project would be compatible with the visual environment.

5.2.4.4 COASTAL ECOSYSTEMS

Objectives

Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies

- Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
- Improve the technical basis for natural resource management;
- Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

- Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
- Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion

The Project is not expected to have adverse impacts on coastal ecosystems. The Project may have potential temporary impacts to coastal resources during construction; however, potential impacts would be mitigated through BMPs that would be developed and implemented during construction. Project activities would not alter existing conditions at the site and impacts are expected to be less than significant. A more detailed discussion on coastal resources is provided in Sections 2.5 to 2.8.

HDD is considered the preferred method for boring due to the ability to avoid sensitive features and resources, however there is still some potential for an inadvertent release of drilling fluid during HDD activities. The potential of an inadvertent release of drilling materials during HDD activities is considered very low as the type of geological material identified in the Project vicinity is considered suitable for HDD, and proper drilling depth for the soil conditions would be maintained to protect against IDFR. Construction activities also have the potential to generate sediments and other pollutants that may be conveyed by stormwater runoff into nearby marine waters. However, the likelihood of construction impacts to marine water quality is very low due to the small disturbance area and implementation of BMPs (i.e. stormwater management plan, spill contingency plan, and IDFR contingency plan) that would prevent and minimize potential impacts to nearby coastal ecosystems. The Project would also follow appropriate measures as recommended by the USACE.

5.2.4.5 ECONOMIC USES

Objectives

Provide public or private facilities and improvements important to the state's economy in suitable locations.

Policies

- Concentrate coastal dependent development in appropriate areas;
- Locate, design, and construct coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
- Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such

areas, and permit coastal dependent development outside of presently designated areas when:

- Use of presently designated locations is not feasible;
- Adverse environmental effects are minimized; and
- The development is important to the state's economy.

Discussion

The Project is considered coastal dependent as it must be located near the shoreline to facilitate the connection of subsea cables. Additionally, the Project has been sited directly adjacent to the exiting Hawaiki CLS facility on the adjoining parcel. The Project was designed with consideration of the nearby social, visual, and environmental resources and is alignment with the State Land Use Laws. All Project construction will occur at grade or below ground, and no above ground structures will be built under this Project scope. The use of HDD for installation of the bore pipes would further reduce environmental effects because it would allow for future subsea telecoms cable landings without multiple, future construction activities conducted over a much longer period of time. HDD installation is unlikely to alter landforms and reefs and would have considerably less impact on water resources than trenching. Potential temporary environmental impacts that may occur during construction will be mitigated through the implementation of BMPs.

This Project and selected location demonstrate the Applicant's proposed plans to expand and improve the capabilities of their existing cable landing infrastructure in Kapolei, which will support the future landing and operation of new subsea fiber optic communication cables to Hawaii in support of the Hawai'i Kākou initiative. The Project is expected to contribute to the economy by increasing the capacity of Hawai'i's only carrier-neutral facility and providing access on a fair, competitive, and equal basis. The Project would provide capacity for up to six (6) new subsea cable systems to be terminated at the Project Site, based on market demand. These could be either domestic cables linking islands in the Hawai'ian archipelago, interstate cables linking Hawai'i to the CONUS, or international cables providing connectivity between Hawai'i/CONUS and across the Pacific Ocean. The Project would have positive impacts on the economy as the Project would increase competition in Hawai'i broadband and create direct links to overseas markets.

5.2.4.6 COASTAL HAZARDS

Objectives

Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies

- Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
- Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;

- Verify that developments comply with requirements of the Federal Flood Insurance Program; and
- Prevent coastal flooding from inland projects.

Discussion

The Project would not create increased hazards to life and the property. The Project Site would be located in Flood Insurance Rate Maps (FIRM) Zone D and the HDD bore pipes would extend from FIRM Zone D through Zone VE. According to the DLNR, flood hazards within Zone D are possible but the overall extent of the hazard is undetermined as no analysis has been conducted. Additionally, Zone VE indicates that the area is within the 1 percent annual chance coastal floodplain and is exposed to additional storm wave hazards. However, as the structures would be placed underground, flood hazards are not expected to impact Project facilities.

The Project Site would be located within an Extreme Tsunami Evacuation Zone, as indicated in the Oʻahu Tsunami Evacuation Map 17 Inset 1 (Pacific Disaster Center N.d.). People living within an Extreme Tsunami Evacuation Zone are only recommended to evacuate during extreme tsunamis triggered by an earthquake in the eastern Aleutian Islands with a magnitude of 9.0 or greater (City and County of Honolulu Department of Emergency Management 2024). Tsunami alerts are issued by the Hawaiʻi Pacific Tsunami Warning Center. However, as all structures are being placed underground and would not be occupied, the facilities associated with the Project would not be impacted by tsunami or storm waves. Although the Project could result in a minor increase of impervious surface area if the manhole lids are not buried, the Project Site would be graded to provide adequate drainage for local runoff and erosion control BMPs would be employed during construction. The completed Project is not expected to increase the potential for flooding.

5.2.4.7 MANAGING DEVELOPMENT

Objectives

Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies

- Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and
- Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion

The Project would go through the environmental review process, which includes the solicitation of input from public agencies and all necessary permits, including an SMA and shoreline setback variance (SSV), which would be obtained prior to construction. Comment letters received on the

Draft EA will be addressed and included in the Final EA. This process would help confirm that there are no long-term, adverse impacts on coastal resources, the public, and the environment. Throughout the environmental review process there would be various opportunities for the public to participate and provide comments on any issues and topics related to the proposed Project.

5.2.4.8 PUBLIC PARTICIPATION IN COASTAL MANAGEMENT

Objectives

Stimulate public awareness, education, and participation in coastal management.

Policies

- Promote public involvement in coastal zone management processes;
- Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and
- Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion

The environmental review process would provide opportunities for public participation once the draft EA has been published and public meetings would be required prior to the issuance of certain permits. In addition to the required public engagements, the Applicant is currently seeking public involvement via engagement with local stakeholders. As discussed further in Section 9, consultation with various stakeholders has already begun.

5.2.4.9 BEACH PROTECTION

Objectives

Protect beaches for public use and recreation.

Policies

- Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;
- Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
- Minimize the construction of public erosion-protection structures seaward of the shoreline.

Discussion

The Project would occur within the shoreline setback area; however, all development would occur underground and would not impact the shoreline or natural resources. The BMHs and fronthaul conduit system consist entirely of below-grade infrastructure that will be located inland of the

shoreline and would not interfere with natural shoreline processes as the Project does not include construction of shoreline hardening structures. HDD installation of the bore pipes, in lieu of open trenching, would allow the Project to cross below the shoreline without impacting beach transit corridors, public recreational use, or the overall shoreline area. The HDD bores would start approximately 3 feet below the upland entry point to a maximum depth of approximately 130 to 150 feet along the boring profile and would exit beyond the surf zone in water depths of about 50 to 65 feet. Project activities would not impact public access to nearby beaches for recreational use. BMPs, including temporary erosion and sediment controls and stormwater management measures, would be implemented during construction to reduce the potential for erosion.

5.2.4.10 MARINE RESOURCES

Objectives

Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies

- Verify that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
- Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;
- Assert and articulate the interests of the state as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
- Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
- Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources

Discussion

As discussed in Section 2.6, the Project is not expected to have a long-term, adverse impact on marine and coastal resources. However, potential short-term impacts during construction could include sediment and turbidity, inadvertent releases, and underwater noise. Such impacts would be temporary and Project activities would not alter the existing habitat for marine wildlife in the area. The implementation of BMPs would help limit any impacts. Additionally, the installation of conduits via HDD has been specifically chosen to avoid any potential impacts to sensitive coastal and benthic habitats. The Project would also follow appropriate measures recommended by the USACE. As such, impacts to marine resources are expected to be less than significant.

5.2.5 HAWAIʻI STATE PLAN, CHAPTER 226, HAWAIʻI REVISED STATUTES

The Hawaiʻi State Planning Act (HRS §226) establishes a framework to guide long-range development throughout the state through the identification of critical goals, objectives, and

policies. The following section discusses the Project's compliance with these relevant objectives, policies, and guidelines.

5.2.5.1 §226-6 OBJECTIVES AND POLICIES FOR THE ECONOMY—IN GENERAL

Objective

Planning for the State's economy in general shall be directed toward achievement of the following objectives:

Policies

Expand Hawai'i's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the state.

Discussion

The Project would provide the infrastructure to increase and expand telecommunication services from Hawai'i/CONUS across the Pacific Ocean. The enhancements to telecommunication services would help enhance Hawai'i's national and international communication capabilities, thereby supporting the Hawai'ian economy in general.

5.2.5.2 §226-10 OBJECTIVES AND POLICIES FOR THE ECONOMY—POTENTIAL GROWTH AND INNOVATIVE ACTIVITIES

Objective

Planning for the State's economy with regard to potential growth and innovative activities shall be directed towards achievement of the objective of development and expansion of potential growth and innovative activities that serve to increase and diversify Hawai'i's economic base.

Policies

(6) Expand Hawai'i's capacity to attract and service international programs and activities that generate employment for Hawai'i's people;

(7) Enhance and promote Hawai'i's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts;

(11) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research;

(12) Develop, promote, and support research and educational and training programs that would enhance Hawai'i's ability to attract and develop economic activities of benefit to Hawai'i;

(15) Increase research and development of businesses and services in the telecommunications and information industries.

Discussion

The purpose of the Project is to construct infrastructure that would provide increased capacity for telecommunication services on O'ahu. This infrastructure can be used to improve the capacity for

and reliability of telecommunication services in Hawai'i and internationally supporting business while enhancing and promoting Hawai'i's role in information technology. The new Project infrastructure would directly support the State's principles of the Connect Kākou initiative and BEAD program which are both designed to build a reliable high-speed internet service that can be enjoyed by communities that currently are underserved or have no internet access.

5.2.5.3 §226-10.5 OBJECTIVES AND POLICIES FOR THE ECONOMY—INFORMATION INDUSTRY

Objectives

Planning for the State's economy with regard to telecommunications and information technology shall be directed toward recognizing that broadband and wireless communication capability and infrastructure are foundations for an innovative economy and positioning Hawai'i as a leader in broadband and wireless communications and applications in the Pacific Region.

Policies

(1) Promote efforts to attain the highest speeds of electronic and wireless communication within Hawai'i and between Hawai'i and the world, and make high speed communication available to all residents and businesses in Hawai'i;

(2) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawai'i to accommodate future growth and innovation in Hawai'i's economy;

(5) Encourage greater cooperation between the public and private sectors in developing and maintaining a well-designed information industry;

(6) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people;

(7) Provide opportunities for Hawai'i's people to obtain job training and education that would allow for upward mobility within the information industry;

(8) Foster a recognition of the contribution of the information industry to Hawai'i's economy; and

(9) Assist in the promotion of Hawai'i as a broker, creator, and processor of information in the Pacific.

Discussion

The Project aligns with the objectives and policies set forth in this section. As mentioned previously, the Project would improve reliability, capacity and redundancy of the State's telecommunication infrastructure. This would benefit the people of Hawai'i by providing improved access to online resources such as job training and educational programs. The Project would assist in the promotion of Hawai'i as a broker, creator, and processor of information in the Pacific.

5.2.5.4 §226-11 OBJECTIVES AND POLICIES FOR THE PHYSICAL ENVIRONMENT—LAND BASED SHORELINE AND MARINE RESOURCES

Objective

Planning for the state's physical environment with regard to land-based, shoreline, and marine resources shall be directed towards achievement of the following objectives:

(1) Prudent use of Hawai‘i's land-based, shoreline, and marine resources.

Policies

(2) Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

(3) Take into account the physical attributes of areas when planning and designing activities and facilities.

(4) Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.

(8) Pursue compatible relationships among activities, facilities, and natural resources.

Discussion

The Project is a coastal-dependent development; however, it would not have any long-term, adverse impacts on shoreline and marine resources. Any potential impacts would be temporary and minimized through the implementation of BMPs and mitigation measures provided in Section 2.6. Adjacent land uses are currently permitted for similar uses; therefore, the Project is compatible with adjacent facilities.

5.2.5.5 §226-12 OBJECTIVES AND POLICIES FOR THE PHYSICAL ENVIRONMENT—SCENIC, NATURAL BEAUTY, AND HISTORIC RESOURCES

Objective

Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai‘i's scenic assets, natural beauty, and multi-cultural/historical resources.

Policies

(1) Promote the preservation and restoration of significant natural and historic resources.

(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.

(3) Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.

(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawai‘i's ethnic and cultural heritage.

(5) Encourage the design of developments and activities that complement the natural beauty of the islands.

Discussion

As discussed in Sections 2.9 and 2.10, there are no cultural, archaeological, or historical resources within the Project Site. There is a culturally significant site approximately 90 meters south-southwest of the Project Site, but it is not currently used for cultural practices, and it would not be impacted by Project activities. Therefore, there are no anticipated impacts to historic resources.

The Project Site would be constructed on the east side of Farrington Highway and would therefore not have an impact on scenic views west of the Highway. Although construction of HDD bores would temporarily impact scenic views east of the Highway (a crane would likely be visible at the Project Site), these impacts would be temporary and are limited to the duration of the construction activities. Once construction is complete, all construction equipment would be removed from the site. All infrastructure is being constructed underground, therefore there are no permanent impacts on scenic views associated with operations.

5.2.5.6 §226-13 OBJECTIVES AND POLICIES FOR THE PHYSICAL ENVIRONMENT—LAND, AIR, AND WATER QUALITY

Objective

Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:

(1) Maintenance and pursuit of improved quality in Hawai‘i's land, air, and water resources.

(2) Greater public awareness and appreciation of Hawai‘i's environmental resources.

Policies

(1) Foster educational activities that promote a better understanding of Hawai‘i's limited environmental resources.

(2) Promote the proper management of Hawai‘i's land and water resources.

(3) Promote effective measures to achieve desired quality in Hawai‘i's surface, ground, and coastal waters.

(4) Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai‘i's people.

(5) Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.

(6) Encourage design and construction practices that enhance the physical qualities of Hawai‘i's communities.

(7) Encourage urban developments in close proximity to existing services and facilities.

(8) Foster recognition of the importance and value of the land, air, and water resources to Hawai‘i's people, their cultures and visitors.

Discussion

The Project would result in minor contributions to emissions via the use of heavy construction equipment. However, impacts to air quality would be temporary and minimal with the implementations of BMPs described in Section 2.11. The Project may also result in minor impacts to water quality due to run-off associated with onshore construction activities or potential IDFR. Development of a SWPPP and TESC Plan, in addition to the implementation of BMPs and mitigation measures outlined in Chapter 2 would minimize the potential for impacts to water quality. As such, the Project would not substantially impact land, air, or water quality and is in line with the policies and objectives of this section.

5.2.5.7 §226-14 OBJECTIVES AND POLICIES FOR FACILITY SYSTEMS—IN GENERAL

Objectives

Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, sustainable development, climate change adaptation, sea level rise adaptation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.

Policies

(1) Accommodate the needs of Hawai‘i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.

(2) Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.

(3) Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.

Discussion

The Project has been sited directly adjacent to the exiting Hawaiki CLS facility on the adjoining parcel and would be connected with the existing facility infrastructure. The Project is in line with the policies and objectives set forth in this section by improving the affordability, reliability, and speed of telecommunication systems to meet the needs of Hawai‘ian citizens.

5.2.5.8 §226-18.5 OBJECTIVES AND POLICIES FOR FACILITY SYSTEMS—TELECOMMUNICATIONS

Objective

Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.

Policies

To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.

(c) To further achieve the telecommunications objective, it shall be the policy of this state to:

(1) Facilitate research and development of telecommunications systems and resources;

(2) Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;

Discussion

The Project would promote competitive, reliable, high-speed telecommunication services between Hawai'i, the CONUS, and countries across the Pacific Ocean through the development of new telecommunications infrastructure which would provide additional capacity for subsurface telecommunication cables. The Project would directly help achieve the objectives and goals set forth in this section.

5.2.5.9 §226-107 QUALITY EDUCATION

Objective

Promote quality education.

Guidelines

(5) Increase and improve the use of information technology in education by the availability of telecommunications equipment for:

(A) The electronic exchange of information;

(B) Statewide electronic mail; and

(C) Access to the Internet.

Encourage programs that increase the public's awareness and understanding of the impact of information technologies on our lives

Discussion

The Project would improve access to reliable, high-speed internet access and telecommunication services between Hawai'i, the CONUS, and other countries across the Pacific Ocean. Improved internet access and reliability would promote access to online information sources and support the use of online educational programs and online communication services.

5.3 CITY AND COUNTY OF HONOLULU

The following sections discuss the ordinances, plans, and policies established by the City and County of Honolulu.

5.3.1 O‘AHU GENERAL PLAN

The O‘ahu General Plan, most recently amended in December 2021, is the first-tier comprehensive planning document prepared to support the long-term development of the City and County of Honolulu. The General Plan has 11 key subject areas used to develop a framework for addressing public needs and government functions. The following discussion is focused on the relevant objectives and policies in each subject area.

5.3.1.1 BALANCED ECONOMY

- **Objective A**: To promote diversified economic opportunities that enable all the people of O‘ahu to attain meaningful employment and a decent standard of living.
- **Objective G**: To bring about orderly economic growth on O‘ahu
  - Policy 1: Concentrate economic activity and government services in the primary urban center and in the secondary urban center at Kapolei.

Discussion

The Project aligns with balanced economy objectives A and G as the Project would provide greater capacity within the secondary urban center at Kapolei to support telecommunication connections between Hawai‘i, the CONUS and across the Pacific Ocean. This Project supports the BEAD initiative which aims to provide all citizens with more affordable, reliable high-speed internet.

5.3.1.2 THE NATURAL ENVIRONMENT AND RESOURCE STEWARDSHIP

- **Objective A:** To protect and preserve the natural environment.
  - Policy 1: Protect O‘ahu’s natural environment, especially the shoreline, valleys, ridges, watershed areas, and wetlands from incompatible development.
  - Policy 4: Require development projects to give due consideration to natural features and hazards such as slope, inland and coastal erosion, flood hazards, water-recharge areas, and existing vegetation, as well as to plan for coastal hazards that threaten life and property.
  - Policy 5: Require sufficient setbacks from O‘ahu’s shorelines to protect life and property, preserve natural shoreline areas and sandy beaches, and minimize the future need for protective structures or relocation of structures.
  - Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawai‘i and O‘ahu, and protect their habitats.
- **Objective B:** To preserve and enhance natural landmarks and scenic views of O‘ahu for the benefit of both residents and visitors as well as future generations.
  - Policy 1: Protect the island’s significant natural resources: its mountains and craters; forests and watershed areas; wetlands, rivers, and streams; shorelines, fishponds, and bays; and reefs and offshore islands.
  - Policy 2: Protect O‘ahu’s scenic views, especially those seen from highly developed and heavily traveled areas.

- Policy 3: Locate and design public facilities, infrastructure and utilities to minimize the obstruction of scenic views.

Discussion

The Project aligns with the natural environment and resource stewardship objectives A and B which aim to preserve and protect O‘ahu’s natural environment. A biological survey and desktop assessment were conducted to assess potential impacts to the natural environment, including marine and terrestrial resources. Natural resources and potential impacts are discussed in more detail in Sections 2.4 through 2.8 which indicate that potential impacts to natural resources would be short term and minimal. Although the Project is located near the shoreline, all telecommunications infrastructure would ultimately be located subsurface (the Project does not involve the placement of aboveground structures so shoreline views would not be impacted). Once construction is completed, the site would be restored similar to its existing condition. With the implementation of best management practices, significant-long term impacts to natural resources are not expected.

5.3.1.3 TRANSPORTATION AND UTILITIES

- **Objective C:** To provide residents with a choice of living environments that are reasonably close to employment, schools, recreation, and commercial centers, and that are adequately served by transportation networks and public utilities
  - Policy 1: Maintain and upgrade utility systems in order to avoid major breakdowns and service interruptions

Discussion

The Project supports the expansion of utility infrastructure for future telecommunication systems to meet the needs of growing consumer demands, improve reliability of current systems and prevent service interruptions.

5.3.1.4 PHYSICAL DEVELOPMENT AND URBAN DESIGN

- **Objective A:** To coordinate changes in the physical environment of O‘ahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they would be located.
  - Policy 1: Provide infrastructure improvements to serve new growth areas, redevelopment areas, and areas with badly deteriorating infrastructure
- **Objective D:** To develop a secondary urban center in ‘Ewa with its nucleus in the Kapolei area.

Discussion

The Project is situated in the secondary urban center in ‘Ewa and would create additional capacity for subsurface telecommunication systems to serve the surrounding area and enhance connections between Hawai‘i/CONUS to across the Pacific Ocean. The development would occur underground and would not impact the urban design of the area nor would it hinder future development.

5.3.2 ʻEWA DEVELOPMENT PLAN

Oʻahu is comprised of eight regional planning areas, each of which has a Development Plan (DPs) or Sustainable Community Plan (SCPs) prepared by DPP. The DPs and SCPs are the second tier through which the City and County of Honolulu manages land use. The purpose of these plans is to provide long-range guidance on land use planning and development which helps to achieve the objectives of the City and County of Honolulu General Plan.

The Project falls within the ʻEwa regional planning area and must comply with the objectives, guidelines, and policies set forth by the ʻEwa Development Plan. The ʼEwa Development Plan serves as a secondary urban center in Oʻahu, with its center being in the City of Kapolei, and the goals and policies are expected to guide development through 2035. ʻEwa's role is to provide a range of residential areas, protect and promote diversified agriculture, provide a secondary employment center, and provide resort areas (City and County of Honolulu Department of Planning and Permitting 2020). The following discussion would focus on the Project's compliance with the DPs relevant policies and guidelines.

5.3.2.1 COMMUNITY GROWTH BOUNDARY

The Community Growth Boundary for ʻEwa is a delineated area designated to support urban development while protecting 3,000+ acres of prime agricultural lands (City and County of Honolulu Department of Planning and Permitting 2013). Urban areas would not be developed outside of this boundary. The Project Site falls within the Community Growth Boundary; therefore, the Project is in line with this policy.

5.3.2.2 OPEN SPACE PRESERVATION AND DEVELOPMENT

General Policies

Use open space to:

- Protect scenic views and natural, cultural, and historic resources; and
- Promote the accessibility of shoreline and mountain areas (as required by City Ordinance).

Guidelines

Shoreline Areas

- Identify and protect areas that are important to Native Hawaiʻian cultural practices.
- Provide, at a minimum, a 60-foot setback along the shoreline, and, where possible, expand the setback to 150 feet where justified, based on historic or adopted projections of shoreline erosion rates.
- Analyze the possible impact of sea level rise for new public and private projects in shoreline areas and incorporate, where appropriate and feasible, measures to reduce risks and increase resiliency to impacts of sea level rise.

Discussion

The Project only involves underground work and following completion of the Project, the scenic landscape would remain unchanged. The Project Site would be restored to a similar condition once construction is complete. As such, any impacts to scenic views would be short-term and there would be no long-term impacts (see Section 2.17 Scenic and Aesthetic Resources). Additionally, as discussed in Section 2.9 Archaeological and Historic Resource, the Project would not significantly impact natural, cultural, or historic resources.

The Project is shoreline dependent and would fall entirely within the 60-foot setback from the shoreline. Therefore, an SSV would need to be obtained, which is discussed further in Section 5.3.5 SSV. Additionally, the Project Area is susceptible to sea level rise and erosion. However, the HDD bore pipes, BMHs, and conduit systems would all be placed underground, and the landing site is approximately 55 feet above sea level; therefore, the Project is not expected to be impacted by sea level rise, nor would it impact erosion rates.

5.3.2.3 HISTORIC AND CULTURAL RESOURCES

General Policies

- Preserve significant historic features from the plantation era and earlier periods.
- Vary the treatment of sites according to their characteristics and potential value.
- Use in situ preservation and appropriate protection measures for historic, cultural, or archaeological sites with high preservation value because of their good condition or unique features, as recommended by the State Historic Preservation Officer. In such cases, the site should be either restored or remain intact out of respect for its inherent value.
- Retain significant vistas wherever possible.

Impacts of Development on Historic and Cultural Resources

- Public Views—Design and site all structures, where feasible, to reflect the need to maintain and enhance available views of significant landmarks and vistas. Whenever possible, relocate or place underground overhead utility lines and poles that significantly obstruct public views, under criteria specified in state law.

OR&L Historic Railway

- Adjacent Uses—Set back new development a minimum of 50 feet on either side of the OR&L right-of-way, unless it is either directly related to the operation of the railroad, or reconstruction of an historic use, or is consistent with the use of the right-of-way for open space and shared pedestrian path/bikeway purposes in stretches where railroad operation is not feasible, or is otherwise specified in existing land use approvals.

Discussion

The Project Site is situated along Farrington Highway, which the OR&L highway runs along (HDOT 2015). Project activities would cross through the OR&L right of way; however, all activities would occur underground and would not impact the surface. Additionally, given that construction would be below ground, there would be no long-term impacts to public views. As discussed in Section

2.9 Archaeological and Historic Resources, no cultural resources were encountered during a study of the Project Site. During the consultation process, a consultant identified a culturally significant site approximately 90 meters south-southwest of the Project Area. However, the site is not currently used for cultural practices and the consultant does not believe that Project activities would impact the culturally significant site. Nevertheless, an Unanticipated Discoveries Plan would be prepared prior to the start of Project activities. Inadvertent discovery protocol would be implemented if cultural or historical resources are encountered during construction.

5.3.2.4 NATURAL RESOURCES

General Policies

- Protect valuable habitat for waterbirds and other endangered animals and plants.
- Protect endangered fish and invertebrates in sinkholes.
- Require surveys for proposed new development areas to identify endangered species habitat, and require appropriate mitigations for adverse impacts on endangered species due to new development.
- Reduce light pollution's adverse impact on wildlife and human health and its unnecessary consumption of energy by using, where sensible, fully shielded lighting fixtures using lower wattage.

Discussion

As detailed in Sections 2.6 through 2.8, a biological survey was conducted during which no special status wildlife species were encountered. However, a desktop review determined that there are special status marine and terrestrial wildlife species with potential to occur in the Project Area. With the implementation of BMPs identified in Sections 2.6 through 2.8, Project activities are not expected to have significant adverse impacts to special status species.

On-shore construction activities may require additional temporary lighting for safety purposes. Any proposed lighting would be directed downward and would not illuminate toward the shoreline. The Project does not involve the addition of any new permanent light fixtures; therefore, there are no anticipated impacts from light or glare on wildlife or human health.

5.3.3 CITY AND COUNTY OF HONOLULU ZONING

The LUO, Chapter 21 of the ROH, sets guidelines and policies to regulate land use and encourage development while protecting public and environmental health. As discussed in Section 1.1.2 Property Description and Surrounding Land Uses, the Project would extend across three zoning districts: AG-2, Country District, and P-2.

The Project would be considered a utility installation which is defined in the LUO as structures and uses associated with the distribution of the utility service. Utility installations can be categorized as Type A or Type B depending on the anticipated impact to adjacent lands associated with the Project. Given that the Project is only anticipated to create minor, short-term impacts on adjacent lands, this Project would be considered a Type A utility installation.

The Project Site is within the General Agriculture District and the HDD bore pipes would be installed beneath the General Preservation District and Country District. Type A utility installations are permitted uses within these districts given that the Project activities comply with standards established in Article 5 of the LUO. However, the standards provided in LUO §21-5.650 for Type A utility installations only apply to installations involving a transmitting antenna. The Project does not involve the installation of a transmitting antenna, therefore the installations associated with the Project are a permitted use and the Project complies with the City and County of Honolulu Zoning Code.

5.3.4 SMA

The SMA is a protected area of land extending inland from the shoreline of Oʻahu. Pursuant to the HRS § 205A-1, each county is the primary authority for administering the SMA. The entirety of the Project Site is located within the SMA (Figure 5-1). Per HRS §205A-28, a permit must be obtained for all development within the SMA and development within this area must comply with the objectives, policies, and guidelines set forth by ROH §25. The current valuation of the project is greater than $500,000; therefore, a Major SMA Use Permit application would need to be obtained prior to the start of construction.

Conditions for development within the SMA are as follows (pursuant to ROH §25-6.1):

- **Exterior Lighting.** All exterior lighting on a shoreline lot must be shielded to reduce the possibility that seabirds and other marine life forms may become disoriented and harmed by the lighting. Shielded exterior lighting must be implemented both during and after any construction work on a shoreline lot. Any wall-mounted exterior lighting on buildings on a shoreline lot must be shielded by wall directors or other acceptable shielding, and all shielding must be specified on building permit plans. Artificial light from exterior lighting fixtures, including but not limited to floodlights, uplights, or spotlights used for decorative or aesthetic purposes on a shoreline lot are prohibited if the light directly illuminates or is directed to project across property boundaries toward the shoreline or ocean waters, or both, except as may otherwise be permitted by HRS Section 205A71(b).
- **Landscaping.** All landscaped areas, landscaping, and irrigation on or for any shoreline lot must be contained and maintained within the property boundaries of the shoreline lot of origin, and may not:
    - Be planted, watered, and maintained so that they act as a shoreline hardening barrier, such as naupaka, particularly if they alter or interfere with the natural beach processes;
    - Extend seaward of the shoreline as depicted on the current certified shoreline survey for the shoreline lot, or in the event there is no current certified shoreline survey for the lot, seaward of the presumed shoreline;
    - Extend into any adjoining beach access right-of-way, public or private.

The Project may involve nighttime work activities; as such any temporary nighttime lighting during construction would be shielded and be directed to the worksite, and away from the shoreline. The Project does not include the placement of any new permanent light fixtures. After construction, the Project Site would be restored to a suitable condition and no new landscaped

areas or irrigation systems are proposed. As such, there are no impacts related to exterior lighting or landscaping and no mitigation measures are proposed for the Project.

5.3.5 SSV

Shoreline setbacks were developed by the City and County of Honolulu to:

1. Reduce exposure to coastal hazards and increase the resilience of the community;
2. Protect and preserve the natural shoreline, coastal zone environments, and associated ecosystems, especially sandy beaches, coastal dunes, wetlands, and reefs;
3. Protect and preserve public pedestrian access laterally along the shoreline and to the sea;
4. Maintain, protect, and preserve open space and coastal scenic resources; and
5. Prohibit shoreline hardening unless necessary for coastal restoration or where it would result in a clear public benefit.

ROH Chapter 26 outlines the guidelines for establishing the shoreline setback line, the prohibited actions within the shoreline setback area, and the criteria for obtaining a shoreline setback variance. Pursuant to ROH §26-1.4, the shoreline setback is "Sixty feet on zoning lots where historical erosion data has not been collected for the Hawai'i shoreline study, or its successor, where the historical erosion data show coastal accretion, or where the historical erosion data show an annual coastal erosion rate of zero". According to the Hawai'i Shoreline Study Web Map (Coastal Geology Group in the School of Ocean and Earth Science and Technology at the University of Hawai'i 2021), there is no historical erosion data available for the Project location.

As the HDD bore pipes would be installed below the shoreline area, a SSV would need to be obtained prior to the start of construction. Once the Final EA is approved and a Finding of No Significant Impact is issued by the DLNR OCCR (and approved by the Board of Land and Natural Resources), the SSV application would be submitted to the DPP for review. Within 21-60 days after accepting the application, a public meeting would be held and within 45 days of the hearing, the DPP would provide a recommendation to the Honolulu City Council. Within 60 days of receiving the recommendation, a decision would be made.

Per ROH Chapter 26, the director may grant a SSV if the proposed activity meets one of three standards, including the "shoreline-dependent facility standard", the "public interest standard", and the "hardship standard". The proposed Project meets the criteria of the "shoreline dependent facility" standard and the "public interest standard".

> *Shoreline-dependent facility standard. A shoreline setback variance may be granted for a structure or activity that is necessary for or ancillary to a shoreline-dependent facility or improvement, including but not limited to public infrastructure, drainage facilities, and boating, maritime, or water sport recreational facilities; provided that the proposal is the practicable alternative that best conforms to the purpose of the shoreline setback rules.*

The Project would be considered a shoreline-dependent facility because the HDD bore pipes must pass through the shoreline setback area to reach the CLF.

> *Public interest standard. A shoreline setback variance may be granted for a structure or activity that is necessary for or ancillary to facilities or improvements by a public agency or public utility regulated under HRS Chapter 269, or necessary for or ancillary to private facilities or improvements that are clearly in the public interest; provided that the proposal is the practicable alternative that best conforms to the purpose of this chapter and the shoreline setback rules.*

The Project would include enhancements to connectivity and communication systems that would serve the public interest. The installation of the telecommunication infrastructure would support the Hawai‘i Connect Kākou Initiative and the BEAD program by increasing the capacity for future subsea cable systems that can support domestic cables linking islands in the Hawai‘ian archipelago, interstate cables linking Hawai‘i to the CONUS or international cables from Hawai‘i/CONUS to across the Pacific Ocean.

