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OFC. OF ENVIRONMENTAL QUALITY CONTROL

STATE OF HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAI'I 96809

REF: OCCL: AJR

COR: OA-17-92

MAY 23 2017

MEMORANDUM

MAY 04 2017

TO: Scott Glenn, Director
Office of Environmental Quality Control

FROM: Suzanne D. Case, Chairperson
Board of Land and Natural Resources

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT (FEA) FOR THE PROPOSED HAWAIKI SUBMARINE CABLE KAPOLEI LANDING PROJECT
Ewa District, Island of Oahu
Tax Map Key (TMK): Submerged lands seaward of (1) 9-1-057:026

The Department of Land and Natural Resources has reviewed the FEA for the subject project and has determined a *Finding of No Significant Impact* (FONSI). Please be advised, however, that this finding does not constitute approval of the proposal.

The Draft Environmental Assessment (DEA) was published in the *February 23, 2017* edition of *The Environmental Notice*. Comments on the DEA were sought from relevant agencies and the public, and were included in the FEA. The FEA has been prepared pursuant to Chapter 343, Hawai'i Revised Statutes (HRS) and Chapter 11-200, Hawai'i Administrative Rules (HAR). Please publish notice of this FEA-FONSI in OEQC's upcoming ***May 23, 2017*** edition of *The Environmental Notice.*

We have enclosed one (1) hard copy of the FEA-FONSI and OEQC publication form, as well as one (1) CD with a pdf file of the FEA-FONSI. A separate e-mail shall be sent with the OEQC publication form in word document format for publication purposes.

Please contact Alex J. Roy, M.Sc. of the Office of Conservation and Coastal Lands staff at 587-0316 should you have any questions.

Thank you.

Attachments: *FEA, OEQC Pub Form, 1 CD*

17-488

APPLICANT
PUBLICATION FORM

Project Name:	Hawaiki Submarine Cable Kapolei Landing
Project Short Name:	Hawaiki Submarine Cable Kapolei Landing
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):	Oahu
Judicial District(s):	'Ewa District
TMK(s):	TMK (1) 9-2-049:005, (1) 9-2-049:002, (1) 9-2-049:001, (1) 9-2-051:011, and (1) 9-2-051:001; (1) 9-2-051:010
Permit(s)/Approval(s):	1. Cable Landing License, Federal Communications Commission 2. Federal Endangered Species Act Section 7 consultation 3. Magnuson-Stevens Fishery Conservation and Management Act Consultation 4. National Historic Preservation Act Section 106 Consultation 5. U.S. Army Corps of Engineers Clean Water Act Section 404 Nationwide permit 6. Conservation District Use permit 7. Right-of-Entry and Grant of Submarine Easement within State Waters 8. Coastal Zone Management Consistency Certification 9. Clean Water Act Section 401 Water Quality Certification 10. Hawai'i Department of Transportation Use and Occupancy Agreement 11. Special Management Area Use Permit (Major) 12. Shoreline Setback Variance 13.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	Alex Roy, Planner Office of Conservation and Coastal Lands State of Hawai'i Kalanimoku Building 1151 Punchbowl St. Rm 131 P.O. Box 621 Honolulu, HI 96809-0621 (808) 587-0316 alex.j.roy@hawaii.gov
Applicant:	Hawaiki Submarine Cable USA and TE SubCom
Contact Name, Email, Telephone, Address	Hawaiki Submarine Cable USA, LLC Richard Howarth 16192 Coastal Highway, Lewis, Delaware 19958 (602)309-9274 richard.howarth@hawaikicable.co.nz TE SubCom Dan Walsh 250 Industrial Way West Eatontown, New Jersey 07724 dpwalsh@subcom.com
Consultant:	Tetra Tech, Inc.
Contact Name, Email, Telephone, Address	Megan Higgins 737 Bishop St., Suite 2340 Mauka Tower Honolulu, HI 96813 (808) 441-6600 Megan.higgins@tetratech.com

Status (select one)

____ DEA-AFNSI

Submittal Requirements

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.

__X__ FEA-FONSI	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 FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	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 FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the approving agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance Determination	The approving agency simultaneously transmits to both the OEQC and the applicant a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
____ FEIS Statutory Acceptance	The approving agency simultaneously transmits to both the OEQC and the applicant a notice that it did not make a timely determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and therefore the applicant's FEIS is deemed accepted as a matter of law.
____ Supplemental EIS Determination	The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.
____ Withdrawal	Identify the specific document(s) to withdraw and explain in the project summary section.
____ Other	Contact the OEQC if your action is not one of the above items.

Project Summary
Provide a description of the proposed action and purpose and need in 200 words or less.

Hawaiki Submarine Cable USA and TE SubCom have prepared a Final Environmental Assessment (EA) for the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). The Project includes installation of subsea fiber optic (F/O) cable and associated telecommunications infrastructure at Kapolei, O'ahu. The F/O cable would be landed via construction of one subterranean horizontal directionally drilled (HDD) conduit extending from a beach manhole (BMH) on land to a subsea punch-out exit point, located approximately 2,520 feet seaward from the shoreline, into which the F/O cable would be installed. Onshore infrastructure include the BMH, a cable landing station building, two diesel generators, and a parking area. The purpose of the Project is to provide direct and affordable telecommunications connectivity between Hawai'i, the mainland U.S., Australia, New Zealand and other Pacific islands.

HAWAIKI SUBMARINE CABLE
KAPOLEI LANDING

Final Environmental Assessment

Prepared for

TE SubCom

and

Hawaiki Submarine Cable USA, LLC

Prepared by

Tetra Tech, Inc.

April 2017

EXECUTIVE SUMMARY

Project Name:	Hawaiki Submarine Cable Kapolei Landing
Location:	Kapolei, Island of Oʻahu, City and County of Honolulu
Judicial District:	ʻEwa District
Tax Map Key (TMK):	Cable landing site: 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 (por.) and (1) 9-2-051:010 (por.)
Land Area:	Approximately 0.6 acres (includes the onshore cable landing site; does not include subsurface area where the fiber optic cable would be installed)
Applicants:	Hawaiki Submarine Cable USA, LLC Richard Howarth 2/A 3 Ceres Court, Rosedale Auckland, 0632, New Zealand Tyco Electronics Subsea Communications LLC Daniel Walsh 100 Piscataqua Drive Newington, NH 03801
Accepting Authority:	Office of Conservation and Coastal Lands State of Hawaiʻi Department of Land and Natural Resources
Landowner:	Hawaiki Submarine Cable USA (TMK (1) 9-2-051:011) Au Trust: (TMK (1) 9-2-051:001) Joel and Yolanda Ballesteros (TMK (1) 9-2-051:010) State of Hawaiʻi (TMK (1) 9-2-049:002) Farrington Highway (State of Hawaiʻi; no TMK) Oahu Railway and Land Company right-of-way (TMK (1) 9-2-049:005) City and County of Honolulu (TMK (1) 9-2-049:001)
Exiting Use:	Vacant; public highway; historic railroad
Current Land Use Designations:	<u>State Land Use</u> Agriculture (TMKs (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) AG-2 – General Agriculture District (TMK (1) 9-2-051:001, (1) 9-2-051:010, and Farrington Highway) P-2 – General Preservation District (TMKs (1) 9-2-049:005, (1) 9-2-049:002 and (1) 9-1-049:001) Special Management Area (SMA): Within SMA
Proposed Action:	Hawaiki Submarine Cable USA and its supplier, Tyco Electronics Subsea Communications LLC, propose to construct the Hawaiki cable system, an approximately 9,313-mile-long (14,988-kilometer-long) submarine fiber optic (F/O) telecommunications cable consisting of a trunk route extending from Pacific City, Oregon, to Coogee, Australia, with connections to Kapolei, Oʻahu, Hawaiʻi; Tafuna, American Samoa; and Mangawhai Heads, New Zealand. The Hawaiʻi portion of this system, the Hawaiki Submarine Cable Kapolei Landing project (Project), includes installation of subsea F/O cable and associated telecommunications infrastructure at Kapolei. The F/O cable would be landed via construction of one subterranean horizontal directionally drilled (HDD) conduit extending from a beach manhole (BMH) on land to a subsea punch-out exit point, located approximately 2,520 feet (768 meters) seaward from the shoreline, into which the F/O cable would be installed. The subsea punch-out location would be at approximately 46 feet (14 meters) sea depth. Onshore infrastructure include the BMH, a cable landing station building (CLS), two diesel generators, and a parking area, would be located mauka (inland) of Farrington Highway.

Alternatives Considered:

The following alternatives were considered:

- No Action: The Project would not be constructed, thus avoiding potential impacts associated with the project or its alternative; however, if no action were taken, the project objectives of increasing broadband data access and developing a more robust network of trans-Pacific communications would not be achieved.
- Alternatives considered but not carried forward include: alternative landing sites on Maui or Hawai‘i Island; alternative landing sites on Oahu; and an alternative submarine cable route (see Chapter 4 of this EA).

Potential Impacts and Mitigation Measures:

The Project is to provide direct and affordable telecommunications connectivity between Hawai‘i, the mainland U.S., Australia, New Zealand and other Pacific islands. It would respond to needs identified in the Hawai‘i Broadband Initiative, and would benefit the State through improved telecommunications speed, and reliability. 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, and Countermeasures Plan, and dust control plan).
- Marine mammals and sea turtles could be exposed to temporary noise and disturbance from vessels during cable laying and installation, which would occur over a 1.5-day period. Measures including monitoring an Exclusion Zone and Hazard zone to avoid noise disturbances; pausing construction near the HDD punch-out location when marine mammals or sea turtles are present; and reducing vessel operational noise if whales are observed within specified distances during operations.
- Other marine and nearshore biological resources could be exposed to disturbance or temporary marine water quality impacts during cable installation. These effects would be minimized by using HDD as the shore crossing method (including implementation of an Inadvertent Drilling Fluid Release or “frac-out” plan); timing construction to avoid coral spawning season; avoiding construction in reef and nearshore fish, sea turtle and marine mammal breeding areas or other sensitive habitats; and reducing the number of cable crossing structures.
- There are no plant or animal species on the proposed cable landing site currently listed as endangered, threatened, or proposed for listing. The use of down-shielded lighting during construction (though not anticipated) would minimize potential impacts to seabirds and sea turtles occurring in the vicinity.

Anticipated Determination:

Finding of No Significant Impact

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ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
AIS	Archaeological Inventory Survey
amsl	above mean sea level
APE	Area of Potential Effect
BFE	Base Flood Elevations
BLNR	Board of Land and Natural Resources
BMH	beach manhole
BMP	Best Management Practice
BU	Branching Unit
CAA	Clean Air Act
CDUA	Conservation District Use Application
CDUP	Conservation District Use Permit
CFR	Code of Federal Regulations
CIA	Cultural Impact Assessment
CLS	cable landing station
CO	carbon monoxide
CO_2	carbon dioxide
CWA	Clean Water Act
CWB	DOH Clean Water Branch
CWRM	State Commission on Water Resource Management
CZM	Coastal Zone Management
CZMA	Coastal Zone Management Act
DAR	State of Hawaiʻi Division of Aquatic Resources
dB	decibel
dBA	A-weighted decibel
DLNR	State of Hawaiʻi Department of Land and Natural Resources
DMM	discarded military munitions
DOD	Department of Defense
DP	development plan
DPS	distinct population segment
EA	environmental assessment
EEZ	Exclusive Economic Zone

EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
EZ	Exclusion Zone
F/O	fiber optic
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
FUDS	Formally Used Defense Site
GANDA	Garcia and Associates
HAAQS	Hawai‘i ambient air quality standards
HAPC	Habitat Areas of Particular Concern
HAR	Hawai‘i Administrative Rules
Hawaiki	Hawaiki Submarine Cable USA, LLC
HBWS	Honolulu Board of Water Supply
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
HEPA	Hawai‘i Environmental Protection Agency
HRS	Hawai‘i Revised Statutes
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
HZ	Hazard Zone
IDFR	Inadvertent Drilling Fluid Release
IPCC	Intergovernmental Panel on Climate Change
ITS	Incidental Take Statement
kHz	kilohertz
km	kilometer
kph	kilometer per hour
LCA	Land commission award
LCM	Lost Circulation Material
LNM	Local Notice to Mariners

LSB	Land Study Bureau
LUC	Land Use Commission
LUO	Land Use Ordinance
μPa	micropascal
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
MSA	Magnuson-Stevens Fishery Conservation and Management Act of 1996
NAAQS	National Ambient Air Quality Standards
NCCOS	National Centers for Coastal Ocean Science
NHPA	National Historic Preservation Act
nm	nautical mile
NO_2	nitrogen dioxide
NOAA	U.S. Department of Commerce, National Oceanic and Atmospheric Administration
NOAA Fisheries	NOAA National Marine Fisheries Service
NRHP	National Register of Historic Places
NWHI	Northwestern Hawaiian Islands
NWP	Nationwide Permit
OCCL	Office of Conservation and Coastal Lands
OEQC	Office of Environmental Quality Control
OR&L	Oahu Railway and Land Company
PIFC	Pacific Island Fisheries Science Center
PIRO	Pacific Islands Regional Office
$PM_{2.5}$	particulate matter with a diameter less than 2.5 microns
PM_{10}	particulate matter with a diameter less than 10 microns
psi	pounds per square inch
PSO	Protected Species Observers
ROH	Revised Ordinances of Honolulu
ROV	remotely operated vehicle
rpm	revolutions per minute

SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Officer
SMA	Special Management Area
SO_2	sulfur dioxide
SPCC	Spill Prevention, Containment, and Countermeasure
SSV	shoreline setback variance
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TE SubCom	Tyco Electronics Subsea Communications LLC
TMK	Tax Map Key
TDS	total dissolved solids
TSS	total suspended sediment
UBC	Uniform Building Code
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UXO	Unexploded Ordnance
WoUS	waters of the U.S.
WPRFMC	Western Pacific Regional Fishery Management Council
WQC	Water Quality Certification
WWII	World War II

1.0 INTRODUCTION

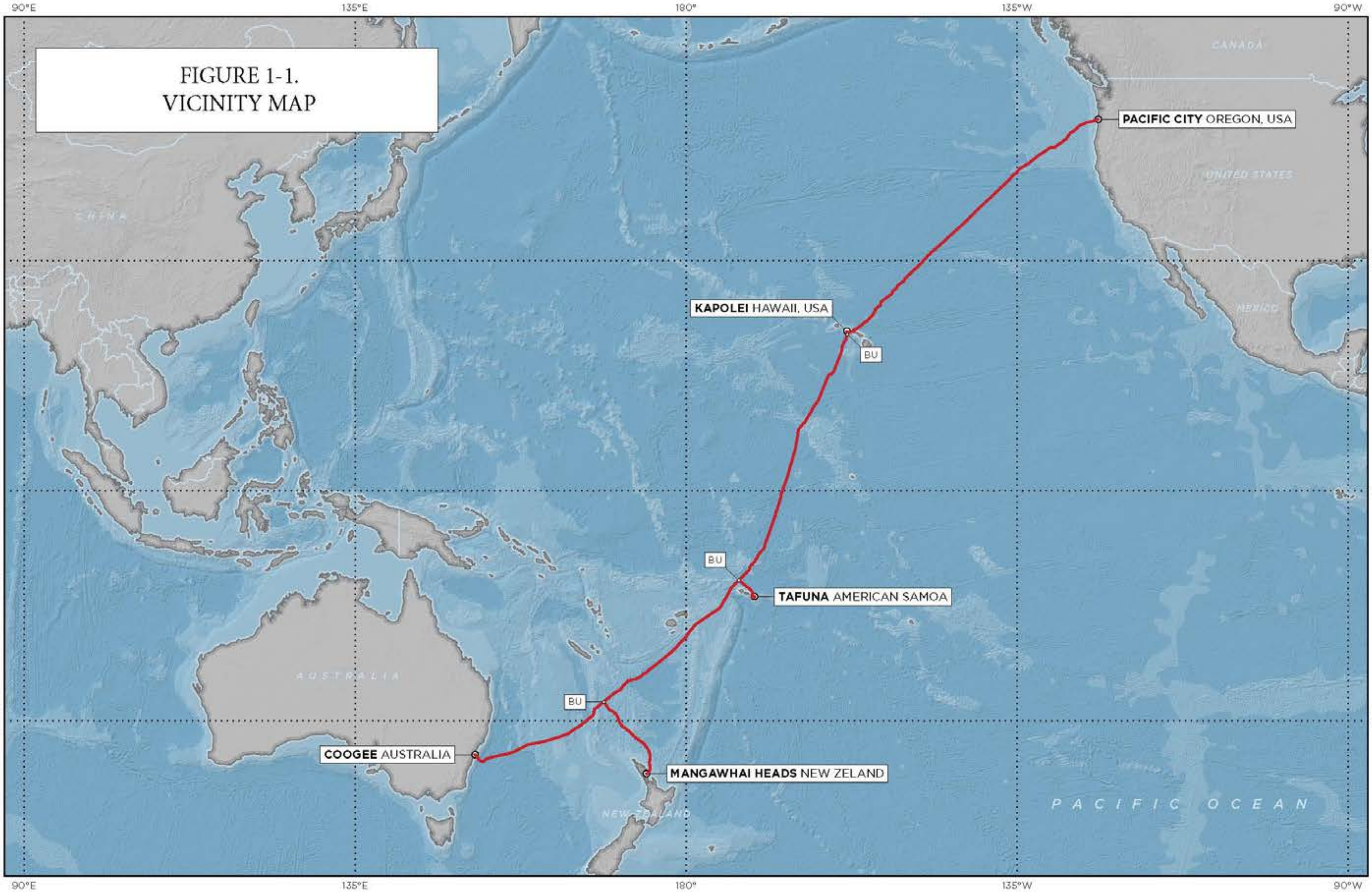
Hawaiki Submarine Cable USA, LLC (Hawaiki) and its supplier Tyco Electronics Subsea Communications LLC (TE SubCom), referred to collectively as the Applicants, propose to construct the Hawaiki cable system, an approximately 9,313-mile-long (14,988-kilometer [km]-long) submarine fiber optic (F/O) telecommunications cable consisting of a trunk route extending from Pacific City, Oregon, to Coogee, Australia, with branches connecting to Kapolei, Oʻahu, Hawaiʻi; Tafuna, American Samoa; and Mangawhai Heads, New Zealand (Figure 1-1). The Hawaiʻi portion of this system, the Hawaiki Submarine Cable Kapolei Landing project (Project), includes installation of subsea F/O cable and associated telecommunications infrastructure at Kapolei, ʻEwa District, Island of Oʻahu, Hawaiʻi (Figure 1-2).

The proposed Project occurs within the State of Hawaiʻi marine waters under the jurisdiction of the Hawaiʻi Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) and therefore must comply with the Hawaiʻi Revised Statute (HRS) Chapter 343 environmental review process. OCCL is the accepting authority for the environmental assessment (EA). With approval from the Board of Land and Natural Resources, DLNR Land Division will be the agency to grant a submerged lands easement for the portion of the cable located in the State of Hawaiʻi waters, upon completion of the Chapter 343 environmental review process. Hawaiʻi Environmental Policy Act (HEPA) environmental review is also required for the terrestrial portion of the cable which must cross under the shoreline area at Kahe Beach Park, owned by the City and County of Honolulu, and cross under Farrington Highway, Tax Map Key (TMK) parcel (1) 9-2-049:002, and the Oʻahu Railway and Land Company (OR&L) right-of-way, which are owned by the State of Hawaiʻi. This Final EA has been prepared pursuant to HEPA (Chapter 343 of the HRS) and in accordance with Hawaiʻi Administrative Rules (HAR) § 11-200.

The original Draft EA for the Project was published on December 23, 2016, in the Office of Environmental Quality Control's (OEQC) *The Environmental Notice*. After its publication, the Project design was refined, resulting in a shift of the proposed Horizontal Directional Drill (HDD) subsea punch-out exit point and the HDD conduit to the north, and a lengthening of the HDD conduit by approximately 47 feet (14 meters; Figure 1-3). The F/O cable route as later proposed would make landfall to the north of its originally proposed location, adding two new parcels (TMKs (1) 9-2-049:001 and (1) 9-2-049:002) to the Project, and removing two parcels (TMKs (1) 9-1-056:001 and (1) 9-1-057:026) from the Project. In accordance with HEPA rules, the OEQC recommended the publication of a Second Draft EA to inform the public of these changes. No major changes were proposed to any other component of the Project, and per OEQC recommendation a Second Draft EA was published February 23, 2017, in OEQC's *The Environmental Notice*.