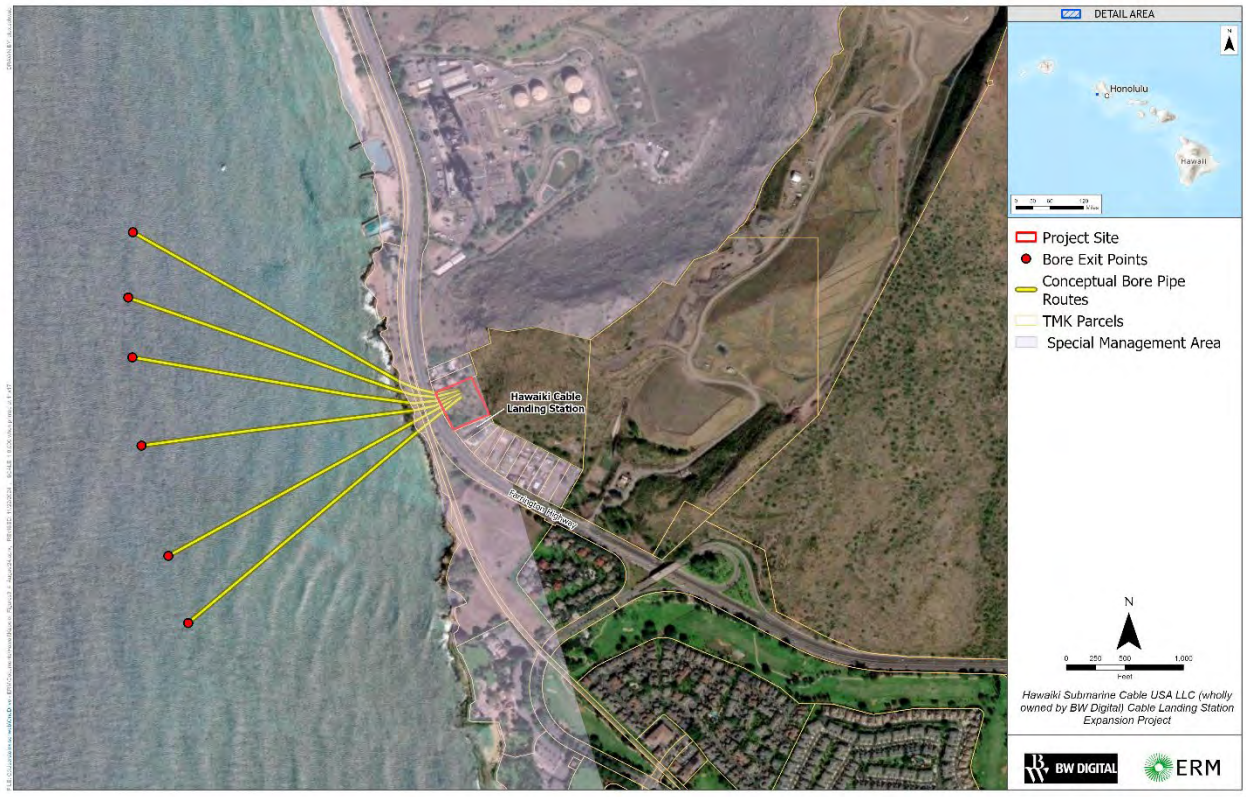


FIGURE 5-1: SMA

5.4 APPROVALS AND PERMITS

The following provides an overview of the federal, state, and local permits and approvals that must be obtained prior to the start of Project activities.

TABLE 5-1: FEDERAL APPROVALS AND PERMITS

Approval/Permit	Agency
Magnuson-Stevens Fishery Conservation and Management Act Consultation, inclusive of EFH Assessment	NMFS
Nationwide Historic Preservation Act Section 106 Consultation	SHPD
Nationwide Permit 57 under Section 10 of the Rivers and Harbors Act of 1899	United States Army Corps of Engineers
Standard Local Operating Procedures for Endangered Species in the Central and Western Pacific Region (Pac-SLOPES)	United States Army Corps of Engineers
ESA Section 7 Consultation	USFWS, NMFS

TABLE 5-2: STATE OF HAWAIʻI APPROVALS AND PERMITS

Approval/Permit	Agency
Conservation District Use Permit	DLNR
Environmental Assessment (HRS 343)	DLNR, Office of Conservation and Coastal Lands
Right of Entry Permit/Grant of Submarine Easement	DLNR, Board of Land and Natural Resources
Shoreline Certification	DLNR
Blanket CWA Section 401 Water Quality Certification	HDOH CWB
Construction General Permit (NPDES Permit)	HDOH CWB
Use and Occupancy Agreements (Farrington Highway and OR&L right-of-way	HDOT Highways Division
Permit to Perform Work Upon State Highways	HDOT Highways Division
Blanket Coastal Zone Management Consistency Certification	Hawaiʻi Office of Planning and USACE, Honolulu District
Noise Variance or Noise Permit	HDOH Indoor and Radiological Health Branch

TABLE 5-3: CITY AND COUNTY OF HONOLULU APPROVALS AND PERMITS

Approval/Permit	Agency
Right-of-Entry and Grant of Easement within Park (Kahe Beach Park)	Department of Parks and Recreation
Grading Permit	Department of Planning and Permitting
Shoreline Setback Variance	Department of Planning and Permitting
Special Management Area Use Permit (Major)	Honolulu City Council

6. UNAVOIDABLE ADVERSE IMPACTS

As discussed in Section 2: Affected Environment and Environmental Impacts, Project activities have the potential to result in temporary, localized, unavoidable adverse impacts to the environment and the public. The following section provides a summary of potential impacts and the Best Management Practices and mitigation measures that would be used to minimize any potential adverse impacts.

6.1 GEOLOGY

Impacts associated with geology include temporary removal of sediment, therefore the BMPs prescribed to reduce significant, long-term impacts include restoring the site to pre-existing conditions after construction.

6.2 NATURAL HAZARDS

There are no unavoidable adverse impacts related to natural hazards, such as floods, tsunamis, hurricanes, tropical storms, or earthquakes expected. However, to minimize the potential for impacts, the potential for natural hazards and lines of communication will be discussed during site safety training sessions.

6.3 ONSHORE WATER RESOURCES AND HYDROLOGY

There are no unavoidable adverse impacts related to onshore water resources and hydrology expected. The proposed implementation of a SWPPP and TESC will minimize the potential for erosion and sediment transfer from the temporary disturbance activities at the Project Site.

6.4 MARINE WATER QUALITY

Potential unavoidable adverse impacts to marine water quality include sediment deposition into offshore waters during onshore construction activities and inadvertent release of drilling fluid. With the implementation of BMPs and the development of an Inadvertent Contingency Release Plan, impacts would be minimal, localized, and temporary.

6.5 MARINE AND NEARSHORE BIOLOGICAL RESOURCES

There is potential for protected marine species to occur within the offshore portion of the Project. Additionally, the Project overlaps EFH, National Oceanic and Atmospheric Administration (NOAA)-mapped critical habitat, and NOAA-mapped proposed critical habitat. Potential impacts to these resources may be caused by sediment and turbidity, inadvertent fluid releases, noise, and vessel strikes. However, with the implementation of BMPs such as a HDD inadvertent release contingency plan, a spill contingency and hazardous materials management plan, and other measures outlined in Section 2.6.3, impacts would be minimal, localized, and temporary.

6.6 TERRESTRIAL BOTANICAL RESOURCES

The Project Site is dominated by non-native, invasive vegetation and there were no sensitive species observed during a biological field survey. Additionally, there are no sensitive plant species

with potential to occur. As such, no impacts to terrestrial botanical resources are expected and no BMPs or mitigation measures are proposed.

6.7 TERRESTRIAL WILDLIFE RESOURCES

Habitat on the Project Site may provide marginal habitat for the ‘ope‘ape‘a, pueo, migratory birds, and seabirds (flyovers). Impacts to the species would be minimized with the implementation of BMPs, such as pre-vegetation clearance nesting bird surveys, kiawe clearing outside the bat pupping period, and onshore lighting directed downward/shielded to avoid attracting migrating seabirds.

6.8 ARCHAEOLOGICAL, HISTORICAL, AND CULTURAL RESOURCES

Two archaeological surveys and a desktop literature review were conducted and determined that there are unlikely to be any archaeological, historical, or cultural resources present at the site. However, in the case of any inadvertent discoveries, an Unanticipated Discoveries Plan would be developed.

6.9 AIR QUALITY

The use of heavy equipment during construction is expected to generate minor contributions of air pollutants and fugitive dust at the Project Site. The proposed BMPs to reduce impacts to air quality and maintain compliance with emission standards include daily equipment inspections, spill response procedures, designated fueling and maintenance areas, wind screens, watering down areas with dust accumulation, weather-dependent timing of Project phases, using gravel for the temporary access road, keeping roads clean, reducing vehicle speed on dirt roads, and covering open bodies trucks.

6.10 NOISE

Construction activities, including the use of diesel-powered construction equipment, may temporarily cause elevated noise levels near the Project Site. With the implementation of BMPs provided in Section 2.12.3, noise-related impacts would be less than significant. Additionally, consultation with HDOH would occur prior to construction to properly address any noise concerns to avoid adverse impacts. The applicant plans to pursue a noise variance permit from the HDOH.

6.11 INFRASTRUCTURES AND UTILITIES

Project activities are not expected to negatively impact potable water, electric communications, wastewater, or solid waste generation. However, the Project would minorly increase the percentage of impermeable surfaces on site, limited to the three BMHs therefore causing increased stormwater runoff. To mitigate this, a TESC Plan and SWPPP would be developed to help comply with stormwater regulations.

6.12 SOCIOECONOMIC RESOURCES

The Project would create minor, temporary increases in traffic and each site contractor will be required to produce and abide by Traffic Management Plans to be agreed with HDOT.

6.13 PUBLIC SERVICES AND FACILITIES

The Project has the potential to increase fire risks during construction, as detailed in Section 2.15 Public Services. Fire risks would be minimized with adherence to general safe working practices. There are no expected impacts to medical services.

6.14 RECREATION

Other than the temporary traffic impacts previously discussed, there may be temporary navigation restrictions in offshore waters at the punch out location during construction. However, mariners would be provided with a notice of operations prior to the start of construction to inform them of the work, therefore no BMPs or mitigation measures are proposed. Construction would not require long-term or permanent closure of any adjacent resources.

6.15 SCENIC AND AESTHETIC RESOURCES

There are no anticipated impacts to scenic and aesthetic resources as the Project Site would be restored to pre-construction conditions and all equipment and debris would be removed from the site after construction. Therefore, no BMPs or mitigation measures are proposed. The potential environmental and public impacts associated with the Project are less than significant with the implementation of BMPs. The Project is instead expected to have an overall positive impact and directly benefit the public by providing infrastructure to enhance capacity for telecommunications connectivity between Hawai‘i/CONUS and across the Pacific Ocean which would improve the speed and reliability of telecommunication services for consumers.

7. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Project would require the use of construction materials and human and fiscal resources. As discussed in Sections 2.6 to 2.8, the Project Site is unlikely to provide critical habitat for any sensitive species and the implementation of BMPs would help prevent impacts to species that have the potential to occur at the site. Additionally, although minor vegetation removal is required to create the temporary access road, once construction is complete the access road would not be maintained, and the vegetation would be left to regrow. The site would also be restored as close to its original condition as possible once construction is complete, noting existing derelict animal shelters and general refuse will be removed. Historical and cultural resources were determined to be unlikely to be discovered at the site. Nevertheless, an Inadvertent Discovery Plan would be developed in the unlikely case resources are encountered during construction.

The Project Site is in proximity to privately and publicly owned recreational resources, but as stated in Section 2.16, construction activities would not require the closure of any resources and the only potential impacts to these resources are temporary increased traffic on Farrington Highway during construction and temporary patrolling in offshore waters near the punch-out location.

The Project is not expected to cause irreversible and irretrievable commitment of any resources. The Project would yield long-term benefits, such as increased reliability of telecommunication services throughout Hawai‘i and across the Pacific Ocean, which would help to justify the commitment of construction, human, and fiscal resources.

8. FINDINGS AND DETERMINATION

8.1 ANTICIPATED DETERMINATION

Based on the information presented in this EA, the proposed Project is not anticipated to have a significant environmental impact. Therefore, it is anticipated that the DLNR OCCL would issue a Finding of No Significant Impact. This determination is based upon an evaluation of the significance criteria set forth in HAR § 11-200-12, provided below.

8.2 SIGNIFICANCE CRITERIA

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resource**

As discussed in Section 7, the Project does not involve an irrevocable commitment to loss or destruction of any natural or cultural resources. No cultural resources were identified during the two AIS and desktop literature reviews that were conducted. During the consultation process with community members, one culturally significant site was identified. However, due to the distance of the Project to the site, no impacts are anticipated. As such, the Project is not expected to cause the loss of any cultural resources.

There are wildlife species with potential to occur in the area, but none of the habitat is considered essential for the viability of the species and any impacts are expected to be minimal and temporary. The implementation of BMPs identified in Section 2 would help reduce the potential for impacts to sensitive species. Additionally, minor vegetation removal would be required to construct the temporary access road. However, none of the vegetation being removed is native to the area and following construction the site would be restored to pre-construction conditions as much as possible and all vegetation would be left to re-grow. As such, the Project is not expected to cause the loss of any natural resources.

2. **Curtails the range of beneficial uses of the environment**

The Project would not curtail the range of beneficial uses of the environment. The Project Site is owned by the Applicant and is currently vacant and undeveloped. Project construction would not create the permanent closure of any recreational resources. Offshore waters would be temporarily patrolled near the punch-out area to limit users from approaching the work site. A notice would be provided to mariners so that they are aware of the upcoming construction. Controlled access would be temporary and once construction is complete there would be no impact to public access. Project activities would have no long-term, adverse impacts on the environment.

3. **Conflicts with the State's long-term environmental policies or goals, and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders**

As discussed in detail in Section 5: Land Use Plan and Policy Conformance, the Project does not conflict with any of the State's long-term environmental policies or goals. Project activities are in alignment with the State's policies and would not adversely impact environmental or public health.

4. Substantially affects the economic or social welfare of the community or state

The Project would have a positive impact on the economic and social welfare of the community and state. The Project would improve upon existing telecommunications infrastructure which would improve internet reliability for the community. Additionally, temporary jobs would be created during the construction phase.

5. Substantially affects the public health

Potential impacts to public health related to noise and air quality would be minor, temporary, and localized and would be mitigated through BMPs and compliance with regulations on the federal, state, and local level, all of which were identified in Section 2 of this EA. Additionally, construction and operation at the Project Site would not result in increased demands on local health care facilities and emergency services. As such, project activities are not expected to have adverse impacts on public health.

6. Involves substantial secondary impacts, such as population changes or effects on public facilities

As discussed in Section 3, the Project would not have significant adverse or secondary impacts, such as population changes or effects on public facilities. The proposed Project is intended to increase the capacity for telecommunication facilities and increase bandwidth of existing telecommunication services, however, it is not intended to specifically promote population growth. Additionally, the Project would not cause increased demands on public facilities. Any secondary impacts are expected to be temporary and less than significant.

7. Involves a substantial degradation of environmental quality

The Project does not involve a substantial degradation of environmental quality. Construction of the proposed Project would occur underground and any impacts to the environment would be minor and temporary. After construction, the site would be restored as closely to pre-construction conditions as possible. The implementation of BMPs and mitigation measures would help avoid any impacts.

8. Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions

Other local activities or projects may include vessel traffic, vehicle traffic, and local recreational activities. However, as previously mentioned, any potential impacts from the proposed Project would be temporary, localized, and minor. Therefore, any cumulative or concurrent activities or projects are unlikely to result in a considerable effect on the environment. The proposed Project would not involve any specific commitments to larger actions. However, the proposed Project would incentivize or encourage future subsea cable projects to utilize the proposed Project's infrastructure in order to streamline future permitting and planning processes. Any future subsea cable projects that utilize the proposed Project's infrastructure would be considered a separate project and would require a separate environmental review.

9. Substantially affects a rare, threatened or endangered species or its habitat

Rare, threatened, or endangered species or their habitat are not expected to be substantially impacted by the Project. There is some potential for protected species to occur in the offshore and

onshore portions of the Project (Sections 2.6 and 2.8). Additionally, the Project intersects NMFS National ESA critical habitat for Hawai‘ian monk seal, proposed critical habitat for green sea turtle, and EFH (Section 2.6.1.2). However, the Project would only result in short-term impacts that would not cause permanent alteration or damage to critical or essential habitat. The BMPs outlined in Section 2.6.3 and 2.8.3 would be implemented to minimize the potential for environmental impacts to biological resources.

10. Detrimentally affects air or water quality or ambient noise levels

The Project may have minor, temporary, and localized impacts on air or water quality and ambient noise levels. The use of heavy construction equipment is expected to release minor quantities of air pollutants into the environment. However, BMPs outlined in Section 2.11, such as using equipment that is properly maintained and in compliance with state and federal emission standards, would help to minimize the quantity of emissions.

Construction activities have the potential to create sediment runoff which may have minor impacts on water quality. However, any sediment deposited into the ocean are expected to quickly dissolve. Through the implementation of BMPs, a TESC Plan, and a SWPP, impacts to water quality would be minor.

The use of heavy equipment during construction activities would temporarily increase ambient noise levels at the Project Site. However, such increased noise levels would only be temporary and localized. As a result, impacts to air or water quality and ambient noise levels would be considered less than significant.

11. Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters

The Project does not involve the construction of any aboveground structures; all development would be constructed below the ground surface. The Project CLF are located within an Extreme Tsunami Evacuation Zone. Evacuation is recommended in Extreme Tsunami Evacuation Zones when an earthquake in the eastern Aleutian Islands with a magnitude of 9.0 or greater occurs as it increases the likelihood of an extreme tsunami occurring (City and County of Honolulu Department of Emergency Management 2024). However, it is unlikely that an extreme tsunami would occur during construction. As such, the Project and associated development are unlikely to be impacted by hurricanes, earthquakes, tsunamis, or other intense storms.

The CLS landing site is located within FIRM Zone D and the HDD bore routes would pass through FIRM Zone VE. Zone VE indicates that the area is high risk for flood hazards, however as the conduits are being installed underground, they would not be impacted during floods. For the portion of the Project Site within Zone D, the overall flood hazards remain undetermined, and the associated risks are unknown. With the implementation of stormwater runoff BMPs described in Chapter 2, impacts related floods are not anticipated.

12. Substantially affects scenic vistas and view planes identified in county or state plans or studies

As discussed in Section 2.17, the Project would not substantially affect scenic vistas and view planes identified in county and state plans or studies. Project construction would require the temporary use of one offshore dive vessel and onshore construction equipment such as a crane. Although the vessel and construction equipment would be visible, they would not substantially diminish scenic views and once construction is complete. The Project only involves the placement of underground structures, therefore there are no long-term impacts to scenic vistas associated with the Project.

13. Requires substantial energy consumption

The Project would not require substantial energy consumption. Vehicles and equipment used during construction would temporarily increase energy consumption. However, increased energy consumption would be less than significant and would be limited to the duration of work.

9. CONSULTATION

In the course of planning for the Project, community and department meetings were held. These efforts are summarized in the following subsection.

9.1 COMMUNITY MEETINGS

Community outreach for the Project began October 2024. The Applicants attended two community meetings for the purpose of introducing the Project, providing an overview of the planning process, and meeting with the community members. These included:

- Makakilo/Kapolei/Honokai Hale Neighborhood Board Meeting on 23 October 2024. Attendees included Makakilo/Kapolei/Honokai Hale Neighborhood attendees, Project representatives Lei'a Haff, John Bradfield, and Achie Reyes.
- Nānākuli-Māʻili Neighborhood Board - Land & Water Committee Meeting on 7 November 2024. Attendees included Nānākuli-Māʻili Neighborhood Board - Land & Water Committee, Project representatives Lei'a Haff, David Slessor, John Bradfield, and Achie Reyes.

9.2 PRE-ASSESSMENT CONSULTATION

A variety of meetings were held with politicians and departments. The purpose of the pre-assessment consultation was to consult with federal, state, and local agencies; organizations; and individuals with technical expertise or who may have an interest in or may be affected by the Project. Early consultation is part of the scoping process for the Draft EA, and input received in response to the meetings is taken into consideration.

A list of the agencies and other stakeholders that met with project applicants are listed below:

- Meeting and Hawaiki CLS tour with State Senator Maile Shimabukuro on 20 May 2024. Attendees included Project applicants and State Senator Maile Shimabukuro.
- City and County of Honolulu, Honolulu Department of Information and Technology, on 21 May 2024. Attendees included Project applicants and Mark Wong (Director and Chief Information Officer),
- State Digital Equity Coordinator on 21 May 2024. Attendees included Project applicants and Burt Lum QC (State Digital Equity Coordinator).
- Office of the Lieutenant Governor on 22 May 2024. Attendees included Project applicants, Lieutenant Governor Sylvia Luke, and Michele Kurihara-Klein (Executive Advisor).
- Department of Land and Natural Resources Office of Conservation and Coastal Lands (OCCL) on 23 May 2024. Attendees included Project applicants, Michael Cain (Administrator), and Trevor Fitzpatrick (Planner).
- SHPD on 23 May 2024. Attendees included Project applicants and Jessica Puff (Architecture Branch Chief).
- Department of Business, Economic Development and Tourism on 23 May 2024. Attendees included Project applicants, James Kunane Tokioka (Director), Chung I. Chang (Strategic Broadband Coordinator), and Burt Lum QC (State Digital Equity Coordinator).

- USACE Honolulu Office on 22 October 2024. Attendees included Project applicants, ERM Consultants, Dave Rojeck (USACE), and Josh Moffi (USACE).
- Honolulu Department of Planning and Permitting on 15 August 2024. Attendees included Project Applications, ERM Consultants, Alexander Beatty (DPP), and Jordan Dildy (DPP).

10. REFERENCES

Project Description

Belt Collins Hawai'i LLC. 2016. *Preliminary engineering report Hawaiki submarine cable station. Honouli' uli', Hawai'i*. Hawai'i.gov. Accessed 6 September 2024. Retrieved from: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2017-05-23-OA-FEA-Hawaiki-Submarine-Cable-Kapolei-Landing.pdf

Belt Collins Hawai'i LLC. 2017. *Traffic Assessment Report Hawaiki Cable Landing Station.* Hawai'i.gov. Accessed 6 September 2024. Retrieved from: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2017-05-23-OA-FEA-Hawaiki-Submarine-Cable-Kapolei-Landing.pdf

City and County of Honolulu, HESD (Honolulu Emergency Services Department). 2024a. *EMS Unit Locations.* Honolulu Emergency Medical Services. Accessed 6 September 2024. Retrieved from: https://emergencyservices.honolulu.gov/emergency-medical-services/ems-unit-locations/

City and County of Honolulu, HESD (Honolulu Emergency Services Department). 2024b. *Ocean Safety Task Force Recommendations.* Honolulu Emergency Services Department. Accessed 6 September 2024. Retrieved from: https://emergencyservices.honolulu.gov/wp-content/uploads/2024/04/OSTF-Recommendations-to-Mayor-Final-Report.pdf

EPA (United States Environmental Protection Agency). 2024a. Environmental Justice Screening Tool. Accessed 9 September 2024. Retrieved from: http://www.epa.gov/ejscreen

Hawai'ian Telcom. 2024. *About Us.* Hawai'ian Telcom. 6 September 2024. Retrieved from: https://www.hawaiiantel.com/aboutus/

HDOT (Hawai'i Department of Transportation). 2024. *HDOT Highways Project Status Map.* Hawai'i State GIS, Hawai'i Department of Transportation. Accessed 6 September 2024. Retrieved from: https://histategis.maps.arcgis.com/apps/MapSeries/index.html?appid=39e4d804242740a89d3fd0bc76d8d7de

Hawai'i Office of the Lieutenant Governor. 2024. *Connect Kākou Would Bring High-Speed Internet to Underserved Communities*. Office of the Lieutenant Governor Sylvia Luke. Accessed 24 October 2024. Retrieved from: https://ltgov.hawaii.gov/featured/connect-kakou-would-bring-high-speed-internet-to-underserved-communities/

U.S. Census Bureau. 2022. *American Community Survey (ACS) Demographic and Housing Estimates, 2019-2022 American Community Survey 5-Year Estimates*. Accessed 6 September 2024. Retrieved from: www.factfinder.census.gov

Climate

California Office of Environmental Health Hazard Assessment. 2024. *Coastal Ocean Temperature.* Accessed 30 October 2024. Retrieved from: Coastal ocean temperature - OEHHA

Clare, M.A.; I.A. Yeo; L. Bricheno; Y. Aksenov; J. Brown; I.D. Haigh; T. Wahl; J. Hunt; C. Sams; J. Chaytor; B.J. Bett; and L. Carter. 2023. *Climate change hotspots and implications for the global subsea telecommunications network.* Earth-Science Reviews Vol. 237, February 2023, 104296. Accessed 24 October 2024. Retrieved from: https://doi.org/10.1016/j.earscirev.2022.104296

EPA (United States Environmental Protection Agency). 2016. *What Climate Change Means for Hawai'i*. United States Environmental Protection Agency. Accessed 24 October 2024. Retrieved from: https://19january2017snapshot.epa.gov/sites/production/files/2016-09/documents/climate-change-hi.pdf

ORMP (Hawai'i Office of Planning, Coastal Zone Management Program). 2020. *The Hawai'i Ocean Resources Management Plan.* Accessed 24 October 2024. Retrieved from: https://files.hawaii.gov/dbedt/op/czm/ormp/ormp_update_reports/2020_ormp_final.pdf

Hawai'i Tourism Authority. 2024. *O'ahu Weather.* The Hawai'ian Islands. Accessed 24 October 2024. Retrieved from https://www.gohawaii.com/islands/oahu/travel-info/weather

Leadvent Group. 2024. *Submarine Power Cables in the Era of Climate Change: Risks and Mitigation.* Leadvent Group. Accessed 24 October 2024. Retrieved from: https://www.leadventgrp.com/blog/submarine-power-cables-in-the-era-of-climate-change-risks-and-mitigation#:~:text=Ocean%20acidification%2C%20caused%20by%20the,materials%2C%20leading%20to%20premature%20failure.

Pacific RISA. 2024. *Hawai'i*. Pacific RISA a NOAA Cap Team. Accessed 24 October 2024. Retrieved from: https://www.pacificrisa.org/places/state-of-hawaii-usa/

Price, Saul. 1983. *Climate of Hawai'i*. "Atlas of Hawai'i, Second Edition." University of Hawai'i Press. Accessed online 24 October 2024. Retrieved from https://www.weather.gov/hfo/climate_summary

Romine, B.M.; Habel, S.; Lemmo, S.J.; Pap, R.A.; Owens, T.M.; Lander, M.; Anderson, T.R. 2020. *Guidance for Using the Sea Level Rise Exposure Area in Local Planning and Permitting Decisions*. Prepared by the University of Hawai'i Sea Grant College Program with the Hawai'i Department of Land and Natural Resources—Office of Conservation and Coastal Lands for the Hawai'i Climate Change Mitigation and Adaptation Commission—Climate Ready Hawai'i Initiative. (Sea Grant Publication TT-20-01). Accessed 24 October 2024. Retrieved from: https://climate.hawaii.gov/wp-content/uploads/2020/12/Guidance-for-Using-the-Sea-Level-Rise-Exposure-Area.pdf.

WeatherGuy. 2024. *O'ahu Climate*. WeatherGuy: Predict, Provide, Protect. Accessed 24 October 2024. Retrieved from: https://www.weatherguy.com/oahu-climate/

Geology

Hirata & Associates. 2016. Drilling and Laboratory Testing Services, Hawaiki Cable Landing Station, Kapolei, Oahu, Hawaii. TMK: 9-2-051:11. Prepared for DR Fortress, Honolulu, Hawaii.

Hunt, C.D., Jr. 1996. *Geohydrology of the island of Oahu.* Hawaii: U.S. Geological Survey Professional Paper 1412-B.

Sherrod, D.R., J.M. Sinton, S.E. Watkins, and K.M. Brunt. 2007. Geologic Map of the State of Hawai`i: U.S. Geological Survey Open-File Report 2007-1089, 83 p., 8 plates, scales 1:100,000 and 1:250,000, with GIS database.

Tetra Tech, Inc. 2017. *Final Environmental Assessment for Hawaiki submarine cable Kapolei Landing, Kapolei, Island of Oʻahu, City and County of Honolulu*. Prepared for TE SubCom and Hawaiki Submarine Cable USA, LLC.

Natural Hazards

Businger, S. 1998. *Hurricanes in Hawai`i*. University of Hawaiʻi, Department of Meteorology. September 1988. Accessed on: 27 September 2024. Retrieved from: http://www.soest.Hawai`i.edu/MET/Faculty/businger/poster/hurricane/

City and County of Honolulu. 2008. *Seismic Hazards, 8. Earthquakes*. Nuclear Regulatory Commission. nrc.gov Accessed 27 September 2024. Retrieved from: 2008/08/26 - Pa'ina - Prefiled Staff Exhibit 52 - Honolulu Seismic Hazards, Earthquakes. (nrc.gov)

City and County of Honolulu, Department of Emergency Management. 2024. *Tsunami*. Accessed 04 October 2024. Retrieved from: https://www8.honolulu.gov/dem/tsunami/

FEMA (Federal Emergency Management Agency). 2024. Flood Data Viewers and Geospatial Data. Retrieved from: Flood Data Viewers and Geospatial Data | FEMA.gov.

Low, David K. and Mahadevia, Amit. 2013. *Floodproofing Non-Residential Buildings*. FEMA. Accessed 27 September 2024. Retrieved from: https://www.fema.gov/sites/default/files/2020-07/fema_p-936_floodproofing_non-residential_buiildings_110618pdf.pdf

NEC (NEC Corporation of America). 2016. *Final Environmental Assessment Southeast Asia-United States (SEA-US) Cable System, Makaha Beach Landing, Makaha Beach, Waianae, Island of Oʻahu Hawaiʻi*. Prepared for R.M Towould Corporation. Honolulu, Hawaiʻi. Project No. 1-22645-00P. Accessed 27 September 2024.

USGS (U.S. Geological Survey). 2017a. *About Earthquakes in Hawaiʻi*. Hawaiʻian Volcano Observatory (HVO). Accessed 04 October 2024. Retrieved from: http://hvo.wr.usgs.gov/earthquakes/

USGS. 2017b. *Damaging Earthquakes—A Common Hazard in Hawaiʻi*. Hawaiʻian Volcano Observatory (HVO). Accessed 04 October 2024. Retrieved from: http://hvo.wr.usgs.gov/earthquakes/hazards/

USGS. 2020. *Tsunami and Earthquake Research*. Retrieved from: Tsunami and Earthquake Research | U.S. Geological Survey.

WRCC (Western Regional Climate Center). 2024. *Climate of Hawai'i.* Climate Narrative of the States. National Oceanic and Atmospheric Administration Narrative Summaries, Tables, and Maps for Each State with Overview of State Climatologist Programs, Third Edition. Gale Research Company. Accessed 04 October 2024. Retrieved from: WRCC: Hawaii Climate

Onshore Water Resources and Hydrology

CWRM (State of Hawai'i Commission on Water Resource Management). 2024. *Surface Water Hydrologic Unit Boundaries—Update*. Accessed 24 September 2024. Retrieved from: https://geoportal.Hawaii.gov/datasets/HiStateGIS::watersheds/explore?location=21.410881%2C-157.961744%2C11.08

DLNR DAR (Division of Aquatic Resources). 2022. *Hawaii Streams. Hawaii State Office of Planning Statewide GIS Program*. Accessed 24 October 2024. Retrieved from: https://geoportal.hawaii.gov/datasets/HiStateGIS::streams/explore?location=21.342095%2C-158.116045%2C14.72

DOH (State of Hawai'i Department of Health). 2011. *DOH Aquifers Layer*. 2011. Department of Health. Accessed 24 October 2024. Retrieved from: https://files.hawaii.gov/dbedt/op/gis/data/aquifers_doh.pdf

Frazier, Abby G., Thomas W. Giambelluca, Henry F. Diaz, and Heidi L. Needham. 2016. "Comparison of Geostatistical Approaches to Spatially Interpolate Month-Year Rainfall for the Hawai'ian Islands." *International Journal of Climatology*.

Hirata & Associates. 2016. Drilling and Laboratory Testing Services, Hawaiki Cable Landing Station, Kapolei, Oahu, Hawaii. TMK: 9-2-051:11. Prepared for DR Fortress, Honolulu, Hawaii.

National Weather Service (NWS). 2024. O'ahu Precipitation Year to Date Map. Accessed 5 November 2024. Retrieved from: https://www.weather.gov/images/hfo/hydrosum/oahu_ytd_0924.gif

Nichols, Wouldiam D., Patricia J. Shade, and Charles D. Hunt, Jr. 1997. *Summary of the Oahu, Hawaii, Regional Aquifer-System Analysis.* United States Geological Survey – Professional Paper 1412-A. Accessed 24 October 2024. Retrieved from: https://pubs.usgs.gov/pp/1412a/report.pdf

Waste Management, Inc./Geosyntec Consultants, Inc. 2006. *Hydrological Setting and Groundwater Monitoring, Waimanolo Gulch Sanitary Landfill*, Kahe Valley, Island of Oahu, Hawaii.

Marine Water Quality

Beguería, Santaigo. 2022. Global SPEI Database. sbegueria/SPEIbase: Version 2.7 (v2.7). Zenodo. https://doi.org/10.5281/zenodo.5864391

Clean Water Branch (State of Hawai'i Department of Health Clean Water Branch). 2024a. *Water Quality Standards*. Clean Water Branch. Accessed 24 October 2024. Retrieved from: https://health.hawaii.gov/cwb/clean-water-branch-home-page/water-quality-standards/

Clean Water Branch (State of Hawai'i Department of Health Clean Water Branch). 2024b. 2024 State of Hawai'i *Water Quality Monitoring and Assessment Report.* Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117). Accessed 24 October 2024. Retrieved from: https://health.hawaii.gov/cwb/files/2024/02/IR-2024-public-comment-draft.pdf

CWRM (State of Hawai'i Commission on Water Resource Management). 2019. *Water Resource Protection Plan—2019 Update*. Prepared for State of Hawai'i Department of Land and Natural Resources Commission on Water Resource Management. Available online at: https://dlnr.hawaii.gov/cwrm/planning/hiwaterplan/wrpp/

CWRM (State of Hawai'i Commission on Water Resource Management). 2024. *Surface Water Hydrologic Unit Boundaries—Update*. Accessed 24 September 2024. Retrieved from: https://geoportal.Hawaii.gov/datasets/HiStateGIS::watersheds/explore?location=21.410881%2C-157.961744%2C11.08

EPA (United States Environmental Protection Agency). 2024b. *How's My Waterway? – Ko Olina, Hawaii.* My Waterway. Accessed 9 September 2024. Retrieved from: https://mywaterway.epa.gov/community/Ko%20Olina/overview

Tetra Tech, Inc. 2017. *Final Environmental Assessment for Hawaiki submarine cable Kapolei Landing, Kapolei, Island of O'ahu, City and County of Honolulu.* Prepared for TE SubCom and Hawaiki Submarine Cable USA, LLC.

Marine and Nearshore Biological Resources

Kerr, S.J. 1995. Silt, turbidity, and suspended sediments in the aquatic environment: an annotated bibliography and literature review. Ontario Ministry of Natural Resources, Southern Region Science and Technology Transfer Unit, Technical Report TR-008, Brockville, Ontario.

NMFS (National Marine Fisheries Service). 2022. Multi-Species Pile Driving Calculator Tool. Accessed 5 November 2024. Available online: Multi-Species Pile Driving Calculator Tool | NOAA Fisheries.

NMFS. 2024. EFH Mapper. Accessed on 29 July 2024. Access from: https://www.habitat.noaa.gov/apps/efhmapper/?page=page_5.

Tetra Tech, Inc. 2017. *Final Environmental Assessment for Hawaiki submarine cable Kapolei Landing, Kapolei, Island of O'ahu, City and County of Honolulu.* Prepared for TE SubCom and Hawaiki Submarine Cable USA, LLC.

Terrestrial Botanical Resources

Hawaii State Office of Planning. 2024. Hawaii Statewide GIS Program. Accessed 17 May 2024. Available online: https://geoportal.hawaii.gov/.

Archaeological and Historic Resources

Byerly, David and Patrick O'Day. 2017. *Archaeological Inventory Survey Report, Hawaiki Submarine Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i*. Prepared for Tetra Tech, Inc. Garcia and Associates, Kailua.

Fackler, Shawn. 2021a. *Cultural Resources Survey for the U.S. Fish & Wildlife Service's Gill Akupu Fence Construction Project*, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i. Prepared for the US Fish & Wildlife Service, North Wind Resource Consulting, Honolulu.

Fackler, Shawn. 2021b. Cultural Resources Survey for the U.S. Fish & Wildlife Service's Olson Palehua Fence Construction Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i. Prepared for the US Fish & Wildlife Service, North Wind Resource Consulting, Honolulu.

Fackler, Shawn. 2024. *Cultural Resources Survey for the Kapolei Submarine Cable landing Facilities*, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i. Prepared for BW Digital. Environmental Resources Management, Inc., Honolulu.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. *Online Rainfall Atlas of Hawai'i: Mean Annual Rainfall Island of O'ahu, 2011 Rainfall Atlas of Hawai'i*, Department of Geography, University of Hawai'i at Manoa. Go Visit Hawai'i. Accessed 24 October 2024. Retrieved from https://govisithawaii.com/2015/09/08/oahu-weather-guide/

Gill, Timothy M., Patrick V. Kirch, Clive Ruggles, and Alexander Baer. 2015. *Ideology, Ceremony and Calendar in Pre-Contact Hawai'i: Astronomical Alignment of a Stone Enclosure on O'ahu Suggests Ceremonial Use During the Makahiki Season*. The Journal of the Polynesian Society. Volume 124, No. 3. The Polynesian Society, University of Auckland, Auckland.

Hammatt, Hallett H and D.W. Shideler. 1989. *Archaeological Reconnaissance of the Six-Acre Proposed HECO Kahe Training Facility* (T.M.K. 9-1-3:27), Honouliuli, 'Ewa, O'ahu. Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.

Hammatt, Hallett H and D.W. Shideler. 1999. *An Archaeological Inventory Survey and Assessment for the Waimanalo Gulch Sanitary Landfill Project Site*, Honuliuli, 'Ewa, O'ahu. Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.

Handy, E.S. Craighill and Elizabeth G. Handy. 1972. *Native Planters in Old Hawai'i: Their Life, Lore, and Environment*. Bishop Museum Bulletin 233, Honolulu.

Haun, Alan E., and Marion Kelly. 1984. *Research Design for an Archaeological Survey of Naval Communication Area Radio Transmission Facility*, Lualualei; and Naval Air Station, Barbers Point, O'ahu, Hawai'i. Dept. of Anthropology, Bishop Museum, Honolulu.

Macdonald, Gordon A., Agatin T. Abbott, and Frank L. Peterson. 1983. *Volcanoes in the Sea: Geology of Hawai'i.* Second Edition. University of Hawai'i Press, Honolulu.

Monahan, Christopher M., and Douglas W. Thurman. 2013. *Archaeological Inventory Survey, Kunia Maka Loa Ridge C&C Farmlands Project*, Honouliuli Ahupua'a, 'Ewa District, O'ahu

Island, Hawai‘i. TMK (1) 9-2-004. Prepared for C&C Farmlands, LLC. TCP Hawai‘i, LLC, Kailua.

O’Day, Patrick. 2017. *Cultural Impact Assessment, Hawaiki Submarine Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupua‘a, ‘Ewa District, Island of O‘ahu, Hawai‘i*. Prepared for Tetra Tech, Inc. Garcia and Associates, Kailua.

Sterling, Elspeth P. and Catherine C. Summers. 1978. *Sites of O‘ahu*. Dept. of Anthropology, B.P. Bishop Museum, Honolulu

USDA-NRCS (U.S. Department of Agriculture—Natural Resources Conservation Service). 2024. Web Soil Survey. Electronic document, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed 10 May 2024.

Cultural Resources

Bowser, G. 1880. *The Hawaiian Kingdom Statistical and Commercial Directory*. George Bowser and Company, Honolulu and San Francisco.

Chiddix, J. and M. Simpson. 2004. *Next Stop Honolulu! The Story of the Oahu Railway and Land Company*. Sugar Cane Press, Honolulu.

Dorrance, W.H. and F.S. Morgan. 2000. *Sugar Islands: The 165-Year Story of Sugar in Hawai‘i.* Mutual Publishing, Honolulu.

Garcia and Associates. 2017. Archaeological Inventory Survey Report, Hawaiki Submarine Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupua’a, ‘Ewa District, Island of O’ahu, Hawai’i.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2013. *Online Rainfall Atlas of Hawai‘i: Mean Annual Rainfall Island of O‘ahu, 2011 Rainfall Atlas of Hawai‘i, Department of Geography, University of Hawai‘i at Manoa*. Go Visit Hawai‘i. Accessed 24 October 2024. Retrieved from https://govisithawaii.com/2015/09/08/oahu-weather-guide/

Frierson, B. 1972. *A Study of Land Use and Vegetation Change: Honouliuli, 1790-1925.* Manuscript prepared for Graduate Seminar in Geography (750), University of Hawai‘i, Honolulu.

Jayatilaka, H., T. Patolo, B. Nakamura, and R. Nees. 1992. Archaeological Survey and Subsurface Testing of the Proposed Hawaii Prince Golf Course, Ahupua‘a Honouliuli, ‘Ewa District, Island of O‘ahu. Prepared for the Myers Corporation, Honolulu. PASARG Bishop Museum, Honolulu.

Kuykendall, R.S. 1967. *The Hawaiian Kingdom, Vol.III*. University of Hawai‘i Press, Honolulu.

O’Day, Patrick. 2017. *Cultural Impact Assessment, Hawaiki Submarine Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupua‘a, ‘Ewa District, Island of O‘ahu, Hawai‘i*. Prepared for Tetra Tech, Inc. Garcia and Associates, Kailua.

Pukui, M.K., S.H. Elbert, and E.T. Mookini. 1974. *Place Names of Hawaii, 2nd Edition*. University of Hawai‘i Press, Honolulu.

Rasmussen C.M. and M.J. Tomonari-Tuggle. 2006. *Archaeological Monitoring of Waiau Fuel Pipeline, ʻEwa District, Island of Oʻahu*. Prepared for Hawaiian Electric Co, Inc., Honolulu. International Archaeological Research Institute, Inc., Honolulu.

Sterling, Elspeth P. and Catherine C. Summers. 1978. *Sites of Oahu*. Bishop Museum Press, Honolulu.

Tetra Tech, Inc. 2017. *Hawaiki Submarine Cable Kapolei Landing Final EA.* Hawaiki Submarine Cable, USA LLC.

The Oahu Railway & Land Company. 2020. Sugar Cane Press, Ltd. Retrieved from: https://oahurailway.com/history-operations/history/

Tuggle, H.D. and M.J. Tomonari-Tuggle. 1997. *Synthesis of Cultural Resource Studies of the "Ewa Plain, Task 1a:Archaeological Research Services for the Proposed Cleanup, Disposal and Reuse of Naval Air Station Barbers Point, Oʻahu, Hawaiʻi.* International Archaeological Research Institute, Inc., Honolulu.

Wilcox, C. 1997 *Sugar Water; Hawaiʻi's Plantation Ditches*. University of Hawaiʻi Press, Honolulu.

Unexploded Ordnance

DENIX (Department of Defense, Environment, Safety & Occupational Health Network and Information Exchange). 2022a. *3Rs Explosives Safety Education Program*. Retrieved from: 3Rs Explosives Safety Education Program (osd.mil)

DENIX (Department of Defense, Environment, Safety & Occupational Health Network and Information Exchange). 2022b. *Ordinance Reef Hawai'i*. Retrieved from: Ordnance Reef Hawaiʻi (osd.mil)

OCM (Office for Coastal Management). 2024. *Unexploded Ordnance Areas*. National Oceanographic and Atmospheric Administration National Marine Fisheries Service Office for Coastal Management. Accessed 24 October 2024. Retrieved from: Unexplodehttps://www.fisheries.noaa.gov/inport/item/66206#:~:text=Unexploded%20ordnances%20(UXO)%20are%20explosive,by%20the%20Department%20of%20Defense.d Ordnance Areas | InPort

USACE (U.S. Army Corps of Engineers). 2024. Formerly Used Defense Sites. Retrieved from: Honolulu District | Environmental | FUDS (army.mil)

Air Quality

HDOH (State of Hawaii, Department of Health). 2024. Retrieved from: Environmental Hazard Evaluation and Environmental Action Levels – Hazard Evaluation & Emergency Response (HEER) Office.

Infrastructure and Utilities

Belt Collins Hawaiʻi LLC. 2016*. Preliminary engineering report Hawaiki submarine cable station. Honouli' uli', Hawai'i*. Hawaiʻi.gov. Accessed 6 September 2024. Retrieved from: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2017-05-23-OA-FEA-Hawaiki-Submarine-Cable-Kapolei-Landing.pdf

Belt Collins Hawai'i LLC. 2017. *Traffic Assessment Report Hawaiki Cable Landing Station.* Hawai'i.gov. Accessed 6 September 2024. Retrieved from: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2017-05-23-OA-FEA-Hawaiki-Submarine-Cable-Kapolei-Landing.pdf

Hawai'ian Telcom. 2024. *About Us.* Hawai'ian Telcom. 6 September 2024. Retrieved from: https://www.hawaiiantel.com/aboutus/

SocioEconomic

Belt Collins Hawai'i LLC. 2017. *Traffic Assessment Report Hawaiki Cable Landing Station.* Hawai'i.gov. Accessed 6 September 2024. Retrieved from: https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2017-05-23-OA-FEA-Hawaiki-Submarine-Cable-Kapolei-Landing.pdf

EPA (U.S. Environmental Protection Agency). 2024a. Environmental Justice Screening Tool. Accessed 9 September 2024. Retrieved from: http://www.epa.gov/ejscreen

HDOT (Hawai'i Department of Transportation). 2024. *HDOT Highways Project Status Map.* Department of Transportation. Accessed 6 September 2024. Retrieved from: https://histategis.maps.arcgis.com/apps/MapSeries/index.html?appid=39e4d804242740a89d3fd0bc76d8d7de

U.S. Census Bureau. 2022. *American Community Survey (ACS) Demographic and Housing Estimates, 2019-2022 American Community Survey 5-Year Estimates*. Accessed 6 September 2024. Retrieved from: www.factfinder.census.gov

Public Services

City and County of Honolulu, HESD (Honolulu Emergency Services Department). 2024a. *EMS Unit Locations*. Honolulu Emergency Medical Services. Accessed 6 September 2024. Retrieved from: https://emergencyservices.honolulu.gov/emergency-medical-services/ems-unit-locations/

City and County of Honolulu, HESD (Honolulu Emergency Services Department). 2024b. *Ocean Safety Task Force Recommendations.* Honolulu Emergency Services Department. Accessed 6 September 2024. Retrieved from: https://emergencyservices.honolulu.gov/wp-content/uploads/2024/04/OSTF-Recommendations-to-Mayor-Final-Report.pdf

Recreation

City and County of Honolulu, Department of Parks and Recreation. 2024. *Park Locations and Facilities.* Accessed 08 October 2024. Retrieved from: https://www.honolulu.gov/parks/default/park-locations.html

Scenic and Aesthetic Resources

City and County of Honolulu, Department of Planning and Permitting. 2020. *'Ewa Development Plan.* City and County of Honolulu Department of Planning and Permitting. July 2013 Amended 2020. Accessed 24 October 2024. Retrieved from: https://www.honolulu.gov/rep/site/dpp/pd/pd_docs/Ewa_DP_2013_Amended_2020_Ordinance_20-46.pdf

Environmental Resources Management. 2024. *Draft National Marine Fisheries Service Biological Assessment, Kapolei Cable Landing Facilities*.

Land Use and Policy Conformance

City and County of Honolulu, Department of Planning and Permitting. 2013. *'Ewa Development Plan.* July 2013. Adopted on 22 July 2013 by Ordinance 13-26.

Coastal Geology Group in the School of Ocean and Earth Science and Technology (SOEST) at the University of Hawai'i. 2021. Hawai'i Shoreline Study. Retrieved from https://www.soest.hawaii.edu/crc/index.php/hawaii-shoreline-study-web-map

HDOT (Hawai'i Department of Transportation). 2015. Former OR&L Right-of-Way Section 106 Procedural Programmatic Agreement. OR&L Board Graphics 10.pdf (hawaii.gov)

Hawai'i Statewide GIS Program. 2013. LSB. LSB | Hawaii Statewide GIS Program

Hawai'i Statewide GIS Program. 2014. Conservation District Subzones. Conservation District Subzones - Overview (arcgis.com)

NPS (National Park Service). 2023. National Historic Preservation Act of 1966. National Historic Preservation Act of 1966 - Archeology (U.S. National Park Service) (nps.gov)

Pacific Disaster Center. N.d. Tsunami Evacuation Zones (Hawai'i). Hawaii State Tsunami Evacuation Maps (pdc.org)

USACE Wilmington District. 2021. NATIONWIDE PERMIT 57 - Utility Line Activities NWP57.pdf (army.mil)

Findings and Determination

City and County of Honolulu Department of Emergency Management. 2024. *Tsunami*. Tsunami (honolulu.gov)

APPENDIX A CULTURAL RESOURCES REPORT

Cultural Resources Survey for the Hawaiki Submarine Cable USA LLC (wholly owned by BW Digital) Cable Landing Station Expansion Project, Honouliuli Ahupua‘a, ‘Ewa District, O‘ahu Island, Hawai‘i

TMK 9-2-051-001

PREPARED FOR

BW DIGITAL

DATE
11 June 2024

REFERENCE
07336633

© Copyright 2023 by The ERM International Group Limited and/or its affiliates (‘ERM’). All Rights Reserved.

No part of this work may be reproduced or transmitted in any form or by any means, without prior written permission of ERM.

MANAGEMENT SUMMARY - ABSTRACT

Project Name:	Cultural Resources Survey for the Hawaiki Submarine Cable USA LLC (wholly owned by BW Digital) Cable Landing Station Expansion Project
Project Location:	Honouliuli Ahupua‘a, ‘Ewa District, O‘ahu Island, Hawai‘i
Tax Map Key:	9-2-051-001
Project Sponsor:	Hawaiki Submarine Cable USA LLC (wholly owned by BW Digital)
Applicable Regulations:	ERM conducted the survey to comply with Hawaii Revised Statues §6E-42 and in accordance with the implementing regulations contained in Hawaii Administer Rules (HAR) §13-276. Additionally, the project could be considered a federal “undertaking” as defined in 36 Code of Federal Regulations (CFR) 800.16(y), triggered by a requirement for U.S. Federal Highways Administration approval as well as permitting required by the U.S. Army Corps of Engineers. Therefore, the study was also conducted to Section 106 standards for compliance with the National Historic Preservation Act of 1966, as amended (NHPA).
Funding Source:	Private
Undertaking Description:	Hawaiki Submarine Cable USA LLC (Hawaiki) plans to develop a portion of TMK: 9-2-051-001, adjacent to its existing Hawaiki Cable Landing Station at 92-384 Farrington Highway. The proposed additional landing site will potentially include up to six horizontal directionally drilled (HDD) cable bores, up to three associated shoreline manholes, and fronthaul duct to the existing Cable Landing Station (CLS).
Area of Potential Effects:	Approximately 3 acres
Land Jurisdiction:	Private
Consultant Firm:	Environmental Resources Management, Inc. (ERM)
Hawaii Archaeological Permit No.	24-21
Project Number:	ERM Project No. 07336633
Date(s) of Fieldwork:	20 May 2024
Number of Isolates:	0
Number of Sites:	0
Management Summary:	No archaeological sites or features were identified during the survey; therefore, the undertaking is documented as an archaeological assessment pursuant to Chapter 13-284-5(5A)

under state of Hawaii rules and a "**no historic properties affected**" finding under 36 Code of Federal Regulations (CFR) §800.4.d., the implementing regulations of NHPA.

CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

On behalf of Hawaiki Submarine Cable USA LLC (Hawaiki), wholly owned by BW Digital, Environmental Resource Management, Inc. (ERM) conducted a Class III cultural resources survey for the proposed Hawaiki Submarine Cable USA LLC Cable Landing Station (CLS) Expansion Project (Project) in Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i (**Figures 1 and 2**). Hawaiki plans to develop a portion of Tax Map Key (TMK): 9-2-051-001, adjacent to its existing Hawaiki Cable Landing Station at 92-384 Farrington Highway (**Figure 3**).

The direct Area of Potential Effects (APE) is the proposed additional landing site while the indirect APE includes up to six horizontal directionally drilled (HDD) cable bores, up to three associated beach manholes, and fronthaul duct to the existing Cable Landing Station (CLS). ERM's survey focuses on the direct APE, approximately 3-acres of TMK: 9-2-051-001, as the indirect APE was previously covered during a recent archaeological inventory for the existing Hawaiki CLS facility (Byerly and O'Day 2017).

Shawn Fackler, MA, RPA served as the Project's Principal Investigator. He meets the professional qualification standards set by the Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation and Hawaii Administrative Rule (HAR) §13-281-3. Fieldwork was conducted on 20 May 2024, under Hawaii archaeological permit number 24-21.

No archaeological sites or features were identified during the survey; therefore, the undertaking is documented as an archaeological assessment pursuant to Chapter 13-284-5(5A) under state of Hawaii rules and a "no historic properties affected" finding under 36 Code of Federal Regulations (CFR) §800.4.d., the implementing regulations of NHPA. As required, this report contains a description of the field methods and of the APE. This report presents the results of ERM's study.

REGULATORY CONTEXT

ERM conducted the survey to comply with Hawaii Revised Statues §6E-42 and in accordance with the implementing regulations contained in HAR §13-276. Additionally, the project could be considered a federal "undertaking" as defined in 36CFR§800.16(y), triggered by a requirement for U.S. Federal Highways Administration approval as well as permitting required by the U.S. Army Corps of Engineers. Therefore, the study was also conducted to Section 106 standards for compliance with the National Historic Preservation Act of 1966, as amended (NHPA). The objective of the ERM survey is to satisfy historic preservation regulatory review requirements of Section 106 of NHPA, the Hawaii Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) review of effect of proposed state projects as contained with Hawai'i Administrative Rules, Chapter 6E-8 and inventory (and assessment) survey

requirements as contained within HAR, Title 13, DLNR, Subtitle 13, *State Historic Preservation Rules* (2003).

FIGURE 1. PROJECT DIRECT AREA OF POTENTIAL EFFECTS.

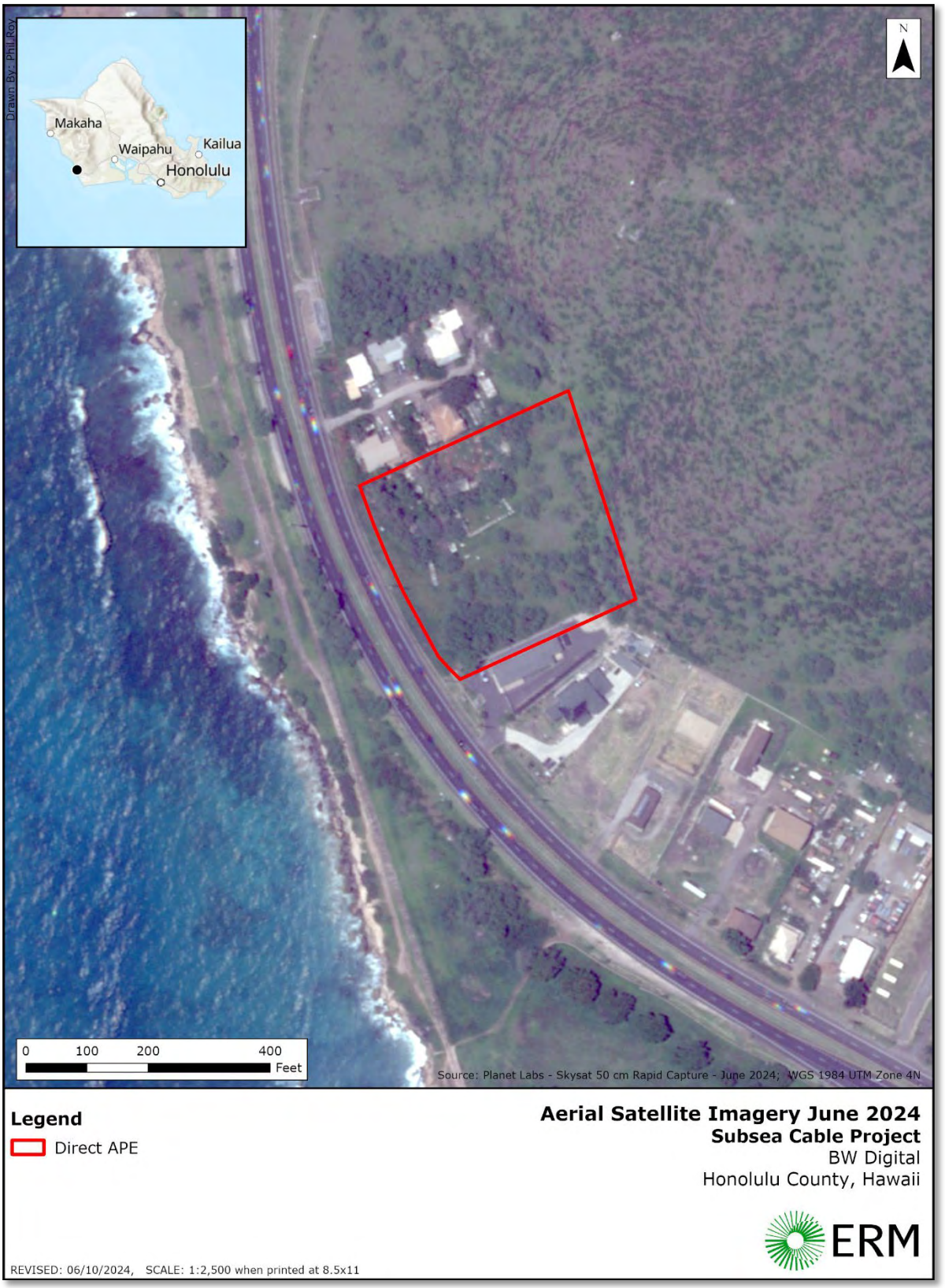


FIGURE 2. AERIAL IMAGERY OF THE DIRECT APE.

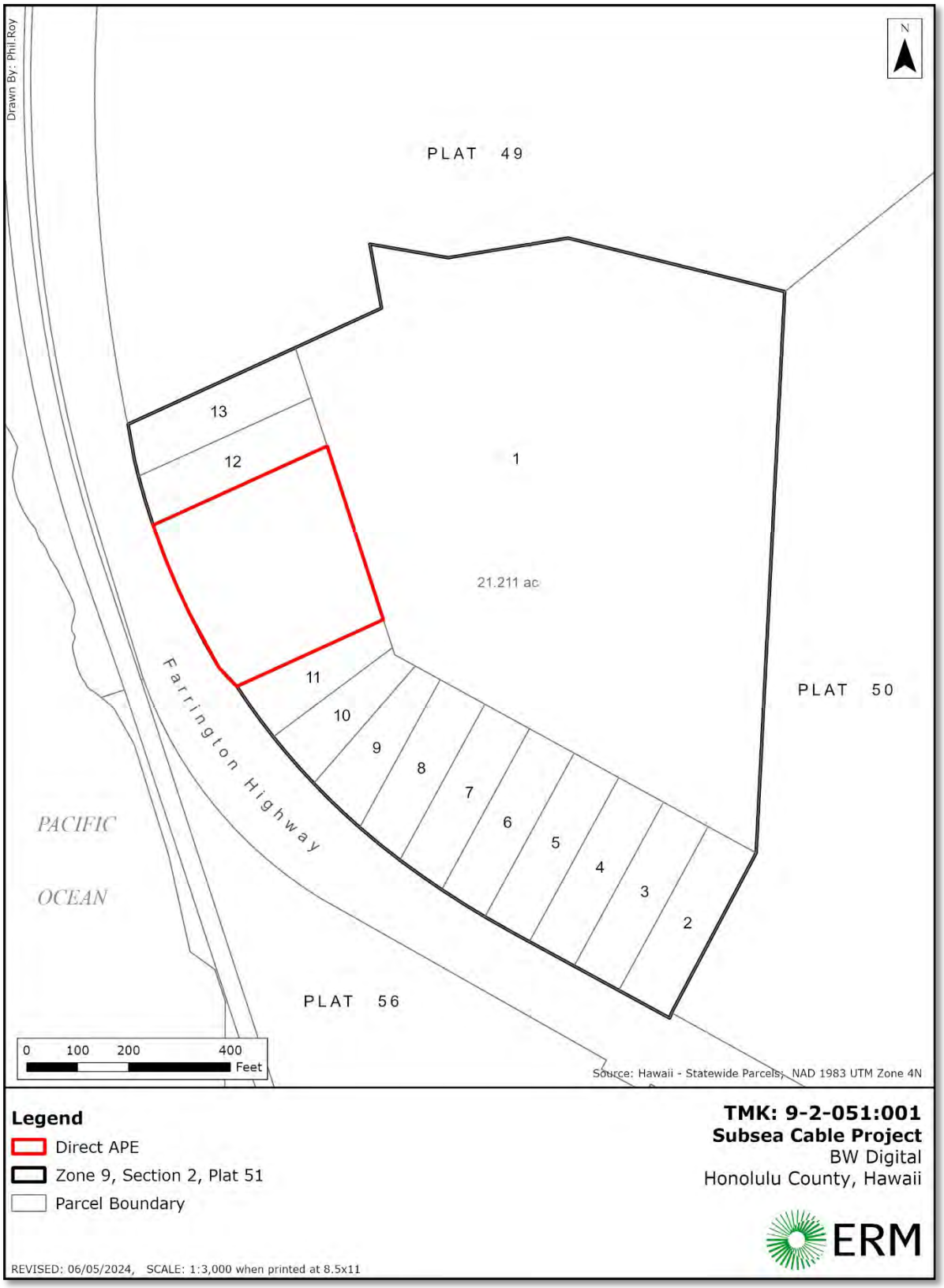


FIGURE 3. TAX MAP KEY (1) 9-2-051:001(POR) DEPICTING DIRECT APE.

The proposed undertaking requires compliance with federal and state preservation laws. The National Environmental Policy Act requires that federal agencies work to preserve not only natural resources but also important historical and cultural aspects of our national heritage (42 United States Code [USC] § 4321–4347). Federal agencies are required to consider the effects of their undertakings on historic properties and afford DLNR-SHPD and other parties with a demonstrated interest a reasonable opportunity to comment on such undertakings (16 USC 470).

Regulations for Protection of Historic Properties (36 CFR Part 800) implement Section 106 of NHPA. These regulations define a process for responsible federal agencies to consult with DLNR-SHPD, Native Hawaiian groups, other interested parties, and, when necessary, the Advisory Council on Historic Preservation to ensure that historic properties are duly considered as federal undertakings are planned and implemented.

For cultural resources, eligibility for listing in the National Register of Historic Places (NRHP) is used as the benchmark for evaluating the significance of the identified prehistoric and historic-period resources. Cultural resources generally include archaeological sites, historic buildings and structures, artifacts, and places of traditional, religious, and cultural importance. “Historic properties” are cultural resources that are either listed or eligible for listing in the National Register. Section 106 of NHPA (16 USC § 470) and its implementing regulations (36 CFR Part 800) provide the process and guidelines for historic property evaluations. To be determined eligible for inclusion in the National Register, properties must be important in history, architecture, archaeology, engineering, or culture. They also must possess integrity of location, design, settings, materials, workmanship, feeling, and association, and meet at least one of the following four criteria:

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

State requirements include **Criterion E**:resources that have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts--these associations being important to the group's history and cultural identity.

Properties can be of local, state, or national importance. Typically, historic properties are at least 50 years old, but younger properties can be considered for listing if they are of exceptional importance.

AREA OF POTENTIAL EFFECTS

The direct APE consists of the 3-acre parcel where the proposed additional telecommunications facility will be built within (1) 9-2-051: 001 (por). The indirect APE includes up to six horizontal directionally drilled (HDD) cable bores, up to three associated beach manholes, and fronthaul duct to the existing Cable Landing Station (CLS). The indirect APE was previously covered during a recent archaeological inventory for the existing Hawaiki CLS facility; no further work was recommended (Byerly and O'Day 2017).

HORIZONTAL DIRECTIONAL DRILLING METHODOLOGY

An HDD boring rig will be staged onshore, within the proposed CLS site (i.e., direct APE). The proposed beach manhole locations will be excavated into a pit approximately 3 meters (m) wide by 1 m deep to accommodate the installation and use of the HDD boring rig.

Six bore pipes, up to eight inches in diameter, would be installed to provide shore crossings for six future subsea fiber-optic cables. The bore pipe would be advanced along the pre-determined drill path while drilling fluid (containing bentonite) is pumped down the inside of the bore pipe and exited through the drill head. As drilling proceeds, pipe segments would be added, forming the steel conduit used to house the fiber-optic cable. Drilling fluid carrying hole cuttings would then return to the entry point through the annulus between the outside of the bore pipe and the bore hole.