Two 30-day public comment periods were initiated with the publication of the original Draft and Second Draft EA, from December 23, 2016 to January 23, 2017, and from February 23, 2017 to March 28, 2017, respectively. All written public comments received during the public comment periods for the original Draft and Second Draft EA have been provided with a written response (see

FIGURE 1-1.
VICINITY MAP



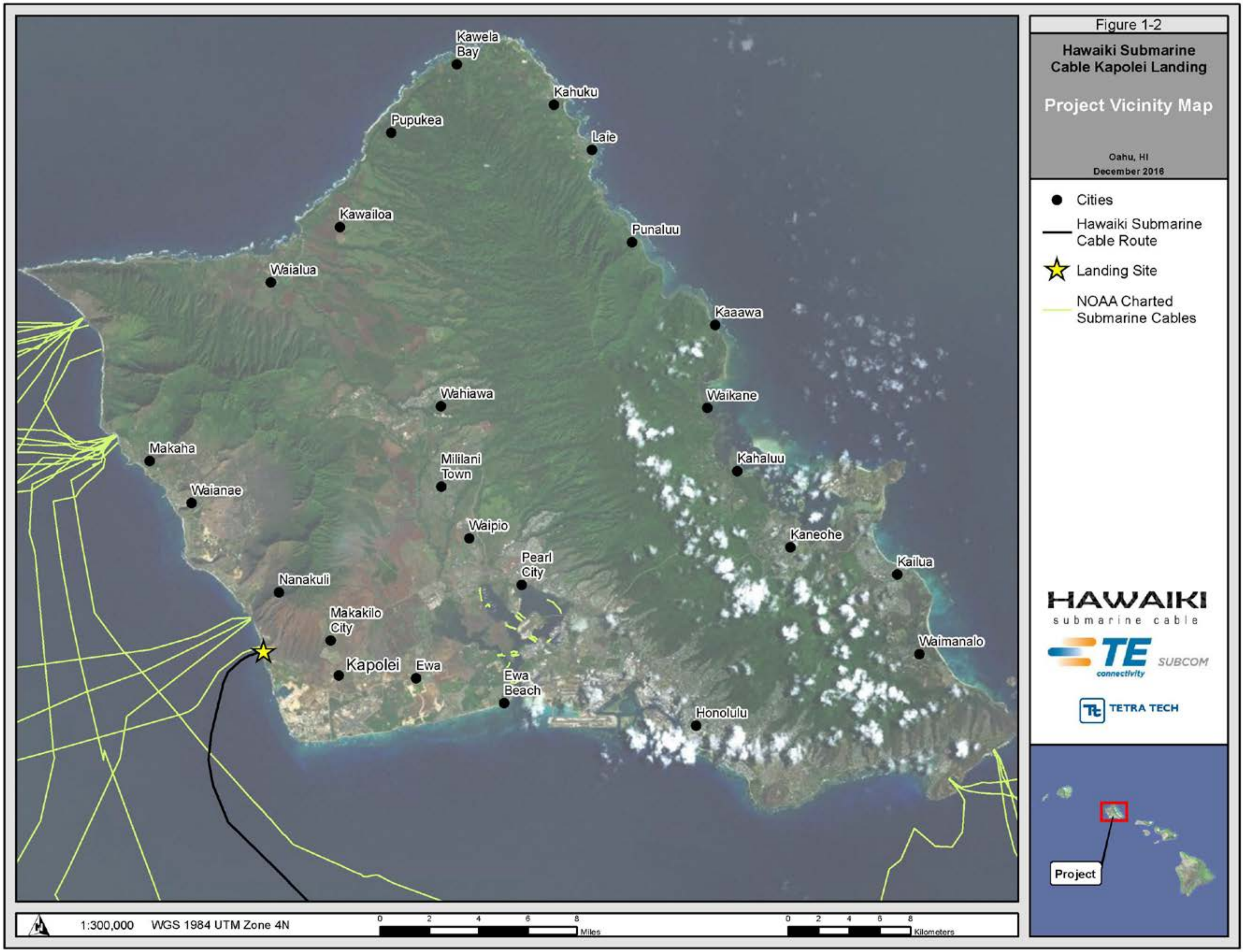


Figure 1-2
Hawaiki Submarine Cable Kapolei Landing
Project Vicinity Map
Oahu, HI
December 2016
Cities
Hawaiki Submarine Cable Route
Landing Site
NOAA Charted Submarine Cables
Kawela Bay
Kahuku
Pupukea
Laie
Kawailoa
Punaluu
Waialua
Kaaawa
Wahiawa
Waikane
Makaha
Mililani Town
Kahaluu
Waianae
Waipio
Kaneohe
Pearl City
Kailua
Nanakuli
Makakilo City
Waimanalo
Kapolei
Ewa
Ewa Beach
Honolulu
HAWAIKI
submarine cable
TE connectivity
SUBCOM
TETRA TECH
Project
1:300,000 WGS 1984 UTM Zone 4N
0 2 4 6 8 Miles
0 2 4 6 8 Kilometers

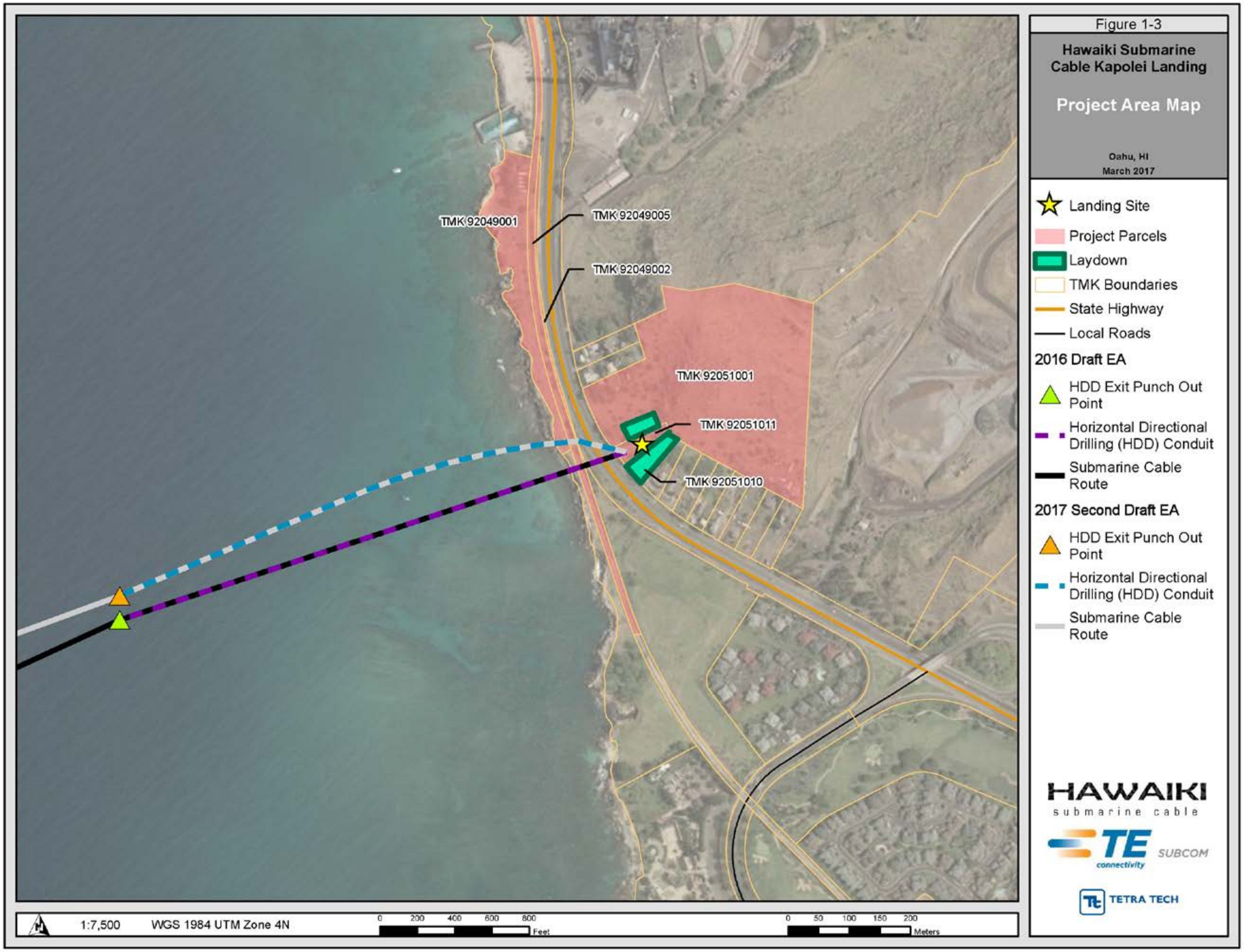


Figure 1-3
Hawaiki Submarine Cable Kapolei Landing
Project Area Map
Oahu, HI
March 2017
Landing Site
Project Parcels
Laydown
TMK Boundaries
State Highway
Local Roads
2016 Draft EA
HDD Exit Punch Out Point
Horizontal Directional Drilling (HDD) Conduit
Submarine Cable Route
2017 Second Draft EA
HDD Exit Punch Out Point
Horizontal Directional Drilling (HDD) Conduit
Submarine Cable Route
TMK 92049001
TMK 92049005
TMK 92049002
TMK 92051001
TMK 92051011
TMK 92051010
1:7,500
WGS 1984 UTM Zone 4N
0 200 400 600 800 Feet
0 50 100 150 200 Meters
HAWAIKI submarine cable
TE connectivity SUBCOM
TETRA TECH

Section 9.3 and Appendix H). Where appropriate, additional information and analyses of potential impacts were added to the Final EA to address issues and concerns raised during public review of the Project. The Final EA and associated Finding of No Significant Impact (FONSI) will be filed with OEQC by OCCL.

1.1 PROJECT DESCRIPTION

1.1.1 Project Location and Land Ownership

The Project cable would be laid on the seafloor along a predetermined route from the territorial limit of the State of Hawai‘i waters (out to 3 nautical miles [nm]) to Kapolei, crossing the State of Hawai‘i submerged lands. From Kapolei, the cable would extend to a Branching Unit (BU) located approximately 19 nm (35 km) from the shore where it would connect with the trunk cable linking Oregon and Hawai‘i to Australia and New Zealand. The proposed cable landing site is located near the Waimanalo Gulch and Hawaiian Electric Company's Kahe Power Plant on O‘ahu's southwest shore, approximately 3.7 miles (6 km) northwest of Barbers Point and 20.5 miles (33 km) west of Honolulu along Farrington Highway (Figure 1-2).

The cable would be landed via construction of one subterranean HDD bore extending from a beach manhole (BMH) on land to a subsea punch-out exit point, located approximately 2,520 feet (768 meters) seaward from the shoreline, into which the F/O cable would be installed (Figure 1-3). The HDD conduit would be installed beneath Farrington Highway, the OR&L right-of-way (TMK (1) 9-2-049:005), TMK (1) 9-2-049:002, owned by the State of Hawai‘i, Kahe Beach Park (TMK (1) 9-2-049:001, owned by the City and County of Honolulu, and TMK (1) 9-2-051:001, owned by Au Trust. The upland features of the Project, consisting of the BMH, a cable landing station (CLS) building, two diesel generators, and a parking area (collectively referred to as the cable landing site), would be located on approximately 0.6 acres (0.2 hectares [ha]) at 92-384 Farrington Highway (TMK (1) 9-2-051:011) owned by Hawaiki (Figure 1-4). The Applicants have obtained "in principle" agreements for a temporary lease of the adjacent parcel to the north (TMK (1) 9-2-051:001), owned by Au Trust, and the adjacent parcel to the south (TMK (1) 9-2-051:010), owned by Joel and Yolanda Ballesteros, for parking and equipment and materials staging during construction. In addition, the Applicants are seeking an HDD passage easement through TMK (1) 9-2-051:001, owned by Au Trust. Legal agreements with these two parcel owners are in progress at the time of publication of the Final EA with anticipated closure by mid-2017.

1.1.2 Property Description and Surrounding Land Uses

The proposed cable landing site is located in the State Land Use Agricultural District; the HDD conduit would pass beneath land located in the Agricultural District (Table 1-1, Figure 1-5). City and County of Honolulu Land Use Ordinance (LUO) zoning for the cable landing site parcel is Country, and the proposed land-based location of the HDD conduit is zoned as General Agriculture and General Preservation (Figure 1-6). Submerged lands surrounding the Hawaiian Islands are in the State Conservation district, which extends to the territorial limits of the State of Hawai‘i.

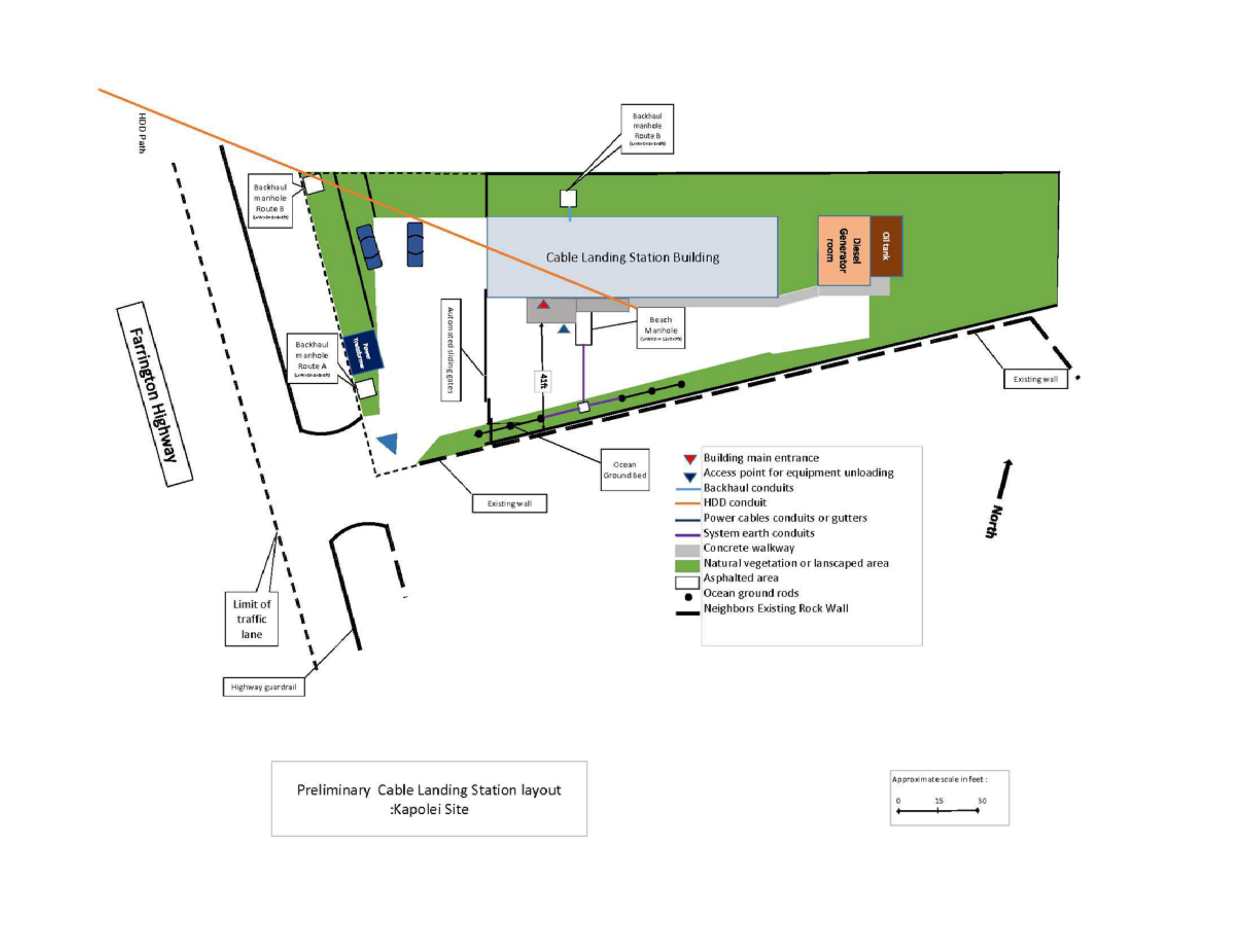


Figure 1-4. Proposed Cable Landing Station Layout

Table 1-1. Current Land Use Designations for the Project Area

Category	Cable Landing Site (1) 9-2-051:011	Temporary Parking and Equipment and Materials Staging (1) 9-2-051:001 and (1) 9-2-051:010 (portions)	HDD Conduit				
			(1) 9-2-049:005 (portion)	(1) 9-2-049:002 (portion)	(1) 9-2-049:001 (portion)	Farrington Highway	Submerged Lands
State Land Use	Agricultural	Agricultural	Agricultural	Agriculture	Agriculture	Agricultural	Conservation
CCH LUO (Zoning)	C – Country	AG-2 General Agricultural	P-2 – General Preservation	P-2 – General Preservation	P-2 – General Preservation	A-2 – General Agriculture	NA
Special Management Area (SMA)	Within SMA	Within SMA	Within SMA	Within SMA	Within SMA	Within SMA	NA

The proposed cable landing site is bordered on the west by Farrington Highway, on the north and east by privately owned agricultural land, and to the south by private residential land. Hawaiian Electric Company's (HECO) Kahe Electric Power Plant is located directly to the north and the Waimanalo Gulch Sanitary Landfill, owned by the City and County of Honolulu and managed by Waste Management Inc., is located 1,280 feet (390 meters) to the southeast. In the vicinity of the cable landing site are residential, resort (Ko ʻOlina Resort and Marina), recreational (Makaīwa and Kahe beach parks), and industrial use areas. Access to the cable landing site for both construction and operation of the Project would be from Farrington Highway. The HDD conduit will be drilled from the CLS parcel and it will pass underneath Farrington Highway and the OR&L right-of-way, both owned and managed by the Hawaiʻi Department of Transportation (HDOT). The installation of the HDD conduit will not require surface level access for construction.

The proposed cable landing site was historically used for grazing but is currently vacant. As noted above, the HDD conduit would pass under Farrington Highway and the OR&L right-of-way, which is listed on both the State and National Registers of Historic Places. Farrington Highway is a HDOT divided highway at the location of the cable landing site consisting of two lanes westbound to Waiʻanae and two lanes eastbound toward Waipahu. The state-owned parcel that would be passed under by the HDD conduit is unoccupied.

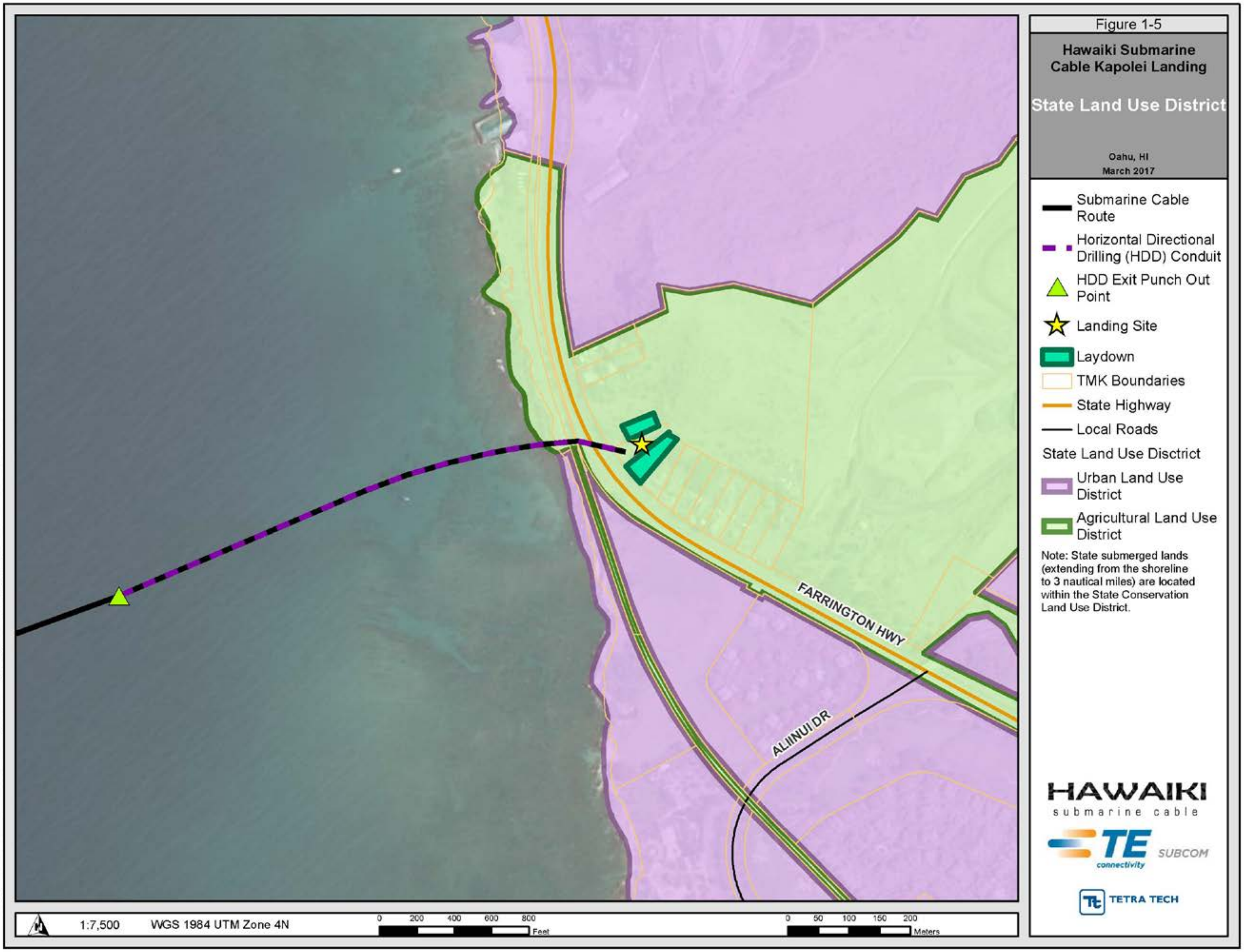


Figure 1-5
Hawaiki Submarine Cable Kapolei Landing
State Land Use District
Oahu, HI
March 2017
Submarine Cable Route
Horizontal Directional Drilling (HDD) Conduit
HDD Exit Punch Out Point
Landing Site
Laydown
TMK Boundaries
State Highway
Local Roads
State Land Use Disctrict
Urban Land Use District
Agricultural Land Use District
Note: State submerged lands (extending from the shoreline to 3 nautical miles) are located within the State Conservation Land Use District.
FARRINGTON HWY
ALIINUI DR
1:7,500
WGS 1984 UTM Zone 4N
0 200 400 600 800 Feet
0 50 100 150 200 Meters
HAWAIKI
submarine cable
TE connectivity SUBCOM
TETRA TECH

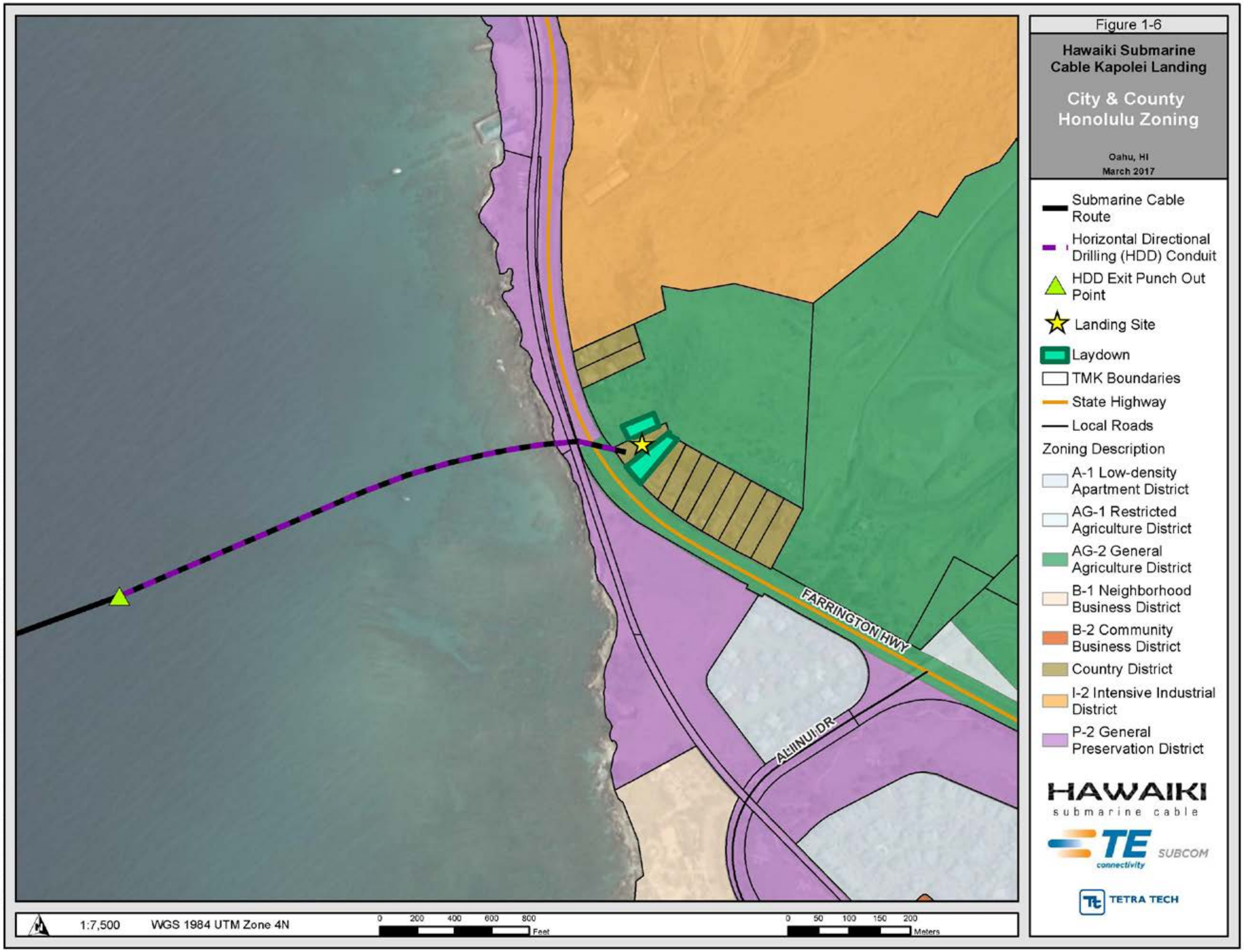


Figure 1-6
Hawaiki Submarine Cable Kapolei Landing
City & County Honolulu Zoning
Oahu, HI
March 2017
Submarine Cable Route
Horizontal Directional Drilling (HDD) Conduit
HDD Exit Punch Out Point
Landing Site
Laydown
TMK Boundaries
State Highway
Local Roads
Zoning Description
A-1 Low-density Apartment District
AG-1 Restricted Agriculture District
AG-2 General Agriculture District
B-1 Neighborhood Business District
B-2 Community Business District
Country District
I-2 Intensive Industrial District
P-2 General Preservation District
FARRINGTON HWY
ALIINUI DR
1:7,500
WGS 1984 UTM Zone 4N
0 200 400 600 800 Feet
0 50 100 150 200 Meters
HAWAIKI submarine cable
TE connectivity SUBCOM
TETRA TECH

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Hawai'i's Broadband[1] Strategic Plan (Hawai'i Department of Commerce and Consumer Affairs 2012) describes transpacific connectivity as Hawai'i's broadband "lifeline" due to the State's unique island geography. With thousands of miles of ocean separating it from the nearest continent, Hawai'i relies on transpacific submarine fiber optic cables for the vast majority of broadband capacity required to connect it to the rest of the world.[2] Broadband has been recognized as critical infrastructure to the State of Hawai'i's advancement in education, health, public safety, research and innovation, economic diversification and public services (Hawai'i Broadband Taskforce 2008).