The bore depth profile would start approximately 3 ft below ground level (1 m) at the onshore entry point to a maximum depth of approximately 130 to 150 ft (40 to 45 m) belowground level, passing under Farrington Highway and the Oahu Railway and Land Company (OR&L) right-of-way. Once the appropriate distance offshore is reached with the bore pipe, the drill head would be guided to the surface to complete the bore. The bore would "daylight" (exit) beyond the surf zone approximately 2,500 and 3,000 ft

A check valve would be installed at the offshore end of the pipe to keep sand and seabed debris from entering the bore pipe. A cap and locateor ball would also be installed and buried at the onshore end of the pipe priorto allow for easy relocation. Once each of the HDD bore pipe installations are complete, the new infrastructure would be left subsurface of the seabed.

ENVIRONMENTAL CONTEXT

GEOLOGY

The APE is at an elevation of 50 feet above sea level, at the base of the southern Waianae Mountain range. The 22-mile long mountain range derived from Wai'anae Volcano that comprises the western and older part of the island of O'ahu, Hawai'i (Macdonald et al. 1983:420-452). Presently exposed lavas of Wai'anae represent the subaerial shield and post-shield stages of Hawaiian volcanism, and range in age from about 3.9 to 2.8 million years ago. The rock units that make up the Wai'anae Volcano are known as the Wai'anae Volcanics. The Wai'anae Volcanic Series is divided into lower, middle, and upper members. The lower member is made up of the lava flows and pyroclastics that built the main mass of the Waianae shield. The middle member is mainly rocks that accumulated in the caldera, gradually filling it. Lastly, the upper member is a thin cap that has covered much of the shield late in its history. The volcano is now extensively eroded, bearing large amphitheater valleys on its western slopes.

The soil within the APE consists of Lualualei extremely cobbly clay (LPE) found on 3 to 35 percent slopes, derived from alluvial parent materials (**Figure 4**). It is classified as "not prime farmland" (U.S. Department of Agriculture-Natural Resources Conservation Service [USDA-NRCS] 2024). The *mauka* portion of the APE is within rock land (rRK), derived from *pahoehoe* lava with basalt parent material on 5 to 70 percent slopes. Lavas of Waianae volcano span compositions ranging from Tholeiitic and alkalic basalt through to evolved compositions such as icelandite, rhyodacite, hawaiite, and mugearite (Macdonald et al. 1983:420-452).

CLIMATE

The Waianae Mountains are largely shielded from the rains brought into the islands by the Northeasterly bearing trade winds by its neighbor, Koolau Volcano. This makes Waianae Mountains much drier, particularly on its westward (leeward slopes). This dryness keeps runoff to a minimum. Average rainfall in the APE is between 584 millimeters (Giambelluca et al. 2013).

VEGETATION

The indirect APE is largely covered in invasive buffelgrass (*Pennisetum ciliare*) and mature *kiawe* (*Prosopis pallida*) trees. Endemic species might have included *ʻōhiʻa* (*Metrosideros polymorpha)*, *lama* (*Diospyros sandwicensis*), and *ʻaʻaliʻi* (*Dodonaea viscosa*).

CULTURAL CONTEXT

Previous archaeological and ethnographic research conducted in the Honouliuli Ahupua'a helped provide a cultural overview for this study (Byerly and O'Day 2017; Fackler 2021a,

2021b; Gill et al. 2015; Hammatt and Shideler 1999, 2011; Handy and Handy 1972; Haun and Kelly 1984; Monohan and Thurman 2013; O'Day 2017; Sterling and Summers 1978). Much of the following is summarized from their reports, along with other primary and secondary sources. Because no cultural resources were encountered during the current study, the following context is not meant to be exhaustive.

TRADITIONAL HAWAIIAN AGRICULTURE

Traditionally, Hawaiians followed a complex system of land division and the concept of private property was unknown (Kirch 1984:255). High chiefs, or *ali'i* controlled all land and held it in trust for the whole population. Supervision of these lands was designated by the *ali'i* based on rank and standing.

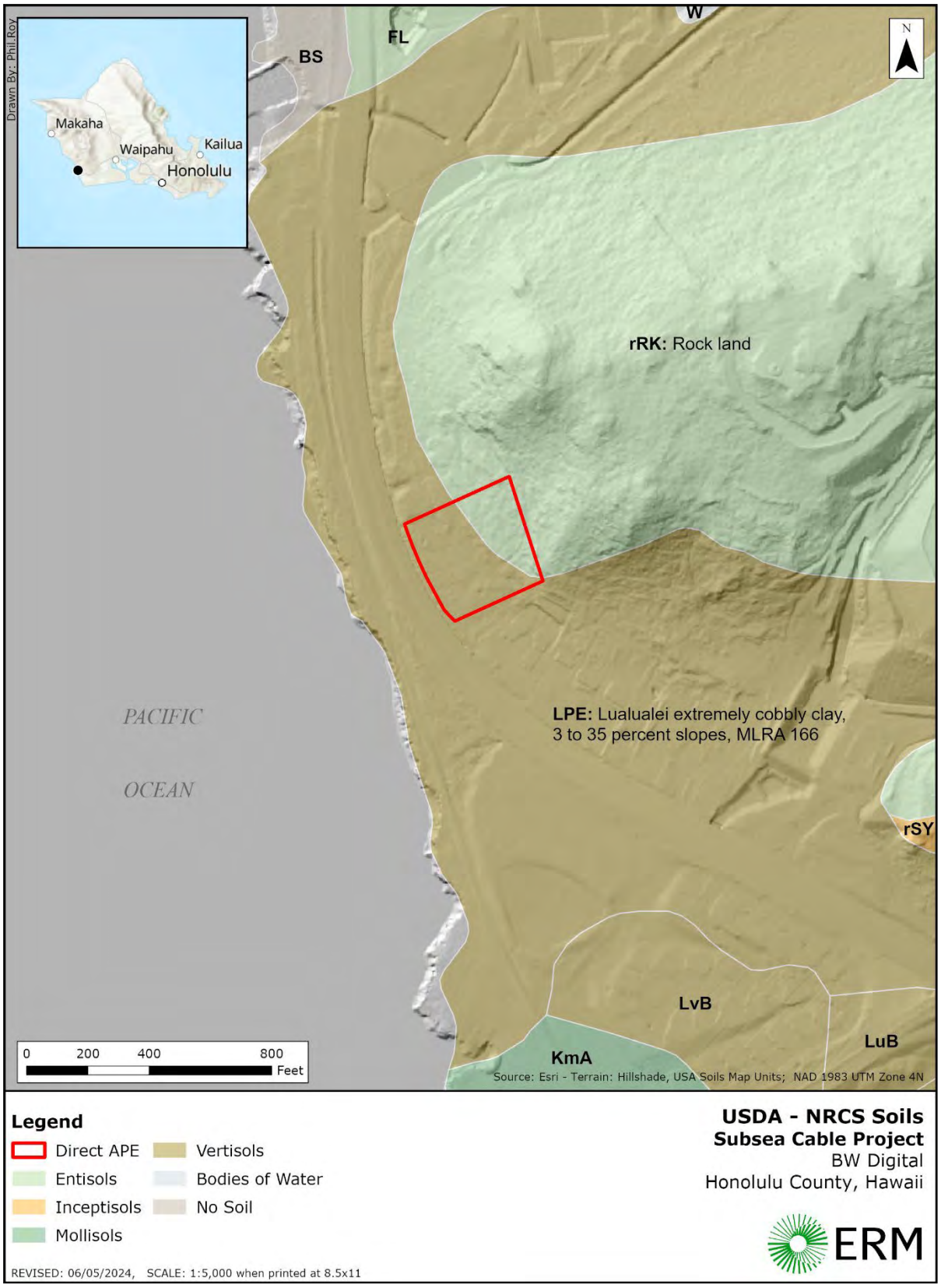


FIGURE 4. USDA-NRCS SOIL DATA OVERVIEW AND THE APE.

Several terms, such as *mokupuni, moku*, *ahupua'a, 'ili* or *'ili'āina*, *kuleana* were used to delineate various land sections. Islands, or *mokupuni* were divided in smaller parts, down to a basic unit belonging to a single family. A *mokupuni* was divided into several *moku* (districts), the largest units within each island, usually wedge-shaped and running from the mountains to the sea.

Several terms, such as *mokupuni, moku*, *ahupua'a, 'ili* or *'ili'āina*, *kuleana* were used to delineate various land sections. Islands, or *mokupuni* were divided in smaller parts, down to a basic unit belonging to a single family. A *mokupuni* was divided into several *moku* (districts), the largest units within each island, usually wedge-shaped and running from the mountains to the sea.

A *kahuna* (priest) named Kalaiha'ōhia, during the time of the *ali'i* (chief) Kakaalaneo, divided the islands into *moku* (Beckwith 1979:383). Each *moku* was further divided into *ahupua'a*, narrower wedge-shaped land sections that also ran from the mountains to the sea (**Figure 5**). The size of *ahupua'a* depended on the resources of the area with poorer agricultural regions split into larger *ahupua'a*, compensating for the relative lack of natural abundance (Kirch 1997:2).

Each *ahupua'a* was ruled by an *ali'i* and administered by a *konohiki* (headman) (Kirch 1997:2). The *ali'i 'ai moku* (the ali'i that rules the district) was entitled to the rights and responsibilities of the land. He kept the parcels he wanted, awarded higher *ali'i* large parcels, who in turn, distributed smaller parcels to lesser ali'i, all while *maka'āinana* (commoners) worked individual plots of land.

Extended household groups living within the *ahupua'a* utilized resources from both the land and the sea. This situation allowed each *ahupua'a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *'ili* or *'ili'āina* were smaller land divisions next to importance to the *ahupua'a* and were administered by the *ali'i* who controlled the *ahupua'a* where it was located (Lucas 1995:40). The land holding of a *hoa 'āina* (tenant) residing in an *ahupua'a* was called a *kuleana* (Lucas 1995:61).

During precontact times, there were primarily two types of agriculture, wetland and dry land farming, both of which were dependent upon geography and physiography (Kirch 1997:217). Stream valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *ko* (sugar cane [*Saccharum officinaruma]*) and *mai'a* (banana [*Musa* sp.]), were also grown and, where appropriate, such crops as *'uala* (sweet potato [*Ipomoea batatas]*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992: 119).

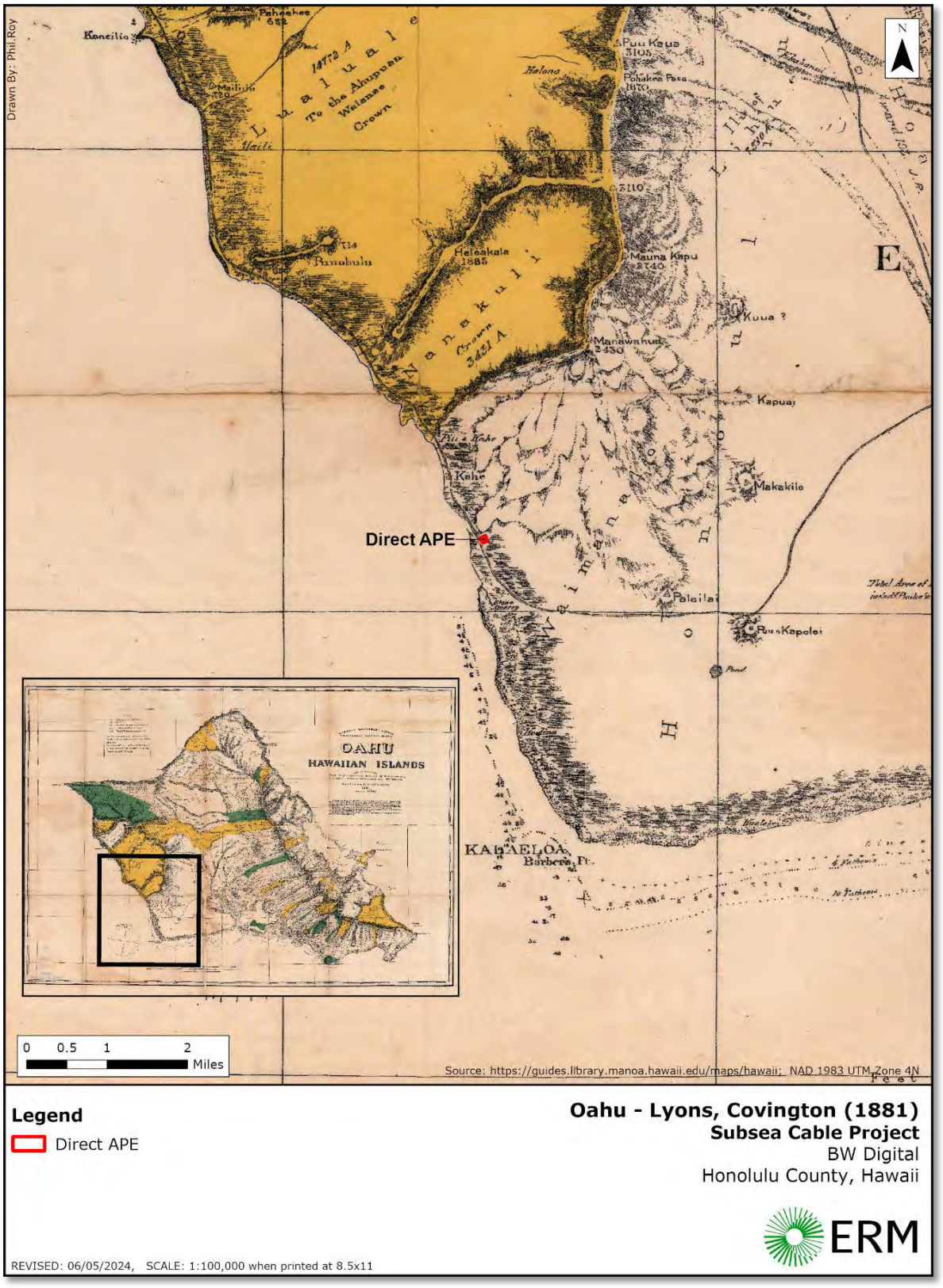


FIGURE 5. MAP OF O'AHU DEPICTING APE IN RELATION TO AHUPUA'A (LYONS 1881).

Moreover, recent study of a walled enclosure in the uplands of Honouliuli reports on multiple lines of evidence (i.e., astronomical orientation, ethnography, and carbon dating) demonstrating that the enclosure had a ceremonial use associated with the annual Makahiki harvest season (Gill et al. 2015). The Mahahiki is a four-month ritual period whose onset was determined by observation of the rising of the Pleiades star cluster that the enclosure is aligned. During the late period of Hawaiian history (AD 1650–1819) the Makahiki was institutionalized as a means of tribute collection by the emerging archaic state hierarchy (Gill et al. 2015; Hommon 2013; Kirch 2010).

MYTHOLOGICAL AND TRADITIONAL ACCOUNTS

The traditions of Honouliuli Ahupua'a have been complied and summarized numerous times, in studies by Sterling and Summers (1978), Hammatt and Folk (1981), Kelly (1991), Charvet-Pond and Davis (1992), Maly and Rosendahl (1993), and Tuggle and Tomonari-Tuggle (1997). Some of the themes of these traditions, include connections with Kahiki (the traditional homeland of Hawaiians, probably in reference to central Polynesia) and the special character and relationship of the places known as Pu'uokapolei and Kualaka'i.

Connections with Kahiki are found in numerous place names, traditional events, and with the beings associated with Honouliuli. There are several versions of Kaha'i leaving from Kalaeloa for a trip to Kahiki to bring breadfruit back to 'Ewa (e.g., Kamakau 1961:110). There are several stories that associate places in the region with Kamapua'a and the Hina family, as well as with Pele's sisters, all of whom have strong connections with Kahiki (Kamakau 1961:111; Pukui 1974:200). Pu'uokapolei was one of the most sacred places in Honouliuli (Sterling and Summers 1978:33). Pu'uokapolei's connections with Kahiki are emphasized when it is noted that the hill was the home of Kamapua'a's grandmother, Kamaunuaniho, the Kahiki ancestor to the people of O'ahu (Fornander 1916-20, V:318; Kahiolo 1978:81, 107). By name, Kapolei is associated with the goddess Kapo, another connection with the Pele and Kamapua'a stories (Kamakau 1976:14).

McAllister (1933:108) records that a *heiau* (temple), was located on Pu'uokapolei, but was destroyed before his survey of the early 1930s. The heiau may have been associated with the sun (Fornander 1916-20, III:292). The hill was used as a point of solar reference or as a place where such observations were made. Pu'uokapolei might have been understood as the gate of the setting sun. It is notable that the rising sun at the eastern gate of Kumukahi in Puna is associated with the Hawaiian goddess Kapo (Emerson 1915). There is little specific information for Pu'uokapolei, but the place name itself ("hill of beloved Kapo") is hard to ignore. It is mentioned in some cosmologies that Kū was the god of the rising sun, and Hina should be associated with the setting sun (Hina is the mother of Kamapua'a). Fornander (1916-20, III; 292) states, Pu'uokapolei may have been a jumping off place (also connected with the setting sun) and associated with the dead who roamed the adjacent Plain of Kaupe'a.

Pu'uokapolei was also the primary landmark for travelers between Pearl Harbor and the west O'ahu coast, with a main trail running just inland of it ('Ī'ī 1959:27, 29). Pu'uokapolei was probably the most common name used as a reference for the area of the 'Ewa Plain in Hawai'i (Fornander 1916-20, II: 318; E.M. Nakuina 1904, in Sterling and Summers 1978:34).

PRECONTACT AND EARLY HISTORY

Oral histories and early historical accounts indicate the ahupua'a of Honouliuli was once widely inhabited by precontact populations, including the Hawaiian ali'i. This was possible because of the plentiful marine and estuarine resources available at the coast, along which several permanent habitations and fishing shrines were located. The ahupua'a also included irrigated lowlands for wetland taro cultivation (Hammatt and Shideler 1999), as well as a lower forest area (*wao kanaka*) that provided upland resources. Use and management of the forest resources in the Wai'anae Range, as described by Handy and Handy (1972:469–470), probably acted as a viable subsistence alternative during times of famine:

> ...The length or depth of the valleys and the gradual slope of the ridges made the inhabited lowlands much more distant from the wao, or upland jungle, than was the case on the windward coast. Yet the wao here was more extensive, giving greater opportunity to forage for wild foods during famine time.

These upper valley slopes may have also been a significant resource for sporadic quarrying of basalt for the manufacturing of stone tools. This is evidenced in part by the existence of a probable quarrying site (Site 4322) in Makaiwa Gulch at 152 m (500 ft) elevation (Hammatt et al. 1991).

Early historical accounts of the general region typically refer to the more populated areas of the 'Ewa District, where missions and schools were established and subsistence resources were perceived to be greater; however, the presence of archaeological sites along the barren coral plains and coast of southwest Honouliuli Ahupua'a, indicates prehistoric (precontact) and early historic populations also adapted to less inviting areas, despite the environmental hardships.

Subsequent to western contact in the area, the landscape of the 'Ewa plains and Wai'anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals including goats, sheep and cattle were brought to the Hawaiian Islands by the British naval officer Captain George Vancouver in the early 1790s and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were brought to O'ahu.

MID TO LATE 19TH CENTURY

During the Māhele of 1848, 99 individual land claims in the ahupua'a of Honouliuli were registered and awarded by King Kamehameha III. Within the APE, it is important to note there were no kuleana land claims awarded to commoners. No claims were made for land within the APE or vicinity. The vast majority of Land Commission Awards (LCA) were located near the Pu'uloa Salt Works and the taro lands of the 'ili of Honouliuli. The largest award (Royal Patent 6071, LCA 11216, 'Āpana 8) granted in Honouliuli Ahupua'a was to Miriam Ke'ahi-Kuni Kekau'onohi on January 1848 (Native Register). Kekau'onohi acquired a deed to all unclaimed land within the ahupua'a, including a total of 43,250 acres. Samuel Kamakau relates the following about Kekau'onohi as a child:

> Kamehameha's granddaughter, Ke-ahi-Kuni Kekau-'onohi...was also a tabu chiefess in whose presence the other chiefesses had to prostrate and uncover themselves, and Kamehameha would lie face upward while she sat on his chest. (Kamakau 1961:208-209).

Kekau'onohi was one of Liholiho's (Kamehameha II's) wives, and after his death, she lived with her half-brother, Luanu'u Kahala'i'a, who was governor of Kaua'i (Kamakau 1961:20). Subsequently, Kekau'onohi ran away with Queen Ka'ahumanu's stepson, Keli'i-ahonui, and then became the wife of Chief Levi Ha'alelea. Upon her death on June 2, 1851, all her property was passed on to her husband and his heirs. When Levi Ha'alelea died, the property went to his surviving wife, who in turn leased it to James Dowsett and John Meek in 1871 for stock running and grazing.

In 1877, James Campbell purchased most of Honouliuli Ahupua'a, for a total of $95,000. He then drove off 32,347 head of cattle belonging to Dowsett, Meek, and James Robinson and constructed a fence around the outer boundary of his property (Bordner and Silva 1983:C-12). In 1879, Campbell brought in a well-driller from California to search the 'Ewa plains for water, and a "vast pure water reserve" was discovered (Armstrong 1983). Following this discovery, plantation developers and ranchers drilled numerous wells in search of the valuable resource. By 1881, the Campbell property of Honouliuli prospered as a cattle ranch with "abundant pasturage of various kinds" (Haun and Kelly 1984:45). Within 10 years of the first drilled well in 'Ewa, the addition of a series of artesian wells throughout the island was supplying most of Honolulu's water needs (Armstrong 1983).

In 1889, Campbell leased his property to Benjamin Dillingham, who subsequently formed the Oahu Railway & Land Company (OR&L) in 1890. To attract business to his new railroad system, Dillingham subleased all land below 200 feet elevation to William Castle who in turn sublet the area to the Ewa Plantation Company for sugar cane cultivation (Frierson 1972:15). Dillingham's Honouliuli lands above 200 feet elevation suitable for sugar cane cultivation were sublet to the Oahu Sugar Company.

In 1890, the Ewa Plantation Company was incorporated and continued in full operation up into modern times. The plantation grew quickly with the abundant artesian water. As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the Ewa Plantation Company installed ditches running from the lower slopes of the mountain range to the lowlands and then plowed the slopes vertically just before the rainy season to induce erosion (Frierson 1972:17).

In 1897, the O'ahu Sugar Co. was incorporated and included lands in the foothills above the 'Ewa plain and Pearl Harbor. Prior to commercial sugar cultivation, the lands occupied by the O'ahu Sugar Co. were described as being "of near desert proportion until water was supplied from drilled artesian wells and the Waiāhole Water project" (Conde and Best 1973:313). The O'ahu Sugar Co. took control over the 'Ewa Plantation lands in 1970 and continued operations into the 1990s. Dillingham's *mauka* lands in western Honouliuli that were unsuitable for commercial sugar production remained pasture for grazing livestock. From 1890 to 1892 the Ranch Department of the O.R. & L. Co. desperately sought water for their herds of cattle by tapping plantation flumes and searching for alternative sources of water.

EARLY 1900S TO PRESENT

By 1920, the lands of Honouliuli were used primarily for commercial sugar cane cultivation and ranching (Frierson 1972:18). Much of the *mauka* lands in western Honouliuli, including ridges and deep gulches, were unsuitable for commercial sugar cultivation and remained pastureland for grazing livestock. Historic maps of the Makakilo area indicate a lack of any significant development in the area into the 1940s.

In the late 1920s, the main residential communities were at the northeast edge of the 'Ewa Plain. The largest community was still at Honouliuli village. 'Ewa was primarily a plantation town, focused around the sugar mill, with a public school as well as a Japanese School. Additional settlement was in Waipahu, centered around the Waipahu sugar mill, operated by the O'ahu Sugar Company.

Major land use changes came to western Honouliuli when the U.S. Military began development in the area. Military installations were constructed both near the coast, as well as in the foothills and upland areas. Barbers Point Military Reservation (a.k.a. Battery Barbers Point from 1937-1944), located at Barbers Point Beach, was used beginning in 1921 as a training area for firing 155 mm guns (Tuggle and Tomonari-Tuggle 1997). Camp Malakole Military Reservation (a.k.a. Honouliuli Military Reservation) was also in the lowlands, used from 1939, and Gilbert Military Reservation, used from 1922-1944. Barbers Point Naval Air Station (NAS), in operation from 1942 into the 1990s, was the largest and most significant base built in the area. It housed numerous naval and defense organizations, including maritime surveillance and anti-submarine warfare aircraft squadrons, a U.S. Coast Guard Air

Station, and the U.S. Pacific Fleet. Fort Barrette (a.k.a. Kapolei Military Reservation and Battery Hatch), located atop Pu'u Kapolei, was in use from 1931 to 1948 for housing four 3-inch anti-aircraft batteries. In the 1950s, the site was used as a Nike missile base. Palailai Military Reservation, located atop Pu'u Palailai in Makakilo, was in service from 1921, housing Battery Palailai and Fire Control Station B. Fire Control Station A, was located atop Pu'u Makakilo. From 1942 to 1945 the Pu'u Makakilo Training Area, including lands in and around Pu'u Makakilo, was used for military training during WWII (Tuggle and Tomonari-Tuggle 1997).

Adjacent to TMK (1) 9-2-051: 001, *mauka* of the APE sits the remnants of Battery Arizona. The battery mounted the reclaimed 14-inch, 3-gun rear turret from the USS Arizona battleship, sunk on 7 December 1941, from the Japanese attack on Pearl Harbor. Battery Arizona was a tunneled complex with only the gun turret and commander/radar station above ground (Bennett 2005:65). Construction of the battery began in 1941, halted in 1945, and was subsequently abandoned in 1948, never reaching operational status. The turret was eventually cut up as scrap metal.

In response to increased demand for housing, spurred by the increased development at Barbers Point NAS, the Estate of James Campbell set aside land in the foothills of the southern Wai'anae Range in 1960 for the development of the residential community of Makakilo (Tulchin and Hammatt 2005). Development began just *mauka* of the H-1 Freeway and continued *mauka*, with ranch lands being incrementally replaced by subdivision construction. At present, former ranching pasture lands are continually being replaced by residential house lots. Development in the uplands of western Honouliuli has generally been limited to ranch related housing and infrastructure, military training and NIKE missile stations, as well as the construction of military and commercial communication and atmospheric observation stations on the ridges near Palehua (Tulchin and Hammatt 2005).

PREVIOUS RESEARCH/RECORD SEARCHES

Prior to conducting the fieldwork, ERM completed a records search and literature review to identify previously recorded sites and cultural resource studies within the vicinity of the APE (**Tables 1 and 2; Figure 6**). This review included a records search of the DLNR-SHPD Oahu Office library, historic-period maps and aerial imagery, and other secondary sources online and on file with ERM to determine the potential of encountering archaeological and historic-period resources in the vicinity of the APE.

The records search revealed that 16 cultural resource investigations were performed in the vicinity; of those; one covered portions of the Direct APE (Byerly and O'Day 2017). A total of six State Inventory of Historic Places (SIHP) records were available. Historical aerial imagery from 1928, 1951, 1965, and 1968 was analyzed and not structures or features were identified within the direct APE (University of Hawaii at Manoa Library 2024).

TABLE 1. PRIOR STUDIES WITHIN VICINITY APE (BOLD = DIRECT APE COVERAGE)

Reference	Project
Barrera 1979	West Beach Archaeological Survey
Barrera 1986	West Beach Archaeological Investigations
Bath 1989	Waimanalo Gulch Petroglyph Project
Bordner and Silva 1983	Archaeological Reconnaissance and Historical Documentation for Waimanalo Gulch and Ohikilolo Valley
Byerly and O'Day 2017	**Archaeological Inventory Survey for the Hawaiki Submarine Cable Landing Project**
Glidden et al. 1993	Subsurface Data Recovery in Selected Areas of Paradise Cove
Hammatt 1984	Archaeological Reconnaissance at Hawaiian Electric Company (HECO) Kahe Power Plant
Hammatt and Shideler 1989	Archaeological Reconnaissance of the Six-Acre Proposed HECO Kahe Training Facility
Hammatt and Shideler 1999	Archaeological Inventory Survey and Assessment for the Waimanalo Gulch Sanitary Landfill Project Site
Hammatt et al. 1991	Archaeological Inventory Survey for the Makaiwa Hills Project
Jourdane 1995	Inadvertent Discovery of Human Remains at Paradise Cove
Komori and Dye 1979	Archaeological Testing at Lanikuhonua
Neller 1985	West Beach Estates Preliminary Review and Evaluation of Archaeological Studies and Recommendations
Pietrusewsky 1988	Forensic Identification (Site File 4061)
Soehren 1964	Waimanalo Gulch House Site (TMK: 9-2-03:72)
Yucha and Hammatt 2012	Kahe Valley Archaeological Inventory Survey

TABLE 2. PREVIOUSLY RECORDED CULTURAL RESOURCES IN THE VICINITY.

SIHP Number	Description	Reference
50-80-12-1433	Beach burial recovery site; five individuals	Jourdane 1995
50-80-12-2317	Possible native-Hawaiian house site	Hammatt and Shideler 1999
50-80-12-4061	Beach burial recovery site; one individual	Pietrusewsky 1988
50-80-12-4110	Three shallow-pecked petroglyphs on lava rock: two anthropomorphic and one undetermined	Bath 1989
50-80-12-7137	Military site complex consisting of 15 features relating to a military defensive position known as "Kahe Strong Point", predating Battery Arizona and Battery Kahe	Yucha and Hammatt 2012
50-80-12-9714	OR&L Railroad Right-of-way: 25.5 miles of raised bed railway built starting in 1889 for agricultural and freight purposes. Also used as passenger carriage around the island and by the military. Listed on NRHP.	Cummins 1974

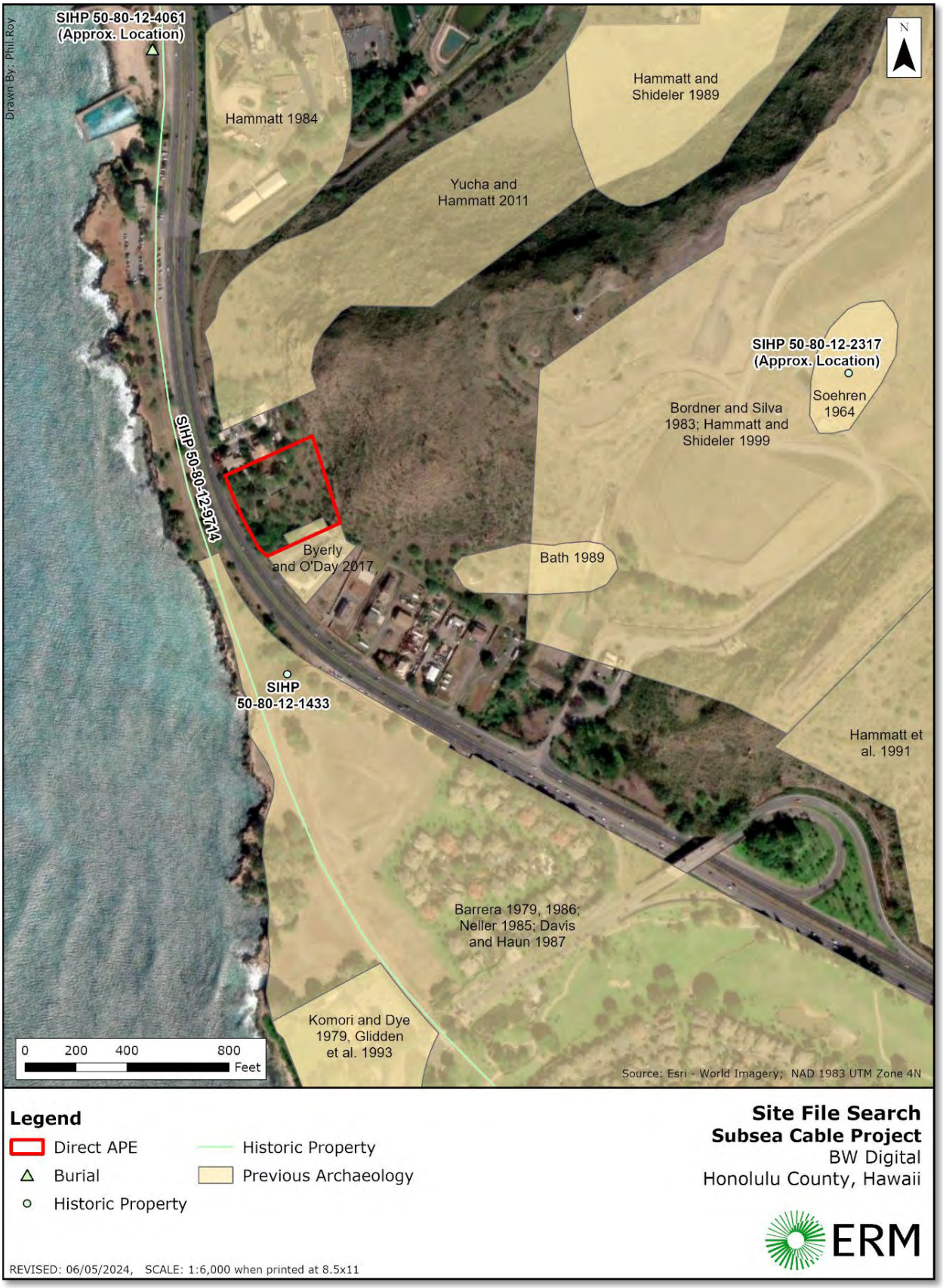


FIGURE 6. SITE FILE RESULTS IN THE VICINITY OF THE APE.

In 2016, Garcia and Associates conducted an archaeological survey for the adjacent Hawaiki Submarine Cable Land Project (Byerly and O'Day 2017). The archaeological inventory survey consisted of a systematic pedestrian survey of the entire terrestrial portion of the APE (TMK [1] 9-2-051:001 por., 010, and 011) and extensive subsurface testing within TMK (1) 9-2-051:011. Test trenching was conducted only within parcel TMK (1) 9-2-051:011 because that was the only area in which their undertaking would involve significant ground disturbing activity. No cultural resources were encountered during the pedestrian survey or subsurface testing.

The survey revealed that the majority of the parcel was mechanically disturbed, evidenced by modern trash, illegal dumping, and squatting throughout the parcel and displaced boulders in the northeastern portion of their APE. Subsurface testing included excavation of 10 trenches with a miniature tracked excavator to a depth of approximately 230 centimeters below surface (cmbs). All ten trenches indicated disturbed native alluvium from 0 to 90/230 cmbs. Only five had undisturbed coastal deposits that ranged from 90 to 200 cmbs. Modern trash and construction debris was noted in all trenches down to 100 cmbs. No cultural materials were encountered in the undisturbed alluvial sediments.

RESEARCH EXPECTATIONS

Various cultural resources have been either documented or noted in the vicinity that range from precontact Native Hawaiian beach burials, house sites, and petroglyphs to historic-period resources that include a NRHP-listed railway and WWII-era military installations. The Waimanalo Gulch, east of the current study area, was surveyed for the current landfill location (Bath 1989; Bordner and Silva 1983; Hammatt and Shideler 1999). It was noted that lands at the base of the gulch, were extensively modified by bulldozing. More recently, the Byerly and O'Day (2017) survey conducted adjacent to the Direct APE encountered no cultural resources either on the surface or during their subsurface investigations; moreover, the study indicated that the area has been heavily mechanically disturbed from the surface to at least 100 cmbs. A prior Cultural Impact Assessment was recently completed for the existing Hawaiki Submarine Cable Landing Project and determined that no traditional Hawaiian cultural sites or practices were identified in the area (O'Day 2017).

Based on the cultural background and literature review, ERM expects that the APE has a low-to-moderate probability for the presence of undisturbed precontact and historic-period cultural resources. This expectation was developed based on the environmental setting, cultural context, and previous cultural resource studies described above.

FIELD METHODS AND RESULTS

ERM Archaeologist and Principal Investigator, Shawn Fackler, M.A., RPA performed the survey fieldwork on 20 May 2024, under Hawaii archaeological permit number 24-21. Phil Roy provided support with Global Information System (GIS) technologies, including aerial imagery analysis, and figure production for this report.

Staff was equipped with a Trimble GeoXH handheld global positioning system capable of recording data with sub-meter precision, and 10-megapixel or greater digital cameras for photo documentation. GPS unit was set to North American Datum (NAD) 1983, UTM Zone 4N to view

and record data. The crew performed the survey using pedestrian transects spaced no more than 5 meters (m) apart, where vegetation allowed.

ERM carefully examined the ground surface for evidence of archaeological resources. Soil visibility within the APE varied because of vegetation cover, averaging poor to fair mineral soil visibility (**Figure 7**); however, understory vegetation was open around rock outcrops, allowing good visibility to inspect for archaeological features, which was considered adequate for the purpose of archaeological site identification; therefore, no subsurface investigation is recommended.

The APE contains cluster of boulders and cobbles from previous landform modifications. The rock outcrops appeared to have been produced by mechanical grading, to some extent, and modern trash could be seen in between boulders and cobbles. The piles are not intentionally built features and appear modern. Moreover, the western half of the APE is subject to unauthorized encroachment of modern livestock makeshift structures for chickens and pigs (**Figures 8 and 9**). No cultural resources (i.e., traditional Hawaiian or historic-period) were encountered during the survey.

FIGURE 7. OVERVIEW OF THE MIDDLE PART OF THE DIRECT APE, FACING NORTHWEST.

FIGURE 8. OVERVIEW OF ENCROACHMENT IN THE DIRECT APE, FACING WEST.

FIGURE 9. OVERVIEW OF MORE ENCROACHMENT IN THE DIRECT APE, FACING WEST.

SUMMARY AND RECOMMENDATIONS

On behalf of Hawaiki, ERM conducted a Class III cultural resources survey for the proposed Kapolei Submarine Cable Landing Facilities Project. Hawaiki plans to develop the direct APE, located adjacent to its existing Hawaiki Cable Landing Station at 92-384 Farrington Highway.

ERM performed an extensive records search at the DLNR-SHPD's Oahu office. The records search revealed that 16 cultural resource investigations were performed in the vicinity; of those; one covered portions of the direct APE and did not encounter any cultural resources (Byerly and O'Day 2017). A total of six SIHP records were available for the vicinity; none were recorded within the direct APE.

No archaeological sites or features were identified during the ERM survey; therefore, the undertaking is documented as an archaeological assessment pursuant to Chapter 13-284-5(5A) under state of Hawaii rules and a "**no historic properties affected**" finding under 36 Code of Federal Regulations (CFR) §800.4.d., the implementing regulations of NHPA. As required, this report contains a description of the field methods and of the APE. This report presents the results of ERM's study.

If previously unrecorded cultural resources or human remains are encountered during construction activities, work must stop in the area of the discovery and the DLNR-SHPD immediately notified. The DLNR-SHPD will resolve their treatment in accordance with Hawaii Administrative Rules (HAR) 13-13-280, Rules Governing General Procedures for Inadvertent Discoveries of Historic Properties During a Project Covered by the Historic Preservation Review Process, or with HAR 13-13-300-40 (Inadvertent Discovery of Human Remains).

Inadvertent discovery of human remains and their associated cultural material should be preserved in place until the provisions of Hawai'i Revised Statutes (HRS) Chapter 6E-43.6 and HAR 13-13-300-40 and the Native American Graves Protection and Repatriation Act of 1991, as amended (43CFR10) are met. No archaeological work, beyond obtaining locational and descriptive data, should be undertaken in the event that human remains are discovered during construction, unless and until specifically requested by DLNR-SHPD.

REFERENCES

Armstrong, R. Warwick (Ed.)
1983 *Atlas of Hawai'i*, 2nd edition. University of Hawaii Press, Honolulu.

Barrera, W.M., Jr.
1979 *West Beach, Oahu: An Archaeological Survey*. Chiniago Inc., Honolulu.
1986 *West Beach Archaeological Investigations*, Manuscript. Chiniagi Inc., Honolulu.

Bath, J.
1989 *Waimanalo Gulch Petroglyphs*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawaii.

Beckwith, Martha
1979 *Hawaiian Mythology*. The University Press of Hawaii. Honolulu.

Bennett, John D.
2005 Battery Arizona and the Kahe Point Military Reservation. *The Coast Defense Journal*, Volume 19, Issue 1, pp 61-80.

Bordner, Richard M. and Carol Silva
1983 *Archaeological Reconnaissance and Historical Documentation: Waimanalo Gulch, Oahu, TMK:9-2-03:2,40,13 (por)*. Archaeological Research Center Hawai'i, Inc.

Byerly, David and Patrick O'Day
2017 *Archaeological Inventory Survey Report, Hawaiki Submarine Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i.* Prepared for Tetra Tech, Inc.. Garcia and Associates, Kailua.

Charvet-Pond, Ann and Bertel D. Davis
1992 *West Beach Data Recovery Program Phase 4, Archaeology and Paleontological Excavations*. Paul H. Rosendahl, Inc., Hilo.

Condé, Jesse C. and Gerald M. Best
1973 *Sugar Trains, Narrow Gauge Rails of Hawaii*. Glenwood Publishers, Felton.

Cummins, Gary
1974 *National Register of Historic Places Inventory Nomination Form*, Oahu Railway and Land Company Right of Way. Hawaii Register of Historic Places Site Number 80-12-9714. On file with the US Department of the Interior, National Park Service, Washington, D.C.

Emerson, Nathaniel B.
1915 *Pele and Hi'iaka,* Copyright 1993 by 'Ai Pōhaku Press, Honolulu.

Fackler, Shawn

2021a *Cultural Resources Survey for the U.S. Fish & Wildlife Service's Gill Akupu Fence Construction Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i*. Prepared for the US Fish & Wildlife Service, North Wind Resource Consulting, Honolulu.

2021b *Cultural Resources Survey for the U.S. Fish & Wildlife Service's Olson Palehua Fence Construction Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i*. Prepared for the US Fish & Wildlife Service, North Wind Resource Consulting, Honolulu.

Fornander, Abraham

1916 *Fornander Collection of Hawaiian Antiquities and Folk-Lore*, with translations edited and illustrated with notes by Thomas G. Thrum, Volume 4, First series, 1916-1917 notes by Thomas G. Thrum, Memoirs of the Bernice P. Bishop Museum, Vols. 4, 5, 6, Honolulu.

Frierson, Barbara

1972 *A Study of Land Use and Vegetation Change: Honouliuli, 1790-1925*, Manuscript prepared for Graduate Seminar in Geography (750), University of Hawaii, Honolulu.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte

2013 Rainfall Atlas of Hawai'i. *Bulletin of American Meteorological. Society*, 94, 313-316.

Gill, Timothy M., Patrick V. Kirch, Clive Ruggles, and Alexander Baer

2015 Ideology, Ceremony and Calendar in Pre-Contact Hawai'i: Astronomical Alignment of a Stone Enclosure on O'ahu Suggests Ceremonial Use During the Makahiki Season. *The Journal of the Polynesian Society*. Volume 124, No. 3. The Polynesian Society, University of Auckland, Auckland.

Glidden, C., M. Major, and B. Dixon

1993 *Results of Subsurface Data Recovery in Selected Areas of Paradise Cove, Honouliuli, 'Ewa, O'ahu, Hawai'i*. Bernice P. Bishop Museum, Department of Anthropology, Honolulu.

Hammatt, Hallett H. and David W. Shideler

1999 *An Archaeological Inventory Survey and Assessment for the Waimanalo Gulch Sanitary Landfill Project Site, Honouliuli, 'Ewa, O'ahu*. Cultural Surveys Hawaii, Kailua.

2011 *Archaeological Assessment for the Board of Water Supply Fire Dip Tank Project at Palehua, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu. TMK: [1] 9-2-003:008 por*. Cultural Surveys Hawaii, Kailua.

Hammatt, Hallett H.

1984 Archaeological Reconnaissance at HECO Kahe Power Plant (Letter Report to Dames &Moore). Cultural Surveys Hawai'I, Kailua, Hawai'i.

Hammatt, Hallett H. and William H. Folk

1981 *Archaeological and Paleontological Investigation at Kalaeloa (Barber's Point), Honouliuli, 'Ewa, O'ahu, Federal Study Areas 1a and 1b, and State of Hawai'i, Optional Area 1*. Cultural Surveys Hawaii, Kailua.

Hammatt, Hallett H., Jennifer Robins, Mark Stride and Matthew McDermott
1991 *An Archaeological Inventory Survey for the Makaiwa Hills Project Site, Honouliuli, ‘Ewa, O‘ahu*. Cultural Surveys Hawaii, Kailua.

Hammatt, Hallett H and D.W. Shideler
1989 *Archaeological Reconnaissance of the Six-Acre Proposed HECO Kahe Training Facility (T.M.K. 9-1-3:27), Honouliuli, 'Ewa, O'ahu*. Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.
1999 *An Archaeological Inventory Survey and Assessment for the Waimanalo Gulch Sanitary Landfill Project Site, Honuliuli, 'Ewa, O'ahu*. Cultural Surveys Hawai'i Inc., Kailua, Hawai'i.

Handy, E.S. Craighill and Elizabeth G. Handy
1972 Native Planters in Old Hawaii: Their Life, Lore, and Environment. Bishop Museum Bulletin 233, Honolulu.

Haun, Alan E., and Marion Kelly
1984 *Research Design for an Archaeological Survey of Naval Communication Area Radio Transmission Facility, Lualualei; and Naval Air Station, Barbers Point, Oahu*, Hawaii. Dept. of Anthropology, Bishop Museum, Honolulu.

Hommon, R.J.
2013. *The Ancient Hawaiian State*. Oxford: Oxford University Press.

ʻĪʻī, John Papa
1959 *Fragments of Hawaiian History*. Revised. Bishop Museum Press, Honolulu.

Jourdane, M.
1978 *He Moolelo No Kamapuaa, The Story of Kamapuaa*, translated by Esther T. Mookini and Erin C. Neizmen with the assistance of David Tom, Hawaiian Studies Program, University of Hawaii, Mānoa.
1995 Inadvertent Discovery of Human Remains at Paradise Cove, Honouliuli, 'Ewa, Oahu, State Site No. 50-80-12-4968, SHPD #762. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Kamakau, Samuel M.
1961 *Ruling Chiefs of Hawai*i. The Kamehameha Schools Press, Honolulu.
1976 *The Works of the People of Old, Na Hana a ka Po‘e Kahiko*. Bishop MuseumSpecial Publication, No. 61, Honolulu.

Kelly, Marion
1991 “Notes on the History of Honouliuli,” in: *An Archaeological Survey of the Naval Air Station, Barber’s Point, O‘ahu, Hawai‘i*. B.P. Bishop Museum, Honolulu.

Kirch, Patrick V.
1984 T*he Evolution of the Polynesian Chiefdoms*. Cambridge University Press, Cambridge.
1997 *Feathered Gods and Fishooks: An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawaii Press, Honolulu.
2010 *How Chiefs Became Kings: Divine Kingship and the Rise of Archaic States in Ancient Hawai‘i*. University of California Press, Berkeley.

Kirch, Patrick V. and Marshall Sahlins
1992 *Anahulu. Vol. 1 and 2*. University of Chicago Press, Chicago.

Komori, E.K. and T. Dye
1979 *Archaeological Testing at Lanikuhonua, West Beach, Ewa, Oahu Hawaii. (TMK 9-1-13:por.10)*. Bernice P. Bishop Museum, Honolulu.

Lucas, Paul F. Nahoa
1995 *A Dictionary of Hawaiian Legal Land-terms*. Native Hawaiian Legal Corporation. University of Hawaii Committee for the Preservation and Study of Hawaiian Language, Art, and Culture. University of Hawaii Press, Honolulu.

Lyons, C.J.
1875 Land Matters in Hawaii. The Islander, Vol. 1. Honolulu.
1881 Oahu, Hawaiian Islands. Hawaiian Government Survey, 1881. Library of Congress Geography and Map Division Washington, D.C., accessed June 3, 2024. https://www.loc.gov/resource/g4382o.ha000014/?r=0.224,0.423,0.352,0.203,0.

Macdonald, Gordon A., Agatin T. Abbott, and Frank L. Peterson
1983 *Volcanoes in the Sea: Geology of Hawaii*. Second Edition. University of Hawaii Press, Honolulu.

Maly, Kepa and Paul H. Rosendahl
1993 *'Ewa Marine Community Project, Memorandum of Agreement, Items 2.a,b Compliance Plans, Land of Honouliuli, 'Ewa District, Island of Oahu (TMK 9-1-001-001,2,3,4,5,6,7; 9-1-012:2,3,5-17,23)*. Paul H. Rosendahl, Inc., Hilo.

McAllister, J. Gilbert
1933 *Archaeology of Oahu*. Bulletin 104. Bishop Museum: Honolulu.

Monahan, Christopher M., and Douglas W. Thurman
2013 *Archaeological Inventory Survey, Kunia Maka Loa Ridge C&C Farmlands Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island, Hawai'i. TMK (1) 9-2-004*. Prepared for C&C Farmlands, LLC. TCP Hawai'i, LLC, Kailua.

Nakuina, Emma M.
1904 *Hawaii - Its People and Their Legends*. Honolulu.

O'Day, Patrick
2017 *Cultural Impact Assessment, Hawaiki Submarine Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i*. Prepared for Tetra Tech, Inc.. Garcia and Associates, Kailua.

Neller, E.
1985 *A Preliminary Review and Evaluation of Archaeological Studies and Recommendation for the proposed West Beach Estates at 'Ewa, O'ahu*. Department of Land and Natural Resources, State Historic Preservation Division, Kapolei, Hawai'i.

Pietrusewsky, M.
1988 Forensic Identification Report dated 12/7/88. Site file 4061. State Historic Preservation Division, Kapolei, Hawai'i.

Pukui, Mary Kawena
1983 *'Ōlelo No'eau: Hawaiian Proverbs and Poetical Sayings*. Bishop Museum Special Publication No.71, Bishop Museum Press, Honolulu.

Soehren, L.
1964 *Waimanalo Gulch House Site, (TMK: 9-2-03:72)*. Bernice P. Bishop Museum, Honolulu.

Sterling, Elspeth P. and Catherine C. Summers
1978 *Sites of O'ahu.* Dept. of Anthropology, B.P. Bishop Museum, Honolulu.

Tuggle, H. David and M.J. Tomonari-Tuggle
1997 *Synthesis of Cultural Resource Studies of the 'Ewa Plain, Task 1a: Archaeological Research Services for the Proposed Cleanup, Disposal and Reuse of Naval Air Station Barbers Point, O'ahu, Hawai'i*, Internatinoal Archaeological Research Institute, Inc., Honolulu.

Tulchin, Jon and Hallett H. Hammatt
2005 *Archaeological Field Inspection for the Proposed HECO Meteorological Observation Stations, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu*. Cultural Surveys Hawai'i, Kailua.

University of Hawaii at Manoa Library
2024 Digital Aerial Photographs. https://guides.library.manoa.hawaii.edu/aerials/digital. Accessed May 10, 2024

U.S. Department of Agriculture—Natural Resources Conservation Service
2024 Web Soil Survey. Electronic document, http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed May 10, 2024.

Yucha, T.M. and H.H. Hammatt
2012 *Archaeological Inventory Survey Report For Portions of Kahe Valley, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island (TMK: [1] 9-2-003:027 por.)*. Cultural Surveys Hawai'i Inc., Kailua, Hawai'i

APPENDIX B NMFS BA

National Marine Fisheries Service Biological Assessment

Hawaiki Cable Landing Expansion Project

PREPARED FOR
Hawaiki Submarine Cable USA, LLC
(subsidiary of BW Digital)

DATE
25 October 2024

REFERENCE
0736633

LIST OF TABLES

© Copyright 2024 by The ERM International Group Limited and/or its affiliates ('ERM'). All Rights Reserved.
No part of this work may be reproduced or transmitted in any form or by any means, without prior written permission of ERM.

ACRONYMS AND ABBREVIATIONS

Acronym	Description
ºF	degree Fahrenheit
BA	Biological Assessment
BMH	beach manhole
CFR	Code of Federal Regulations
CLS	cable landing station
cm	centimeter
DAR	Division of Aquatic Resources
dB	decibel
dB re 1 µPa	decibels relative to 1 microPascal
dB re 1 µPa2s	decibels relative to 1 microPascal squared normalized to 1 second
DPS	distinct population segment
DW	disc width
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
ESA	Endangered Species Act of 1973
FE	federally endangered
FEP	Fishery Ecosystem Plan
FHWG	Fisheries Hydroacoustic Working Group
fm	fathom
FMP	Fishery Management Plan
FR	Federal Register
FT	federally threatened
ft	foot
HAPC	Habitat Area of Potential Concern
HAR	Hawai‘i Administrative Rules
HDD	horizontal directionally drilled
HRS	Hawai‘i Revised Statutes
IUCN	International Union for Conservation of Nature
km	kilometer
m	meter

Acronym	Description
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
mg/L	milligrams per liter
mm	millimeter
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NWI	National Wetlands Inventory
PE	proposed endangered
RMC	root mean square
SEL_{cum}	cumulative sound exposure level
SPL	sound pressure level
sq ft	square foot
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WPRFMC	Western Pacific Regional Fishery Management Council
WSDOT	Washington Department of Transportation

EXECUTIVE SUMMARY

Hawaiki Submarine Cable USA LLC (Hawaiki), wholly owned by BW Digital, is proposing to develop a new carrier-neutral cable landing station (CLS), hereafter “the Project,” in Kapolei on the island of O‘ahu, Hawai‘i. The Project proposes to install new telecommunications infrastructure, involving up to six horizontal directionally drilled (HDD) bores extending into the Pacific Ocean and up to three associated beach manholes (BMH), as well as a subsurface fronthaul conduit system connecting the new subsurface infrastructure to Hawaiki’s CLS. Additionally, a short segment of gravel access road would be constructed between the Project site and the existing permanent access road and driveway serving the adjacent Hawaiki CLS facility. Due to Project activities within Section 10 Waters of the U.S., permitting with the U.S. Army Corps of Engineers (USACE) is required (i.e., the Project’s federal nexus).

Under the federal Endangered Species Act (ESA), the USACE is required to consult with the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS) to determine whether any federally listed endangered, threatened, proposed, or candidate species, or their designated critical habitats, could be affected by the proposed Project and whether the effects of the proposed Project could jeopardize any listed or candidate species or result in the destruction or adverse modification of designated critical habitat. This Biological Assessment (BA) has been prepared to facilitate consultation between the USACE and the NMFS under Section 7 of the ESA. An Essential Fish Habitat (EFH) assessment is also included to fulfill the requirements of Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act. In addition, marine mammal species protected by the Marine Mammal Protection Act of 1972, as amended, are also considered herein.

This BA has been prepared with reference to information retrieved from the NMFS website. The probable presence of listed species was further evaluated by reviewing publicly available data from the State of Hawai‘i, fish distribution spatial data, stock assessments, the National Hydrography Dataset, National Wetlands Inventory data, bathymetric maps, aerial photographs, and recent scientific literature. The actual occurrence of a species in the Project vicinity would depend on multiple factors, such as the presence of suitable habitat, the season of the year, and the species’ distinct migratory habits. This BA represents the initiation consultation between the USACE and NMFS.

1. INTRODUCTION

Hawaiki Submarine Cable USA LLC (Hawaiki), wholly owned by BW Digital, owns and operates the Hawaiki Cable Landing Station (CLS) in Kapolei, some 20 miles west of Honolulu on the island of O'ahu, Hawai'i. Hawaiki recently completed the purchase of approximately 22 acres of land immediately adjacent to this CLS, specifically to enable and encourage the landing and operation of new subsea cable systems. The following provides an overview of Hawaiki's proposed plans to develop this parcel for future subsea cables in support of the Hawai'i Connect Kākou initiative, hereafter known as the "Project."

The upland portion of the Project site is in tax parcel (TMK) 9-2-051-001 and adjacent to Hawaiki's existing CLS at 92-384 Farrington Highway (TMK 9-2-051-011). The Project parcel is bordered to the north by residences, beyond which is the Hawai'ian Electric Company Kahe Electric Power Plant; to the west by the Farrington Highway; to the south by the CLS; and to the east by the Waimānalo Gulch Sanitary Landfill. Horizontal directionally drilled bores would occur under TMKs 9-2-049-001, 9-2-049-00, and 9-2-049-005. The aquatic portion of the Project site is located in the nearshore environment, west of the terrestrial portion of the Project (no TMK). A detailed Project description is provided in Section 2.3.

1.1 PURPOSE AND NEED

The Project would provide capacity for up to six future subsea cable systems to be terminated on the Project site, based on market demand. These could be either domestic cables linking islands in the Hawai'ian archipelago, interstate cables linking Hawai'i to the continental United States (CONUS) or international cables providing connectivity from Hawai'i/CONUS across the Pacific Ocean. Hawaiki's latest investment in Hawai'i demonstrates their continued commitment to the State as they further expand the Hawai'i Connect Kākou initiative. The Project would provide new subsea infrastructure capability on O'ahu, aligning with the NTIA Broadband Equity, Access, and Deployment (BEAD) Program.

1.2 DEFINITIONS

Definitions of key terms used throughout this Biological Assessment (BA) are as follows:

- *Project Area*: Area of direct project construction impacts within the marine environment (Figure 1).
- *Action Area*: Area directly or indirectly affected by the proposed Project and an aquatic buffer of 500 ft from the proposed bores and exit point locations. A full description of the Action Area is provided in Section 2.1 (Figure 2).
- *Project*: The installation of the bore pipes including the bore site, horizontal directionally drilled (HDD) bore pipes, beach manholes (BMHs), fronthaul conduit system, and bore pipe exit points.

2. DESCRIPTION OF THE ACTION

2.1 ACTION AREA

The Action Area is defined in Title 50 of the Code of Federal Regulations (CFR) Part 402.02 as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." For the purposes of this BA, the Action Area was defined by analyzing the potential extent of effects of the proposed Project in the context of existing infrastructure, habitat suitability, and species sensitivity to human-caused disturbance (e.g., noise levels).

The Action Area for this BA includes the marine portions of the Project footprint, which is the HDD bore route to six exit points beyond the surf zone approximately 2,500-3,000 ft (760-920 m) from the entry point, in water depths of about 50 to 65 ft (15-20 m). In addition to the Project footprint, the Action Area includes a 500 ft buffer off the Project alignment (Figure 2). The buffer was chosen to encompass any potential project effects that could result from sediment disturbances, drilling fluid release, or release of contaminants such as petroleum products.

2.2 ACTION AREA BASELINE CONDITIONS

2.2.1 NEARSHORE ENVIRONMENT

The Action Area is in Kapolei, approximately 20 miles west of Honolulu. The HDD bore pipes will be installed from shore and will extend seaward beyond the surf zone approximately 2,500 to 3,000 ft (760-920 m) from the HDD entry point onshore. The HDD bore exit points will be in water depths of approximately 50 to 65 ft (15-20 m). The bathymetry in this area is gradually sloping as the distance from shore increases. The shoreline adjacent to the Action Area consists of a rocky, bluff shoreline with little to no beach. Immediately upland from the shoreline is the O'ahu Railway and Land Company rail line and Highway 93 (Farrington Highway).

A marine habitat survey was conducted in 2017 for a separate submarine cable (this survey area partially overlaps the Action Area). This survey covered approximately 77 acres and characterized the marine habitat in this area as predominantly sand and rubble with small, isolated patches of paddle grass seagrass (*Halophila decipiens*) and sparse patches of relict reef where coral was abundant (Tetra Tech 2017). However, the average cover of coral for the area was less than 10 percent. A nearshore geophysical survey for this Project will be completed prior to the HDD installation to determine exact HDD punch-out locations.

2.3 DETAILED PROJECT DESCRIPTION

The Project would involve construction of new telecommunications infrastructure on approximately 1.72 acres of the Project parcel, including up to six HDD bores extending into the Pacific Ocean, up to three associated BMHs, and a subsurface fronthaul conduit system connecting the new infrastructure to the existing Hawaiki CLS on the adjacent parcel (TMK 9-2-051-011). The bore pipes would be installed using HDD from shore, which avoids potential trenching-related impacts to the O'ahu Railway and Land Company rail line, Farrington Highway, the coastal bluffs, or nearshore coral reefs. Additionally, a short segment of gravel access road would be constructed

between the Project site and the existing permanent access road and driveway serving the adjacent Hawaiki CLS facility.

The major Project components are described in additional detail below.

2.3.1 LAND SURVEY AND BORE DESIGN

Prior to HDD activities, a detailed engineering plan and profile would be generated based on bathymetric and geophysical surveys as well as a terrestrial topographic survey. The correct depths, mud mixtures, and drilling head types would be determined based on soil boring samples and geophysical analysis. The profile of the ocean floor would be used to establish a true running elevation for the drill path. At the proposed offshore drill exit locations, the GPS location would be measured and verified by a marine support crew.

2.3.2 BORE SITE PREPARATION

Onshore, the Project would require the clearing of vegetation and the creation of a gravel road and temporary staging area to support drilling operations. The staging area and active HDD work area would be approximately 16,000 sq ft in size and would be accessed from the gravel access road connected to the adjacent Hawaiki CLS property. A HDD rig and associated equipment will be contained within the staging area. A crane would also be used for setup and demobilization of the work site and for HDD operations. The exact location of the HDD rig and supporting equipment may change within the site boundaries provided.

A drill entry pit would be excavated in line with the HDD rig to contain the mud returning from the bore during drilling. A slurry sump pump would be set in place in the entry pit to pump out the returning fluid, feeding it to the recycling unit for further treatment, adjustment, and reuse. A small crane would likely be used during set up and to load pipes. Water supply for the above activities would be provided from the water main on the adjacent Hawaiki property (subject to agreement with the local water authority) or by a water truck.

2.3.3 HDD BORE PIPES

HDD operations would begin after mobilization and preparation of the drill rig and other support equipment and placement of the terrestrial wire tracking grid. The drill rig operates on a carriage assembly that travels by hydraulic power along the frame of the bore rig. Directional bores are initially steered by a drill head fitted with a wireline guidance tool in conjunction with an energized wire tracking grid to track the direction of advance, horizontally and vertically, and to determine the exact location of the bore pipe placement. Once beyond the terrestrial wire tracking grid, the tracking system remains would be continuously maintained to verify the drill position and path.

Six bore pipes, up to eight inches in diameter, would be installed to provide shore crossings for six future subsea fiber-optic cables. The bore pipe would be advanced along the pre-determined drill path while drilling fluid (containing bentonite) is pumped down the inside of the bore pipe and exited through the drill head. As drilling proceeds, pipe segments would be added, forming the steel conduit used to house the fiber-optic cable. Drilling fluid carrying hole cuttings would then return to the entry point through the annulus between the outside of the bore pipe and the bore hole.

The bore depth profile would start approximately 3 ft below ground level (1 m) at the onshore entry point to a maximum depth of approximately 130 to 150 ft (40 to 45 m) along the profile. Once the appropriate distance offshore is reached with the bore pipe, the drill head would be guided to the surface to complete the bore. The bore would “daylight” (exit) beyond the surf zone approximately 2,500 and 3,000 ft (760-920 m) from the entry point, in water depths of about 50 to 65 ft (15 -20 m).

The last 100 to 130 ft (30 to 40 m) of the pilot bore would be drilled with fresh water, flushing out drilling fluid back to the entry pit. This would prevent drilling fluid escaping to the sea when the bore pipe exits the seabed. The exact length of flushing would be decided on site, depending on the drilling findings and the actual drilled material at the end of the pilot bore.

Once the HDD has advanced significantly towards the bore exit point, marine support of directional bore operations would commence. A vessel would establish its location and hold position, without anchoring, approximately 50 ft (15 m) seaward of the bore exit point to serve as a marine dive platform. While onshore activities may occur 24-hours per day, marine support for HDD activities is expected to be needed for one to two days per bore pipe (i.e. approximately twelve days in total) during daytime hours only.

The marine support team would visually monitor the sea floor as the drill head approaches the exit point. Once the HDD drill head assembly has exited the seafloor, the support dive crew would be deployed to verify the bore pipe exit point. If necessary, divers would then excavate sediment around the bore pipe exit point to help remove the drill head assembly; this would be returned to shore by the support boat. The divers would then support a process to prove the internal diameter smooth continuity of the bore by mandrelling. This process also allows installation of a hauling line inside the bore pipe, which would ultimately be used to pull future fiber-optic cable from the seabed to land. A check valve would be installed at the offshore end of the pipe to keep sand and seabed debris from entering the bore pipe. A cap and locator ball would also be installed at the offshore end of the pipe to allow for easy relocation.

Once each of the HDD bore pipe installations are complete, the new infrastructure would be left subsurface of the seabed.

2.3.4 DRILLING FLUID MANAGEMENT

Drilling fluid used to hydraulically drive the drill cutting head for the HDD requires water, a bentonite drilling additive, and a mixing unit. Bentonite clay is a naturally occurring biodegradable, non-toxic substance. If required, a polymer additive would be added to the drilling fluid in negligible concentration to enhance the bore stability by strengthening the filter-cake being formed on the bore walls during the drilling operation. Drilling fluid that returns to the Project site via the onshore entry pit would be recycled to the extent feasible by pumping the returns to a recycling unit. Solid and liquid materials that cannot be recycled further would be transported off-site by a vacuum truck and disposed of at an approved location.

If significant cracks or fissures exist in the bore hole substrate, there is a possibility that drilling fluid could move through the cracks and find a way to the surface, in this case along the terrestrial route or into the sea offshore of the landing site. This is known as an inadvertent drilling fluid

release. The Project would implement a series of monitoring and management measures during HDD to detect and respond to a potential drilling fluid release. While drilling is taking place, the drilling fluid system operator would monitor drilling fluid volumes from the pumps and return flows from the borehole and alert personnel if there is a significant change in the return volume. This is the most effective and efficient way to detect a drilling fluid release. Detailed planning and management measures, as well as corrective actions to be taken in the event of a drilling fluid release, would be included in an Inadvertent Release Contingency Plan, to be provided to agencies in advance of starting construction.