In 2011, Governor Neil Abercrombie established the Hawai'i Broadband Initiative to work toward providing statewide access to affordable, reliable, ultra-high-speed broadband services by 2018. The Hawai'i Broadband Initiative identifies four objectives, which include:

- Ensure ubiquitous access to word-class gigabit-per-second broadband service at affordable prices throughout Hawai'i;
- Increase the use of ultra-high-speed broadband services and applications for economic development, health care, education, public safety, government efficiency, and civic engagement;
- Reduce Hawai'i's barriers to global participation and ensure equitable access for all our island, including the most remote areas of the state; and
- Develop and implement a modern regulatory and permitting environment that supports and advances investment in broadband infrastructure and public services.

Currently, there are six transpacific F/O cable systems that provide broadband connection between Hawai'i and the United States (U.S.) mainland, Asia, and the South Pacific. Many of these systems have recently been upgraded to allow transmission of greater amounts of data over the existing cables. However, projections indicate that with increased demand for broadband access, additional capacity is needed to facilitate future economic growth (Hawai'i Department of Commerce and Consumer Affairs 2012). Of the four undersea cables connecting Hawai'i and the U.S. mainland, one has reached the end of its lifespan and two are more than half way through their anticipated lifespan; the newest cable has only 5 terabits of bandwidth and will soon reach its threshold (see the pre-consultation letter from Oceanic Time Warner Cable included in Appendix A). Additionally, one of the biggest challenges facing submarine F/O networks is vulnerability to disruptions in service due to lack of redundancy. That is, with redundant or multiple bidirectional cable links between stations, there is less likelihood that the failure of a single cable will slow down or disrupt broadband service.

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[1] Broadband, or high-speed Internet access, allows users to access the Internet and Internet-related services at significantly higher speeds than those available through "dial-up" services. Fiber is one of several platforms for providing broadband. Fiber optic technology converts to light electrical signals carrying data and sends the light through transparent glass fibers about the diameter of a human hair. The same fiber providing broadband can also simultaneously deliver voice (VoIP) and video services, including video-on-demand. (Source: Federal Communications Commission 2015)

[2] A very small proportion of international broadband capacity is provided by satellite. However, satellites are inherently restricted in broadband capacity provision, with other technical limitations such as excessive latency (or 'delay') for most telecommunications applications.

The purpose of the Project is to provide direct and affordable telecommunications connectivity between Hawaiʻi, the mainland U.S., Australia, New Zealand and other Pacific islands. The system is designed for at least 60 Terabits/sec of traffic, with all transpacific capacity transiting through the Kapolei landing site. This includes six fiber pairs landing in Hawaiʻi, each providing approximately 10 Terabits/sec of traffic. As such, the Project would respond to the needs identified under the Hawaiʻi Broadband Initiative by contributing to the development of broadband infrastructure in the State and providing additional international connectivity, thereby facilitating the State's global competitiveness. The Project would also directly benefit the State through increased telecommunications speed and reliability, due to the provision of advanced broadband capacity and redundancy to the existing transpacific cables. The Project facilitates at least 25 years of broadband connectivity for Hawaiʻi.

The Project would provide added redundancy to the Hawaiʻi submarine cable network by following a cable route to the south of the Island of Oʻahu when most existing cables are routed to the north of the island. Also, the Project is landing in Oregon when the majority of other trans-Pacific cables are landing in California.

Hawaiki is the first alternative "carrier neutral" and open access cable system of its kind in Hawaiʻi. Accordingly, the Project would also bring much needed telecommunications competition to the region. Due to Hawaiʻi's remote location and small market, there is limited competition among broadband service providers and transpacific cable operators that provide connectivity to points outside of Hawaiʻi (Hawaiʻi Department of Commerce and Consumer Affairs 2012). This presents few options for Hawaiʻi consumers and reduces cost competitiveness. Additionally, with advances in fiber optic technology enabling longer fiber spans, several cables already directly connect the U.S. mainland to Asia or the South Pacific and bypass Hawaiʻi, further reducing cost competitiveness amongst the existing transpacific cable systems serving Hawaiʻi. DRFortress has been selected by the Applicants as their landing and operating partner in Hawaiʻi. This key appointment is entirely consistent with Hawaiki's open access principles, as DRFortress is the only carrier-neutral datacenter and cloud services provider operating in Hawaiʻi.

1.3 PROPOSED ACTION AND ALTERNATIVES

The alternatives evaluated in detail below consist of the No Action (Alternative 1) and the Proposed Action (Alternative 2). Additional alternatives that were considered but not carried forward for further evaluation are discussed in Chapter 4.

1.3.1 No Action Alternative

Under the No Action Alternative, the Hawaiki Submarine Cable Kapolei Landing Project would not be constructed. Therefore, there would be no contribution to broadband development in Hawaiʻi.

1.3.2 Proposed Action

The Proposed Action includes the installation and operation of the Hawaiki submarine fiber optic telecommunications cable (F/O cable) and associated infrastructure (Figure 1-4). Project components include:

- Onshore telecommunications infrastructure, which would include a CLS building of <4,000 square feet (372 square meters), two diesel generators to provide backup power to the CLS, a parking area, and a subterranean BMH, where the subterranean HDD conduit would make entry to land. These facilities would be located on one Hawaiki-owned 0.6-acre (0.2 hectare) parcel along Farrington Highway (TMK (1) 9-2-051:011) in Kapolei, Hawaiʻi. This parcel is referred to as the onshore cable landing site. Inside the CLS, the F/O cable would be connected to powering and transmission equipment, allowing the interface of the Hawaiki system with the terrestrial broadband network infrastructure on Oʻahu.
- A subterranean HDD conduit, approximately 2,982 feet (909 meters) in length, which would extend from the BMH on land to the subsea punch-out exit point (at a depth of approximately 46 feet [14 meters]) into which the F/O cable would be installed. The HDD conduit would be installed beneath TMK (1) 9-2-051:001, owned by Au Trust, Farrington Highway, OR&L right-of-way (TMK (1) 9-2-049:005), Kahe Beach Park (TMK (1) 9-2-049:001), owned by the City and County of Honolulu, and TMK (1) 9-2-049:002, owned by the State of Hawaiʻi.
- A submarine F/O cable, installed by a cable-laying ship, on the surface of the seabed following a surveyed and engineered route in the Pacific Ocean extending from the punch-out point to the territorial limit of the State of Hawaiʻi waters (out to 3 nm [5.5 kilometers]) would include approximately 4.9 miles (7.9 km) of cable length. The 4.9 miles (7.9 km) of cable will provide sufficient amount of cable to accommodate topographic variations along the determined F/O route. From the 3 nm territorial limit, the F/O cable would extend another 14 nm (26 kilometers) where it would connect with the cable trunk route at a sea-floor located Branching Unit (BU).

Each of these elements is described in more detail below.

1.3.3 Shore End Site Work and Nearshore Landing

1.3.3.1 Site Preparation

Site preparation would include clearing for the HDD and cable landing activities, construction of the BMH and CLS, and resurfacing the existing dirt driveway with gravel to facilitate access from Farrington Highway. This would include some site grading/leveling, compaction (excavator traversing back and forth only) and lay down of crushed rock road base on the driveway access and CLS site to support the HDD rig, excavator, dump trucks, cranes, and delivery trucks. Following completion of construction on the CLS site, the hard surfacing along the driveway would be revisited to ensure suitability for regular motor vehicle access and to maintain consistency with ground finishing within the site.

All onshore construction activities would occur within the 0.6-acre (0.24 ha) parcel (TMK (1) 9-2-051:011). Security perimeter fencing, security lighting (shielded), and on-site utilities and connections to existing infrastructure located along Farrington Highway, including water, power, and communication, would be installed. A small portion of the adjacent parcel to the north (TMK (1) 9-2-051:001) (approximately 82 feet by 164 feet [25 meters by 50 meters]) and a portion of the adjacent parcel to the south (TMK (1) 9-2-051:010) would serve as a laydown area and would be used for additional parking and equipment and materials staging during the construction period only. Minor grubbing (vegetation removal) and some grading and leveling may occur in the laydown areas to facilitate parking and staging activities; following construction these areas would be returned to their original state.

1.3.3.2 Cable Landing Station and Associated Infrastructure

An approximately 3,850 square foot (350 square meter), 15-foot-high (4.5-meter-high) CLS building would be constructed to house the cable landing equipment (Figure 1-4). The CLS may be a modular prefabricated structure or a site-build structure. Current design includes a site-build structure and Figure 1-7 provides a rendering and elevation drawing of the proposed CLS building. Two diesel generators would be housed in a sound-dampened generator room adjacent to the CLS building. Once the submarine F/O cable system is commissioned, generators would run for approximately one hour per month during normal business hours. If the generator is needed to run at night during a power outage, noise would be minimal due to sound-dampening provisions. Connections to required infrastructure (water, power, and communications) would occur within the Farrington Highway right-of-way. It is planned that one person would be on-site during business hours for Project operations, with occasional (monthly visits) from various contractors for operation and maintenance visits for heating, ventilation, and air conditioning (HVAC) systems and diesel generator station. Peak occupancy of the CLS facility would be two persons under a repair or repair simulation scenario, which averaged over the 25 year system lifetime, would be a maximum of 1 week per year.

1.3.3.3 Horizontal Directional Drilling and Cable Landing

HDD would be carried out from the BMH to the seabed punch-out point at a water depth of up to approximately 46 feet (14 meters; Figures 1-8 and 1-9). The exact location of the punch-out point has been determined by nearshore geophysical and benthic surveys. HDD is a construction method for delivering an underground path to avoid obstacles such as existing infrastructure, rivers, surf, and ecological zones from one point to another. It is achieved using a combination of a hydraulic rock cutting head attached by a string of drill pipe to a drill rig providing forward thrust (Figure 1-10). Telemetry equipment is housed just behind the drill head which allows the direction and depth of the bore to be tracked and managed from the surface. A naturally occurring, thixotropic[3] mud is pumped at pressure through the drill string to the cutting face to provide the hydraulic power for the cutter rotation and to carry the cuttings back to the surface where they are filtered out and the mud can be reused. At completion of the bore, the drill string may be left in situ to maintain the hole or withdrawn and an alternate pipe hauled into the bore.

[3] Thixotropic refers to a material that becomes fluid when stirred or shaken, returning to a semi-solid state upon standing.

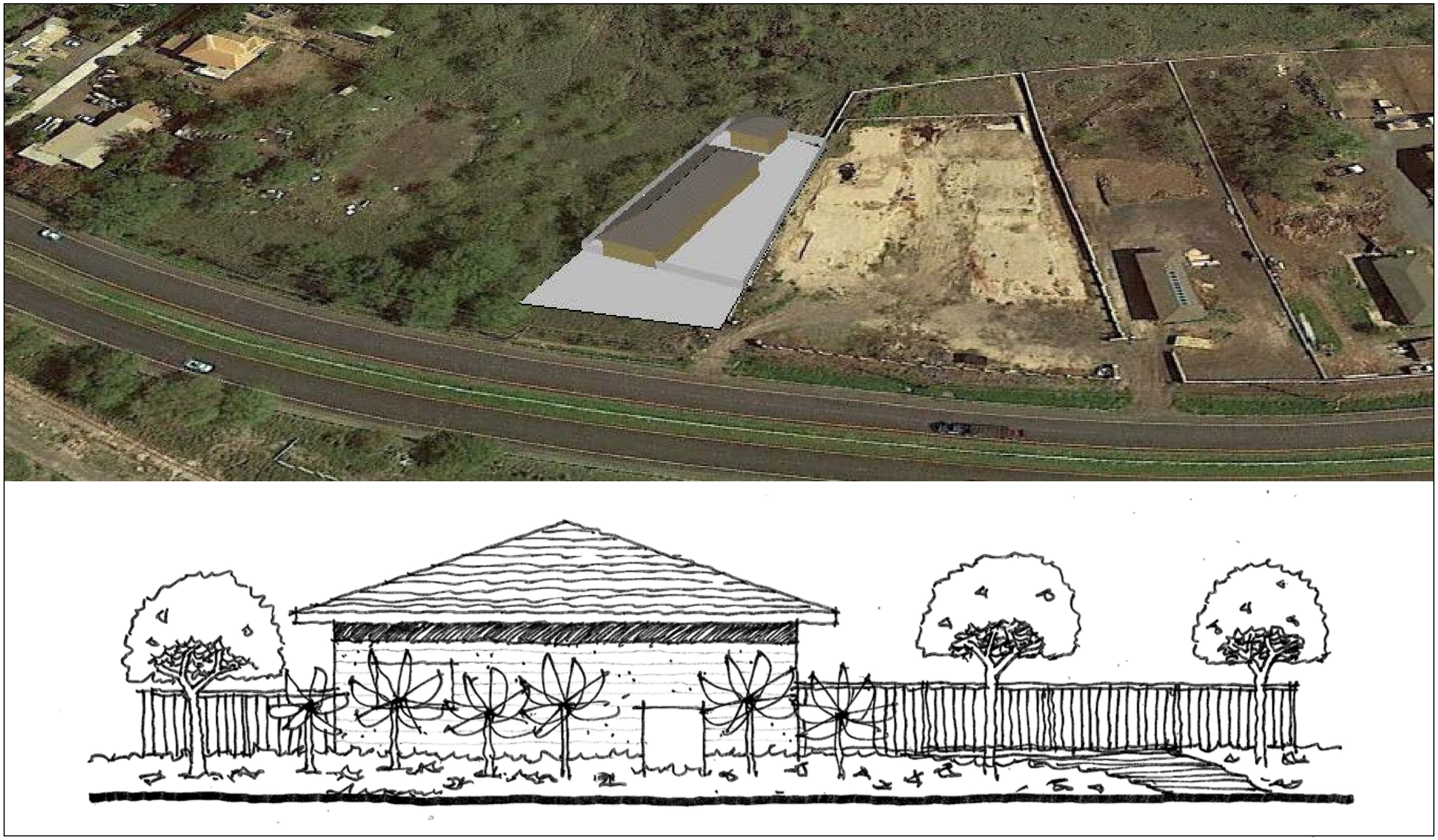

Figure 1-7. CLS Building Rendering and Elevation Drawing

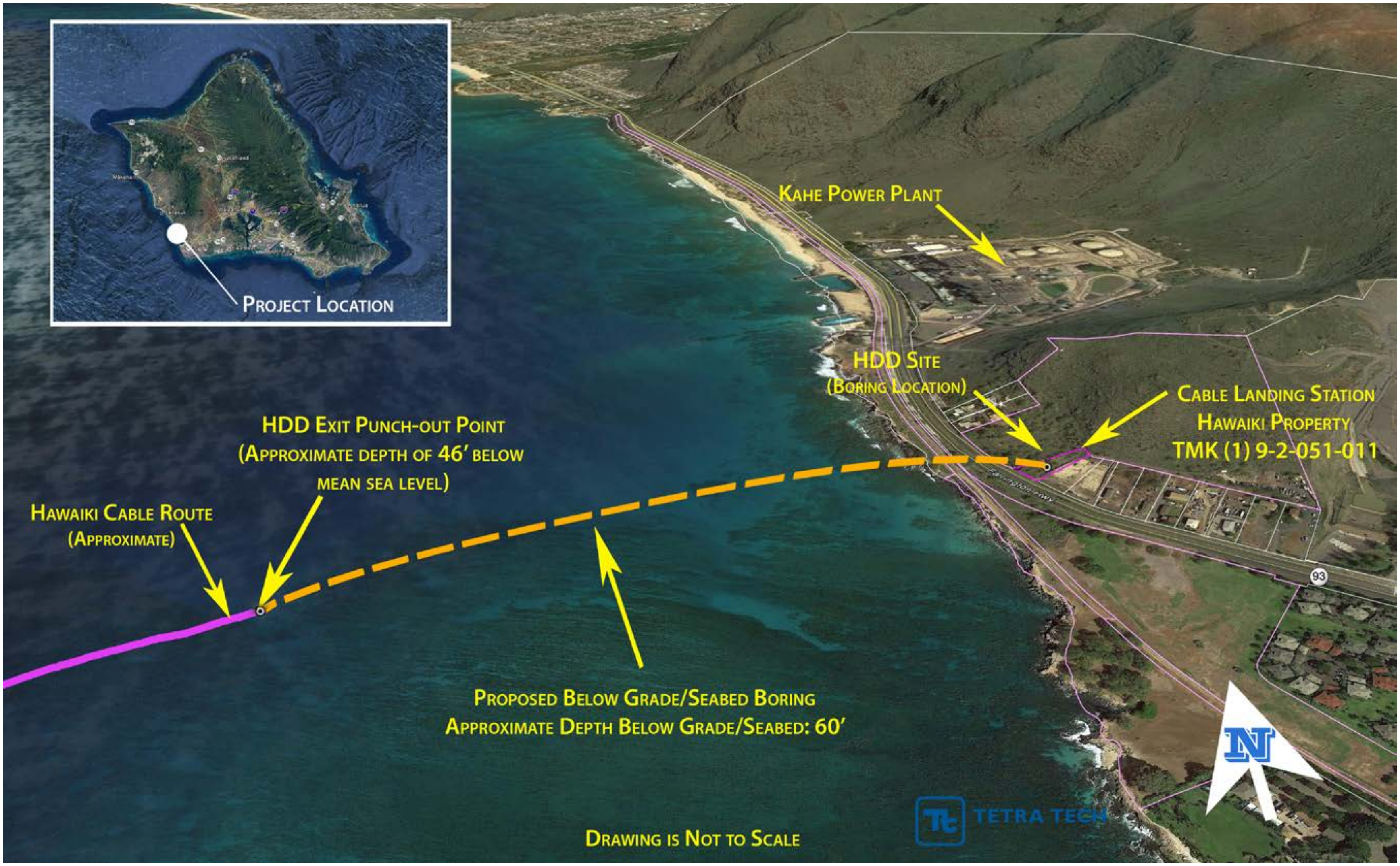

Figure 1-8. Nearshore and Terrestrial Project Location

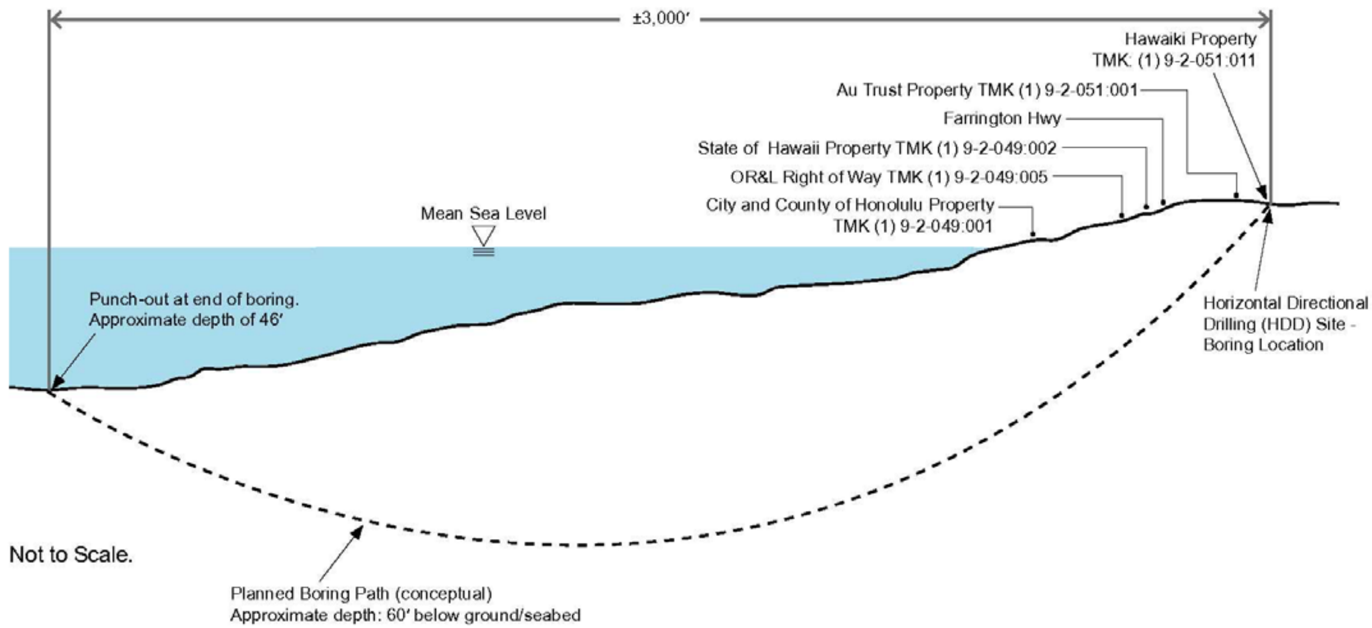

Figure 1-9. Horizontal Direction Drilling Cross-section

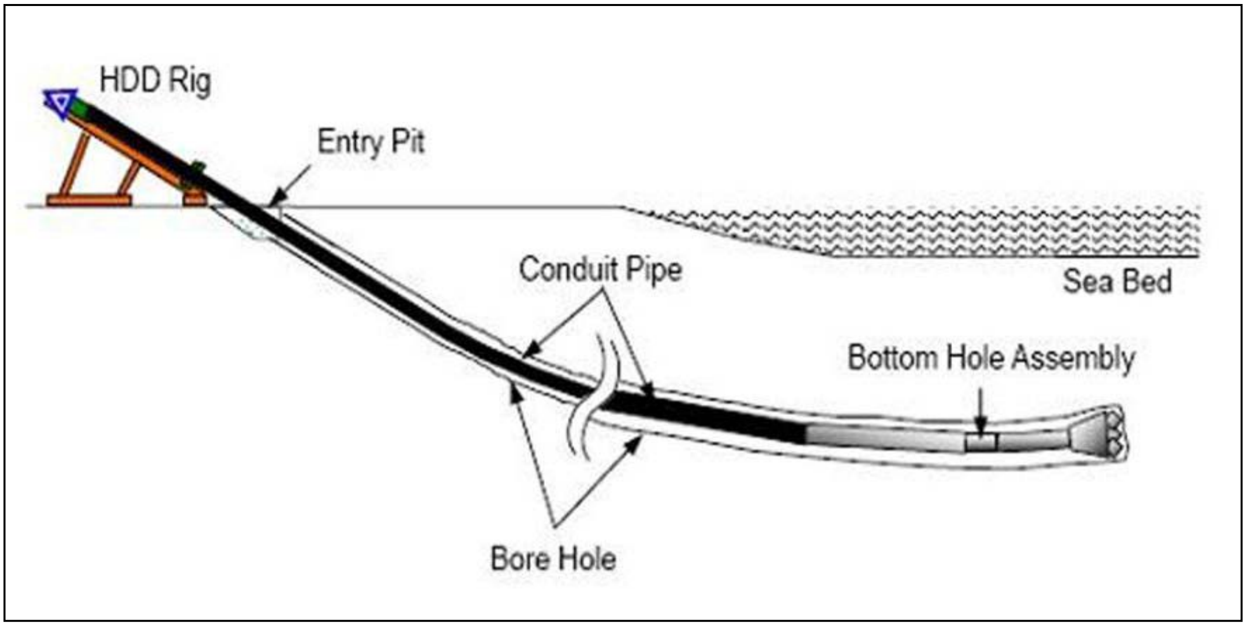

Figure 1-10. HDD Schematic

An HDD boring rig would be staged onshore, within the cable landing site. The proposed BMH location would be excavated into a pit up to 6 feet (3 meters) wide by 3 feet (1 meter) deep to accommodate the installation and use of the HDD boring rig. Depending on the geotechnical findings at the site, a 12- to 16-inch casing pipe may need to be installed in the pit to the rock interface. An approximately 10-inch-diameter (25 centimeter) borehole would be drilled in the pit wall and guided underground following a smooth curve to gradually reach an approximate depth of 60 feet (18 meters) below ground level/seabed. It would pass a portion of the Au Trust Land, and then under Farrington Highway, a parcel of state-owned land, the OR&L right-of-way, and Kahe Beach Park (Figure 1-9), then progress offshore, to a punch-out point at a water depth of approximately 46 feet (14 meters), approximately 2,520 feet (768 meters) from the shoreline. An approximately 5-inch-(125-centimeter) diameter steel drill pipe would be installed following the completion of the boring from the BMH location to the subsea punch-out point (approximately linear 2,982 feet [909 meters] in total) as a conduit for the F/O cable. To identify the makeup of substrata through which the HDD bore would pass, a geotechnical test bore was performed on the Hawaiki CLS site. See Section 2.2.1.1 for more information about the substrata in the area of the proposed HDD bore.

As noted above, the drilling operation would involve use of a naturally occurring thixotropic mud such as bentonite to facilitate passage of the drill bit through the substratum. Bentonite is a non-toxic, naturally occurring clay commonly used in farming practices. The actual bentonite-based drilling fluid used during drilling operation will be selected by the contractor and will be based on water quality of the area. The drilling fluid would be recycled via a sump pump located in the drill pit to direct the returned, used drilling fluid to a slurry separation plant located near the drill pit where clean drilling fluid would be separated and reused for drilling. The clean soil by-product would be stockpiled for use or disposed of at an off-site facility authorized by the State to accept construction and demolition debris. Slurry that cannot be reused would also be disposed of offsite at an authorized location.

During the drilling operation, drill pipe would be advanced through the borehole along with the drill bit. Once the drill bit and attached drill pipe clears the submerged hole, either the drilling head assembly (bottom hole assembly) would be removed and recovered to a barge, or the drill assembly would be recovered back to the drill rig through the bore pipe and a pipe then inserted down the bore. A pilot line would then be installed and the ends sealed ready for the F/O cable.

1.3.3.4 Construction of the Beach Manhole

The BMH is a concrete chamber situated below ground and above the high-water mark that would serve as the primary point of connection for the submarine F/O cable with the land cable. Once the cable landing is complete, the HDD equipment would be removed from the drill pit, and a pre-cast concrete BMH would be installed. The BMH would be approximately 13 feet by 7 feet by 7 feet (4 meters by 2 meters by 2 meters). It would be located next to the CLS building.

1.3.3.5 Ocean Ground Bed Installation

Prior to the cable landing, an ocean ground bed would be installed. The ocean ground bed is a collection of electrodes buried below ground level, which provides the return path for the electrical circuit that powers the repeaters (amplifiers) in the submarine cable system. This would involve the installation of approximately six anodes at least 7 feet (2 meters) below ground level near the BMH, located within the cable landing site property, linked by a ground cable that would connect to the F/O cable running back to the CLS (Figure 1-4).

1.3.3.6 Cable Connections to the CLS

To complete the connection between the submarine F/O cable at the BMH and the CLS, a conduit path would be built at a depth of 3 feet (1 meter) or greater from the BMH passing under the CLS and then up into the transmission room (Figure 1-10). Due to the proximity of the BMH to the CLS, these ducts would be only of the order of 30 feet (10 meters). The ductlines would be installed with a pre-installed pull rope, which would facilitate the installation of the F/O cable. Installing the cable below grade would provide physical security from natural disasters, potential accidents, and tampering. After installation, all equipment no longer necessary to the site would be demobilized and the site would be paved and landscaped around the constructed CLS.

1.3.4 Submarine Cable Laying and Installation

The submerged segment of the Hawaiki cable system would be installed using one of six special purpose TE SubCom Reliance Class cable ships, or equivalent alternative. These cable ships are approximately 460 feet (140 meters) in length and would operate at speeds of up to 6 knots during cable laying. The submarine F/O cable length from the subsea punch-out point to the 3 nm limit would be approximately 4.9 miles (7.9 km). Cable laying on the high-seas and through an EEZ is typically a 24 hour per day operation. Nearshore installation into the HDD punch-out point would take approximately 1 day to complete, depending on external forces such as weather and sea state. Installation of the F/O cable from the punch-out location to the 3 nm limit or vice versa would take approximately 0.5 day, pending weather, sea state, and time of day.

The submarine portion of the F/O cable would be laid on the seabed; no trenching or burying would be required. Cable laying does take into account the seabed profile, cable type, and bottom characteristics. Prior to the cable-laying operation, all data from the route surveys were studied and a cable laying plan was developed.

One or two support boats would be required to assist the cable ship during the nearshore landing operation. The support boats would be smaller vessels, sourced from local entities. Positioning of the cable ship at the subsea punch-out point would be accomplished using thrusters.

Once the cable ship is properly positioned, it would begin laying out cable while personnel attach suspension floats at regular intervals, as required, to allow the cable to be floated toward the subterranean HDD conduit by divers, a small motor boat, and/or other means. Once the cable reaches the HDD conduit, the floats would be removed, allowing the cable to sink and enter the HDD conduit at the proper angle. Divers would feed the F/O cable into the open subterranean HDD conduit by attaching it to the pilot line. The cable would then be hauled through the HDD conduit toward the BMH by a winch or other suitable method with floats being progressively removed. Once sufficient F/O cable has reached shore, the cable would be secured onshore, the remaining floats would be removed allowing the rest of the cable to sink to the sea bottom, with the F/O cable correctly positioned on the seabed, in the HDD conduit, and anchored into the beach manhole. The submarine portion of the F/O cable would then be spliced to the terrestrial cable, which terminates at the CLS.

The nearshore landing operation would occur during daylight hours and suitable conditions (calm weather and minimal swell) and is anticipated to take approximately one day. Following onshore installation, the cable landing site would be restored to pre-landing conditions.

The cable ship and support boats would comply with applicable federal and state regulations and conventions addressing navigational safety, safe operations, and pollution prevention measures. A Local Notice to Mariners (LNM) will be prepared in accordance with U.S. Coast Guard (USCG), District 14 requirements. An LNM would provide information concerning aids to navigation, hazards to navigation, and other items of marine information of interest to mariners within State of Hawaiʻi waters. The LNM to be issued for this Project would provide information on the presence of Project vessels within the State of Hawaiʻi waters. The USCG would issue the LNM to alert other vessels of the cable ship's presence, expected time in the area, and contact information.

1.3.5 Cable System Operation

Once installed, Hawaiki will be responsible for the operation and maintenance of the Hawaiʻi branch of the Hawaiki cable system. As required, replacement and maintenance of installed equipment at the cable landing station will be performed. Given the durability of the system and proven F/O cable installation methods, the need for submarine cable repairs is expected to be infrequent but would consist of recovering and splicing damaged cable. Such incidents of cable damage are rare, with a likelihood of just one or two incidents within the Hawaiʻi territorial waters over the estimated 25-year lifespan of the Project.

1.3.6 Safety Considerations

During the onshore construction period (approximately 7 to 9 months), consideration may be made for a periodic security guard service. Open pits, and other potentially hazardous openings, would be covered at the cable landing site at night and on weekends to ensure public safety during non-working hours.

No ocean waters would be closed to ocean activities such as boating, surfing, diving, and swimming during the cable-laying process (approximately 0.5 days, depending on weather conditions). During the cable installation process (approximately 1 day), no nearshore ocean waters would need to be closed between the shoreline and the subsea punch-out point. During installation an approximately 328-foot (100 meter) safe zone would be created around the installation area. This area would be patrolled by the use of small boats or jet skis, to keep patrons and vessels out of the work area. Additionally, a notice to mariners would be issued prior to the arrival of the vessel to the area.

1.4 PROJECT TIMEFRAME AND PRELIMINARY COSTS

Start of grading and site leveling of the CLS is tentatively scheduled for September 2017. After the grading and site leveling of the CLS is complete, installation of the CLS foundations and utility requirements would commence (estimated October 2017) and is estimated to take approximately 6 weeks. Preparation of the site for the HDD operations would require approximately one week and would start at the same time as the installation of the CLS foundations (after grading and site prep is complete), followed by CLS construction which is expected to take 5 months. Mobilization of the HDD drill rig is also estimated for October 2017 and drilling and installation of the borepipe would commence soon after. Duration of the HDD is anticipated to last 8 to 10 weeks. Demobilization of the HDD drill rig would follow the completion of HDD. Installation of the cable through the HDD conduit and nearshore cable landing activities are expected to take approximately 1 day and are scheduled for late 2017/early 2018. In total, the construction activities at the cable landing site are anticipated to last 7 to 9 months. The Project expects to start delivering services by end of June 2018. The estimated cost to construct the Project will exceed $13 million.

2.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

This chapter describes the existing conditions within the Project Area and environmental impacts of the proposed Project. Alternatives evaluated include the No Action Alternative and the Proposed Action (described in Chapter 1). For the purposes of analysis, the Project Area is defined as the cable landing site (TMK: (9)2-051:011), the adjacent laydown areas, the HDD corridor, and the submarine F/O cable route.

2.1 CLIMATE

2.1.1 Existing Conditions

The Hawaiian Islands have a semi-tropical climate, characterized by relatively mild temperatures and moderate humidity throughout the year (except at high elevations), persistent northeasterly trade winds, and infrequent, severe storms. Two primary seasons are recognized including a 5-month summer season (May through September) and a 7-month winter season (October through April). Summer is typically warmer and drier than winter, with few storm events. Local climate conditions in Hawai‘i are influenced by its rugged, mountainous topography and the persistent flow of the trade winds.

The Project is located on the leeward lowlands of the southwestern shore of O‘ahu. The Western Regional Climate Center describes this area as typically experiencing higher daytime temperatures, lower night time temperatures, and less rainfall than the windward side of the island (WRCC 2016). Average annual temperatures range from approximately 65 degrees Fahrenheit (°F) to 88°F, and average monthly precipitation varies between 0.5 to 4.0 inches (WC 2016). The majority of this precipitation occurs during the winter months.

The trade winds are prevalent 80 to 90 percent of the time during the summer months, when high pressure systems tend to be located north and east of the Hawaiian Islands. However, during the winter months, the high pressure systems are often located farther south, thereby decreasing the prevalence of the trade winds in this area by about 50 to 80 percent (WRCC 2016).

The Intergovernmental Panel on Climate Change (IPCC) recently concluded that islands are particularly vulnerable to the predicted effects of global climate change due to their small size, generally low elevation, remote geographic location and concentration of communities and infrastructure along coastlines (IPCC 2014). Potential loss of shorelines due to rising sea levels, ocean acidification, increased frequency and severity of storms, a decrease in the prevailing trade winds, as well as increased temperatures and drought are some of the climate change effects that have been observed and/or are predicted for the Hawaiian Islands (ORMP 2009; UH 2014). By the end of this century, global mean temperatures are projected to increase by approximately 2.7°F, ocean temperatures in tropical and semi-tropical regions are projected to increase by up to 3.6°F, and sea levels are projected to rise between 0.85 feet and 3.2 feet (0.25 meter to 1.0 meter; IPCC

2014, UH 2014). These effects have been attributed to increased emissions of greenhouse gases, such as carbon dioxide and methane, resulting from human activities since the mid-20th century (EPA 2012; IPCC 2014).

The State of Hawai'i recognizes the potential risks associated with climate change and has established a policy to address greenhouse gas emissions via Act 234, Session Laws of Hawai'i 2007. 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 2009).

2.1.2 Environmental Impacts

2.1.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no effect on the climate.

2.1.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Construction and operation of the Project would not result in direct or indirect effects to local climate conditions including temperature, rainfall, humidity, or wind patterns. Although construction of the Project would contribute a minor amount of greenhouse gases to the environment in the form of exhaust from construction equipment, cable-laying vessels, and vehicles, emissions would be temporary and localized and would not measurably contribute to regional or global greenhouse gas levels (see Section 2.12). Likewise, during Project operation two diesel generators would be used to provide backup power to the CLS[1]. For maintenance and test purposes, these generators would run for approximately one hour per month during normal business hours, producing a minor amount of greenhouse gases, and therefore would not be expected to measurably contribute to regional or global greenhouse gas levels. Therefore, the Project would not result in significant adverse impacts to the regional climate or climate change.

Given that the Project would be built along the coastline, the anticipated effects of climate change such as increased sea level rise, storm severity, and shoreline erosion have the potential to impact Project infrastructure. The location of the cable landing site is 50 feet (15 meters) above the current sea level[2], thereby protecting it from the anticipated up to 3.2-foot (1.0-meter) rise in sea level. Furthermore, given the criticality of the infrastructure being delivered by the Project, the Project would, at a minimum, be designed and engineered in compliance with industry standards to withstand elevated storm conditions predicted to occur in coming years, as well as potential shoreline erosion.

[1] The generators would be water cooled diesel 4-stroke compression ignition engines with a rotation speed of 1500 revolutions per minute (rpm) for 50 hertz (Hz) or 1800 rpm for 60 Hz.
[2] Based on NAVD88 data.

2.1.3 Best Management Practices and Mitigation Measures

All Project vessels, vehicles, and equipment, including the generators used during operation, would be maintained in proper working order and in compliance with state and federal emission standards. This will ensure that the amount of greenhouse gases emitted by the Project would be negligible. Therefore, no mitigation is proposed.

2.2 GEOLOGY, TOPOGRAPHY, AND SOILS

2.2.1 Existing Conditions

The Island of Oʻahu is the third largest of the Hawaiian Islands, formed by two coalesced shield volcanoes, Waiʻanae and Koʻolau, which are now inactive. Secondary geologic processes, including subsidence, landslides and slumping, weathering, erosion, sedimentation, and rejuvenated volcanism, have resulted in substantial modification of these volcanoes (Hunt 1996). Both volcanoes have been truncated by massive submarine landslides which have been mapped on the seabed to the southwest (Waiʻanae Slump) and northeast (Nuʻu-anu Slide) of the island. Subaerial fluvial erosion has further sculpted the flanks of both volcanoes, forming steep-sided ridges, valleys, and gullies that comprise the existing Waiʻanae and Koʻolau mountain ranges.

The Project is situated on the southwest side of the island at the base of Waiʻanae Mountains, which rise up steeply to the north-northwest to over 2,200 feet (671 meters; Figure 2.2-1). Elevation levels at TMK (9)2-051:011, the cable landing site property, are between 40 and 85 feet (12 meters to 26 meters) above mean sea level (amsl) with a slope ranging from 5 to 10 percent.

2.2.1.1 Onshore Setting

The area surrounding the proposed cable landing site is underlain primarily by unconsolidated calcareous reef rock and marine sediment of Pleistocene age (Qcrs), with some Holocene age Alluvium (Qa) at the base of the Waiʻanae Range and beach deposits (Qbd) along the shoreline. The volcanics of the Waiʻanae Range on which the CLS is situated are primarily lava flows (Takl), which are described as being primarily Pāhoehoe with lesser ʻaʻā (Sherrod et al. 2007). The proposed HDD corridor passes through the volcanics and unconsolidated sediment (Qcrs). Figure 2.2-2 shows the mapped distribution of these sediments in the Project Area. Beach deposits to the north and south of the Project Area include sand and gravel worked by the surf into unconsolidated coastline deposits that are primarily cream-colored and calcareous (derived from coral, shells, and foraminifera tests) in composition, with some sandstone (Sherrod et al. 2007).

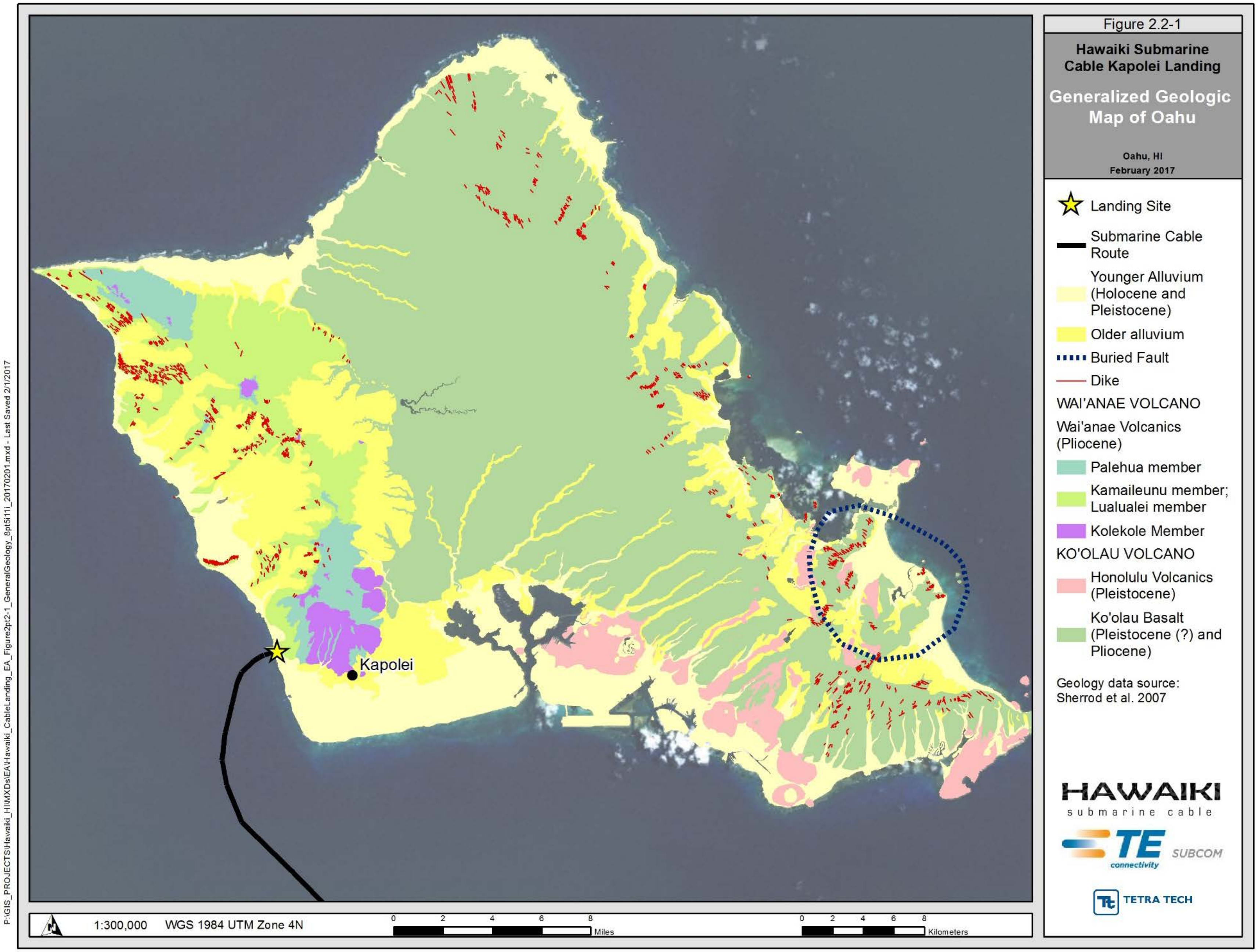
Figure 2.2-1
Hawaiki Submarine Cable Kapolei Landing
Generalized Geologic Map of Oahu
Oahu, HI
February 2017
Landing Site
Submarine Cable Route
Younger Alluvium (Holocene and Pleistocene)
Older alluvium
Buried Fault
Dike
WAI'ANAE VOLCANO
Wai'anae Volcanics (Pliocene)
Palehua member
Kamaileunu member; Lualualei member
Kolekole Member
KO'OLAU VOLCANO
Honolulu Volcanics (Pleistocene)
Ko'olau Basalt (Pleistocene (?) and Pliocene)
Geology data source: Sherrod et al. 2007
Kapolei
1:300,000 WGS 1984 UTM Zone 4N
0 2 4 6 8 Miles
0 2 4 6 8 Kilometers
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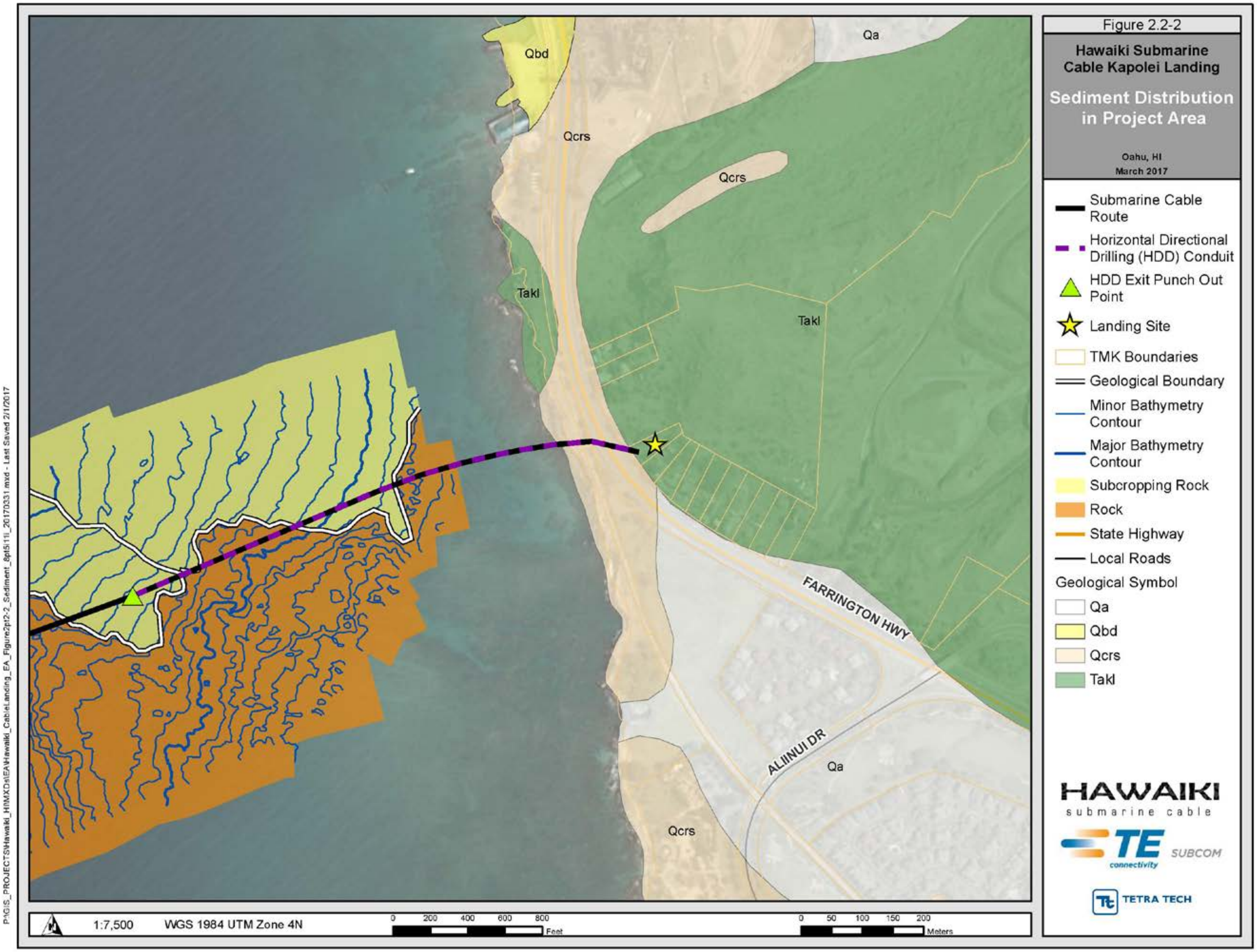

Figure 2.2-2
Hawaiki Submarine Cable Kapolei Landing
Sediment Distribution in Project Area
Oahu, HI
March 2017
Submarine Cable Route
Horizontal Directional Drilling (HDD) Conduit
HDD Exit Punch Out Point
Landing Site
TMK Boundaries
Geological Boundary
Minor Bathymetry Contour
Major Bathymetry Contour
Subcropping Rock
Rock
State Highway
Local Roads
Geological Symbol
Qa
Qbd
Qcrs
Takl
FARRINGTON HWY
ALIINUI DR
1:7,500
WGS 1984 UTM Zone 4N
0 200 400 600 800 Feet
0 50 100 150 200 Meters
HAWAIKI submarine cable
TE connectivity SUBCOM
TETRA TECH

An onshore geotechnical investigation at the cable landing site was performed on August 31 and September 1, 2016 (Hirata & Associates 2016, Appendix B). One exploratory test boring was drilled to a depth of approximately 50 feet (15 meters) with a Mobile B-80 truck-mounted drill rig. The boring was located approximately 15 feet (5 meters) south and 40 feet (12 meters) west from the BMH. Representative soil samples were recovered from the boring for selected laboratory testing and analyses and details related to these core samples are included in Appendix B.