2.3.5 BEACH MANHOLES

Upon completion of the HDD operations, the bore pipes would be capped, and the bore site demobilized. The surface of each drill pit would be cleaned and prepared for installation of the BMHs. Up to three pre-cast concrete BMHs would be installed at the landward end of the bore pipes. Each BMH would serve as the terminus point for up to two directional bore pipes. The BMHs would be buried and capped with a cast-iron manhole cover at grade level. Manholes can typically be installed within the excavated HDD entry pits for selected bore pipes. BMHs would be constructed at an appropriate depth on the Project site at the location of the HDD entry pit where additional excavation may be required to accommodate the BMH. . Installation of the manholes would then require putting the manhole in place on aggregate base material (e.g., crusher run) and backfilling around the manhole with the native soils. Exact locations for the BMHs will be determined following HDD; locations would be within the 16,000 sq ft work footprint. Once construction is complete, the BMHs would be at grade or below and the site would be restored.

2.3.6 FRONTHAUL CONDUIT SYSTEM

A subsurface conduit system would be installed between the proposed BMHs and the existing CLS located on the adjacent land at 92-384 Farrington Highway in Kapolei. The Project anticipates the conduit route would be installed via open trenching. A single trench would be excavated from the furthest BMH location with a backhoe or similar excavating equipment. The trench would be an estimated 20 inches (50 cm) wide at its base and 48 inches (120 cm) deep, depending on underground utilities encountered. Native soils/sands would be side cast during trenching and either replaced as backfill or tested and removed off-site as required. A duct nest to allow for conduit connections between the BMH and CLS will be installed in the trench.

The terrestrial conduit system would include six ducts (one for each bore pipe and future cable). Each duct would be sized to house the three sub-ducts needed for the future cables, including the fiber-optic, power, and ground cables. The group of three subducts would constitute one cable system. The six ducts to the CLS would remain vacant until the future subsea cable systems are landed and installed (outside the scope of this Project).

2.3.7 SITE RESTORATION

The Project site would be restored to a suitable condition, as required by the local authorities. Trench and manhole backfilling would begin immediately after the conduits or manholes are installed, using a backhoe or similar equipment. Backfill material would likely consist of sand-cement slurry and/or native sand/soil compacted to eliminate erosion and soil settlement in conformance with

specifications of the local authority. Any material removed permanently during excavation would be disposed of at locations approved to receive clean fill. Compaction of the backfill would be accomplished with a pneumatic-drum roller or vibratory compactor, using water to achieve the required density.

Materials and equipment would be retrieved and the Project site would be cleared of rubbish. This generally includes removal of the following:

- Excess drilling fluid and sediment excavated during drilling operations and transport to an approved disposal site;
- Removal of drill rig anchoring system;
- Removal of debris and Project-generated material, supplies, and equipment from the site at the completion of the work; and
- Removal of evidence of machinery presence, including track marks in the soil and any oil marks or tire tracks.

Restoration would occur following the completion of the Project infrastructure installation

2.3.8 SCHEDULE AND DURATION

Construction is expected to begin mid- 2025 and end mid- 2026.

Subtasks are expected to have the following duration contingent on good weather conditions and no equipment malfunctions (unforeseen circumstances such as these could extend the total number of working days):

- Site Preparation: two months
- Mobilization: one month
- HDD boring: two months (five-day work week, 24 hours per day)
- BMH installation: two weeks
- Trenching from BMH to CLS conduits: three weeks.
- Equipment Demobilization: two weeks
- Restoration: three to six weeks

2.3.9 CONSERVATION MEASURES

The following best management practices (BMPs) and measures would be implemented to minimize the potential for environmental impacts.

2.3.9.1 HDD BORE EXIT POINTS

As the HDD process is nearing completion, prior to exiting the seabed, the following measures will be implemented:

- Micrositing will be carried out for each bore exit point to avoid or minimize impacts to sensitive benthic habitats such as corals, rocky reefs, or seagrasses.

- The last 100 to 130 ft (30-40 m) of the pilot bore would be drilled with freshwater to flush the drilling fluid back to the entry point. This would prevent drilling fluid from escaping to the sea when the bore pipe exits the seabed.

2.3.9.2 HDD INADVERTENT RELEASE CONTINGENCY PLAN

Prior to HDD operations, Hawaiki or their representatives will prepare an Inadvertent Release Contingency Plan. The plan would include the following details:

- Measures to confirm decrease in returns, adjust mix to better fill fissures, assess results and readjust;
- If necessary, stop work, obtain further filler materials to bulk up mix attempt sealing bore;
- If losses remain uncontrollable or release to surface or waterbody, stop work, maintain appropriate control materials onsite, contain and remove released drilling mud. Site will be stood down preventing further migration of drilling mud, and notify all applicable authorities. Complete list of the agencies (with telephone number) to be notified.;
- Requirements for onshore and offshore monitors to identify signs of an inadvertent release of drilling fluids;
- Any abandonment contingency plans in case the HDD operations are forced to be suspended and a partially completed bore hole abandoned.

2.3.9.3 SPILL CONTINGENCY AND HAZARDOUS MATERIALS MANAGEMENT PLAN

A petroleum and chemical product Spill Contingency and Hazardous Materials Management Plan will be developed for both the terrestrial and marine Project areas:

Terrestrial: Measures for terrestrial operations must include, but not be limited to, identifying appropriate fueling and maintenance areas for equipment, a daily equipment inspection schedule, and spill response procedures including maintaining spill response supplies onsite. The terrestrial plan will identify, at a minimum, the following best management practices related to using hazardous substances:

- Follow manufacturer's recommendations on use, storage, and disposal of chemical products used in construction,
- Avoid overtopping construction equipment fuel gas tanks,
- During routine maintenance of construction equipment, properly contain and remove grease and oils,
- Conduct all equipment fueling at least 100 ft (30 m) from wetlands and other waterbodies if present,
- Properly dispose of discarded containers of fuels and other chemicals, and
- Maintain a complete list of agencies (with their telephone numbers) to be notified of potential hazardous material spills.

Marine: For marine activities involving work vessels, the primary work vessel (dive vessel) will be required to carry onboard a spill kit appropriate to the size of the vessel to clean up any small hazardous material spill or sheen on the water surface. The marine plan must

provide for the immediate call-out of additional spill containment and cleanup resources in the event of an incident that exceeds the rapid cleanup capability of the onsite work force.

2.3.9.4 MINIMIZE UNNECESSARY LIGHTING

Lighting would only be used for safety and security purposes and limited to the onshore work area. Light would be directed downward or toward active construction to minimize potential disturbance to any wildlife in adjacent habitats.

2.3.9.5 VESSEL OPERATIONS

The Project vessel will adhere to the following regulations and BMPs during operation:

- Approach regulations for humpback whales in waters surrounding the Hawai'ian Islands (50 CFR Part 216) and
- Hawai'i Department of Land and Natural Resources Division of Boating and Ocean Recreation's BMPs for operating vessels in close proximity to protected marine species.

2.3.9.6 VESSEL STRIKES

- Maintain a vigilant watch for marine mammals and sea turtles and slow down or stop the vessel to avoid striking species:
- When whales are sighted, maintain a distance of 100 yards or greater from the whale:
- When small cetaceans or sea turtles are sighted, attempt to maintain a distance of 50 yards or greater whenever possible:
- When cetaceans or sea turtles are sighted while a vessel is underway, attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area:
- Reduce vessel speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity of the vessel; therefore, precautionary measures should always be exercised; and
- Whales may surface in unpredictable locations or approach slow-moving vessels. When vessel personnel sight animals in the vessel's path or in close proximity to a moving vessel, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

3. EFFECTS OF THE ACTION

The following describes general effects of the proposed Project on the marine environment. Section 5 evaluates these effects in relation to individual listed species with potential to occur in the Action Area.

3.1 SEDIMENT DISTURBANCE AND TURBIDITY

Project activities have the potential to result in the temporary, localized, suspension of sediments during the HDD process. HDD in-water activities involve a bore exit point (location where the bore pipe and drill head exit the seabed) and removal of the drill head assembly via divers and hand tools. The HDD bores will target sandy areas for the bore pipe exits to the extent feasible. The amount of seabed disturbance around each bore exit point will be minimal and consist of an area only slightly larger than the diameter of the bore pipe exiting the seabed.

Previous marine habitat and coral surveys conducted within the southern portion of the Action Area (near the three southern proposed bore pipe exit locations) characterized the area as being low-quality habitat dominated by sand and rubble with patches of reef (Tetra Tech 2017). This survey also noted that general habitat quality appeared to decrease to the north, which is the location of this Project's Action Area. Furthermore, mapping efforts for coral habitat in the Hawai'ian Islands concluded that the southwestern side of O'ahu is one of the least-rich, shallow-water habitat areas in the main Hawai'ian Islands (Friedlander et al. 2008). Bore heads would target exit points in sandy sediments, avoiding any sensitive benthic habitats such as coral, to the extent feasible.

Any generated turbidity would be expected to dissipate quickly should sand or coarse substrates occur at the bore exits, and any resuspended sediments would settle within minutes of the disturbance. Federally listed wildlife species in the vicinity would be expected to avoid the bore pit locations due to temporary construction disturbances.

3.2 INADVERTENT RELEASES

3.2.1 HDD DRILLING FLUID

HDD of the steel conduits poses a small risk of an accidental release of drilling fluid to the marine environment. Drilling fluid is composed of water and bentonite, which is a natural marine clay. The drilling fluid is used to lubricate the bore head cutting tool and transport borehole cuttings back to shore. During the HDD process, it is possible that some bentonite drilling fluid could be released to the seafloor and thus into the water column. An accidental release of drilling fluid to the seafloor could result in a temporary, localized, negative effect on the marine environment and associated marine biota. The bentonite contained in the drilling fluid could result in short-term burial and smothering of benthic epifauna and infauna, cause localized increased turbidity around the area of release, and potentially clog fish gills (Kerr 1995). However, bentonite releases are relatively infrequent in recent years due to improvements in drilling technologies and fluid pressure monitoring. Since 2000, bentonite fluid releases have been detected in only four of 29 HDD-bored coastal landings for which records are available. In each of four recorded discharges, the borehole locations were suspected to be naturally fractured due to the proximity of known

geologic fault lines (AMS 2020). O'ahu is a volcanic island with many geological faults and generally porous sediments. To mitigate the potential risks of drilling in this type of geology, the drillers will monitor for potential releases at all times, to be described in their proposed *HDD Inadvertent Release Contingency Plan* (see 2.3.9.2).

An accidental release of drilling fluid may occur just prior to the drill head exiting the seafloor. In these cases, the drilling fluid may be substituted for water, which would curtail any further loss of drilling fluid. For this Project, water would be used to drill the last 100 to 130 ft (30-40 m) of each steel conduit to reduce the potential for inadvertent releases. A marine support team would be present during the tail end of the HDD process to monitor the seafloor as the drill head approaches the exit point.

3.2.2 PETROLUEM PRODUCT SPILLS

Project activities, specifically the marine support and dive team that will be monitoring the HDD bore exit point, will require the use of one small dive vessel that has the potential to release fuel, oil, or lubricants into the marine environment. Petroleum product releases into the marine environment have the potential to impact all trophic levels and taxa of marine wildlife at some level depending on the quantity released. Accidental releases affect marine species through oiling, habitat loss or degradation, effects to food resources, and lethal and sub-lethal physical effects. Marine support for HDD activities via dive vessel is expected to be needed for only 1 to 2 days per bore pipe exit (or up to 12 days total for 6 bore pipe exit points), all of which would be occurring during daytime hours.

Vessels operate under strict regulatory requirements that include measures to prevent and respond to an unforeseen accident. Requirements include federal and state oil spill prevention and response requirements. Implementation of conservation measures, as discussed in Section 2.3.9, would minimize the potential for an oil spill to affect any listed species in the Action Area.

3.3 LIGHT

HDD activities would take place over 24 hours for approximately two months. However, the HDD process would be carried out predominantly from land and no lights would be over the water during this period. A marine support and dive team would be deployed as the drill head approaches the exit point in approximately 50 to 65 ft (15-20 m) of water depth offshore; however, this team would only be active during the day. No effects to listed species from Project lighting are anticipated.

3.4 UNDERWATER NOISE

The Action Area's offshore acoustic environment is currently influenced by a number of anthropogenic sources such as military operations, commercial shipping, research, fishing, and recreation. Noise sources are typically classified into two main categories: impulsive and non-impulsive. Impulsive sounds are typically transient, brief (less than 1 second), broadband, and consisting of high peak sound pressure with rapid rise time and rapid decay. Non-impulsive sounds can be broadband, narrowband, or tonal; brief or prolonged; continuous or intermittent; and typically do not have a high peak sound pressure with rapid rise and decay time. The Project-

related activities associated with the HDD bore pipe installation and offshore vessel support for the HDD bore exit would generate temporary and non-impulsive continuous noise for approximately two months.

3.4.1 LISTED SPECIES UNDERWATER NOISE THRESHOLDS

3.4.1.1 FISH

In 2008, the Fisheries Hydroacoustic Working Group developed interim fish injury and disturbance thresholds for underwater noise. Table 1 presents the current injury and behavioral thresholds for fish based on fish size. The criteria identifies sound pressure levels of 206 dB_{peak} (peak sound pressure level) and 187 dB SEL_{cum} (cumulative sound exposure level) for all fish except for those that are less than 2 grams as noise potentially causing physical injury. For fish less than 2 grams, the injury threshold for SEL_{cum} is 183 dB. Behavioral impacts on fish were not addressed in the agreement; however, an RMS SPL in excess of 150 dB re 1 µPa is expected to cause temporary behavioral changes, such as elicitation of a startle response, disruption of feeding, or avoidance of an area (WSDOT 2020). See section 3.4.2 for an analysis of Project noise on listed fish species with potential to occur in the Action Area.

TABLE 1: UNDERWATER NOISE CRITERIA FOR FISH

Hearing Group	Injury Criteria, Peak SPL (dB re 1 µPa)	Injury Criteria, SEL_{cum} (dB re 1 μPa^2s)	Behavioral Response, RMS SPL (dB re 1 µPa)
Fish (≥ 2 grams)	206	187	150
Fish (< 2 grams)	206	183	150

Sources: FHWG 2008; WSDOT 2020

Notes: dB re 1 µPa = decibels relative to 1 microPascal; dB re 1 µPa2s = decibels relative to 1 microPascal squared normalized to 1 second; RMS = root mean square; SEL_{cum} = cumulative sound exposure level; SPL = sound pressure level

* = There are no formal criteria for non-impulsive noise*. The impulsive noise thresholds are commonly applied in the absence of a specific threshold.*

3.4.1.2 MARINE MAMMALS

NMFS released its *Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing* (NMFS 2016, NMFS 2018) to address the potential effects of underwater sound sources on marine mammals. The Guidance defines thresholds at which marine mammals may experience onset of temporary or permanent impacts to hearing (i.e., "threshold shifts"). NOAA Fisheries defines these marine mammal hearing thresholds as "the received levels at which individual marine mammals are predicted to experience changes in their hearing sensitivity for acute, incidental exposure to underwater anthropogenic sound sources" (NOAA Fisheries, 2018a). Threshold shifts are further categorized as temporary (TTS) or permanent (PTS). PTS refers to a permanent increase in the threshold of audibility for an ear at a specified frequency above a previously established reference level, whereas a TTS is a temporary change in hearing sensitivity that is non-injurious and reversible. In the Technical Guidance, NMFS equates the onset of PTS with "harm" as defined in the ESA; therefore, PTS is considered equivalent to take. NMFS equates temporary TTS with "harassment" as defined under the ESA. NMFS also considers noise that results in behavioral changes to constitute "harassment." Table 2 presents a summary of the

auditory bandwidth for various hearing groups, as well as injury and behavioral thresholds for impulsive and non-impulsive sounds. Both Peak SPL and SEL_{cum} are used to define thresholds, depending on whether the underwater sound produced is on an impulsive or non-impulsive basis

TABLE 2: NON-IMPULSIVE CUMULATIVE SOUND EXPOSURE LEVELS FOR MARINE MAMMALS

Hearing Group	Generalized Hearing Range	Non-impulsive Noise		Behavioral Disturbance Threshold
		TTS Threshold	PTS Threshold	
		SEL_{cum} (weighted) (dB re 1 μPa^2s)	SEL_{cum} (weighted) (dB re 1 μPa^2s)	Non-impulsive
Low-frequency (LF) cetaceans (baleen whales)	7 Hz to 35 kHz	179	199	120 dB_{RMS}
Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales)	150 Hz to 160 kHz	178	198	
High-frequency (HF) cetaceans (true porpoises, Kogia, river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*)	275 Hz to 160 kHz	153	173	
Phocid pinnipeds (PW) (true seals)	50 Hz to 86 kHz	181	201	
Otariid pinnipeds (OW) (sea lions and fur seals)[b]	60 Hz to 39 kHz	199	219	

Sources: NOAA Fisheries 2018a; NMFS 2023a

Notes: dB = decibel; RMS = root mean square; SEL = sound exposure level

Ocean noise pollution is of particular concern to marine species, particularly marine mammals, because of their high dependency on sound as their primary sense for navigating, finding prey, avoiding predators, and communicating with conspecifics. Underwater noise disturbances may displace marine mammals from habitat, mask their ability to communicate, or cause stress (Hildebrand 2005).

Louder anthropogenic sounds may also lead to temporary or permanent impacts to hearing (TTS or PTS). This, in turn, could interfere with foraging efforts or increase vulnerability to predators. A relationship may exist between certain types of underwater noise (possibly sonar exercises) and strandings (University of Rhode Island and Inner Space Center 2021). See Section 3.4.2 for an analysis of the effects of underwater on listed marine mammal species with potential to occur in the Action Area. Project underwater noise effects to marine mammals would be minimized with implementation of Project conservation measures (see Section 2.3.6 for Project Conservation Measures).

3.4.1.3 SEA TURTLES

Data are limited regarding sea turtle behavioral responses to sound levels below those expected to cause injury. However, sea turtles have been observed to modify their behavior in response to low-frequency, impulsive sounds from seismic sources (McCauley et al. 2000). In August 1997, the Center for Marine Science and Technology of Curtis University in Western Australia conducted tests to determine sea turtle response to nearby air gun exposure. The tests showed that, when exposed to noises air gun noise at 166 dB re 1 µPa RMS SPL, the sea turtles noticeably increased their swimming activity compared to non-air gun operation periods. Further, it showed that above 175 dB re 1 µPa RMS SPL, their behavior became more erratic, indicating the sea turtles were possibly in an agitated state (McCauley et al. 2000).

NMFS established underwater noise injury and behavioral disturbance thresholds for sea turtles for both impulsive and continuous sound sources in the Multi-Species Pile Driving Calculator (NMFS 2021). These thresholds are presented in Table 3. See Section 3.4.2 for an analysis of Project noise on each listed sea turtles with potential to occur in the Action Area. Project underwater noise effects to sea turtles would be minimized with the implementation of Project conservation measures (see Section 2.3.6 for Project Conservation Measures).

TABLE 3: THRESHOLD FOR INJURY OR DISTURBANCE TO SEA TURTLES

Hearing Group	Permanent Injury Onset, Peak SPL (dB re 1µPa)	Permanent Injury Onset, SEL_{cum} (dB re 1 μPa^2s)		Behavioral Response, RMS SPL (dB re 1 µPa)	
	Impulsive	Impulsive	Non-Impulsive	Impulsive	Non-Impulsive
Sea turtles	232	204	220	175	175

Source: NMFS 2023a, McCauley et al. 2000
Notes: dB = decibel; RMS = root mean square; SEL = sound exposure level

3.4.2 EFFECTS OF UNDERWATER NOISE ON LISTED MARINE SPECIES

To assess the effects of Project-generated underwater noise on listed or fish, turtle, and marine mammal species, proxy HDD noise source data was reviewed from other projects and input into the NMFS Multi-Species Calculator. Noise associated with underwater HDD operations were detailed in Nedwell et al. (2012), which measured sound source levels in a shallow aquatic environment. At 39 m (~ 128 ft) below the sediment, the maximum unweighted sound pressure levels were measured as 129.5 dB re 1 µPa (Nedwell et al. 2012). The source of the underwater noise on this project would be generated from an onshore location travelling offshore subsurface of the seabed toward exit points and eventually "daylighting" in water depths of approximately 50-65 ft (15-20m). The maximum offshore subsurface depth of the HDD bore pipes would be approximately 130–150 ft (40-45). Assuming similar HDD underwater noise levels on this Project as in Nedwell et al., and based on calculated results, the threshold criteria for permanent injury or temporary behavioral shifts for fish and turtles would not be exceeded (FHWG 2008; WSDOT 2020; NOAA Fisheries 2018a; NMFS 2023a). The threshold criteria for permanent injury for marine mammal hearing groups would not be exceeded during the HDD operations; HDD noise source could exceed the NMFS behavioral disturbance threshold (120 dB) within approximately 130 ft of the noise source. However, marine mammals are not expected to occur within this distance of HDD activities for long durations. HDD noise would be very localized and of short duration. No effects to listed marine species from HDD underwater noise are expected, and underwater noise will not be considered further in this BA.

3.5 VESSEL STRIKES

Vessel speed has been correlated with marine species injury or mortality, where strikes are associated with a mean vessel speed of 18.1 knots (Jensen and Silber 2003; Hazel et al. 2007). However, vessel strikes are unlikely during Project activities due to the fact that only one small dive boat would be operating for short periods of time offshore (1 to 2 days per bore pipe, up to 12 days total), would be transiting to and from each bore exit point at low speeds, and would travel along a predictable path. Implementation of conservation measures, as discussed in Section 2.3.6, will further minimize the potential for a vessel strike.

4. ESA LISTED SPECIES AND CRITICAL HABITAT CONSIDERED

Federally listed threatened and endangered, proposed, and candidate species under NMFS jurisdiction that may occur within the Project vicinity were identified from the following databases:

- NOAA Fisheries ESA Threatened and Endangered Species list (NOAA Fisheries 2024a): ESA Threatened and Endangered Species under NOAA jurisdiction on the U.S. West Coast
- NOAA Fisheries National ESA Critical Habitat Mapper (NOAA Fisheries 2024b): designated critical habitats for listed species under NOAA jurisdiction in the Project area
- NOAA Fisheries EFH Mapper (NOAA Fisheries 2024c): designated EFH and Habitat Areas of Particular Concern (HAPCs) for NOAA managed fish species
- National Wetlands Inventory (NWI) Mapper (U.S. Geological Survey 2024): wetland resources in the Project Area

Table 4 lists all species evaluated in this review.

4.1 ESA LISTED SPECIES CONSIDERED

Table 4 shows 20 federally listed species identified during literature and desktop review that have the potential to occur in the vicinity of the Action Area and are under NMFS jurisdiction. Critical habitat for one species, Hawai'ian monk seal, overlaps with the Action Area and proposed critical habitat for one species, green sea turtle, overlaps the Action Area (Figure 3). As noted above, Project effects within the Action Area would be limited to the nearshore marine environment. Based on existing scientific literature and technical reports, several species and critical habitat were eliminated from further consideration due to lack of habitat and/or the fact that the Action Area is outside the species' known range. Rationale for exclusion is noted for each species.

TABLE 4: SPECIES AND DESIGNATED CRITICAL HABITAT DETERMINATIONS

Common Name	Scientific Name	Status[1]	Determination/Species Potential to Occur in Action Area	Determination/Critical Habitat Presence Within the Action Area
Fishes				
Giant manta ray	*Mobula birostris*	FT	**Not Likely to Adversely Affect.** The Action Area occurs within the range of the species and giant manta ray can occur in both offshore and nearshore waters. Effects of the Action may include vessel strikes or exposure to inadvertently released drilling fluid or petroleum products. Potential effects would be minimized with implementation of conservation measures.	**No Effect**. NMFS has determined that designation of critical habitat for the giant manta ray is not prudent at this time.
Oceanic whitetip shark	*Carcharhinus longimanus*	FT	**No Effect.** The Action Area occurs within the range of the species; however, oceanic white tip sharks are typically found offshore in deeper water depths (184 m; 604 ft.) than those in the Action Area (NOAA Fisheries 2017).	**No Effect**. NMFS has determined that designation of critical habitat for the oceanic whitetip shark is not prudent at this time.
Sea Turtles				
Green sea turtle – Central North Pacific Distinct Population Segment (DPS)	*Chelonia mydas*	FT	**Not Likely to Adversely Affect.** The Action Area occurs within the range of the species and green sea turtles can occur in both offshore and nearshore waters. Effects of the Action may include vessel strikes or exposure to inadvertently released drilling fluid or petroleum products. Potential effects would be minimized with implementation of conservation measures.	**Not Likely to Adversely Affect**. Proposed critical habitat for the green sea turtle overlaps the Action Area. The proposed designation is for essential reproductive and foraging/resting features that occur from the mean high-water line to 20 m depth. Although the Project will not physically alter any proposed critical habitat primary constituent elements and the Project area would not be located under any coastal bluffs or beaches, the potential for inadvertent releases could affect proposed critical habitat for this

Common Name	Scientific Name	Status[1]	Determination/Species Potential to Occur in Action Area	Determination/Critical Habitat Presence Within the Action Area
				species. Potential effects would be minimized with implementation of conservation measures.
Hawksbill sea turtle	*Eretmochelys imbricata*	FE	**Not Likely to Adversely Affect.** The Action Area occurs within the range of the species and hawksbill sea turtle can occur in both offshore and nearshore waters. Effects of the Action may include vessel strikes or exposure to inadvertently released drilling fluid or petroleum products. Potential effects would be minimized with implementation of conservation measures.	**No Effect**. The designated critical habitat for the hawksbill sea turtle does not overlap with the Action Area.
Leatherback sea turtle	*Dermochelys coriacea*	FE	**No Effect.** The Action Area occurs within the range of the species. However, due to their highly migratory nature, leatherback sea turtles are most common in offshore waters (deeper than the Project) southeast of the Hawai'ian archipelago (NMFS and USFWS 1998a).	**No Effect**. The designated critical habitat for the leatherback sea turtle does not overlap with the Action Area.
Loggerhead sea turtle – North Pacific Ocean DPS	*Caretta caretta*	FE	**No Effect.** The Action Area occurs within the range of the species. However, loggerhead sea turtles are most common in offshore waters of Hawai'i at depths greater than those of the Action Area (NMFS and USFWS 1998b).	**No Effect**. No critical habitat has been designated by NMFS to date for the North Pacific Ocean DPS loggerhead sea turtle.
Olive Ridley sea turtle	*Lepidochelys olivacea*	FT	**No Effect.** The Action Area occurs within the range of the species. However, olive Ridley sea turtles are most common in the offshore waters of Hawai'i at depths greater than those of the Action Area (NMFS and USFWS 1998c).	**No Effect**. No critical habitat has been designated by NMFS to date for olive Ridley sea turtle.

Common Name	Scientific Name	Status[1]	Determination / Species Potential to Occur in Action Area	Determination / Critical Habitat Presence Within the Action Area
Invertebrates				
Chambered nautilus	*Nautilus pompilius*	FT	**No Effect.** This species typically occurs at water depths greater than 200 m (656 ft) and has not been documented in the Hawai'ian Islands (Miller 2018). The Action Area does not occur within the current range of this species and potential presence in the vicinity of the Action Area is unlikely.	**No Effect**. NMFS has determined that critical habitat for the chambered nautilus is not prudent at this time.
Corals				
Acropora globiceps coral	*Acropora globiceps*	FT	**Not Likely to Adversely Affect.** The Action Area occurs within the range of the species, and *A. globiceps* occurs at depth ranges between 0-20 m (65.6 ft), with most observations occurring below 8 m (26.2 ft). The potential presence of this species within the vicinity of the Project Area is not likely as it is primarily observed in the Northwestern Hawai'ian Islands (NMFS 2023b). However, the Action Area contains potentially suitable habitat for this species and presence cannot be completely excluded. Effects of the Action may include inadvertent release exposure or sediment disturbances. Potential effects would be minimized with implementation of conservation measures.	**No Effect**. Critical habitat was proposed for *A. globiceps* on 27 November 2020 (85 FR 76262). Revisions to the proposal were submitted on 30 November 2023 (88 FR 83644). The proposed critical habitat is not present in the Action Area. The Project will have no effect on proposed critical habitat for this species.
Acropora retusa coral	*Acropora retusa*	FT	**No Effect.** This species occurs at depths between 0 and 29 m (95.1 ft) but has not been documented in the Hawai'ian Islands. Therefore, the Action Area does not occur within the current range of *A. retusa* and presence is unlikely (NMFS 2023b).	**No Effect**. Critical habitat was proposed for *A. retusa* on 27 November 2020 (85 FR 76262). Revisions to the proposal were submitted on 30 November 2023 (88 FR 83644). The proposed critical habitat is not present in the Action

Common Name	Scientific Name	Status[1]	Determination/Species Potential to Occur in Action Area	Determination/Critical Habitat Presence Within the Action Area
				Area. The Project will have no effect on proposed critical habitat for this species.
Acropora speciosa coral	*Acropora speciosa*	FT	**No Effect.** This species occurs from 12-65 m (39 to 213 ft) but has not been documented in the Hawai'ian Islands. Therefore, the Action Area does not occur within the current range of this species and potential presence in the vicinity of the Action Area is unlikely (NMFS 2023b).	**No Effect**. Critical habitat was proposed for *A. speciosa* on 27 November 2020 (85 FR 76262). Revisions to the proposal were submitted on 30 November 2023 (88 FR 83644). The proposed critical habitat is not present within the Action Area. The Project will have no effect on proposed critical habitat for this species.
Fibriaphyllia paradivisa coral	*Fibriaphyllia paradivisa*	FT	**No Effect.** This species typically occurs at depths between 5-75 m (16-246 ft) but has not been documented in the Hawai'ian Islands (NMFS 2023b). The Action Area does not occur within the current range of this species and potential presence in the vicinity of the Action Area is unlikely.	**No Effect**. Critical habitat was proposed for *F. paradivisa* on 27 November 2020 (85 FR 76262). Revisions to the proposal were submitted on 30 November 2023 (88 FR 83644). The proposed critical habitat is not present in the Action Area. The Project will have no effect on proposed critical habitat for this species.
Isopora crateriformis coral	*Isopora crateriformis*	FT	**No Effect.** This species is most common at depths between 0 to 20 m (66 ft) but has not been documented in the Hawai'ian Islands (NMFS 2023b). The Action Area does not occur within the current range of this species and potential presence in the vicinity of the Action Area is unlikely.	**No Effect**. Critical habitat was proposed for *I. crateriformis* on 27 November 2020 (85 FR 76262). Revisions to the proposal were submitted on 30 November 2023 (88 FR 83644). The proposed critical habitat is not present in the Action Area. The Project will have no effect on proposed critical habitat for this species.
Marine Mammals				

Common Name	Scientific Name	Status[1]	Determination/Species Potential to Occur in Action Area	Determination/Critical Habitat Presence Within the Action Area
Blue whale - Central North Pacific Stock	*Balaenoptera musculus musculus*	FE	**No Effect.** Inhabits all oceans and can occur in both nearshore and deep oceanic waters. Blue whales belonging to the Central North Pacific Stock feed in summer in the North Pacific, south of the Aleutian Islands and in the Gulf of Alaska, and then migrate to lower latitudes in the winter (NOAA Fisheries 2018b). Suitable habitat is not likely present in the Action Area. The Project is within 0.5 mile of the shoreline and only extends into waters 50-65 ft of depth.	**No Effect.** There is no critical habitat overlapping the Action Area.
False killer whale - Main Hawai'ian Islands Insular DPS	*Pseudorca crassidens*	FE	**No Effect.** This species generally prefers tropical and subtropical offshore waters with depths greater than 3,300 ft (1,006 m) (NOAA Fisheries 2022). Potential presence in the vicinity of the Action Area.	**No Effect.** Critical habitat for false killer whale (Main Hawai'ian Islands Insular DPS) (83 FR 35062) is designated in the waters surrounding the main Hawai'ian Islands from the 45 m to the 3,200 m depth contour. The Action Area does not directly overlap critical habitat and the Project-related activity will have no effect on the critical habitat for this DPS.
Fin whale - Hawai'i Stock	*Balaenoptera physalus velifera*	FE	**No Effect.** Considered rare in Hawai'ian waters, fin whales prefer deep, offshore waters of the temperate and polar oceans, but can also be present in tropical regions. Individual density in a region varies seasonally. Most individuals migrate from Arctic and Antarctic feeding areas in summer to tropical breeding and calving areas in the winter, but locations of winter breeding are unknown (NOAA Fisheries 2021g). Potential presence in the vicinity of the Action Area is unlikely.	**No Effect.** There is no critical habitat overlapping the Action Area.