The boring encountered surface soil classified as stiff, grayish brown silty clay to a depth of about 4 feet (1 meter) below the ground surface. Underlying the silty clay was medium dense to dense tan silty sand to a depth of about 18 feet (5 meters). The silty sand was mixed with coralline gravel from a depth of about 10 feet (3 meters). The silty sand was underlain by 27 feet (18 meters) of dense grayish brown highly weathered basalt. Underlying the highly weathered basalt was medium hard gray moderately weathered basalt extending to the bottom of the core. Groundwater was encountered at a depth of about 29.5 feet (9 meters); this level is expected to fluctuate with tidal variations.

2.2.1.2 Offshore Setting

In the approach to Oʻahu, the proposed cable route crosses over the Waiʻanae Slump, a massive landslide deposit located to the southwest of the island (Figure 2.2-3), before ascending the island slope. This deposit is the result of one of 17 distinct landslides that have occurred in the Hawaiian Islands in the last several million years (U.S. Geological Survey [USGS] 2014).

The island slope is gentle to moderate with localized steep to very steep rocky ridges. Offshore geophysical data collected along the route indicate that the seabed leading to the cable landing site is composed of scattered, high-relief rocky basalt and coral debris outcrops with intermittent exposures of sand underlain by sub-cropping rock. Sub-bottom data show that there are relatively small areas of appreciable sediment deposition (Figure 2.2-4). It is anticipated that after the HDD bore passes through 18 feet (5 meters) of silty clay and gravelly sands from its entry point at the CLS site, it will enter into hard basalt layers which are anticipated to be consistent and continuous along the HDD route until the bore rises towards the punch-out point and exits the subcropping rock. Approximately 6 feet (2 meters) of sand overlies the subcropping rock at the HDD punch out point (as confirmed by the diver survey conducted by Tetra Tech in September 2016).

Benthic habitat maps compiled by the National Centers for Coastal Ocean Science (NCCOS) based on imagery indicate that the subsea F/O cable final approach (from the 3 nm point) to the punch-out location comprises coral reef and hard bottom with limited areas of unconsolidated sediments. Geophysical survey data along the proposed cable route around the HDD punch-out location confirm this assessment.

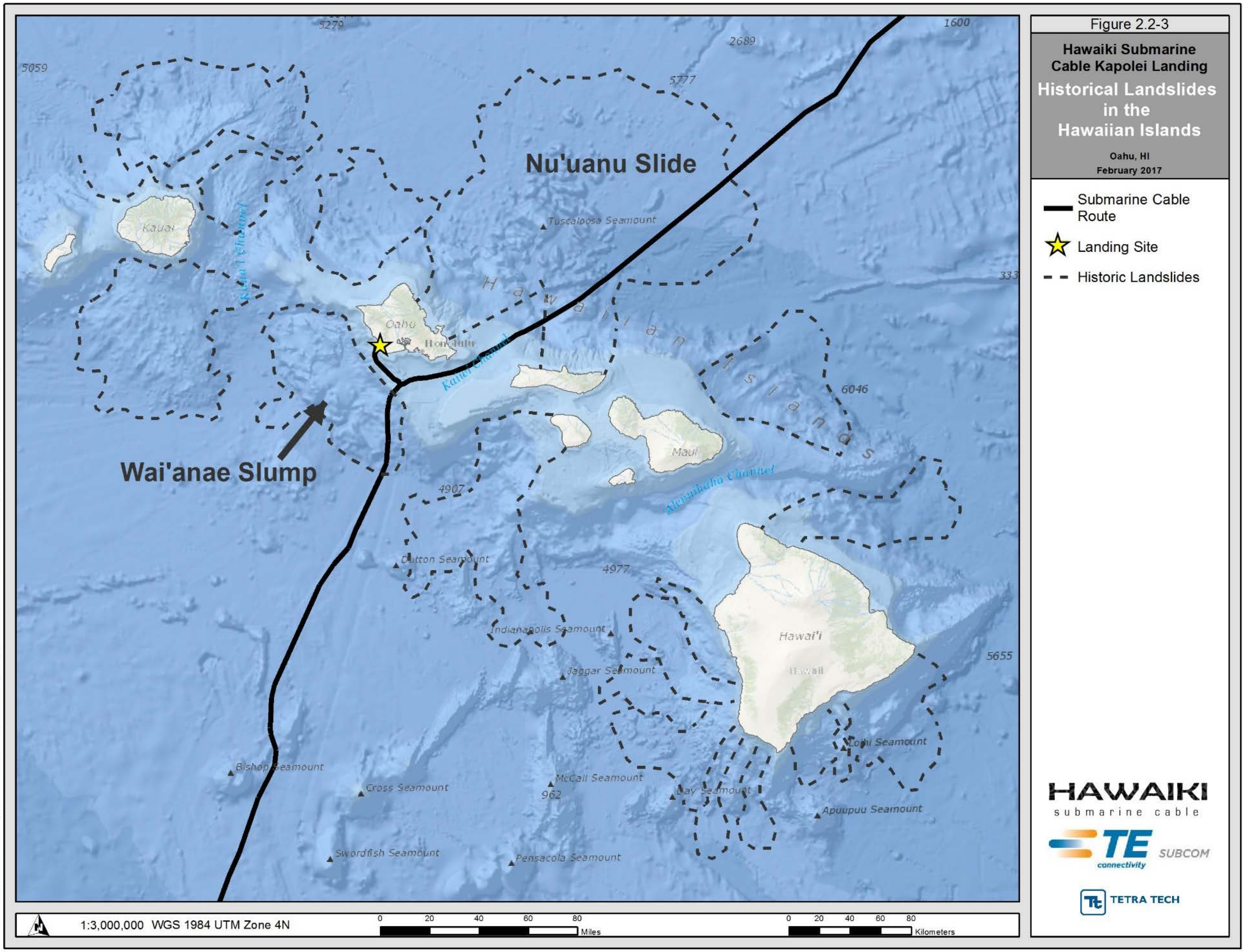

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Figure 2.2-4
Hawaiki Submarine Cable Kapolei Landing
Offshore Geophysical Data
Oahu, HI
December 2016
Submarine Cable Route
Horizontal Directional Drilling (HDD) Conduit
HDD Exit Punch Out Point
Landing Site
TMK Boundaries
Geological Boundary
Major Bathymetry Contour
Subcropping Rock
Sand
Rock
Geological Symbol
QTao
Qa
Qbd
Qcrs
Takl
Talel
Talev
Tapl
HAWAIKI
submarine cable
TE connectivity
SUBCOM
TETRA TECH
1:73,000
WGS 1984 UTM Zone 4N
0 0.25 0.5 0.75 1 Miles
0 0.5 1 1.5 2 Kilometers

2.2.2 Environmental Impacts

2.2.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no effect on the geology, topography, or soils.

2.2.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Construction of the cable landing site would not alter the topography or geologic character of the Project Area. Short-term impacts to the cable landing site include disturbance of soils during construction of shore-end facilities, including the CLS, BMH, HDD conduit, and associated infrastructure. Construction activities at the CLS, BMH and HDD conduit area are expected to take approximately 9 months. Disturbance would include earthmoving to grade the cable landing site for construction vehicle access, as well as construction of the CLS and HDD drill pit at the BMH, all of which would occur within the 0.6-acres (0.2-hectare) cable landing site property, and potentially a small portion of the Au Trust property to the north. Therefore, no long-term impacts on the regions geology, topography, or soils are anticipated.

The HDD punch-out would be located offshore at a water depth of approximately 46 feet (14 meters), approximately 2,520 feet (768 meters) from the shoreline. The punch-out area is situated on an area of surficial sandy sediment with sub-cropping rock. Bedrock exposures are located to the south, east, and west of the HDD punch-out location. Control methods would be in place during construction of the HDD conduit to minimize dispersal of sediment. Offshore from the HDD punch-out the cable would be surface-laid over the rocky seabed. The level of disturbance to the areas of sediment on the seabed during installation would be insignificant compared with natural sediment movement in the nearshore area.

2.2.3 Best Management Practices and Mitigation Measures

Best management practices (BMPs) would include site restoration and/or return of the cable landing site to preexisting conditions to the extent possible. Sediments excavated from the HDD conduit would be reused during the construction of the cable landing site or disposed of at a location approved by the State. Therefore, the Project would not result in significant impacts to geology, topography, or soils.

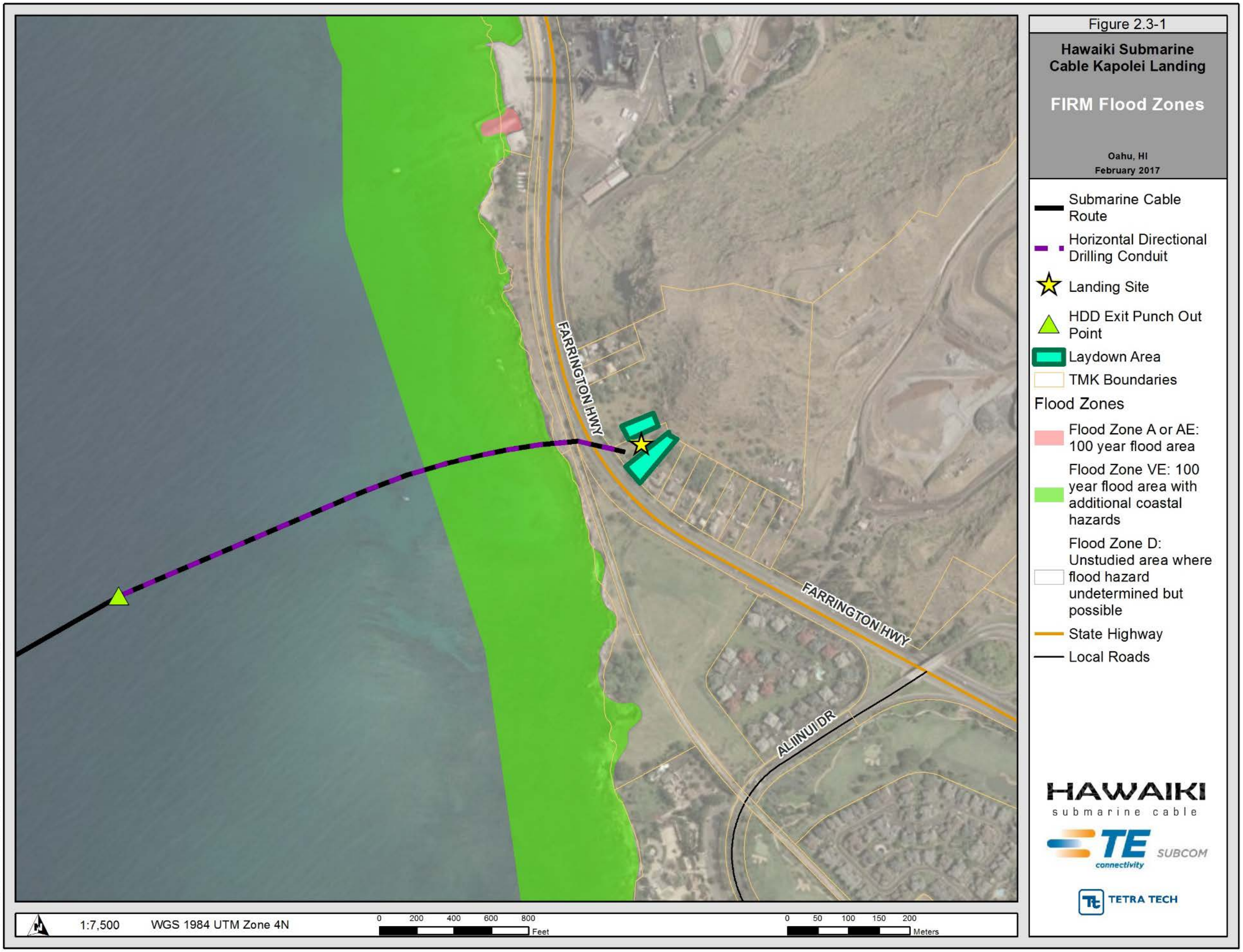
2.3 NATURAL HAZARDS

A natural hazard is a naturally occurring event that could negatively affect people, infrastructure, and/or the environment. Many natural hazards can be triggered by another event, though they may occur in different geographical locations; for example, an earthquake can trigger a tsunami 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 Hawaiian Islands which 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) National Flood Insurance Program and are mapped on Flood Insurance Rate Maps (FIRM). The maps classify land into zones depending on the potential for flood inundation. As shown on Figure 2.3-1, the Project Area is mapped by FIRM as being located within Zones D and VE (FEMA 2016a) (Figure 2.3-1). The onshore cable landing site is located in Zone D. Zone D includes unstudied areas where flood hazards are undetermined but flooding is possible (FEMA 2011). The HDD conduit is located within Zone D (described above) and Zone VE. Zone VE includes areas subject to inundation by the 1 percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses have been determined for Zone VE (FEMA 2016b).



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2.3.1.2 Tsunami

Tsunamis are large, rapidly moving ocean waves triggered both by disturbances around the Pacific Rim and locally by earthquakes, submarine landslides, and, occasionally, by volcanic eruptions (USGS 2015). Tsunami hazards include not only the powerful waves, but also large debris within the waves, and flooding of low-lying areas (Pacific Disaster Center 2016). Through 2002, 26 tsunamis with flood elevations greater than 3.3 feet (1 meter) have made landfall in the Hawaiian Islands during recorded history and 10 of these had an adverse impact on the Island of Oʻahu (Fletcher et al. 2002). The HDD conduit is located within the tsunami evacuation zone and the onshore cable landing site is located within the extreme tsunami evacuation zone (NOAA 2016). The "Tsunami Evacuation Zone" indicates the area that should be evacuated during any tsunami warning; whereas, the "Extreme Tsunami Evacuation" zone indicates areas that should be evacuated during extreme tsunami warnings (i.e., tsunamis where the waves may move significantly inland) (City and County of Honolulu, Department of Emergency Management 2016).

2.3.1.3 Hurricanes and Tropical Storms

Hurricanes develop over warm tropical oceans, and have sustained winds that exceed 74 miles per hour (mph; 119 kilometers per hour [kph]). Hurricanes can cause destruction through a combination of high winds, heavy rains, and abnormally high waves and storm tides (Businger 1998). The Central Pacific Hurricane season runs from June 1 to November 30. The most recent hurricane events in the Hawaiian Islands include Iniki (1992), which mainly affected the Island of Kauaʻi, and Iselle (2014), which mainly affected the Island of Hawaiʻi (NEC 2016). Hurricanes are relatively rare in Hawaiʻi; from 1950 through 1998 only five hurricanes (not including Iselle which made landfall as a tropical storm in 2014) have caused serious damage to the islands (Businger 1998). Although a few of these hurricanes have affected Oʻahu through high winds and flooding, no recorded hurricane has made landfall on the Island of Oʻahu.

Tropical storms are similar to hurricanes, except that the sustained winds are below 74 mph (119 kph). These events can also produce torrential rains. Tropical storms occur more frequently in Hawaiʻi than hurricanes and typically pass sufficiently close every 1 to 2 years to affect the weather in some part of the Hawaiian Islands (WRCC 2013).

2.3.1.4 Earthquakes and Seismicity

Earthquakes in Hawaiʻi are often linked with volcanic activity (USGS 2001). Numerous small volcanic earthquakes take place every year, primarily occurring beneath the Island of Hawaiʻi, and are triggered by eruptions and magma movement within the presently active volcanoes of Kīlauea, Hualalai, and Mauna Loa on the Island of Hawaiʻi, and Lōʻihi off the coast of the island.

Seismicity refers to the geographic and historical distribution of earthquakes (USGS 2016). The estimated risk of earthquakes for the Hawaiian Islands, using the measure of ground motion hazard as measured by peak ground acceleration, is shown in Figure 2.3-2. In the vicinity of the Project

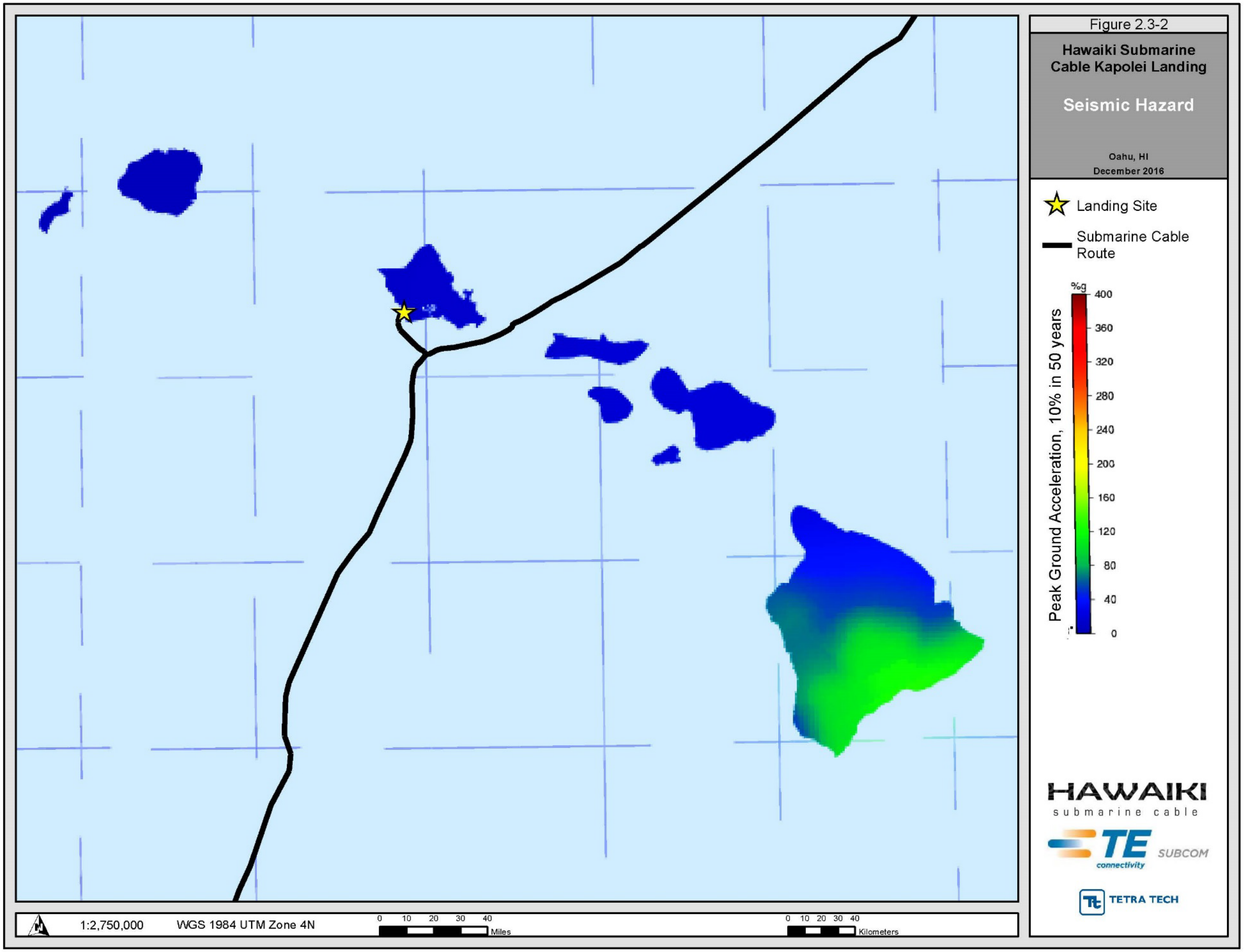
Figure 2.3-2
Hawaiki Submarine Cable Kapolei Landing
Seismic Hazard
Oahu, HI
December 2016
Landing Site
Submarine Cable Route
Peak Ground Acceleration, 10% in 50 years
%g
400
360
320
280
240
200
160
120
80
40
0
HAWAIKI
submarine cable
TE connectivity
SUBCOM
TETRA TECH
1:2,750,000
WGS 1984 UTM Zone 4N
0 10 20 30 40 Miles
0 10 20 30 40 Kilometers

Area, the earthquake peak ground acceleration that has a 10 percent chance of being exceeded in 50 years is between 0 and 40 percent g (acceleration due to gravity; Figure 2.3-2). As seen in Figure 2.3-2, Oʻahu has a reduced risk of earthquakes; whereas the south flank of the Island of Hawaiʻi has an increased earthquake hazard risk.

The Uniform Building Code (UBC) was developed to regulate building codes in specific areas to account for seismic hazards and provides minimum design criteria to address potential for damage due to seismic disturbances. Hawaiʻi has four UBC seismic hazard zones. According to the USGS, Zone 0 means that there is "no chance of severe ground shaking" and a seismic hazard rating of 4 means that there is a "10 percent chance of severe shaking in a 50-year interval" (USGS 2001). Currently, Oʻahu has a UBC seismic risk zone ranking of 2A, which indicates a low level of seismic risk (USGS 2001).

2.3.2 Environmental Impacts

2.3.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, the No Action Alternative would have no effects related to natural hazards.

2.3.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Floods

The majority of the Project Area is located within Flood Zone D, which corresponds to areas where analysis of flood hazards has not been conducted and flood hazards are undetermined, but given the proximity to the shoreline are expected to be driven only by sea level rise. The National Flood Insurance Program does not have any regulations regarding development within Zone D. The HDD conduit is located within Zone VE. This zone is designated as special flood hazard, or high risk, areas and is mapped as lying within the 1-percent-annual-chance (or 100-year) floodplain (FEMA 2013b). The HDD conduit, however, would be installed below ground; therefore, there is minimal risk of impacts to construction activities due to flooding. Additionally, the Project would not alter the existing drainage of the area and the Project would adhere to appropriate State and City and County of Honolulu construction guidelines and standards. During the detailed design phase of the Project, the construction contractor would confirm stormwater runoff requirements and, if necessary, implement stormwater control measures. The implementation of these measures would minimize the potential for flood events.

In the event of a flood, the site construction safety manager would be responsible for implementing the appropriate procedures in accordance with the Site Safety Handbook to ensure the safety of staff.

Tsunami

The HDD conduit is located within the tsunami evacuation zone; however, the conduit would be installed below ground and therefore would not be impacted in the event of a tsunami. The onshore cable landing site is located within the extreme tsunami evacuation zone, meaning evacuation is only recommended during an extreme tsunami warning generated by a very large earthquake with a magnitude of 9 or more. The likelihood of an extreme tsunami event during construction and operations of 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 to the Project from hurricanes and tropical storms are anticipated. Project facilities would be designed to meet or exceed minimum State and City and County of Honolulu requirements, which would mitigate for potential effects in the event of a hurricane.

Earthquakes and Seismicity

The entire Island of O‘ahu has a UBC seismic risk zone ranking of 2A (USGS 2001), which indicates a low level of seismic risk. No impacts to the Project from earthquakes and seismicity are anticipated. To reduce the risk of earthquake damage, all building structures associated with the proposed project would meet or exceed current building code requirements, according to standards for UBC Seismic Zone 2A.

2.3.3 Best Management Practices and Mitigation Measures

BMPs that would be implemented by the Applicants and would minimize impacts from and reduce risk of natural hazards include:

- To reduce the risk of earthquake damage, all structural elements of the Project would meet or exceed current building code requirements for the seismic risk on O‘ahu. The current design standard is defined by the 2006 UBC.
- A Site Safety Handbook would be prepared for construction, and operations and maintenance.

Impacts associated with natural hazards would be minimal; therefore, no additional mitigation beyond implementation of the above BMPs and industry standard BMPs is required.

2.4 ONSHORE WATER RESOURCES AND HYDROLOGY

Onshore water resources include groundwater and surface water, as well as other resources such as watersheds and floodplains. Groundwater refers to the subsurface water resources such as water occurring in subsurface geological formations called aquifers. Surface water features include wetlands, rivers, streams, springs, and lakes.

2.4.1 Existing Conditions

The project is in the Makaīwa Watershed, which encompasses roughly 12 square miles (31.5 square km) in the southwest portion of the island (Hawai‘i Office of Planning 1995). Hydrological conditions along the leeward coast of O‘ahu are influenced by the regions’ relatively low rainfall and high evapotranspiration rates. Mean annual rainfall in this area is approximately 23 inches (60 centimeters). Rainfall is typically highest in January and lowest in June-July (Giambelluca et al. 2013).

2.4.1.1 Groundwater

Groundwater occurs within aquifers, underground beds or layers of permeable rock, sediment or soil through which water can easily move. Volcanic-rock aquifers are found throughout the Hawaiian Islands and are locally overlain by sedimentary deposits (Oki et al. 1999). The State Commission on Water Resource Management (CWRM) has established groundwater hydrologic units across the Hawaiian Islands (CWRM 2008). An aquifer coding system is used to name and describe these groundwater hydrologic units (CWRM 2008). The onshore cable landing site and proposed onshore HDD corridor are located in the Makaīwa Aquifer System (CWRM 2008). The CWRM has not calculated a Sustainable Yield for the Makaīwa Aquifer System due to a lack of recharge data for this system (CWRM 2008). The area in the vicinity of the onshore cable landing site is underlain by a basal, unconfined aquifer, which contains fresh water (<250 milligrams per liter chlorine [mg/l Cl]) suitable for drinking (HDOH 1992). This aquifer is highly vulnerable to contamination (HDOH 1992). The HDD corridor is underlain by an upper, unconfined aquifer and lower aquifer that is confined due to coastal caprock. The water in the upper aquifer is moderately saline (1,000-5,000 mg/L Cl), while the water of the lower aquifer has low salinity (250-1,000 mg/L Cl). The upper aquifer is highly vulnerable to contamination, while the lower aquifer has low vulnerability to contamination (HDOH 1992).

The main groundwater reservoir in the vicinity of the Project Area occurs in lava flows of the middle and lower members of the Wai‘anae Volcanic Series (Takasaki 1971). The system is recharged by infiltration from upland surface runoff and precipitation (Takasaki 1971). In general, the regional direction of groundwater flow for the site vicinity is west-southwest, or toward the coast (EDR 2015). However, the presence of low permeable caprock along the ‘Ewa Plain inhibits groundwater discharge to the ocean near Waimānalo Gulch, with data suggesting a more northwestern flow and discharge near Kahe Point Beach Park (Waste Management, Inc./Geosyntec Consultants, Inc. 2006).

Several monitoring wells were drilled in the lower part of the valley and at nearby Kahe Point as part of a previous project unrelated to the proposed Project. Depth to groundwater at the five monitoring wells in the vicinity ranged from 55 to 200 feet (17 to 61 meters; Waste Management, Inc./Geosyntec Consultants, Inc. 2006). A geotechnical study was conducted for the Project by Hirata & Associates to determine the specific substrate and groundwater conditions at the cable landing site (Hirata & Associates 2016). The geotechnical study included a 50-foot (15-meter) deep exploratory borehole within the western portion of the cable landing site to identify which soil types occur at what depth and to determine the depth to groundwater. Soils encountered during this investigation include stiff silty clay to a depth of 4 feet (1 meter); medium dense to dense silty sand from 4 to 18 feet (1 to 5 meters; mixed with coralline gravel to 10 feet [3 meters]); highly weathered basalt in dense condition to 27 feet (8 meters); and moderately weathered basalt in medium hard condition to 50 feet (15 meters; Hirata & Associates 2016). Groundwater was encountered at a depth of approximately 29.5 feet (19 meters), although the depth to groundwater level is expected to vary with tidal fluctuations (Hirata & Associates 2016). Given the close proximity of the site to the ocean, the elevation that the groundwater was encountered and that the groundwater encountered during the geotechnical study is expected to be influenced by tidal fluctuations, groundwater encountered during HDD is likely to be saline/brackish and therefore not usable as a potable water supply.

2.4.1.2 Surface water

There are no wetlands, streams (either perennial or intermittent), or other surface water bodies within the onshore cable landing site or potential onshore HDD corridor. The closest surface water body to the cable landing site is the Pacific Ocean, located approximately 250 feet (76 meters) to the west. The closest fresh surface water feature is Waimānalo Gulch located roughly 984 feet (300 meters) to the southeast of the cable landing site.

A man-made concrete line drainage ditch is located between the onshore cable landing site and Farrington Highway within the HDOT right of way. A culvert pipe currently exists under driveway parallel with the highway. This drainage may occasional carry storm water from uplands areas.

2.4.2 Environmental Impacts

2.4.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no effect to onshore water resources and hydrology.

2.4.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

<u>Groundwater</u>

Estimates of the depth of the Waiʻanae Volcanics, which contain the primary groundwater supply, taken to the north of the Project Area suggest the depth is at least 200 feet (61 meters) below sea level (TNWR 2015). The target depth of HDD would be between 50 to 65 feet (15 to 20 meters) below ground level; therefore, the Project is not expected to encounter lava flows of the Waiʻanae Volcanics, or impact the drinking water aquifer which resides in these volcanics. Additionally, based on the geotechnical study, groundwater encountered during the HDD would likely be brackish/saline, making this water unlikely to be used as a source of drinking water. HDD would be performed using a bentonite drilling fluid to facilitate the drilling, as stabilization of the borehole and for the return of the cuttings (Hawaiki Submarine Cable USA 2016). Bentonite is a non-toxic, naturally occurring clay commonly used in farming practices; however, if large volumes of bentonite are discharged to waterways it can cause environmental degradation by smothering benthic invertebrates, aquatic plants and fish and their eggs. During HDD, it is possible that fractures in the underlying rock substrate may potentially result in the inadvertent release of bentonite clay into the environment. This event is described as an Inadvertent Drilling Fluid Release (IDFR), or "frac-out" and typically occurs in highly fractured soils or if the bore path is extremely shallow (Hawaiki Submarine Cable USA 2016). The substrate encountered during the geotechnical survey of the Project Area was identified as stiff silty clay over medium dense to dense silty sand before reaching basalt at 18 feet (5 meters; Hirata & Associates 2016). The basalt layer extended to the maximum drilling depth of 50 feet (15 meters). The consistency of the clay/sand substrate appears suitable to the low pressure of drilling fluid required during HDD activities (Hawaiki Submarine Cable USA

2016). However, this will be further assessed by the drilling contractor, and following site setup, if deemed necessary, a casing pipe would be installed to the depth where the substrate is deemed capable of holding the hydraulic pressure of the drilling fluid to a maximum depth of the bedrock identified at approximately 24 feet. Because the substrate appears to be suitable to the low pressure of drilling fluid during HDD activities and with implementation of BMPs identified in the IDFR Contingency Plan (Hawaiki Submarine Cable USA 2016), no impacts to groundwater as a result of potential frac-outs are anticipated during HDD activities. The potential impacts of frac-out during HDD activities are discussed in more detail in Section 2.5.

Surface Water

No surface water resources occur within the cable landing site or potential onshore HDD corridor; therefore, the Project would not result in impacts to onshore surface waters. During construction approximately 60 percent of the cable landing site (0.37 acres [0.15 hectares) would be converted to impervious hard surfaces which can increase stormwater runoff. With the implementation of stormwater control measures, such as detention basins or gutter collection, this minor increase in impervious surface is expected to have a negligible effect on surface waters in the vicinity of the Project Area during operation of the Project. The potential impacts to marine surface waters are discussed in Section 2.5.

2.4.3 Best Management Practices and Mitigation Measures

No adverse effects to groundwater or surface water are anticipated from construction or operation of the Project. BMPs and mitigation measures with regard to water resources would be developed during the Clean Water Act (CWA) Section 402 permit process, and would be incorporated into a Project-specific Temporary Erosion and Sediment Control (TESC) Plan and Stormwater Pollution Prevention Plan (SWPPP). BMPs and mitigation measures defined in the NWP-12 and WQC authorizations (inclusive of Section 10 of the Rivers and Harbors Act of 1899 and CWA 401 processes) will be adhered to during cable installation. Thus, any potential impacts to onshore water resources during construction and operation of the Project would be mitigated to insignificant levels by adherence to federal, state, and county regulations.

2.5 MARINE WATER QUALITY

2.5.1 Existing Conditions

The offshore waters within the Project Area (including the HDD corridor, punch-out location, and submarine cable until the territorial limit of the State of Hawai‘i waters) are classified as Class A marine waters by the Hawai‘i Department of Health (HDOH) – Clean Water Branch (CWB). According to HAR, Chapter 11-54 (Water Quality Standards):

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 waters 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 2.5-1 below. Only "dry" criteria are listed because the open coastal waters within the Project Area are expected to receive minimal fresh water discharge (i.e., less than 3 million gallons per day per shoreline mile).

Most of the water quality standards are based on a geometric mean for each parameter; thus, three separate samples must be collected to compare to the standard. Although a single data point for each parameter is insufficient to determine compliance with water quality standards, individual data points can provide insight into additional studies that may be needed for the waterbody.

Table 2.5-1. HAR 11-54 Water Quality Standards for 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, stormdrain or groundwater discharge may depress the pH to a minimum level of 7.0
Turbidity (Nephelometric Turbidity Units [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
TSS (mg/L)	n/a
Nitrate + Nitrite Nitrogen (µg [NO_3 +NO_2] - 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 NH_4-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)[1]	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

[1] 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.

The HDOH CWB sporadically monitors water quality at sites across the state. The closest sampling site to the proposed HDD punch-out location and the submarine cable is Waimānalo Gulch (21HI-000295). Microbiology and chemistry water quality data collected from the Waimānalo Gulch site by HDOH CWB in 2006 are presented in Table 2.5-2. More recent water quality data were also collected at the nearby Kahe Point Park site (21HI-000188) in 2009, as shown in Table 2.5-3. According to the most recent 303(d) Final List of Impaired Waters in Hawaiʻi, waters at Kahe Point Beach Park are listed as in attainment for *Enterococci*. All other parameters (e.g., turbidity) have insufficient data to determine (HDOH 2014a).

Table 2.5-2. Water Quality Results from Sampling Events at Waimānalo Gulch in 2006

Date	Temp. (°C)	Salinity (ppt)	pH	DO (mg/L)	DO saturation (%)	Turbidity (NTU)	*Enterococcus* (cfu/100 ml)	*Clostridium perfringens* (cfu/100 ml)
7/20/2006	26.33	34.56	8.03	5.2	94.7	1.04	20	2
8/3/2006	26.76	35.11	8.08	6.02	93	1.38	222	3
8/24/2006	26.85	34.59	8.03	5.85	90	2.55	10	4
9/14/2006	26.35	34.71	7.99	5.42	83	1.23	10	ND
10/12/2006	27.07	35.42	N/A	N/A	N/A	4.36	2.3	2
10/26/2006	26.05	34.77	7.95	5.82	88.3	1.87	2.3	2
11/16/2006	27.01	35.94	8.2	5.16	80.2	1.34	2.3	4
12/21/2006	24.64	31.83	8.17	6.55	95.3	0.75	207	5

Source: National Water Quality Monitoring Council 2016.
N/A = Not Collected, ND = Not Detected, °C = degree Celsius, ppt = parts per thousand, mg/L = milligram per liter, NTU = nephelometric turbidity unit, cfu = colony forming units, ml = milliliter

Table 2.5-3. Water Quality Results from Sampling Events at Kahe Point Park in 2009

Date	Temp. (°C)	Salinity (ppt)	pH	DO (mg/L)	DO saturation (%)	Turbidity (NTU)	*Enterococcus* (cfu/100 ml)	*Clostridium perfringens* (cfu/100 ml)
4/16/2016	22.98	36.01	8.25	6.28	91.20	2.76	10.00	1
6/25/2016	25.83	35.43	8.23	5.96	90.70	2.02	2.3	1

Source: National Water Quality Monitoring Council 2016.
°C = degree Celsius, ppt = parts per thousand, mg/L = milligram per liter, NTU = nephelometric turbidity unit, cfu = colony forming units, ml = milliliter

2.5.2 Environmental Impacts

2.5.2.1 Alternative 1 – No Action

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

2.5.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Construction and operation of the onshore cable landing site, HDD activities, and submarine cable laying 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. Additional BMPs would be detailed in applicable permit requirements and adhere to all applicable federal, state, and county regulations and permits.

Onshore CLS

Construction activities at the cable landing 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 enter stormwater and be conveyed by runoff into nearby marine waters. However, the likelihood of activities on the cable landing site impacting marine water quality is low due to the small disturbance area and BMPs that would be incorporated to avoid and minimize adverse impacts. Construction of the cable landing site will require approximately 1,107 cubic yards of excavation and 1,382 cubic yards of embankment. In total, approximately 0.71 acres (0.29 hectares) would be graded, which includes the 0.6-acre [0.2-hectare] Hawaiki parcel and potentially a small portion of the Au Trust parcel to the north.

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. Additionally, a Spill Prevention, Containment, and Countermeasure (SPCC) Plan would be prepared prior to construction, which would include measures for the safe transport, handling, and storage of hazardous materials. As a result, onshore construction activities are not expected to result in adverse impacts to marine water quality.

Once in operation, approximately 60 percent of the cable landing site (0.37 acres [0.15 hectare]) would be impervious hard surfaces, which can increase stormwater runoff. With the implementation of stormwater control measures, such as detention basins or gutter collection, this minor increase in impervious surface is expected to have a negligible effect on water quality. Stormwater management would be addressed according to all county, state, and federal regulations.

HDD Activities

The drilling fluid used during HDD activities would consist primarily of water and bentonite, a non-toxic and naturally occurring clay. Although HDD is considered the preferred cable landing method due to the ability to avoid sensitive features and resources, there is some potential for an inadvertent release of drilling fluid (i.e., bentonite clay) into the environment during HDD activities. This event is described as an IDFR or "frac-out." Frac-out refers to the inadvertent release of drilling fluids and returns through preferential saturation and break through fractured or weathered strata. Frac-outs can be caused by blockage of the return flow around the drill pipe, and typically occurs when highly fractured soils or unconsolidated materials are encountered, or when the bore path is extremely shallow. While bentonite is non-toxic, the fine particles have the potential to smother invertebrates, plants, fish, and other aquatic organisms and impact water quality (specifically total suspended solids [TSS], total dissolved solids [TDS], and turbidity) if large amounts are released.

The potential of an IDFR occurring during the Project's HDD activities is considered low for several reasons. First, the type of geological material identified at the cable landing site is considered suitable for HDD. A geotechnical survey at the cable landing site identified a substrate of firm clay over firm sand from the surface to about 18 feet (5 meters). The silty sand was mixed with coralline gravel from a depth of about 10 feet (3 meters). The consistency of the clay/sand substrate appears suitable to the low pressure of drilling fluid required, but would be assessed by the drilling contractor once on site to determine if casing pipe installation would be beneficial. Basalt was encountered from 18 to 50 feet (5 to 15 meters) deep. Additional geotechnical surveys would be conducted at the cable landing site prior to HDD activities.

Secondly, following best practice and maintaining proper drilling depth and pressure for the ground conditions minimizes the risk of IDFRs. Frac-outs have the highest likelihood of occurring at drill entry, drill exit, and during shallow drilling. The Project's drilling profile would be designed to gain depth as soon as possible and then maintain a minimum depth of cover below ground or seabed level of greater than 50 feet (15 meters), which is much deeper than the depth at which frac-outs usually occur (i.e., less than 20 feet [6 meters]).

Finally, the Project's IDFR and Contingency Plan (Appendix C) outlines measures and protocols that would be implemented to prevent, identify, contain, and properly respond to any inadvertent releases of drilling fluids.

The purpose of the IDFR and Contingency Plan is to:

- Minimize the potential for IDFRs;
- Provide the timely detection of any IDFRs that could enter or otherwise compromise or impact any sensitive cultural, environmental or biological resources, surface facilities or features;
- Facilitate notification of all appropriate agencies immediately and documentation of any incident; and
- Facilitate proper response, containment, and clean-up in the event an IDFR occurs.

The types of measures to be included in the IDFR and Contingency Plan are described below.

Pre-Construction IDFR Prevention

Experienced Crew: IDFR prevention begins well before the mobilization of the drilling equipment to the Project Area. The nominated drilling company will employ skilled, competent workers who are familiar with HDD construction and have performed many crossings of multiple complexities and are well versed in monitoring for IDFR's and the warning signs that are precursors to an IDFR.

Drilling Profile Design: The profile of the drill path will be designed to gain depth as soon as possible and will then maintain a minimum depth of cover below ground or seabed level of greater than 50 feet (15 meters) which is much deeper than the depth at which frac-outs usually occur (i.e., less than 20 feet [6 meters]).

Casing Pipe at Entry: A geotechnical survey was completed by Hirata and Associates that identified a substrate of silty clay to a depth of about 4 feet (1 meter) from the surface, underlain by silty sand extending to 18 feet (5 meters) deep. The silty sand was mixed with coralline gravel from a depth of about 10 feet (3 meters) deep. Weathered basalt was encountered from 18 to 50 feet (5 to 15 meters) deep. The substrate appears suitable for HDD. A further assessment will be conducted by the drilling contractor once on site. Following site setup, a casing pipe may be installed to the appropriate depth of the bedrock identified (as identified by the geotechnical survey) where the drilling contractor is absolutely confident that substrate is capable of holding the hydraulic pressure of the drilling fluid.

Drilling Fluid Selection: The drilling fluids would predominantly consist of water and a high yield bentonite clay. It is not anticipated that any other additives would be necessary to safely accomplish this crossing; however, if it is determined that other non-toxic additives would be beneficial, Material Safety Data Sheets would be reviewed and included in all applicable Project plans prior to their use. Bentonite and any other additives would be used in accordance with the manufacturer's specifications and per all applicable regulations.

Lost Circulation Material (LCM) may be used in case of an IDFR or loss of circulation. LCM products are used to "bridge" fractured ground and fissures allowing a foundation for bentonite to form a waterproof filter cake against fracture zones and stop fluid flowing into the frac-out zone. Once lodged in the problem voids, it will swell up to 200 times its original size thus bridging the fractured ground and allowing it to be sealed off with bentonite. LCM can also be spotted into caving zones to prevent collapse. Material Safety Data Sheets for LCM would be reviewed and included in all applicable Project plans prior to their use.

Punch-out Point Siting: The punch-out point has been selected to minimize the length of the HDD conduit while optimizing the clearance from outcropping rock, and is positioned at the closest position to shore where the cable ship is able to safely undertake landing of the cable into the bore pipe. The location where the drill bit will punch-out, or daylight, has also been selected by side-scan sonar and diver surveys to be positioned in the center of a large section of sand-covered, hard-bottom substrate. As the drill bit emerges from the hard substrate, the blanketing effect of the > 7 feet (2 meters) of sand cover would filter and capture any emergent drilling fluid, and the release of any sediments and turbidity. Once daylighting occurs, some minimal drilling fluid loss is expected, which is normal.

Construction IDFR Monitoring

Project Site Monitoring: Monitoring of the Project Area provides the primary HDD good practice and BMPs necessary to minimize the IDFR potential. The frequency of monitoring may be increased or decreased depending on the conditions of the work and phase of the work (i.e., increased monitoring during period of lost circulation, monitoring of increased downhole pressures or reduced return monitoring when HDD activities have been demonstrated to consistently produce anticipated results).

Drilling Fluid Pressure Monitoring: The drilling company will maintain drilling fluid monitoring equipment on site (and crew members who are proficient in their use) 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 in order to achieve a more stable borehole, improve cuttings return, and/or to reduce the IDFR potential during difficult drilling circumstances.

Pump pressures will 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 will 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. Standpipe pressure may increase and decrease depending on the strength of the formation being drilled at any given time, but it is anticipated mud pressures would range from 500-700 pounds per square inch (psi).

In addition, the drilling company will 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, reducing the chances for a frac-out from occurring. Annular pressures of 50 - 125 psi may be anticipated for this bore with annular pressures expected to increase gradually as the length of the drill increases.

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.

Plugging of the bore-hole annulus or the presence of a major formation fracture can lead to partial or full loss of drilling fluid circulation. It is possible to monitor fluid loss by watching for significant differences between the fluid rate being pumped downhole and the rate of returns flowing into the surface containment pits. The presence of back pressure in the drill pipe when unscrewing from the downhole work string is also a warning of a plugged annulus, which could lead to a frac-out.

In accordance with this plan, the drilling company will 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 will 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 will 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 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 will 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 will continuously monitor the area for IDFRs as long as the mud pumps remain on.
6. If circulation is re-established, drilling will proceed as usual and monitoring for IDFRs will become more routine as long as circulation is maintained. If circulation is not re-established, monitoring will continue while the pumps are on.

Often in the course of drilling the borehole circulation may be temporarily lost as the bit is advanced through more permeable sections of the formation and fluid pressures are at a maximum. Under these circumstances, the loss of fluid circulation alone may be temporary. As the pilot bit advances beyond the zone of lost circulation, fluid pressure may return back to normal and circulation within the borehole re-established.

Punch-out Point: At a suitable distance prior to the punch-out point (as defined by the seabed geology), the use of drilling mud will be curtailed. The borehole will be flushed with fresh water to bring all free mud not maintaining the borehole integrity back to the surface. The borehole will be completed to the punch-out point using either fresh water or a biodegradable, non-solids, biopolymer fluid such as Xantham gum to minimize release of bentonite onto the seabed. Xanthan gum is an industry standard drilling fluid where solids-free systems are a requirement. Xanthan gum is considered nonhazardous and suitable for use in environmentally sensitive locations and applications.

IDFR Response

<u>Land-based Release</u>

If IDFRs are observed on the ground surface, at a location other than the bore containment pits, the following procedures will 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 or 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. Clean-up shall include removal of all visible drilling fluid located in accessible areas. Removal methods will vary based on the volume of the release and the site specific conditions. Removal equipment may include vacuum trucks, loader and track hoe buckets, small pumps, shovels, and buckets. After removal of the released drilling fluid, the release area will 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 out drill pipe to wipe the bore-hole annulus.
9. Determine the suitability of placing LCM in the hole.
10. After tripping the drill string back, allow the formation to "rest" for a suitable period, continue drilling while monitoring the frac-out location and transferring fluids as necessary.
11. Forward reaming of the borehole up to the frac-out location may be considered to relieve annular pressures.
12. Continue drilling with minimum fluid.
13. Consider drilling a vertical relief well over the borehole to relieve borehole pressures and encourage flow to a known source where it can be managed.