Common Name	Scientific Name	Status[1]	Determination/Species Potential to Occur in Action Area	Determination/Critical Habitat Presence Within the Action Area
Hawaiian monk seal	*Neomonachus schauinslandi*	FE	**Not Likely to Adversely Affect.** Specific habitat areas in the main Hawai'ian Islands include marine habitat from the 200 m depth contour line, including the seafloor and all subsurface waters and marine habitat within 10 m of the seafloor, through the water's edge 5 m into the terrestrial environment from the shoreline. Identified boundary points on the islands include: Ka‘ula, Ni‘ihau, Kaua‘i, O‘ahu, Maui Nui (including Kaho‘olawe, Lanai, Maui, and Moloka‘i), and Hawai‘i (NOAA Fisheries 2023a). Potential presence in the vicinity of the Action Area is possible. Effects of the Action may include vessel strikes or exposure to inadvertently released drilling fluid or petroleum products. Potential effects would be minimized with implementation of conservation measures.	**Not Likely to Adversely Affect.** Critical habitat for Hawai'ian monk seal (80 FR 50926) overlaps the Action Area. Terrestrial critical habitat extends from the water's edge inland to 5 m past the shoreline (i.e., edge of vegetation growth or the upper limit of debris). Marine critical habitat includes the seafloor and all subsurface waters within 10 m of the seafloor, out to the 200 m depth contour line. Although the Project will not physically alter any critical habitat primary constituents, potential inadvertent releases could affect critical habitat for this species. Potential effects would be minimized with implementation of conservation measures.
Sei whale Hawai‘i Stock	*Balaenoptera borealis borealis*	FE	**No Effect.** This species prefers deep oceanic waters away from coasts in temperate, mid-latitude regions, but can be found in subtropical to subpolar waters around the world. Individual and population distributions are unpredictable (NOAA Fisheries 2018c). Potential presence in the vicinity of the Action Area is unlikely.	**No Effect.** There is no critical habitat overlapping the Action Area.
Sperm whale Hawai‘i Stock	*Physeter macrocephalus*	FE	**No Effect.** Sperm whales can be found in all oceans, with distribution dependent on prey abundance and location. Sightings have been documented throughout coastal waters of the main Hawai'ian Islands and Northwestern Hawai'ian Islands;	**No Effect.** There is no critical habitat overlapping the Action Area.

Common Name	Scientific Name	Status[1]	Determination/Species Potential to Occur in Action Area	Determination/Critical Habitat Presence Within the Action Area
			however, presence is most closely associated with waters deeper than those of the Action Area (NOAA Fisheries 2021s). Potential presence in the vicinity of the Action Area is unlikely.	

Notes:
Status can be the following: FT = federally threatened; FE = federally endangered; PE = proposed endangered
DPS = distinct population segment
FR = Federal Register
HDD = horizontal directionally drilled

4.2 NO EFFECT

The BA concluded that the proposed Project would have ***no effect*** on the oceanic whitetip shark, hawksbill sea turtle, leatherback sea turtle, loggerhead sea turtle - North Pacific Ocean DPS, olive Ridley sea turtle, *Acropora retusa* coral, *Acropora speciosa* coral, chambered nautilus, *Fibriaphyllia paradivisa* coral, *Isopora crateriformis* coral, blue whale – Central North Pacific Stock, false killer whale – main Hawai'ian Island Insular DPS, fin whale – Hawai'i Stock, sei whale – Hawai'i Stock, sperm whale – Hawai'i Stock, and all critical habitats. These species are not considered further herein.

4.3 MAY AFFECT, NOT LIKELY TO ADVERSELY AFFECT

The BA concluded that the Project ***may affect but is not likely to adversely affect*** the following species: giant manta ray, green sea turtle – Central North Pacific DPS, hawksbill sea turtle, Hawai'ian monk seal, and *Acropora globiceps* coral. Conclusions are discussed in detail for each species below.

4.3.1 GIANT MANTA RAY

The giant manta ray *(M. birostris*) was federally listed as threatened in 2018 (83 FR 2916). The scientific name of the species was revised in 2023 to reflect the accepted taxonomy and nomenclature recognized by the greater scientific community (88 FR 81351). NOAA Fisheries is required to implement a recovery plan for the conservation and survival of the species under the ESA. This plan is still in development and an interim recovery outline is available to direct recovery efforts (NOAA Fisheries 2024d).

In 2019, NOAA Fisheries determined that the designation of critical habitat for the species was not prudent (84 FR 66652). This decision was made when NOAA Fisheries concluded, after extensive review of available data, that there are no physical or biological features of areas under U.S. jurisdiction that are essential to the conservation of the species. As such, no U.S.-occupied areas meet the definition of critical habitat for the giant manta ray (NOAA Fisheries 2019a).

4.3.1.1 LIFE HISTORY

Giant manta rays are found in tropical, subtropical, and temperate marine habitats and occupy both offshore waters and nearshore productive coastlines. The species is considered mainly migratory given the pelagic habitats it occupies, but recent studies suggest site fidelity to specific locations in both nearshore and offshore populations (Stewart et al. 2016).

Giant manta rays primarily feed on plankton and small fish, and seasonally occur at productive areas with upwellings such as island chains and offshore features such as pinnacles and seamounts. While they are considered solitary, they have been found to aggregate at certain sites for cleaning, foraging, and mating. Giant manta rays occupy a wide range of depths that can vary from less than 10 m (33 ft) for aggregating to up to 450 m (1,476 ft) for foraging (NOAA Fisheries 2024d).

The species is long-lived, reaching ages of 28 years (Stewart et al. 2018). Females grow to an average disc width (DW) of between 13.78 ft (4,200 mm) and 14.76 ft (4,500 mm) and males

reaching an average DW of between 10.5 ft (3,200 mm) and 13.12 ft (4,000 mm) (Rambahiniarison et al. 2018).

4.3.1.2 THREATS

The primary threat to giant manta rays is over-harvest from commercial fisheries. The species is both targeted and caught as bycatch in several global fisheries throughout their range. Industrial purse seine and artisanal gillnet fisheries have the most significant adverse impacts on population numbers for the giant manta ray (Lawson et al. 2016). Take of the species in fisheries in the Indo-Pacific have been observed to frequently surpass the number of individuals observed in the same region.

Life history traits make giant manta rays more susceptible to threats to the species' viability. These traits include long gestation periods, potential extensive breaks between pregnancies, and low fecundity/population replacement rates. The migratory nature of the species also makes it more susceptible to anthropogenic threats as populations can travel between jurisdictions, which requires international cooperation for effective conservation efforts (NOAA Fisheries 2019b).

4.3.1.3 POTENTIAL PRESENCE IN ACTION AREA

The species is known to occur off the coast of Hawai'i. Populations that occur within the Hawai'ian Islands are mainly pelagic and rarely approach nearshore waters. The greatest density of the observations for the species in Hawai'i occur along the western Kona Coast. The species is most likely to be found from May to September when waters are warmer and their prey of microscopic plankton are in higher concentrations on the water's surface.

Detailed information on giant manta ray presence specific to the southwest coast of O'ahu is limited (iNaturalist, 2024). However, suitable habitat is present within the Action Area, and therefore, the species must be considered to have potential to occur.

4.3.1.4 POTENTIAL EFFECTS ON GIANT MANTA RAY

The Project-related sediment disturbances at the bore exit locations would be temporary and localized and not expected to affect manta rays. Vessel strikes pose a potentially lethal threat to giant manta rays. The species is highly mobile and often uses surface waters to optimize foraging efforts. However, the only vessel present within the Action Area would be a small diver-support vessel. The vessel captain and spotters would observe the Action Area during Project activities to reduce the potential for contact with giant manta rays. The inadvertent release of petroleum products could also have an adverse effect on giant manta ray and their prey if present in the Project area during an event. The conservation measures discussed in Section 2.3.6 will be implemented to minimize these risks to the species. Therefore, the Project **may affect but is not likely to adversely affect** giant manta ray.

4.3.2 GREEN SEA TURTLE – CENTRAL NORTH PACIFIC DPS

The range of the green sea turtle (*Chelonia mydas*) includes tropical and subtropical oceans worldwide. There are currently 11 DPS of green sea turtle listed under the ESA. Green sea turtles in Hawai'i are part of the Central North Pacific DPS, which encompasses the Hawai'ian archipelago and Johnston Atoll. This DPS is listed as threatened under the ESA throughout its Pacific Range.

In 2023, NOAA and USFWS proposed to designate critical habitat for five DPS of green sea turtle, including the federally threatened North Atlantic, South Atlantic, and Central North Pacific DPS and the federally endangered Central South Pacific and Central West Pacific DPS (NOAA-NMFS-2023-0087) (FWS-R4–ES-2022-0164).

4.3.2.1 LIFE HISTORY

The life history of green sea turtles involves a series of life stages and a variety of habitat types. Nearshore waters, bays, and estuaries are used for foraging, rest, reproduction, accessing nesting beaches, and inter-nesting areas. Deeper waters with depths greater than 200 m are used during migration between reproductive and foraging areas. The green sea turtle reaches sexual maturity at 25 to 40 years of age. The nesting season ranges from late April through late October (USFWS 2023b; Seminoff et al. 2015).

4.3.2.2 THREATS

Green sea turtles face many threats worldwide and locally in Hawai'i. Pollution reduces the availability of seagrass and algae, which are crucial food sources for green sea turtles. Dredging disturbs food resources and disrupts the resting places and foraging areas of green turtles. In-water construction may also create obstacles to migration and access to nesting beaches. Climate change exacerbates these challenges by disrupting migration patterns and nesting seasons. Green sea turtles are vulnerable to coastal fishing and can become entangled in fishing gear/marine debris leading to injury and disease (State of Hawai'i DAR 2024b; USFWS 2023a).

4.3.2.3 POTENTIAL PRESENCE IN ACTION AREA

Green sea turtles largely travel to the main Hawai'ian Islands to forage for food and bask on the beaches. Potentially suitable marine habitat occurs within the Action Area. Proposed critical habitat for green sea turtle overlaps the offshore Project Action Area. The proposed designation is for essential reproductive and foraging/resting features that occur from the mean high-water line to 20 m depth. This species is a commonly observed in the area and is likely to be present within the Action Area.

4.3.2.4 POTENTIAL EFFECTS ON GREEN SEA TURTLES AND CRITICAL HABITAT

The Project-related sediment disturbances at the bore exit locations would be temporary and localized and not expected to affect sea turtles. Vessel strikes pose a potentially lethal threat to sea turtles. However, the only vessel present within the Action Area would be a small diver-support vessel. The vessel captain and spotters would observe the Action Area during Project activities to reduce the potential for contact with sea turtles. The inadvertent release of petroleum products could also have an adverse effect on sea turtles and their prey if present in the Project area during an event. The conservation measures discussed in Section 2.3.6 will be implemented to minimize these risks to the species. Therefore, the Project **may affect, but is not likely to adversely affect** green sea turtles and their critical habitat.

4.3.3 HAWKSBILL SEA TURTLE

The hawksbill sea turtle (*Eretmochelys imbricata*) was listed as endangered in 1970 (35 FR 8491). Critical habitat for the hawksbill sea turtle was designated on September 2, 1998 (63 CFR 46693) which includes the coastal waters surrounding Mona and Monito Islands, Puerto Rico. In 1998, NOAA Fisheries designated critical habitat (NOAA 2024f).

4.3.3.1 LIFE HISTORY

The range of the hawksbill sea turtle includes tropical and subtropical oceans worldwide. Early life history of hawksbills is relatively undescribed. After hatching, this species lives and forages in the shallow nearshore coral reef environments around the Hawai'ian archipelago. Their diet is highly specialized, primarily consisting of sponges. Hawksbills forage near rocky outcrops, high-energy shoals (ideal for sponge growth), and mangrove-lined bays and estuaries. Female hawksbills nesting on Hawai'i Island and Maui have been tracked to feeding grounds on O‘ahu, Moloka‘i, Maui, and Hawai'i Island. These turtles reach sexual maturity between 20 and 35 years of age and typically nest from May to December. Hawksbills inhabiting the Hawai'ian Islands are extremely rare with only 10 to 25 females nesting annually along the southern coast of the island of Hawai'i and the eastern coast of the island of Moloka‘i (NOAA Fisheries 2024f).

4.3.3.2 THREATS

In nearshore foraging areas, coastal fishing poses risks to juvenile and adult sea turtles, while habitat degradation affects water quality and food availability due to invasive species (State of Hawai'i DAR 2024b; NOAA Fisheries 2024f).

4.3.3.3 POTENTIAL PRESENCE IN ACTION AREA

Hawksbill sea turtles have the potential to occur within the Action Area while transiting to and from rocky outcrops or coral reef habitats where they feed. Although the Action Area doesn’t contain preferred habitat for this species and their presence in the Action Area is unlikely, the species has been recorded feeding offshore of O‘ahu and therefore must be considered to have potential to occur.

4.3.3.4 POTENTIAL EFFECTS ON HAWKSBILL SEA TURTLE

The Project-related sediment disturbances at the bore exit locations would be temporary and localized and not expected to affect sea turtles. Vessel strikes pose a potentially lethal threat to sea turtles. However, the only vessel present within the Action Area would be a small diver-support vessel. The vessel captain and spotters would observe the Action Area during Project activities to reduce the potential for contact with sea turtles. The inadvertent release of petroleum products could also have an adverse effect on sea turtles and their prey if present in the Project area during an event. The conservation measures discussed in Section 2.3.6 will be implemented to minimize these risks to the species. Therefore, the Project **may affect, but is not likely to adversely affect** hawksbill sea turtles.

4.3.4 HAWAI'IAN MONK SEAL

The Hawai'ian monk seal (*Neomonachus schauinslandi*) is federally protected by the ESA and the Marine Mammal Protection Act (MMPA). This species was listed as endangered under the ESA in 1976 (41 FR 51611) and is a strategic stock under the MMPA due to the population size which is currently below its optimum sustainable population.

4.3.4.1 LIFE HISTORY

These seals are managed as a single stock, with six main reproductive subpopulations recognized at French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Midway Island, and Kure Atoll. The total estimated population of Hawai'ian monk seals in Hawai'i is approximately 1,600 individuals, with nearly 1,200 seals in the Northwestern Hawai'ian Islands and 400 seals in the main Hawai'ian Islands. These seals prefer subtropical waters and use the waters surrounding atolls, islands, and areas farther offshore on reefs and submerged banks for foraging. Shorelines consisting of sand, coral rubble, and volcanic rock shorelines are used for haul-outs (NOAA Fisheries 2023a; State of Hawai'i DAR 2024a; NOAA Fisheries 2024b).

The NOAA Fisheries final rule to revise the critical habitat for the Hawai'ian monk seal was made effective 21 August 2015 (Final Rule, 80 FR 50926). Terrestrial critical habitat extends from the water's edge inland to 5 m past the shoreline (i.e., edge of vegetation growth or the upper limit of debris). Marine critical habitat includes the seafloor and all subsurface waters within 10 m of the seafloor, out to the 200 m depth contour line (NMFS Office of Protected Resources 2024).

4.3.4.2 THREATS

Threats to the population of Hawai'ian monk seals include deliberate killing, human interaction and harassment, disease, loss of terrestrial habitat, food limitation, shark predation, and entanglement in marine debris, including fishing gear (NOAA Fisheries 2023a; State of Hawai'i DAR 2024a; NOAA Fisheries 2024e).

4.3.4.3 POTENTIAL PRESENCE IN ACTION AREA

The Hawai'ian monk seal could occur in the waters of the Action Area year-round and critical habitat for this species overlaps the Action Area; however, it is not expected on the shore/ terrestrial portion of the Action Area due to the rocky conditions of the shoreline habitat. This area of shoreline is not known or identified as a pupping location for Hawai'ian monk seals. However, potential for presence in the nearshore marine environment cannot be excluded.

4.3.4.4 POTENTIAL EFFECTS ON HAWAI'IAN MONK SEAL

The Project-related sediment disturbances at the bore exit locations would be temporary and localized and not expected to affect sea turtles. Vessel strikes pose a potentially lethal threat to monk seals. However, the only vessel present within the Action Area would be a small diver-support vessel. The vessel captain and spotters would observe the Action Area during Project activities to reduce the potential for contact with monk seas. The inadvertent release of petroleum products could also have an adverse effect on monk seals and their prey if present in the Project area during an event. The conservation measures discussed in Section 2.3.6 will be implemented

to minimize these risks to the species. Therefore, the Project **may affect, but is not likely to adversely affect** Hawai'ian monk seals or their critical habitat.

4.3.5 *ACROPORA GLOBICEPS* CORAL

Acropora globiceps coral was federally listed as threatened in 2014 (79 FR 53851). A 5-year review of the 15 listed species of Indo-Pacific reef building corals (including *A. globiceps*) began in 2021 and concluded in 2024. The 5-year review included the development of a Recovery Status Review document for the 15 species listed under the ESA (NMFS 2023b).

Critical habitat was proposed for the 15 listed Indo-Pacific coral species on 30 November 2023 and includes American Samoa, Commonwealth of the Northern Mariana Islands, Guam, Northwestern Hawai'ian Islands, and the Pacific Remote Islands Area.

4.3.5.1 LIFE HISTORY

A. globiceps is found within multiple environments ranging from shallow forereefs to exposed reef margins and within lagoons with higher wave energy (NMFS 2023b). Limited information and data are available on the life history of *A. globiceps*. The *Acropora* species is typically classified as being hermaphroditic broadcast spawners with a rapid skeletal growth and a low tolerance to stress (NMFS 2023b; Brainard et al. 2011). Due to these characteristics, The *Acropora* species is able to effectively compete for space and recruit on available substrates, but can be subjected to naturally occurring disturbances which implies that they are mostly dominant in ideal conditions (Darling et al. 2012).

4.3.5.2 THREATS

Primary threats for *A. globiceps* include ocean warming and acidification as a result of global climate change; physical impacts from increased fishing activities along reefs within its range; disease, which has been linked to bleaching events; and land-based sources of pollution, which can impact reef-building corals such as *A. globiceps* (NMFS 2023b).

4.3.5.3 POTENTIAL PRESENCE IN ACTION AREA

This species is most common at depths above 8 m (26 ft) but has been found as deep as 20 m (65 ft), which is within the same depth range as the end of the Project's bore pipes at approximately 15 to 20 m (50–65 ft). *A. globiceps* is only documented in the Northwest Hawai'ian Island system (NMFS 2023b). Furthermore, a marine habitat characterization survey completed in 2017 in the vicinity of the Action Area did not detect *A. globiceps* or any other *Acropora* coral species (Tetra Tech 2017). Mapping efforts for coral habitat in the Hawai'ian Islands have also shown the southwestern side of O'ahu as being one of the least-rich, shallow-water coral habitat areas in the main Hawai'ian Islands (Friedlander et al. 2008). However, considering that *Acropora* species are known to be broadcast spawners and their overall distribution range appears to be increasing since 2014 (NMFS 2023b), their presence in the Action Area is considered unlikely but possible.

4.3.5.4 POTENTIAL EFFECTS ON *ACROPORA GLOBICEPS* CORAL

Due to its sessile nature, this species is most susceptible to potential effects resulting from sediment disturbances (i.e., increased levels of turbidity or sedimentation) or the inadvertent release of drilling fluid or petroleum products as a result of Project activities. Sediment deposition has been shown to affect *Acropora* coral species and the ability for their larvae to settle on surfaces, particularly when sediment accumulates on coral tissue over longer periods of time, thus affecting their autotrophic processes (Flores et al. 2012; Babcock and Davies 1991). Studies have shown *Acropora* coral to be insensitive to a range of suspended sediment concentrations (30 to 100 mg/L) as long as there is some level of light attenuation that is able to reach the corals (Bessel-Browne et al. 2017). Based on recent marine habitat surveys in the immediate vicinity of the Action Area (Tetra Tech 2017), the benthic substrate present in the Action Area likely consists of mostly sand and rubble. Therefore, the turbidity and suspended sediments in the Action Area as a result of installation of the Project's bore pipes would be temporary and minimal, dissipating over a short period of time (minutes) and having little to no effect on *A. globiceps* (if present). Bore exit points would avoid any *A. globiceps* coral (if present) or any other sensitive habitats (micrositing for the exit point would be carried out prior to completing the HDD process). Exposure to drilling fluid has been shown to have negative effects on a range of coral species (Jones et al. 2021; Cordes et al. 2016). To reduce potential exposure to drilling fluid, conservation measures would be administered during HDD activities (as discussed in Section 2.3.9). A nearshore geophysical survey will be completed prior to the HDD installation to determine the HDD punch-out locations, which will target sandy substrate areas, though the exact nature of the substrate at these locations cannot be guaranteed. Therefore, the Project **may affect but is not likely to adversely affect** *A. globiceps* coral.

5. NATIONAL MARINE FISHERIES SERVICE JURISDICTION

5.1 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) defines EFH as “those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity” (50 CFR 600). For the purposes of this definition, “waters” means aquatic areas and their associated physical, chemical, and biological properties; “substrate” includes sediment, hard bottom, structures underlying the waters, and associated biological communities; “necessary” means the habitat required to support a sustainable fishery and healthy ecosystem; and “spawning, feeding, and breeding” is meant to encompass the complete lifecycle of species (50 CFR 600).

The Magnuson-Stevens Act created eight regional fishery management councils responsible for conservation of the fisheries in their regions to promote long-term biological and economic sustainability of the fisheries in the U.S. Exclusive Economic Zone (EEZ). Fisheries within the Hawai'ian Islands are managed by the Western Pacific Regional Fishery Management Council (WPRFMC). The WPRFMC is required to identify EFH in Fishery Management Plans (FMPs) for all federally managed species. The waters around the Action Area have been designated as EFH for a number of species that are managed under three FMPs: Bottomfish and Seamount Groundfish, Pacific Pelagic Species (managed under the Fishery Ecosystem Plan [FEP] for Pelagic Fisheries of the Western Pacific), and Main Hawai'ian Islands Coral Reef Ecosystems (NMFS 2024; Figure 4). The EFH under the Bottomfish and Seamount Groundfish FMP consists of any soft-bottom habitats, rocky reefs, and deep reef slopes located from the shoreline to the EEZ down to a depth of 1,312 ft (400 m) for shallow-water species and deep-water species including giant trevally (*Caranx ignoblis*), thicklip trevally (*Carangoides orthogrammus*), pink snapper (*Pagrus auratus*), blue stripe snapper (*Lutjanus kasmira*), amberjack (*Seriola spp.*), and Kona crab (*Ranina ranina*). EFH for species managed under the Pelagic Species FMP includes soft-bottom habitats and areas where fish may aggregate from the shoreline out to the EEZ to a depth of 656 ft (200 m). The Action Area is considered EFH for all pelagic fisheries from the egg to adult life stages. Designated EFH under the Coral Reef Ecosystem FMP includes coral reefs, rocky reefs, artificial reefs or shipwrecks, and lagoons for all life stages of coral reef.

TABLE 5: EFH DESIGNATIONS FOR HAWAI'IAN ARCHIPELAGO FISHERY ECOSYSTEM PLAN MANAGEMENT UNIT SPECIES

Management Unit	Species Complex	EFH	Habitat Types
Bottomfish and seamount groundfish	Shallow-water species (0–50 fathoms [fm] [0–300 ft (0–91 m)]): gray jobfish (uku) (*Aprion virescens*), thicklip trevally (*Pseudocaranx dentex*), giant trevally (*Caranx ignoblis*), black trevally (*Caranx lugubris*), amberjack (*Seriola dumerili*), bluestripe snapper (ta‘ape) (*Lutjanus kasmira*)	Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 1,312 ft (400 m)	Soft-bottom habitats, rocky reef, deep reef slopes, banks, deep ocean floor, abyssal plain
		Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 1,312 ft (400 m)	
	Deep-water species (50–200 fm [300–1,200 ft (91–365 m)]): short-tail red snapper (ehu) (*Etelis carbunculus*), onaga (*Etelis coruscans*), pink snapper (opakapaka) (*Pristipomoides filamentosus*), yellowtail kalekale (*P. auricilla*), kalekale (*P. sieboldii*), gindai (*P. zonatus*), sea bass (hapu‘upu‘u) (*Epinephelus quernus*), silverjaw snapper (lehi) (*Aphareus rutilans*)	Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 1,312 ft (400 m)	
		Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 1,312 ft (400 m)	
	Seamount groundfish species (50–200 fm [300–1,200 ft (91–365m)]): armorhead (*Pseudopentaceros richardsoni),* ratfish/butterfish (*Hyperoglyphe japonica*), alfonsino (*Beryx splendens*)	Eggs and larvae: the (epipelagic zone) water column down to a depth of 656 ft (200 m) of all EEZ waters bounded by latitude 29° N –35° N and longitude 171° E–179° W, which is not within the Project boundaries	Rocky reef, deep reef slopes, seamounts, banks
		Juvenile/adults: all EEZ waters and bottom habitat bounded by latitude 29°–35° N and longitude 171° E–179° W between 200 and 600 m (100 and 300 fm)	

Management Unit	Species Complex	EFH	Habitat Types
Crustaceans	Spiny and slipper lobster: spiny lobster (*Panulirus penicillatus, P.* spp.), ridgeback slipper lobster (*Scyllarides haanii*), Chinese slipper lobster (*Parribacus antarcticus*) Kona crab: Kona crab (*Ranina ranina*)	Eggs and larvae: the water column from the shoreline to the outer limit of the EEZ down to a depth of 492 ft (150 m)	Estuaries, lagoons, submerged aquatic vegetation, intertidal zone, mangroves, coral reefs, soft-bottom habitats, rocky reef, deep reef slopes, outer reef slopes, seamounts, banks, deep ocean floor
		Juvenile/adults: all of the bottom habitat from the shoreline to a depth of 100 m (50 fm)	
	Deepwater shrimp (*Heterocarpus* spp.)	Eggs and larvae: the water column and associated outer reef slopes between 1,804 and 2,296 ft (550 and 700 m)	
		Juvenile/adults: the outer reef slopes at depths between 984 and 2,296 ft (300 and 700 m)	
Precious corals	Deep-water precious corals (150–750 fm): pink coral (*Corallium secundum*), red coral (*C. regale*), pink coral (*C. laauense*), midway deepsea coral (*Corallium* sp *nov.*), gold coral (*Gerardia* spp.), gold coral (*Callogorgia gilberti*), gold coral (*Narella* spp.), gold coral (*Calyptrophora* spp.), bamboo coral (*Lepidisis olapa*), bamboo coral (*Acanella* spp.)	EFH for precious corals is confined to six known precious coral beds located off Keāhole Point, Makapu‘u, Ka‘ena Point, Wespac bed, Brooks Bank, and 180 Fathom Bank EFH has also been designated for three beds known for black corals in the main Hawaiian Islands between Miloli‘i and South Point on the Big Island, the ‘Au‘au Channel and the southern border of Kaua‘i	

Management Unit	Species Complex	EFH	Habitat Types
	Shallow-water precious corals (10–50 fm): black coral (*Antipathes dichotoma*), black coral (*Antipathis grandis*), black coral (*Antipathes ulex*)		
Coral reef ecosystems	All currently harvested coral reef taxa All potentially harvested coral reef taxa	EFH for the Coral Reef Ecosystem Management Unit Species includes the water column and all benthic substrate to a depth of 50 fm from the shoreline to the outer limit of the EEZ	

Note: EEZ = exclusive economic zone

5.2 HABITAT AREAS OF PARTICULAR CONCERN

The NOAA Fisheries Essential Fish Habitat Mapping Tool (NMFS 2024) has identified no HAPC within the Project's Action Area.

5.3 EFH AND HAPC ASSESSMENT OF POTENTIAL EFFECTS

According to NOAA, "an adverse effect is any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components" (NOAA Fisheries 2021a). The proposed Project would not reduce the quality or quantity of EFH for the Bottomfish and Seamount Groundfish, Pacific Pelagic Species, and the Coral Reef Ecosystems FMPs. In-water work would consist of the HDD bores exiting the seabed at finite points (up to six), minor excavation around each bore exit point to remove the drill head, and a marine support vessel with dive support for each bore. As previously discussed, effects to EFH from Project activities could include potential sediment disturbances, noise, and inadvertent releases. All effects are anticipated to be temporary and localized, and would be minimized through the implementation of the conservation measures discussed in Section 2.3.9. No measurable alterations would occur to the physical, chemical, or biological properties of the water or substrate in the Action Area. The Project would have ***no effect*** on EFH.

6. CONCLUSIONS

This BA forms the basis for the conclusions on the effects of the proposed Project on the following federally listed species: giant manta ray, oceanic whitetip shark, green sea turtle – Central North Pacific DPS, hawksbill sea turtle, Hawai'ian monk seal, leatherback sea turtle, loggerhead sea turtle - North Pacific Ocean DPS, olive Ridley sea turtle, *Acropora retusa* coral, *Acropora speciosa* coral, chambered nautilus, *Fibriaphyllia paradivisa* coral, *Isopora crateriformis* coral, *Acropora globiceps* coral, blue whale – Central North Pacific Stock, false killer whale – main Hawai'ian Island Insular DPS, fin whale – Hawai'i Stock, sei whale – Hawai'i Stock, and sperm whale – Hawai'i Stock.

It was determined that the Project would have no effect on any critical habitat for the species listed here. This BA provides the following effect determinations for the Project:

- The Project would have **no effect** on the oceanic whitetip shark, leatherback sea turtle, loggerhead sea turtle - North Pacific Ocean DPS, olive Ridley sea turtle, *Acropora retusa* coral, *Acropora speciosa* coral, chambered nautilus, *Fibriaphyllia paradivisa* coral, *Isopora crateriformis* coral, blue whale – Central North Pacific Stock, false killer whale – main Hawai'ian Island Insular DPS, fin whale – Hawai'i Stock, sei whale – Hawai'i Stock, sperm whale – Hawai'i Stock, and the critical habitat for all species listed in Table 4.
- The Project **may affect but is not likely to adversely affect** the giant manta ray, green sea turtle – Central North Pacific DPS, hawksbill sea turtle, Hawai'ian monk seal, and *Acropora globiceps* coral.
- The Project would have **no effect** on EFH.

7. REFERENCES

AMS. 2020 (original 2019). Marine Aquatic Habitats and Biological Resources Offshore Eureka, California. August. Prepared for RTI. Livermore, CA.

Babcock, R., and P. Davies. 1991. Effects of sedimentation on settlement of *Acropora millepora*. Coral Reefs 9: 205–208.

Baird, R.W. 2005. Sightings of dwarf (*Kogia sima*) and pygmy (*K. breviceps*) sperm whales from the main Hawaiian Islands. Pacific Science 59: 461-466.

Bessel-Browne, P., Negri, A.P., Fisher, R., Clode, P.L., and Jones, R. 2017. Impacts of light limitation on corals and crustose coralline algae. Scientific Reports 7(1): 11553. DOI: 10.1038/s41598-017-11783-z

Bessudo, S., A. German, A. Soler, J. Klimley, A. Ketchum, R. Hearn, and R. Arauz. 2011. Residency of the scalloped hammerhead shark (*Sphyrna lewini*) at Malpelo Island and evidence of migration to other islands in the Eastern Tropical Pacific. Environmental Biology of Fishes 91.

Brainard, R., C. Birkeland, C.M. Eakin, P. McElhaney, M.W. Miller, M.E. Patterson, and G.A. Piniak. 2011. Status review report of 82 candidate coral species petitioned under the U.S. Endangered Species Act. Report to National Marine Fisheries Service, Coral Reef Conservation Program. NOAA technical memorandum 27.

Branstetter, S. 1987. Age, growth and reproductive biology of the silky shark, *Carcharhinus falciformis*, and the scalloped hammerhead, *Sphyrna lewini*, from the northwestern Gulf of Mexico. Environ Biol Fish 19: 161–173.

Cordes, E.E., D.O.B. Jones, T.A. Schlacher, D.J. Amon, A.F. Bernadino, S. Brooke, R. Carney, D.M. DeLeo, K.M. Dunlop, E.G. Escobar-Briones, A.R. Gates, L. Genio, J. Gobin, L.A. Henry, S. Herrera, S. Hoyt, M. Joye, S. Kark, N.C. Mestre, A. Metaxas, S. Pfeifer, K. Sink, A.K. Sweetman, and U. Witte. 2016. Environmental impacts of the deep-water oil and gas industry: a review to guide management strategies. Frontiers in Environmental Science, vol. 4.

Darling, E.S., L. Alvarez-Filip, T.A. Oliver, T.R McClanahan, I.M. Côté, and D. Bellwood. 2012. Evaluating life-history strategies of reef corals from species traits. Ecology letters 15(12): 1378–1386.

Duncan-Seraphin, K., and K.N. Holland. 2006. Habitat use, growth rates and dispersal patterns of juvenile scalloped hammerhead sharks *Sphyrna lewini* in a nursery habitat. Marine Ecology-progress Series 312: 211-221.

Fisheries Hydroacoustic Working Group. 2008. Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving Activities. 12 June 2008 edition. Accessed on 29 July 2024. Available at: https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/bio-fhwg-criteria-agree-a11y.pdf.