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.

<u>Water Body Release:</u>

If an IDFR is observed offshore, the following procedures will 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 due to the fact that 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 will 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 will be adjusted to inhibit flow through the fracture and the drill pipe will be tripped back to wipe the borehole annulus in the region of the IDFR.

9. Determine the suitability of placing LCM in the hole.
10. After tripping the drill string back, allow the formation to "rest" for a suitable period, 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 will 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.

IDFR Control Equipment

In accordance with good HDD practices, the following frac-out containment and clean-up equipment should be present on or near the Project Area:

- Heavyweight sealed plastic bags filled with sand or gravel
- Splash board: three layers of heavy plastic
- Several 5-gallon (19-liter) plastic buckets
- One wide heavy-duty push broom
- Flat blade shovels
- Silt fence, T-posts, and/or straw bales
- Straw logs (wattles) At least two 10-foot (3-meter) rolls
- Portable trash pumps with a minimum of 500 feet (152 meters) of discharge hose
- A minimum of one vacuum unit on site and access to a vacuum truck within one hour of the job site

In addition to IDFRs, sediment disturbance at the HDD punch-out location would cause an increase in turbidity and TSS. These effects would be temporary, occurring only during construction. A detailed water quality sampling program would be developed and approved prior to construction. This plan would specify the various parameters that will be measured (e.g., pH, salinity, temperature, turbidity, TSS) during the pre-construction (baseline), construction, and post-construction phases.

HDD Spoil Handling and Disposal

In addition to driving the cutting head tool, the bentonite drilling fluid serves a secondary purpose of carrying the cutting spoil back up to the surface at the onshore drill site. A drilling fluid catchment pit (approximately 6 feet long x 6 feet wide x 3 feet deep [1.8 meters x 1.8 meters x 0.9 meters]) will be built at the drill head entry point. Pipework will connect the catchment pit to a fluid recycling unit, which is fed by a high volume submersible pump placed within the pit. As the drilling fluid returns to the pit from the bore hole, it is then pumped to the top of the drilling fluid recycling unit. The drilling fluid recycling unit is comprised of a holding tank (approximately the size of a 40 foot [12-meter] container) with a series of strainers and filters mounted on inclined shaker tables at the top of the tank. The spoil laden drilling fluid is pumped over the strainers and filters to remove the spoils and the cleaned mud drops through into the holding tank. The strainers and filters are angled toward a chute which feeds the filtered spoils into a skip bin mounted alongside the recycling unit. The clean fluid is recycled back into the HDD equipment to be used again in the HDD drilling process.

At the completion of drilling, approximately 225 barrels of fluid will be generated and 56 cubic yards of solid material will be displaced as a result of HDD activities. If local permitting allows, some of the clean, filtered spoil may be re-used onsite for the construction process. Otherwise, spoils will be removed from the CLS site and disposed of at a location authorized by the HDOH Solid Waste Section. The frequency of spoil removal trips is expected to occur every 2-3 days depending on drilling productivity. All drilling fluid will be removed from the CLS site at the completion of HDD activities and disposed of at an authorized location.

Submarine Cable-Laying Activities

Laying the submarine cable on the seafloor has the potential for increased turbidity and TSS due to a disturbance and suspension of bottom sediments. However, these impacts would be temporary and localized due to the minimal size of the cable, and the short time period that material is expected to be suspended in the ocean's water column. It is not anticipated that an articulated split pipe would be required around the cable. The submarine cable does not contain materials that would be harmful to water quality; thus, long-term impacts from cable laying are not expected. Impacts to marine biota are discussed more in Section 2.6.

2.5.3 Best Management Practices and Mitigation Measures

General BMPs for the HDD and F/O cable installation activities are described in the IDFR and Contingency Plan, which are summarized above and included as Appendix C. Detailed BMPs and mitigation measures with regard to water quality will be developed during the CWA 402 permit process. BMPs and mitigation measures defined in the NWP-12 and WQC authorizations (inclusive of Section 10 of the Rivers and Harbors Act of 1899 and CWA 401 processes) will be adhered to during cable installation. A detailed water quality sampling program will be developed and approved prior to construction and submitted as part of the Section 401, Water Quality Certification (WQC) process. Water quality sampling will occur prior to, during, and following construction to demonstrate that there are no impacts to water quality during construction.

The Project will also follow appropriate measures recommended by the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries) Protected Resources Division and U.S. Fish and Wildlife Service (USFWS) with regard to protecting water quality. These may include, but are not limited to, ensuring all project-related materials and equipment placed in the water will be free of pollutants, and no contamination by invasive species introductions will result from project-related activities. Thus, all potential impacts to marine water quality during construction and operation of the Project would be mitigated to insignificant levels by adherence to federal, state, and county water quality regulations.

2.6 MARINE AND NEARSHORE BIOLOGICAL RESOURCES

2.6.1 Existing Conditions

This section covers the marine and nearshore biological resources found in the Project Area. Topics discussed include coral and reef habitat; Essential Fish Habitat (EFH); reef and nearshore fish species; echinoderms; and sea turtles and marine mammals.

A diver survey was conducted by Tetra Tech in September 2016. The Survey Area included the HDD punch-out location, as currently proposed (N21 20.8447, W158 08.1920), and the cable corridor between the HDD punch-out location and the 98 foot (30 meter) depth contour. The intent of the survey was to assess potential impacts to marine and nearshore biological resources, as well as inform appropriate state and federal agency consultations, such as EFH (see Appendix D). The diver survey included habitat mapping using towed-divers, habitat quantification (coral, macroalgae, seagrass, sand, etc.), and observations of fish and other marine biota.

2.6.1.1 Coral and Reef Habitat

Corals are the dominant habitat-forming organisms in the Project Area. Most hard corals and soft corals are habitat-forming (i.e., they form coral reefs) (Freiwald et al. 2004; Spalding et al. 2001). The presence of corals is used to define specially-managed habitats, such as EFH types (WPRFMC 2009). Hard corals, also called stony corals, create skeletons of calcium carbonate under a veneer of living tissue. Soft corals have several different skeleton types ranging from rigid with a veneer of tissue to entirely fleshy. The individual coral unit is referred to as a polyp, and most species occur as colonies of polyps. Corals can be categorized as shallow-water and deep-water, with shallow water corals occupying the photic zone shallower than approximately 650 feet (200 meters). All corals feed on small planktonic organisms or dissolved organic matter, and most shallow-water corals derive additional energy from their symbiotic algae (Dubinsky and Berman-Frank 2001). All corals require hard substrate for the juveniles to settle upon. Suitable hard substrates include dead coral skeleton, shells, hardbottom, pavement, rock outcrops, and marine debris. Four types of habitat-forming coral communities are found throughout the Hawaiian archipelago and may be found along the F/O cable route: shallow-water, mesophotic, deep-water, and precious corals. All of the diver survey habitat falls within the 'shallow-water' habitat type (see Appendix D).

As key habitat-forming invertebrates (see U.S. Department of the Navy et al. 2012), the threats to coral and reef habitats are well-studied. Factors that can stress or damage coral reefs are coastal development (Field et al. 2008; Risk 2009), impacts from inland pollution and erosion (Cortes and Risk 1985; Downs et al. 2011), coastal runoff (Downs et al. 2009; Downs et al. 2011), overexploitation and destructive fishing practices (Jackson et al. 2001; Pandolfi et al. 2003), global climate change and acidification (Doney et al. 2012; Doropoulos et al. 2012; Hughes et al. 2003), disease (Lesser et al. 2007; Porter et al. 2001), predation (Hayes 1990), harvesting by the aquarium trade (Caribbean Fishery Management Council 1994), vessel anchors (Burke and Maidens 2004), invasive species (Bryant et al. 1998; Galloway et al. 2009; NOAA Fisheries 2010; Wilkinson 2002), ship groundings (NOAA 2010), oil spills (NOAA 2001), and possibly human-made noise (Vermeij et al. 2010).

There are very few species-specific threats for coral species, though many threats have proportionally greater impact to particular groups, genera, or families of coral. For example, coral bleaching, some diseases, and some predators differentially impact groups or genera of corals. Also, the aquarium and precious coral industries have taxa-specific preferences (Sakashita and Wolf 2009).

Shallow-water coral reef habitat is the most familiar because it is easily accessible. Shallow-water corals have symbiotic dinoflagellate algae called zooxanthellae which provide extra energy to the corals that is usually converted into vigorous skeletal growth (Castro and Huber 2000). While most shallow- and deep-water hard corals form reefs, the more vigorous skeletal growth of shallow-water corals makes them more productive habitat-forming organisms. Shallow-water coral and reef habitat is declining in Hawaiʻi and worldwide (Jokiel 2008). Shallow-water corals are protected by an array of regulations including Executive Order 13089 *Coral Reef Protection* (Clinton 1998), and locally by Title 13 HAR §13-95-1.1].

Because of Hawaiʻi's relatively steep bathymetry and the depth limitations of shallow-water coral, reef habitat is largely limited to the nearshore environments of the Hawaiian Islands. The Hawaiian Islands also support approximately 90 species of shallow-water hard coral. These numbers are approximate because the status of some coral species identification is uncertain (Brainard et al. 2011; Fenner 2005). The shallow-water coral reef habitat of the Project Area is estimated to support 17 species of hard coral (USFWS 2014). The general distribution in the Main Hawaiian Islands is summarized by Jokiel (2008), and the distribution of shallow-water coral reef habitat in the Project Area was surveyed by Tetra Tech (Appendix D) to amplify the existing shallow water reef habitat data in the vicinity of Kapolei (R.M. Towill Corporation 1999a, b; USFWS 2014).

The Project Area intersects shallow-water coral reef habitat that is substantially degraded relative to mean conditions on Oʻahu (Friedlander et al. 2008; Jokiel 2008), and dominated by sand and rubble. The distinct habitat types were identified during the diver survey: sand, relict reef patches with moderate coral abundance, and rubble fields with very low coral abundance. Most (84 percent) of the Project Area has coral cover under 10 percent, and nearly half (41 percent) of the Project Area has coral cover under 1 percent. In all, 14 coral species were identified during the diver survey (Appendix D) as listed in Table 2.6-1. Higher quality reef habitat is inshore of the HDD punch-out location, and away from the cable centerline to the south, and the Project avoids impacts to these areas. The southwestern side of Oʻahu is among the least rich shallow-water coral habitat in the main Hawaiian Islands according to mapping efforts and as inferred by the lack of reef monitoring and assessment efforts in the area (Friedlander et al. 2008). Threats to shallow-water coral reef habitat are not materially different than the general threats to all coral and reef habitat, summarized above.

Table 2.6-1. Coral Species Identified during the Marine Diver Survey

Species
Cyphastrea ocellata
Leptastrea purpurea
Leptastrea bewickensis
Montipora capitata
Montipora patula
Pocillopora damicornis
Pocillopora eydouxi
Pocillopora ligulata
Pocillopora meandrina
Pocillopora verrucosa
Porites compressa
Porites lobata
Porites solida
Psammocora nierstraszi

Mesophotic coral reef habitat is also dominated by the same, or similar, zooxanthellate hard corals as the shallow-water habitat; but their ecosystem functions are quite different (Rooney et al. 2010). Mesophotic corals are protected by the same array of regulations including Executive Order 13089 *Coral Reef Protection* (Clinton 1998), and locally by Title 13 HAR §13-95-1.1]. Because of Hawai‘i's relatively steep bathymetry, mesophotic reef habitat is largely limited to the perimeters of the islands from approximately 131 feet (40 meters) to 492 or 656 feet (150 or 200 meters) depth. The general distribution and community characteristics of mesophotic coral reef habitat in the Main Hawaiian Islands has been described but not well mapped (Kahng et al. 2010; Rooney et al. 2010). Occurrence within the Project Area is likely within the 131 to 656 feet (40 to 200 meter) depth range, but cannot be estimated with any precision. Threats to mesophotic coral reef habitat are not materially different than the general threats to all coral and reef habitat, summarized above.

Deep-water coral reef habitat is dominated by hard corals but soft corals are a larger component of the habitat relative to shallow-water coral reefs in Hawai‘i (Lumsden et al. 2007; Messing et al. 2008). Deep-water reefs grow from approximately 328 to 3,280 feet (100 to 1000 meter) depths, and occasionally deeper (NOAA 2012). Deep-water coral reefs are primarily regulated by the Magnuson-Stevens Fishery Conservation and Management Act of 1996 (MSA), and locally by Title 13 HAR §13-95-1.1. Deep-sea habitats, including deep-water coral reefs, are particularly vulnerable to physical impacts. There are instances in which habitat recovers quickly from physical impacts such as dredging, trenching, or bottom-trawling (Skilleter et al. 2006) and instances that the habitat recovers exceptionally slowly (Lindholm et al. 2011). Deep-water coral reefs in and near the Project Area have not been well mapped and cannot be estimated with any precision, but their occurrence is likely along deeper portions of the F/O cable route (Lumsden et al. 2007; Messing et al. 2008; NOAA 2012). Threats to deep-water coral reef habitat are not particularly well known, although deep-water corals are extremely sensitive to physical strike and disturbance. Even hook and line fishing physically degrades the habitat (Reed et al. 2007; Ross and Quattrini 2007).

A peripheral fourth type of deep-sea coral community is the precious corals. The Hawaiian Islands supports approximately 17 species of precious corals, and nearly all of these are soft corals. These numbers are approximate because several are represented by genus rather than species, and because the exact identification of some coral species is uncertain due to difficulty keying to the precise species level (Fenner 2005). Black corals are usually found in mesophotic depths from 59 to 295 feet (18 to 90 meters), while pink, golden, and bamboo corals are usually found from 899 to 4,501 feet (274 to 1,372 meters). Some precious corals are extremely slow-growing with colonies being 1,000 to 4,000 years old (Roark et al. 2009). Because of their need for fishery management, precious corals have an EFH Management Unit designated (see next section). Known precious coral beds do not coincide with the Project Area (WPRFMC 2001) and no precious corals were observed during the diver survey up to 30 meters depth. The nearest known precious coral bed is Ka'ena Point, about 25 miles (40 km) northwest of the Project Area. Apart from targeted extraction and destructive fishing practices, threats to precious corals are not particularly well known.

2.6.1.2 Essential Fish Habitat

The MSA requires that all federal agencies consult with NOAA Fisheries on any activity that "may adversely affect" EFH. EFH is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity."

In the Pacific Islands Region, EFH has been designated for federally managed species in five Management Unit Species groups: Bottomfish and Seamount Groundfish, Pelagic Species, Crustaceans, Precious Corals, and Coral Reef Ecosystems. The Western Pacific Regional Fishery Management Council (WPRFMC) has authority over the federally managed fisheries in this region and oversees conservation and management through the implementation of five Fisheries Ecosystem Plans, two of which apply to the Project Area. These include the Hawai'i Fishery Ecosystem Plan (WPRFMC 2009) and the Pelagic Fishery Ecosystem Plan (WPRFMC 1986 and 2009), both of which are currently undergoing revision.

Habitat Areas of Particular Concern (HAPCs) are subsets of EFH that merit special attention because they meet at least one of the following criteria (NOAA Fisheries 2014a):

- provide important ecological function;
- are sensitive to environmental degradation;
- include a habitat type that is/will be stressed by development; or
- include a habitat type that is rare.

Table 2.6-2 describes the EFH and HAPCs for each of the five Management Unit Species group. The Project Area includes the defining characteristics of EFH and HAPCs for all Management Unit Species groups and HAPCs in state and federal waters coinciding with the project area, except for Precious Corals. Defining characteristics of these EFH types are summarized in Table 2.6-2.

Table 2.6-2. Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) Designations for the Hawaiʻi Archipelago Fishery Ecosystem Plan Management Unit Species

Management Unit	Species Complex	EFH	Habitat Types	HAPC
Bottomfish and Seamount Groundfish	Shallow-water species (0–50 fm [0–300 ft. (0–91 m)]): uku (*Aprion virescens*), thicklip trevally (*Pseudocaranx dentex*), giant trevally (*Caranx ignoblis*), black trevally (*Caranx lugubris*), amberjack (*Seriola dumerili*), taape (*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	All slopes and escarpments between 131 and 918 ft. (40 and 280 m)
		Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 1,312 ft. (400 m)		Three known areas of juvenile opakapaka habitat: two off Oʻahu and one off Molokaʻi
	Deep-water species (50–200 fm [300–1,200 ft. (91–365 m)]): ehu (*Etelis carbunculus*), onaga (Etelis coruscans), opakapaka (*Pristipomoides filamentosus*), yellowtail kalekale (*P. auricilla*), kalekale (*P. sieboldii*), gindai (*P. zonatus*), hapuupuu (*Epinephelus quernus*), 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)		All slopes and escarpments between 131 and 918 ft. (40 and 280 m)
		Juvenile/adults: the water column and all bottom habitat extending from the shoreline to a depth of 1,312 ft. (400 m)		Three known areas of juvenile opakapaka habitat: two off Oʻahu and one off Molokaʻi
	Seamount Groundfish species (50–200 fm [300–1,200 ft. (91–365 m)]): 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	No HAPC designated for Seamount Groundfish
		Juvenile/adults: all EEZ waters and bottom habitat bounded by latitude 29° N–35° N and longitude 171° E–179° W between 262 and 1,968 ft. (80 and 600 m), which is not within the project boundaries		

Table 2.6-2. Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) Designations for the Hawaiʻi Archipelago Fishery Ecosystem Plan Management Unit Species (continued)

Management Unit	Species Complex	EFH	Habitat Types	HAPC
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) Juvenile/adults: all of the bottom habitat from the shoreline to a depth of 328 ft. (100 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	All banks in the NWHI with summits less than or equal to 98 ft. (30 m) from the surface
	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)		No HAPC designated for deepwater shrimp
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 Keahole Point, Makapuʻu, Kaʻena Point, Wespac bed, Brooks Bank, and 180 Fathom Bank	Deep interisland channels and promontories on solid substrate in areas swept by moderate-to-strong bottom currents	Includes the Makapuʻu bed, Wespac bed, Brooks Banks bed
	Shallow-water precious corals (10–50 fm): black coral (*Antipathes dichotoma*), black coral (*Antipathis grandis*), black coral (*Antipathes ulex*)	EFH has also been designated for three beds known for black corals in the Main Hawaiian Islands between Milolii and South Point on the Big Island, the Auau Channel, and the southern border of Kauai	Solid substrate often associated with vertical surfaces	For Black Corals, the Auau Channel has been identified as a HAPC

Table 2.6-2. Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) Designations for the Hawai'i Archipelago Fishery Ecosystem Plan Management Unit Species (continued)

Management Unit	Species Complex	EFH	Habitat Types	HAPC
Coral Reef Ecosystems	All Currently Harvested Coral Reef Taxa (CHCRT) All Potentially Harvested Coral Reef Taxa (PHCRT)	EFH for the Coral Reef Ecosystem MUS includes the water column and all benthic substrate to a depth of 328 ft. (100 m) from the shoreline to the outer limit of the EEZ	Lagoons, Submerged Aquatic Vegetation, Intertidal Zone, Mangroves, Coral Reefs, Rocky Reef, Artificial Reef / Shipwreck	Includes all no-take Marine Protected Areas identified in the Coral Reef Ecosystems FMP, all Pacific remote islands, as well as numerous existing Marine Protected Areas, research sites, and coral reef habitats throughout the Western Pacific
Pelagic	**Temperate species** Albacore (*Thunnus alalunga*), Bigeye tuna (*Thunnus obesus*), Bluefin tuna (*Thunnus thynnus*), Mackerel (*Scomber* spp.), Pomfret (family *Bramidae*), Striped marlin (*Tetrapurus audax*), Swordfish (*Xiphias gladius*) **Tropical species** Black marlin (*Makaira indica*), Blue marlin (*Makaira nigricans*), Dogtooth tuna (*Gymnosarda unicolor*), Frigate and bullet tunas (*Auxis thazard, A. rochei*), Kawakawa (*Euthynnus affinis*), Mahimahi (*Coryphaena hippurus, C. equiselas*), Ono (*Acanthocybium solandri*), Opah (*Lampris* spp.), Sailfish (*Istiophorus platypterus*), Skipjack (*Katsuwonus pelamis*), Slender tuna (*Allothunnus fallai*), Spearfish (*Tetrapturus* spp.), Yellowfin (*Thunnus albacares*) **Sharks** Bigeye thresher shark (*Alopias superciliosus*), Blue shark (*Prionace glauca*), Thresher shark (*Alopias vulpinus*), Longfin mako shark (*Isurus paucus*), Oceanic whitetip shark (*Carcharhinus longimanus*), Pelagic thresher shark (*Alopias pelagicus*), Salmon shark (*Lamna ditropis*), Shortfin mako shark (*Isurus oxyrinchus*), Silky shark (*Carcharhinus falciformis*) **Squid** Diamondback squid (*Thysanoteuthis rhombus*), Neon flying squid (*Ommastrephes bartamii*), Purple flying squid (*Sthenoteuthis oualaniensis*)	Eggs and larvae: the water column extending from the shoreline to the outer limit of the EEZ down to a depth of 656 ft. (200 m) Juvenile/adults: the water column extending from the shoreline to a depth of 3,280 ft. (1,000 m)	Soft Bottom Habitats, Fish Aggregating Devices, Seamounts	Water column down to 3,280 ft. (1,000 m) that lies above seamounts and banks

General threats to EFH are primarily overexploitation and destructive fishing practices (Halpern et al. 2008; Jackson et al. 2001; Kaiser et al. 2002; Miloslavich et al. 2011; Pandolfi et al. 2003). Because many attributes of EFH are biogenic, like coral reef habitat, the same set of general threats would apply to EFH.

2.6.1.3 Reef and Nearshore Fish Species

More than 500 reef and nearshore fish species are known to occur in Hawaiian waters (Froese and Pauly 2016). Nearly one quarter of those are endemic to (found only in) the Hawaiian Islands (Randall 1998). Marine fishes are closely associated with a variety of habitats. Some species, such as large sharks, tuna, and billfishes, range across thousands of square miles; others, such as gobies and reef fishes, have small home ranges and restricted distributions (Helfman et al. 2009). Marine fishes can also be broadly categorized into horizontal and vertical distributions within the water column.

The primary ecological groups of fishes that occur in the marine environment in the Project Area include the reef community fishes, the unstructured seafloor community fishes, and the surface community fishes (Schwartz 1989). Physical constraints for species diversity and presence include temperature, salinity, oxygen, pH, physical habitat, ocean currents, and latitudinal gradients (Helfman et al. 2009; Macpherson 2002; Nelson 2006). In general terms, the nearshore habitats of Hawaiian waters support a greater diversity of coastal and reef-associated species, while the open ocean areas support a lower diversity of oceanic and deep-sea species (Helfman et al. 2009; Nelson 2006). Each potential habitat type in the Project Area (e.g., coral reef, hard bottom, soft bottom, aquatic beds) supports a fish community associated with that habitat type. Table 2.6-3 lists the 28 fish taxa observed during the diver surveys.

Existing threats to marine fishes include pollutants in the marine environment which are widely distributed by global oceanic circulation patterns (Crain et al. 2009). Pollutants in the marine environment that may impact marine fishes include organic pollutants, inorganic pollutants, and marine debris (Pew Oceans Commission 2003). Entanglement in abandoned commercial and recreational fishing gear has also caused pollution-related declines for some marine fishes; some species are more susceptible to entanglement by marine debris than others (Musick et al. 2000). Other human-caused stressors on marine fishes include overfishing and the introduction of non-native species (Crain et al. 2009).