Flores, F., M.O. Hoogenboom, L.D. Smith, T.F. Cooper, D. Abrego, and A.P. Negri. 2012. Chronic exposure of corals to fine sediments: lethal and sub-lethal impacts. PloS one 7(5).

Friedlander, A., G. Aeby, R. Brainard, E. Brown, K. Chaston, A. Clark, and W. Wiltse. 2008. The State of Coral Reef Ecosystems of the Main Hawaiian Islands. J. E. Waddell and J. M. Clarke (Eds.), The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States. NOAA. Available from http://ccma.nos.noaa.gov/ecosystems/coralreef/coral2008/pdf/Hawaii.pdf.

Harry, A.V., W.G. Macbeth, A.N. Gutteridge, and C.A. Simpfendorfer. 2011. The life histories of endangered hammerhead sharks (*Carcharhiniformes, Sphyrnidae*) from the East Coast of Australia. Journal of Fish Biology 78.

Hazel, J., I.R. Lawler, H. Marsh, and S. Robson. 2007. Vessel speed increases collision risk for the green turtle *Chelonia mydas*. Endangered Species Research 3: 105-113.

Hildebrand, J.A. 2005. “Impacts of Anthropogenic Sound.” Marine Mammal Research: Conservation Beyond Crisis. Baltimore, Maryland: Johns Hopkins University Press, 101–124. Accessed: April 16, 2021. Available online: http://cetus.ucsd.edu/Publications/Publications/PAPERS/HildebrandJHU2005.pdf.

iNaturalist. 2024. Oceanic Manta Ray (*Mobula birostris*). Accessed on 16 August 2024. Available at: https://www.inaturalist.org/taxa/623966-Mobula-birostris

Jensen, A.S., and G.K. Silber. 2003. Large Whale Ship Strike Database. U.S. Department of Commerce, NOAA Technical Memorandum. NMFS-OPR.

Jones, R., M. Wakeford, L. Currey-Randall, K. Miller, and H. Tonin. 2021. Drill cuttings and drilling fluids (muds) transport, fate and effects near a coral reef mesophotic zone. Marine Pollution Bulletin 172.

Kerr, S.J. 1995. Silt, turbidity, and suspended sediments in the aquatic environment: an annotated bibliography and literature review. Ontario Ministry of Natural Resources, Southern Region Science and Technology Transfer Unit, Technical Report TR-008, Brockville, Ontario.

Kitchen-Wheeler, A.M. 2013. The behaviour and ecology of Alfred mantas (*Manta alfredi*) in the Maldives. Doctoral dissertation. Newcastle University, School of Biology.

Lawson, J.M., R.H.L Walls, S.V. Fordham, M. O'Malley, M.R. Heupel, G. Stevens, D. Fernando, A. Budziak, C. Simpfendorfer, L.N.K. Davidson, I. Ender, M. Francis, G. Notarbartolo di Sciara, and N.K. Dulvy. 2016. Sympathy for the devil: A conservation strategy for devil and manta rays. PeerJ 5.

Liu, K.M., and C.T. Chen. 1999. Demographic Analysis of the Scalloped Hammerhead, *Sphyrna lewini,* in the Northwestern Pacific. Fisheries Science 65: 218-223.

Maguire, Jean-Jacques, M. Sissenwine, J. Csirke, R. Grainger, and S.M. Garcia. 2006. The State of World Highly Migratory, Straddling and Other High Seas Fishery Resources and Associated Species. FAO Fisheries Technical Paper 495. January. Accessed on 30 July 2024. Access from:

https://www.researchgate.net/publication/259100329_The_State_of_World_Highly_Migratory_Straddling_and_Other_High_Seas_Fishery_Resources_And_Associated_Species.

McCauley, R.D. & Fewtrell, J. & Duncan, Alec & Jenner, Kenneth & Jenner, M-N & Penrose, J. & Prince, R.I.T. & Adhiyta, A. & Murdoch, J. & McCabe, K.. (2000). Marine seismic surveys-a study of environmental implications. APPEA J. 40. 692-706. 10.1071/AJ99048.

Miller, M.H. 2018. Endangered Species Act Status Review Report: Chambered Nautilus (*Nautilus pompilius*). Report to National Marine Fisheries Service, Office of Protected Resources, Silver Spring, MD. September 2018. 62 pp.

Miller, M.H., J. Carlson, P. Cooper, D. Kobayashi, M. Nammack, and J. Wilson. 2013. Status Review Report: Scalloped Hammerhead Shark (*Sphyrna lewini*). Report to National Marine Fisheries Service, Office of Protected Resources. March 2013. 131 pp.

Nedwell, J.R., A.G. Brooker, and R.J. Barham. 2012. Assessment of underwater noise during the installation of export power cables at the Beatrice Offshore Wind Farm. Prepared for Beatrice Offshore Wind Limited. Hampshire, England.

NMFS and USFWS. 1998a. Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle (Dermochelys coriacea). National Marine Fisheries Service, Silver Spring, MD.

NMFS and USFWS. 1998b. Recovery Plan for U.S. Pacific Populations of the Loggerhead Turtle (*Caretta caretta*). National Marine Fisheries Service, Silver Spring, MD.

NMFS and USFWS. 1998c. Recovery Plan for U.S. Pacific Populations of the Olive Ridley Turtle (*Lepidochelys olivacea*). National Marine Fisheries Service, Silver Spring, MD.

NMFS. 2023a. National Marine Fisheries Service: Summary of Endangered Species Act Acoustic Thresholds (Marine Mammals, Fishes, and Sea Turtles). January 2023. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/s3/2023-02/ESA%20all%20species%20threshold%20summary_508_OPR1.pdf.

NMFS. 2023b. Recovery Status Review for 15 Species of Indo-Pacific Reef-building Corals Listed under the Endangered Species Act. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/resource/document/recovery-status-review-15-species-indo-pacific-reef-building-corals.

NMFS. 2024. EFH Mapper. Accessed on 29 July 2024. Access from: https://www.habitat.noaa.gov/apps/efhmapper/?page=page_5.

NMFS Office of Protected Resources. 2024. Hawaiian Monk Seal (line). Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/inport/item/65317.

NOAA Fisheries. 2014. Endangered and Threatened Wildlife and Plants; Threatened and Endangered Status for Distinct Population Segments of Scalloped Hammerhead Sharks. Federal Register 79: 128.

NOAA Fisheries. 2015. Determination on the Designation of Critical Habitat for Scalloped Hammerhead Shark. Accessed on 29 July 2024. Access from:

https://www.fisheries.noaa.gov/action/determination-designation-critical-habitat-scalloped-hammerhead-shark.

NOAA Fisheries. 2017. Endangered Species Act Status Review Report: Oceanic Whitetip Shark (*Carcharhinus longimanus*). Accessed on 29 July 2024. Access from: https://repository.library.noaa.gov/view/noaa/17097/noaa_17097_DS1.pdf.

NOAA Fisheries. 2018a. 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-OPR-59, 167 p.

NOAA Fisheries. 2018b. Blue Whale (*Balaenoptera musculus musculus*): Central North Pacific Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/dam-migration/pacific-2017-blue_whale-central_north_pacific-508.pdf.

NOAA Fisheries. 2018c. Sei Whale (*Balaenoptera borealis borealis*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/dam-migration/pacific-2017-sei_whale-_hawaii-508.pdf.

NOAA Fisheries. 2019a. Determination on the Designation of Critical Habitat for Giant Manta Ray. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/action/determination-designation-critical-habitat-giant-manta-ray.

NOAA Fisheries. 2019b. Giant Manta Ray Recovery Outline. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/s3/dam-migration/giant_manta_ray_recovery_outline.pdf.

NOAA Fisheries. 2019c. Spinner Dolphin (*Stenella longirostris longirostris*): Hawaiian Islands Stock Complex- Hawaii Island, Oahu/4-islands, Kauai/Niihau, Pearl & Hermes Reef, Midway Atoll/Kure, Hawaii Pelagic. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/dam-migration/hi_spinner_dolphins_final_2018.pdf.

NOAA Fisheries. 2021a. NOAA Fisheries Greater Atlantic Regional Fisheries Office Essential Fish Habitat (EFH) Assessment & Fish and Wildlife Coordination Act (FWCA) Consultation Worksheet. Access 1 August 2024. Accessed from: https://media.fisheries.noaa.gov/2021-08/EFHWorksheet-fillable%20form-aug%202021-final.pdf.

NOAA Fisheries. 2021b. Blainville's Beaked Whale (*Mesoplodon densirostris*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-blainvilles.pdf.

NOAA Fisheries. 2021c. Bryde's Whale (*Balaenoptera edeni*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-Brydes.pdf.

NOAA Fisheries. 2021d. Common Bottlenose Dolphin (*Tursiops truncatus truncatus*): Hawaiian Islands Stock Complex- Kauai/Niihau, Oahu, 4-Islands, Hawaii Island, Hawaii Pelagic.

Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-Commondolphin_hawaii.pdf.

NOAA Fisheries. 2021e. Cuvier's Beaked Whale (*Ziphius cavirostris*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-cuviersHI.pdf.

NOAA Fisheries. 2021f. Dwarf Sperm Whale (*Kogia sima*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-DwarfSW.pdf.

NOAA Fisheries. 2021g. Fin Whale (*Balaenoptera physalus velifera*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-FinHI.pdf.

NOAA Fisheries. 2021h. Fraser's Dolphin (*Lagenodelphis hosei*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-FrasersHawaii.pdf.

NOAA Fisheries. 2021i. Killer Whale (*Orcinus orca*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-KW_hawaii.pdf.

NOAA Fisheries. 2021j. Longman's Beaked Whale (*Indopacetus pacificus*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-longmans.pdf.

NOAA Fisheries. 2021k. Melon-Headed Whale (*Peponocephala electra*): Hawaiian Islands Stock Complex: Hawaiian Islands & Kohala Resident Stocks. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-melonheaded.pdf.

NOAA Fisheries. 2021l. Minke Whale (*Balaenoptera acutorostrata scammoni):* Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-minke.pdf.

NOAA Fisheries. 2021m. Pantropical Spotted Dolphin (*Stenella attenuata attenuata*): Hawaiian Islands Stock Complex – Oahu, 4-Islands, Hawaii Island, and Hawaii Pelagic Stocks. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2022-12/2020Pantropicaldolphin.pdf.

NOAA Fisheries. 2021n. Pygmy Killer Whale (*Feresa attenuata*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-Pygmy.pdf.

NOAA Fisheries. 2021o. Pygmy Sperm Whale (*Kogia breviceps*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-pygmySWhHI.pdf.

NOAA Fisheries. 2021p. Risso's Dolphin (*Grampus griseus*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-Rissos.pdf.

NOAA Fisheries. 2021q. Rough-Toothed Dolphin (*Steno bredanensis)*: Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-RoughToothedHawaii.pdf.

NOAA Fisheries. 2021r. Short-Finned Pilot Whale (*Globicephala macrorhynchus*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-ShortFinPWHI.pdf.

NOAA Fisheries. 2021s. Sperm Whale (*Physeter macrocephalus*): Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-SpermwhaleHI.pdf.

NOAA Fisheries. 2021t. Striped Dolphin (*Stenella coeruleoalba)*: Hawaii Stock. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2021-08/2020-Pacific-SARS-stripeddolphin_hawaii.pdf.

NOAA Fisheries. 2022. False Killer Whale (*Pseudorca crassidens*): Hawaiian Islands Stock Complex – Main Hawaiian Islands Insular, Northwestern Hawaiian Islands, and Hawaii Pelagic Stocks. Accessed on 29 July 2024. Access from: https://media.fisheries.noaa.gov/2022-08/2021-FALSE%20KILLER%20WHALE-Hawaiian%20Islands%20Stock%20Complex.pdf.

NOAA Fisheries. 2023a. Hawaiian Monk Seal (*Neomonachus schauinslandi*). Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/s3/2023-08/Monk-Seal-2022.pdf.

NOAA Fisheries. 2023b. Humpback Whale (*Megaptera novaeangliae kuzira*) - Hawai‘i Stock. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/s3/2023-08/Humpback-Whale-Hawaii-2022-0.pdf.

NOAA Fisheries. 2024a. NOAA Fisheries ESA Threatened and Endangered Species list: ESA Threatened and Endangered species under NOAA jurisdiction on the U.S. West Coast. Accessed on 11 July 2024. Accessed from: https://www.fisheries.noaa.gov/species-directory/threatened-endangered

NOAA Fisheries. 2024b. NOAA Fisheries National ESA Critical Habitat Mapper: designated critical habitats for listed species under NOAA jurisdiction in the project area. Accessed 11 July 2024. Accessed from: https://www.fisheries.noaa.gov/resource/map/national-esa-critical-habitat-mapper.

NOAA Fisheries. 2024c. NOAA Fisheries Essential Fish Habitat Mapper: designated EFH and Habitat Areas of Potential Concern (HAPCs) for NOAA managed fish species. Accessed 11 July 2024. Accessed from: https://www.habitat.noaa.gov/apps/efhmapper/.

NOAA Fisheries. 2024d. Giant Manta Ray: Conservation & Management. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/species/giant-manta-ray/conservation-management.

NOAA Fisheries. 2024e. Hawaiian Monk Seal. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/species/hawaiian-monk-seal.

NOAA Fisheries. 2024f. Hawksbill Turtle. Accessed on 29 July 2024. Access from: https://www.fisheries.noaa.gov/species/hawksbill-turtle/overview.

Noriega, R., J.M. Werry, W. Sumpton, D. Mayer, and S.Y. Lee. 2011. Trends in annual CPUE and evidence of sex and size segregation of *Sphyrna lewini*: Management implications in coastal waters of northeastern Australia. Fisheries Research 110: 472-477.

Rambahiniarison, J.M., M.J. Lamoste, C.A. Rohner, R. Murray, S. Snow, J. Labaja, G. Araujo, and A. Ponzo. 2018. Life History, Growth, and Reproductive Biology of Four Mobulid Species in the Bohol Sea, Philippines. Frontiers in Marine Science 5.

Seminoff, J., C. Allen, G. Balazs, P. Dutton, T. Eguchi, H. Haas, S. Hargrove, M. Jensen, D. Klemm, A. Lauritsen, S. MacPherson, P. Opay, E. Possardt, S. Pultz, E. Seney, K. Van Houtan, and R. Waples. 2015. Status review of the green turtle (*Chelonia mydas*) under the Endangered Species Act. Report to National Marine Fisheries Service.

State of Hawai'i, Division of Aquatic Resources (DAR). 2024a. Hawaiian Monk Seal. Accessed on 29 July 2024. Access from: https://dlnr.hawaii.gov/dar/hawaiian-monk-seal/.

State of Hawai'i, Division of Aquatic Resources (DAR). 2024b. Sea Turtles in Hawai'i. Accessed on 29 July 2024. Access from: https://dlnr.hawaii.gov/dar/species/sea-turtles/.

Stevens, J.D., and J.M. Lyle. 1989. Biology of three hammerhead sharks (*Eusphyra blochii, Sphyrna mokarran* and *S. lewini*) from Northern Australia. Marine and Freshwater Research 40.

Stewart, J.D., C.S Beale, D. Fernando, A.B. Sianipar, R.S. Burton, B.X. Semmens, and O. Aburto-Oropeza. 2016. Spatial ecology and conservation of *Manta birostris* in the Indo-Pacific. Biological Conservation 200: 178-183.

Stewart, J.D., F.R.A. Jaine, A.J. Armstrong, A.O. Armstrong, M.B. Bennett, K.B. Burgess, L.I.E. Couturier, D.A. Croll, M.R. Cronin, M.H. Deakos, C.L. Dudgeon, D. Fernando, N. Froman, E.S. Germanov, M.A. Hall, S. Hinojosa-Alvarez, J.E. Hosegood, T. Kashiwagi, B.J.L Laglbauer, N. Lezama-Ochoa, A.D. Marshall, F. McGregor, G. Notarbartolo di Sciara, M.D. Palacios, L.R. Peel, A.J. Richardson, R.D. Rubin, K.A. Townsend, S.K. Venables, and G.M.W. Stevens. 2018. Research Priorities to Support Effective Manta and Devil Ray Conservation. Frontiers in Marine Science 5: 314.

Tetra Tech. 2017. Final Environmental Assessment for Hawaiki submarine cable Kapolei Landing, Kapolei, Island of O'ahu, City and County of Honolulu. Prepared for TE SubCom and Hawaiki Submarine Cable USA, LLC.

United States Geological Survey. 2024. National Wetlands Inventory (NWI) Mapper.

University of Rhode Island and Inner Space Center. 2021. Discovery of Sound in the Sea – Strandings. Accessed June 20, 2024. Available at: Strandings – Discovery of Sound in the Sea (dosits.org).

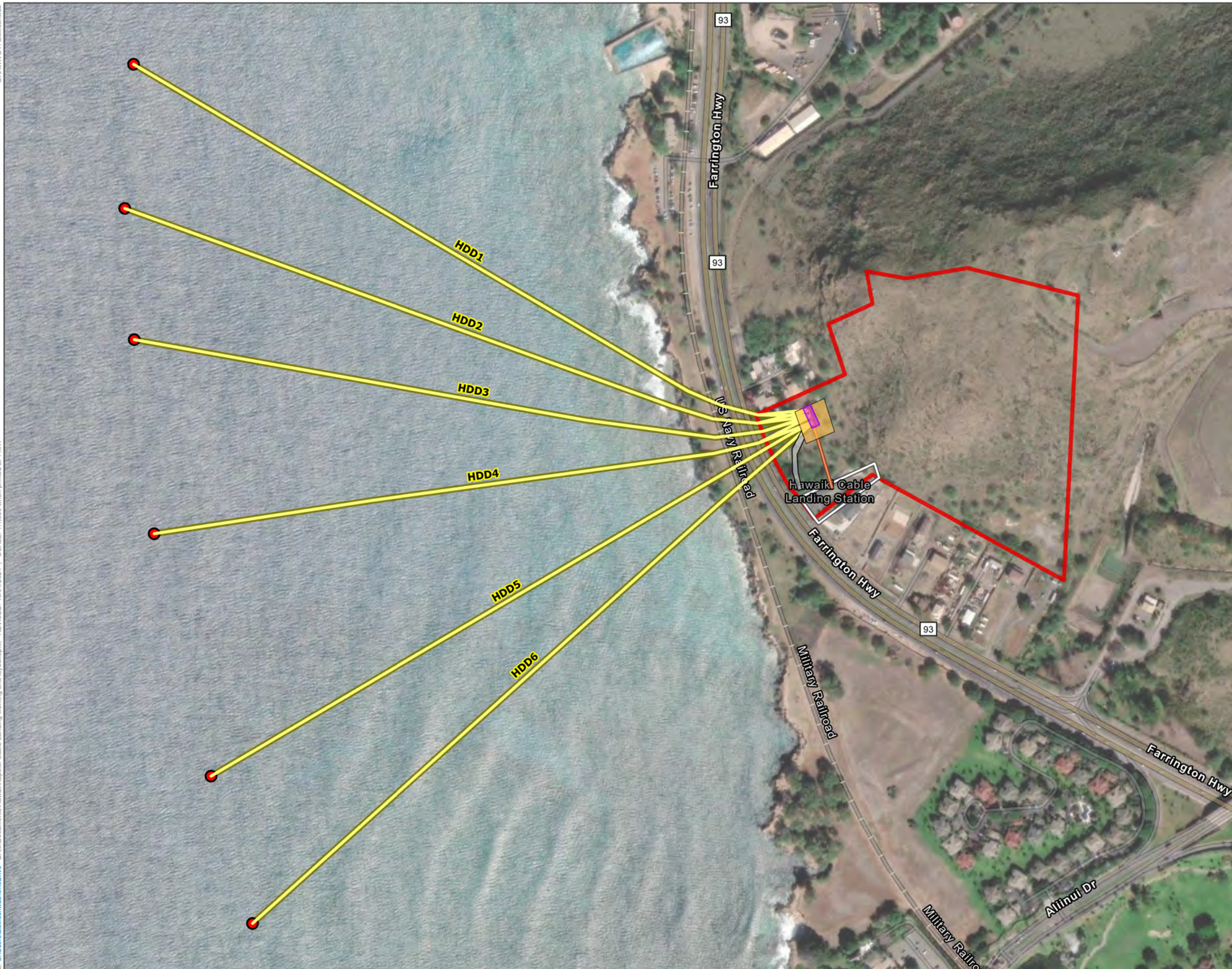
USFWS. 2023a. Proposed Critical Habitat for the Green Sea Turtle. Accessed on 29 July 2024. Access from: https://www.fws.gov/story/2023-07/green-sea-turtle.

USFWS. 2023b. Species Spotlight: Hawaiian Green Sea Turtle (Honu). Accessed on 29 July 2024. Access from: https://www.fws.gov/story/species-spotlight-hawaiian-green-sea-turtle-honu.

Washington Department of Transportation (WSDOT). 2020. Biological Assessment Preparation Manual, Chapter 7 Construction Noise Impact Assessment. Accessed June 28, 2024. Available online: BA Manual Chapter 7 (wa.gov).

APPENDIX A FIGURES

DRAWN BY: alex.schwab



DETAIL AREA

- Bore Exit Points
- Conceptual Bore Pipe Routes
- Conduit
- Beach Manhole Area
- Drilling Pad
- Access Road
- Existing Hawaiki Cable Landing Station
- On Shore Parcel Boundary

N

0 125 250 500
Feet

Figure 1 - Proposed Project Area

Hawaiki Submarine Cable USA LLC (wholly owned by BW Digital) Cable Landing Station Expansion Project

BW DIGITAL ERM

FILE: C:\Users\alex.schwab\OneDrive - ERM\Documents\Hawaii\Kapolei Cable Landing working and layout.aprx, REVISED: 10/04/2024 , SCALE: 1:4,500 when printed at 11x17

DRAWN BY: alex.schwab

FILE: C:\Users\alex.schwab\OneDrive - ERM\Documents\Hawaii\Kapolei Cable Landing working and layout.aprx, REVISED: 10/04/2024 , SCALE: 1:4,500 when printed at 11x17

HDD1
HDD2
HDD3
HDD4
HDD5
HDD6
-60
-20
-40
93
Farrington Hwy
Military Railroad
Hawaiki Cable Landing Station
Farrington Hwy
Military Railroad
Farrington Hwy
Aliinui Dr
Military Railroad

DETAIL AREA

Honolulu
Hawaii
0 50 100 200 Miles

- Bore Exit Points
- Conceptual Bore Pipe Routes
- Conduit
- Beach Manhole Area
- Drilling Pad
- Access Road
- Existing Hawaiki Cable Landing Station
- On Shore Parcel Boundary

Bathymetry
- Contours (ft)

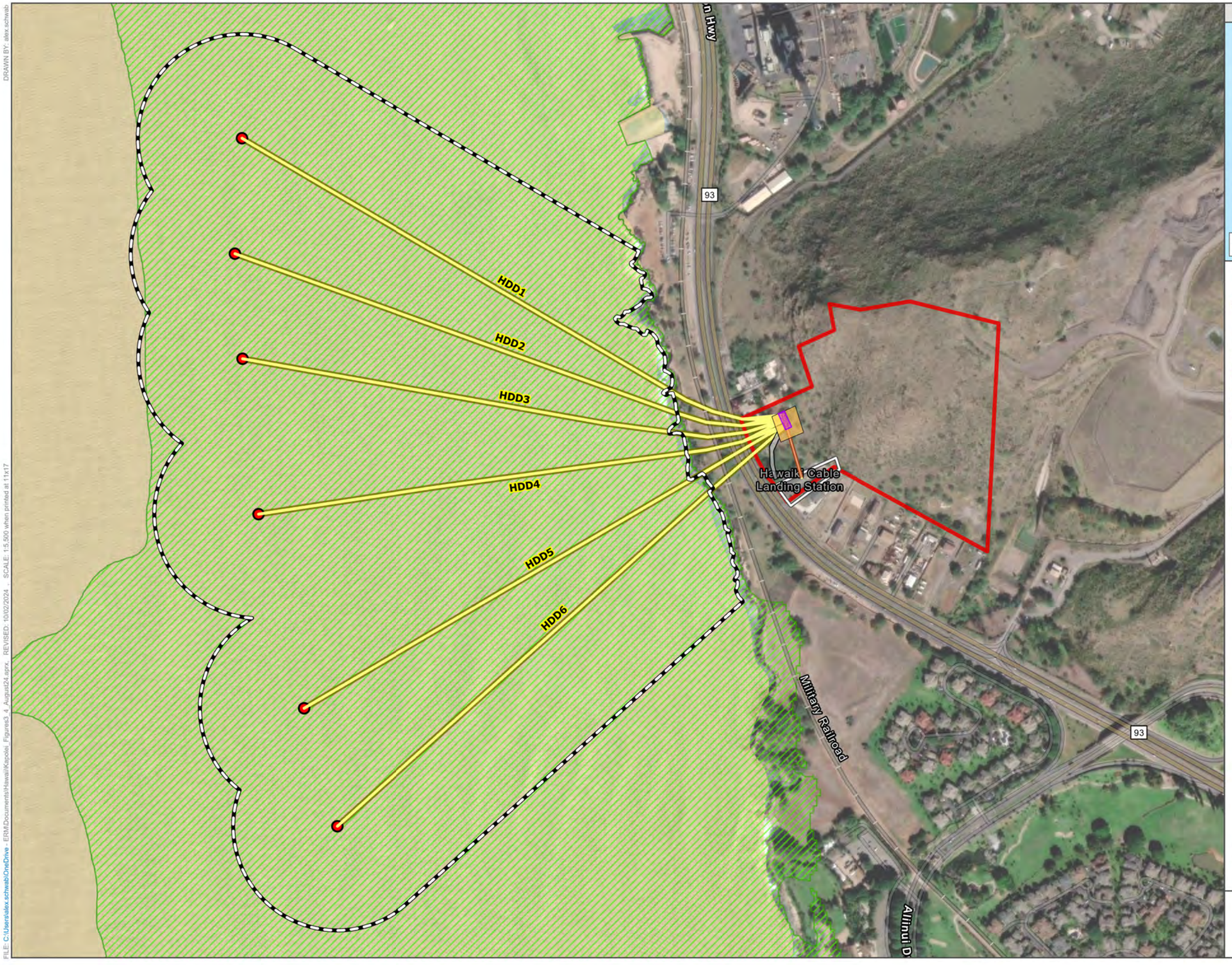
Elevation
- 0
- -120

N
0 125 250 500 Feet

Figure 2 - Action Area

Hawaiki Submarine Cable USA LLC (wholly owned by BW Digital) Cable Landing Station Expansion Project

BW DIGITAL ERM



DETAIL AREA

- Bore Exit Points
- Conceptual Bore Pipe Routes
- Conduit
- Action Area
- Beach Manhole Area
- Drilling Pad
- Access Road
- Existing Hawaiki Cable Landing Station
- On Shore Parcel Boundary

NMFS Critical Habitat

- Sea turtle, green
- Seal, Hawaiian monk

N

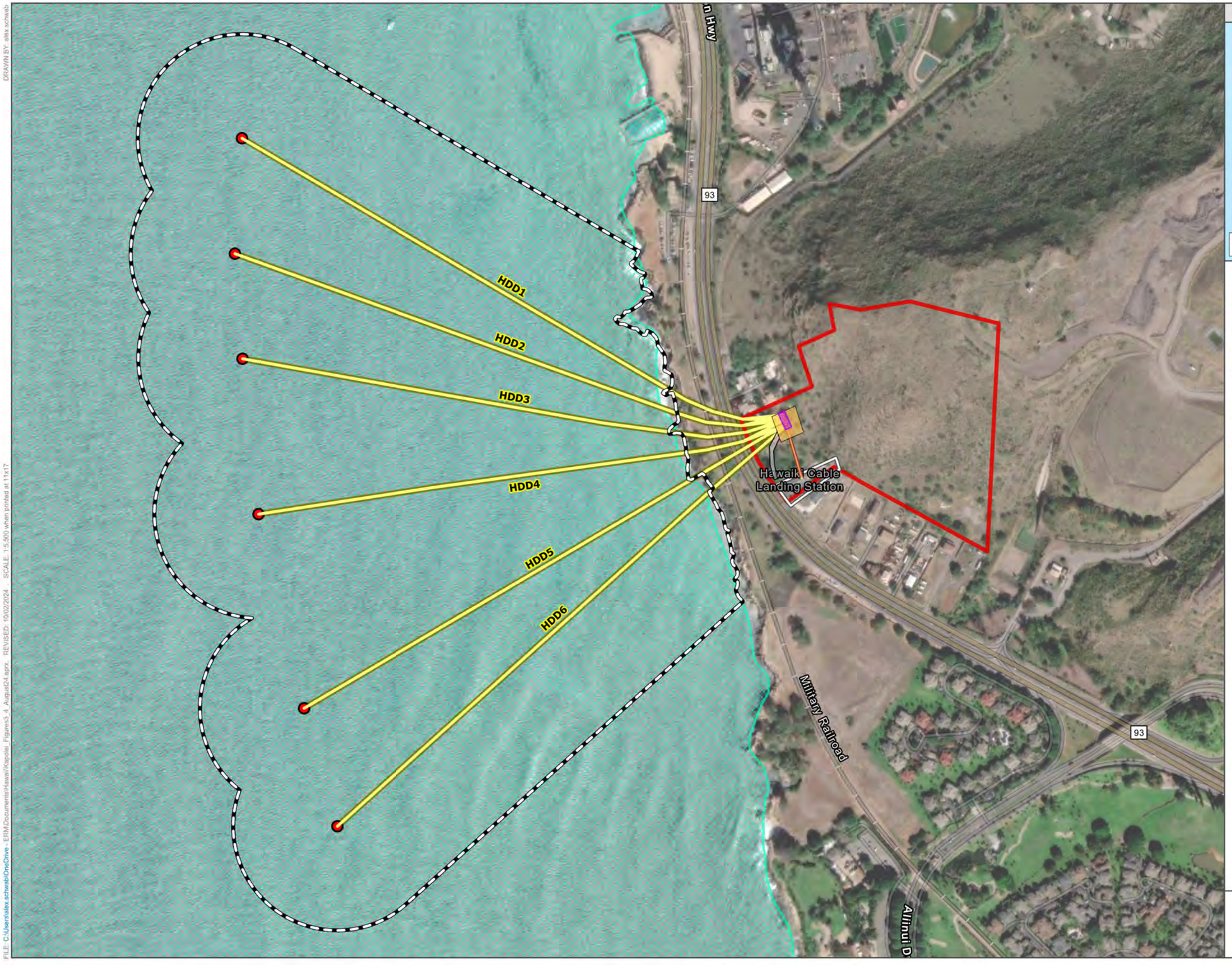
0 250 500 1,000
Feet

Figure 3 - NMFS Critical Habitat

Hawaiki Submarine Cable USA LLC (wholly owned by BW Digital) Cable Landing Station Expansion Project

BW DIGITAL ERM

DRAWN BY: alex.schwab
FILE: C:\Users\alex.schwab\OneDrive - ERM\Documents\Hawaii\Kapolei_Figures\3_4_August24.aprx REVISED: 10/02/2024 SCALE: 1:5,500 when printed at 11x17



DETAIL AREA

- Bore Exit Points
- Conceptual Bore Pipe Routes
- Conduit
- Action Area
- Beach Manhole Area
- Drilling Pad
- Access Road
- Existing Hawaiki Cable Landing Station
- On Shore Parcel Boundary

NMFS Essential Fish Habitat

- Main Hawaiian Islands Coral Reef Ecosystem, FEP for Pelagic Fisheries, Bottomfish and Seamount Groundfish

*Range of all listed FMP groups are the same and overlapping

N

0 250 500 1,000
Feet

Figure 4 - NMFS Essential Fish Habitat

Hawaiki Submarine Cable USA LLC (wholly owned by BW Digital) Cable Landing Station Expansion Project

BW DIGITAL ERM

DRAWN BY: alex.schwab
FILE: C:\Users\alex.schwab\OneDrive - ERM\Documents\Hawaii\Kapolei_Figures3_4_August24.aprx REVISED: 10/02/2024 SCALE: 1:5,500 when printed at 11x17

ERM HAS OVER 160 OFFICES ACROSS THE FOLLOWING COUNTRIES AND TERRITORIES WORLDWIDE

Argentina
Australia
Belgium
Brazil
Canada
China
Colombia
France
Germany
Ghana
Guyana
Hong Kong
India
Indonesia
Ireland
Italy
Japan
Kazakhstan
Kenya
Malaysia
Mexico
Mozambique
The Netherlands
New Zealand
Peru
Poland
Portugal
Romania
Senegal
Singapore
South Africa
South Korea
Spain
Switzerland
Taiwan
Tanzania
Thailand
UAE
UK
US
Vietnam

ERM's Walnut Creek Office

1340 Treat Boulevard
Suite 550
Walnut Creek, CA 94597

T +1 925 946 0455
F +1 925 946 9968

www.erm.com