The majority of the coral reef fisheries in Hawaiʻi occur in nearshore waters. In the Project Area, reef-associated species may be harvested by commercial, recreational, or subsistence fishers. The methods used to collect these species range in sophistication from hook-and-line, spearfishing, and various longline or entanglement gear. The State of Hawaiʻi Division of Aquatic Resources (HDAR) manages commercial and recreational fisheries within the state waters (< 3 nm [6 km] from shore) of Hawaiʻi. Several locations in Oʻahu are specifically regulated as Marine Life Conservation Districts and other Fisheries Management Areas. However, none of these are located near the Project Area. Commercial landings from Hawaiian waters during 2014 totaled 34 million pounds composed primarily of tunas, billfishes, deep bottom fishes, jacks, and miscellaneous inshore fishes. Most commercial landings were obtained by longline and handline (DAR 2015). The Marine Recreational Information Program survey data from Hawaiian waters reports 2.8 million pounds harvested during 2014, composed primarily of jacks, snappers, and goatfishes (NOAA Fisheries 2016a). The WPRFMC is responsible for managing Hawaiian fisheries in federal waters (between 3 to 200 nm [6 to 370 km] from shore). The WPRFMC manages the following pelagic, bottom/reef-fish, and crustacean fisheries in federal waters around Hawai‘i through the following fisheries management units (WPRFMC 2009):

- Hawai‘i Archipelago Bottomfish Management Unit Species
- Hawai‘i Archipelago Bottomfish Management Unit Species - Seamount Groundfish
- Hawai‘i Archipelago Coral Reef Ecosystem Management Unit Species, Currently Harvested Coral Reef Taxa

Table 2.6-3. Fish Species Identified during the Marine Diver Survey

Species	Common Name(s)
Abudefduf abdominalis	Hawaiian sergeant
Acanthurus nigrofuscans	Brown surgeonfish
Aetobatus ocellatus	Spotted eagle ray
Bodianus albotaeniatus	Hawaiian hogfish
Canthigaster jactator	Hawaiian whitespotted toby
Centropyge loriculus	Flame angelfish
Chaetodon multicinctus	Mutiband butterflyfish
Chromis ovalis	Oval chromis
Chromis vanderbilti	Blackfin chromis
Coris gaimard	Yellowtail coris
Ctenochaetus strigosus	Goldring surgeonfish
Dascyllus albisella	Hawaiin dascyllus
Fistularia commersonii	Smooth coronetfish
Fistularia commersonii	Trumpetfish
Forcipiger flavissimus	Longnose butterflyfish
Gorgasia hawaiiensis	Hawaiian garden eel
Gymnothorax eurostus	Stout moray
Labroides phthirophagus	Hawaiian cleaner wrasse
Lutjanus kasmira	Bluestripe snapper
Melichthys vidua	Pinktail durgon
Paracirrhites arcatus	Arc-eye hawkfish
Parupeneus multifasciatus	Manybar goatfish
Parupeneus pleurostigma	Sidespot goatfish
Plectroglyphidodon johnstonianus	Blue-eye damselfish
Sufflamen bursa	Lei triggerfish
Thalassoma duperrey	Saddle wrasse
Zanclus cornutus	Moorish idol
Zebrasoma flavescens	Yellow tang

The scalloped hammerhead shark (*Sphyrna lewini*) may occur in the Project Area waters. This species is listed as threatened for its Indo-West Pacific Distinct Population Segment (DPS), but is not listed in Hawaiʻi (NOAA Fisheries 2014b, c). Scalloped hammerhead sharks follow diel vertical movement patterns within their home range (Holland et al. 1993; Klimley and Nelson 1984). In sum, reef community fishes, the unstructured seafloor community fishes, and the surface community fishes are considered to be potentially present in the Project Area.

2.6.1.4 Echinoderms

Six species of sea urchins (Echinoidea) were noted during the marine diver surveys: rough-spined urchin (*Chondrocidaris gigantea*), needle-spined urchin (*Echinostrephus aciculatus*), banded urchin (*Echinothrix calamaris*), blue-black urchin (*Echinothrix diadema*), *Diadema* sp., and red pencil urchin (*Heterocentrotus mamillatus*). Overall, urchin density is on the order of 1 per 1,075 square feet (100 square meters), but on the most topographically complex relict reef patches urchin density is on the order of 1 per 10 square feet (1 square meter). Activity of urchins is apparent on the more topographically complex relict reef patches where the substrate is highly bioeroded by boring urchins (Appendix D).

Four species of sea stars (Asteroidea) were recorded during the marine diver surveys: crown-of-thorns seastar (*Acanthaster planci*), cushion star (*Culcita novaeguineae*), red velvet star (*Leiaster glaber*), and green linckia (*Linckia guildingi*). Only four crown-of-thorns seastar individuals, which is a coral predator, were observed within the survey area. The three sea cucumber (Holothuria) species recorded during the diver surveys include the teated sea cucumber (*Holothuria whitmaei*), black sea cucumber (*Holothuria atra*), and Hawaiian spiky sea cucumber (*Stichopus sp.*) (Appendix D).

2.6.1.5 Sea Turtles and Marine Mammals

Sea turtles and marine mammals in the Project Area waters occur from nearshore coastal waters out to the open ocean area, and on occasion on the coastal beach habitat (e.g. the monk seal [*Neomonachus schauinslandi*] or sea turtles species). The distribution of these resources varies and is influenced by a number of factors, including prey productivity (which in turn is affected by patterns of major ocean currents), reproductive patterns (particularly for the humpback whale [*Megaptera novaeangliae*] and also some sea turtle species) and also by habitat disturbance from human activities. Habitat use varies among species and within the life stages of individual species, correlating primarily with the distribution of preferred food sources, as well as for those species that breed in Hawaiʻi, by the time of year or for the sea turtle, by the locations of nesting beaches. Most of the larger cetaceans (baleen whales) known from Hawaiʻi are migratory and seasonal while many of the smaller cetaceans (the dolphins or toothed whales) do not migrate in the same sense, however they may have seasonal changes or interisland shifts in density (Baird et al. 2003). The only pinniped (seal) species that regularly occurs in Hawaiʻi is the Hawaiian monk seal. Sea turtles are present in coastal and open ocean waters of Hawaiʻi and are also highly migratory. The only sea turtle species regularly expected in Hawaiian waters are the green (*Chelonia mydas*), and hawksbill (*Eretmochelys imbricata*).

All sea turtles in Hawaiʻi are federally-listed under the Endangered Species Act (ESA) as are several marine mammal species, including Hawaiian monk seals and the locally endemic population of false killer whales. Marine mammals are also protected under the Marine Mammal Protection Act (MMPA). In addition to being protected by the ESA and the MMPA (whales, dolphins, and Hawaiian monk seals), sea turtle and marine mammal species are protected by the HAR Chapter 124 which gives the State of Hawaiʻi Department of Land and Natural Resources (DLNR) management over conserving, protecting, and preserving the important natural resources of the state.

The MMPA prohibits the intentional harassment of marine mammals. Impacts on marine mammals are defined under the MMPA such that a take by harassment might occur either by Level A or Level B harassment. Harassment is defined as "any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment) or has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption to behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment)" (16 U.S.C. 1361 et seq.). An impact would occur if an action were to violate any of the terms listed above for a marine mammal.

There are several large whale species that could potentially occur in the 3 nm to 200 nm (6 to 370 km) Project Area waters, and also past the 200 nm (370 km) area such as the sperm whale (*Physeter microcephalus*), blue whale (*Balaenoptera musculus),* fin whale (*Balaenoptera physalus*), sei whale (*Balaenoptera borealis*), Bryde's whale (*Balaenoptera brydei/edeni),* North Pacific right whale (*Eubalaena japonica*), and various beaked whale species (family *Ziphiidae).* These are either rare (e.g., the North Pacific right whale), transient (blue, fin, sei, or Bryde's whale) and therefore too limited in distribution, or may have regular occurrence (such as the sperm and beaked whales) but are not expected to be collocated with the Project nor affected by any of the Project's actions or ongoing project operations and therefore are not considered further. These whales are also highly mobile and able to navigate away from the short term cable-laying actions should they happen to be in the area.

Critical habitat has not been designated in the Pacific Ocean for either the green sea turtle or the hawksbill. Critical habitat has been designated in the Pacific Ocean for the monk seal. On August 21, 2015, NOAA published a final rule to expand critical habitat for the Hawaiian monk seal to include nearly all coastlines of the main Hawaiian Islands, and the marine waters to the 1,640-foot (500-meter) depth contour (80 Federal Register 50925). It includes the seafloor and marine habitat to 32 feet (10 meters) above the seafloor from the 656-foot (200-meter) depth contour through the shoreline and extending into terrestrial habitat 16 feet (5 meters) inland from the shoreline between identified boundary points around Oʻahu (and other Hawaiian islands). The Project Area is within these boundary points and contains both terrestrial and marine Critical Habitat for the monk seal (Figure 2.6-1).

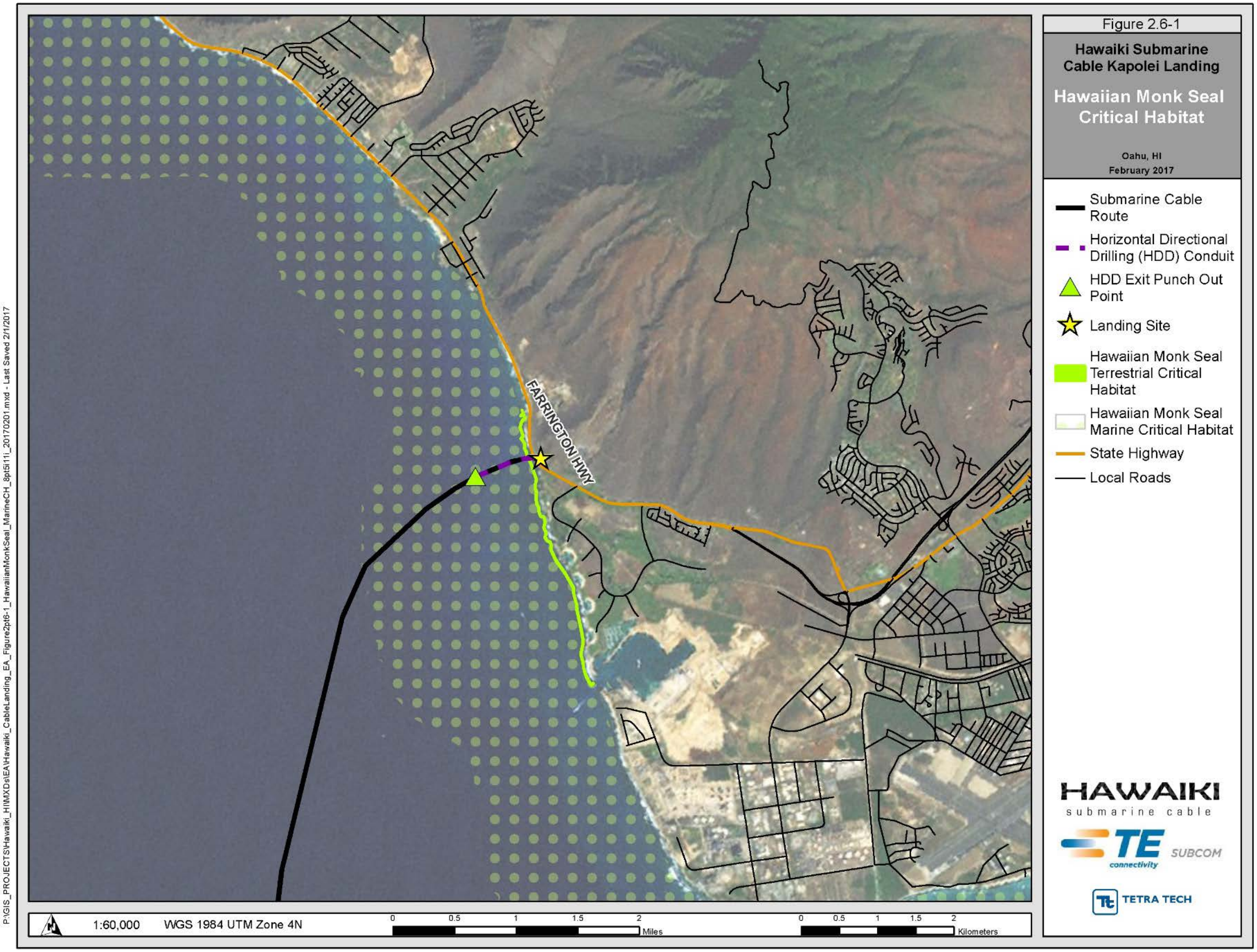
Figure 2.6-1
Hawaiki Submarine Cable Kapolei Landing
Hawaiian Monk Seal Critical Habitat
Oahu, HI
February 2017
Submarine Cable Route
Horizontal Directional Drilling (HDD) Conduit
HDD Exit Punch Out Point
Landing Site
Hawaiian Monk Seal Terrestrial Critical Habitat
Hawaiian Monk Seal Marine Critical Habitat
State Highway
Local Roads
FARRINGTON HWY
1:60,000
WGS 1984 UTM Zone 4N
0 0.5 1 1.5 2 Miles
0 0.5 1 1.5 2 Kilometers
HAWAIKI submarine cable
TE connectivity SUBCOM
TETRA TECH
P:\GIS_PROJECTS\Hawaiki_HI\MXDs\EA\Hawaiki_CableLanding_EA_Figure2pt6-1_HawaiianMonkSeal_MarineCH_8pt5i11i_20170201.mxd - Last Saved 2/1/2017

In summary, two sea turtle species and at least four marine mammal species are considered to be present in the Project Area. The listed and protected species under NOAA Fisheries jurisdiction that frequently occur in the Project Area waters, the onshore cable landing site, and submarine cable route area and that would be expected to regularly occur include the green sea turtle, hawksbill sea turtle, Hawaiian monk seal, humpback whale, false killer whale (*Pseudorca crassidens*), and spinner dolphin (*Stenella longirostris longirostris*). These species are the most likely to occur in the nearshore habitat waters of the submarine cable route that extends from the punch-out point to the territorial limit of the State of Hawaiʻi waters (out to 3 nm [6 km]) and are addressed in the sections below.

Sea Turtles

Five ESA-listed species of sea turtle occur in the Hawaiian Islands. Of these, the green (ESA listed as threatened) and hawksbill (ESA listed as endangered) sea turtles are the two species most likely to occur in the Project Area waters as they are the most common in the Hawaiian Islands. It is anticipated that green sea turtles would be regularly observed from the cable-laying vessel, as they are abundant in the nearshore waters of the Hawaiian Islands (Balazs and Chaloupka 2004). Hawksbill sea turtles are much less common and are a more cryptic species. They have been documented in nearshore waters and in harbors or near harbor channels and it is possible they could occur in the Project Area waters (Ligon and Bernard 2000). Sea turtles are not expected to use the onshore areas near the cable landing station as there are no sandy beaches within roughly 328 feet (100 meters) of the HDD corridor on either side, or along the shoreline areas immediately adjacent. Therefore, the impacts discussion below will be limited to the submarine cable route and Project Area waters.

The three other sea turtle species known to occur in the Hawaiian Islands are the leatherback sea turtle (*Dermochelys coriacea*; ESA listed as endangered), loggerhead sea turtle (*Caretta caretta*; ESA listed as endangered), and olive ridley sea turtle (*Lepidochelys olivacea*; ESA listed as threatened in Hawaiian waters). These species are primarily pelagic and considered only infrequent and transient visitors to the Hawaiian Islands. Few observations of these species have been reported within 25 nm (46 km) of the islands. They are unlikely to be found in the Project Area nearshore waters though could have limited occurrences beyond the 200 nm (370 km) limit. As the Proposed Action would have no effect on these three species of sea turtles, they are not considered further in this EA.

General threats to sea turtle species are common among all species. On beaches, wild dogs, pigs, and other animals ravage sea turtle nests. Humans harvest eggs and nesting females in certain areas, threatening some Pacific turtle populations. Coastal development can cause beach erosion and loss of nesting habitat. It can also create or increase the intensity of artificial light, which can attract hatchlings and lead them away from the water, increasing their deaths. Threats in nearshore foraging habitats include coastal fishing, which can injure or drown juvenile and adult sea turtles, and habitat degradation, including lower water quality and an increase in invasive species that can alter the ecosystem and limit food availability. Threats in the offshore environment include bycatch in commercial fisheries that kill an estimated 447,000 turtles every year worldwide (Wallace et al. 2010), as well as entanglement in abandoned nets and other fishing gear (Carr 1987), which can drown turtles in all life stages. Sea turtles can mistake plastic bags for jellyfish, which are eaten by many turtle species in early life phases, and exclusively by leatherback turtles throughout their lives. Climate change, with predictions of increased ocean and air temperatures and sea level rise, may adversely impact turtles in all life stages, from egg to adult. Fibropapillomatosis is a debilitating tumor-forming disease in marine turtles, primarily green sea turtles, which may be related to environmental degradation (Santos et al. 2010).

Green Sea Turtle. The green sea turtle accounts for more than 98 percent of all sea turtles extant in Hawai‘i (Chaloupka et al. 2008). The Hawaiian population is composed of a single genetic stock (Dutton et al. 2008), with individuals spending most of their lives in the Hawai‘i ecoregion. This population appears to have increased gradually over the past 30 years, with near capacity nesting at French Frigate Shoals (Balazs and Chaloupka 2006; Chaloupka et al. 2008). NOAA Fisheries and the USFWS recently proposed to classify the green sea turtle into 11 DPS, including a Hawai‘i DPS (80 Federal Register 15271). This species is known and common in nearshore Hawaiian waters and from various harbors. The green sea turtle seems to prefer shallow waters, usually less than 100 fathoms (shoreward of the 600-foot [183-meter] depth). It hauls out to bask on sandy beaches throughout the main Hawaiian Islands (Parker and Balazs 2011). The green sea turtle is herbivorous, foraging on a variety of macroalgae and seagrass.

Four green sea turtle individuals were observed from the surface during the marine survey. Small patches of seagrass, specifically *Halophila decipiens*, were also observed during the survey, outside of the punch-out location. In the complete survey area, a total of approximately 10 patches were observed at three locations. Macroalgae taxa seen during the survey include: *Caulerpa taxifolia*, *Caulerpa urvilleana*, *Neomeris annulata*, *Dasya* sp., *Laurencia* sp., and *Dictyota* sp. (Appendix D).

Sound exposure guidelines for sea turtles were recently developed within a technical report by the ANSI-accredited Standards Committee (Popper et al. 2014); the guidelines are presented for different categories of sources including explosions, pile driving, seismic airguns, naval sonar, and shipping and other continuous noise sources. Most sea turtles are reported to hear a limited range of low-frequency sounds that include typical anthropogenic noises such as vessel engines, drilling, low-frequency sonar, and pile driving (Dow Piniak et al. 2012). Juvenile and sub-adult green sea turtles detect sounds from 100 to 500 Hz underwater, with maximum sensitivity at 200 and 400 Hz (Bartol and Ketten 2006). Auditory brainstem response recordings on green sea turtles showed peak response at 300 Hz (Yudhana et al. 2010). Exposure threshold for behavioral disturbance for sea turtles has been set at 160 decibels (dB) re 1 micropascal (μPa), while the injury and hearing loss thresholds is set at the 180 dB re 1 μPa (U.S. Department of the Navy 2007). Behavioral disturbance reactions include rising from depth and remaining at the surface until the sound dissipates or leaving the area (Lenhardt 2002). Sea turtles are also known to become habituated to a steady noise, even at high levels.

Hawksbill Sea Turtle. The hawksbill sea turtle is the most coastal of the marine turtles, with juveniles and adults preferring healthy coral reef habitats (NOAA Fisheries 2016b). The hawksbill sea turtle is the second most common species in the waters of the Hawaiian Islands, as reflected by the stranding records, yet it is far less abundant than green sea turtles (Chaloupka et al. 2008). The lack of hawksbill sightings during aerial and shipboard surveys in Hawai‘i likely reflects the species' small size and difficulty in identifying from a distance. No critical habitat has been designated in Hawai‘i for this species.

The hawksbill remains in the oceanic environment until reaching a carapace length of approximately 8 to 12 inches (20 to 30 centimeters), interpreted as 7 to 10 years, and then recruits into neritic habitats and transition from a pelagic to a benthic diet (NOAA Fisheries and USFWS 2013). Reefs provide shelter and food for resting and foraging hawksbills, and individuals are known to visit the same resting spot repeatedly. The hawksbill's diet is highly specialized and consists primarily of sponges (NOAA Fisheries 2016b). The hawksbill is found around rocky outcrops and high-energy shoals—optimum sites for sponge growth—and mangrove-lined bays and estuaries (NOAA Fisheries 2016b). Females nesting on Hawai‘i Island and Maui have been tracked to feeding grounds on O‘ahu, Moloka‘i, Maui, and Hawai‘i Island (Seitz et al. 2012; Ligon and Bernard 2000; Parker et al. 2009). Unlike other sea turtles, the hawksbill is not generally a deep diver, which may be a reflection of the shallow depths of its primary food, sponges and macroalgae (NOAA Fisheries and USFWS 2013). Shallow coral reefs and hardbottom areas are its preferred habitats.

No hawksbill sea turtle nests or basking hawksbill sea turtles have been reported on O‘ahu (Parker and Balazs 2011), nor has foraging been observed in the nearshore waters of O‘ahu (Seitz et al. 2012). The relatively small hawksbill sea turtle population appears to be concentrated around the Islands of Hawai‘i and Maui. Based on its habitat preferences and reported movements, the hawksbill sea turtle could be encountered in the Project Area but this possibility is remote.

Little auditory research has been done on the hawksbill sea turtle. The information above on the green sea turtles is assumed applicable to the hawksbill sea turtle.

Marine Mammals

Several marine mammal species, including ESA-listed species, inhabit waters around the Hawaiian Islands. Humpback whales are one of the most abundant marine mammals, and the Hawaiian Islands are an important breeding ground for this species. The species most likely to occur in the Project Area nearshore waters are addressed below.

General threats to marine mammals include numerous anthropogenic activities such as hunting (both commercial and native practices), fisheries interactions (such as gear entanglement or shootings by fishers), bycatch (accidental or indirect catch), ship strikes, noise pollution, chemical pollution, and general habitat deterioration or destruction. In Hawai‘i, bycatch has significantly contributed to the decline of the Hawaiian population of false killer whales (Oleson et al. 2010). Ship strikes are a growing issue for most marine mammals and may significantly affect the population of a species, particularly in small populations, and possibly on larger scales (Laist et al. 2001; Van

Waerebeek et al. 2007; Vanderlaan et al. 2009). Noise, in particular human-caused seismic exploration sounds and sonar, or other types of pulses produced by various sources including geologic exploration, government, commercial, or private sources, are of particular concern to marine mammals because noise can cause marine mammal behavioral disturbance, injury, and in some cases death. Chemical pollution is also of great concern. The buildup of human-made long-lasting compounds in marine mammals not only increases their likelihood of contracting diseases or developing tumors but also compromises the function of their reproductive systems (Fair et al. 2010). The risk of adverse health effects is particularly high when contaminants are transferred to a calf through its mother's milk (Fair et al. 2010). Oil and other chemical spills are a specific type of ocean contamination that can have damaging effects on some marine mammal species (see Matkin et al. 2008). Finally, general habitat deterioration and loss is a major disturbance factor for almost all coastal and inshore species of marine mammals and it may include depleting a species' prey base.

Hawaiian Monk Seal. The Hawaiian monk seal was listed as endangered under the ESA in 1976 and is listed as depleted under the MMPA. The species has a recovery priority number of one, based on the high magnitude of threats, the high recovery potential, and the potential for economic conflicts while implementing recovery actions (NOAA Fisheries 2015a). Hawaiian monk seals are managed as a single stock, although six main reproductive subpopulations are recognized: at French Frigate Shoals, Laysan Island, Lisianski Island, Pearl and Hermes Reef, Midway Island, and Kure Atoll. The monk seal has an estimated population of approximately 1,200 individuals in Hawai'i, of which about 900 are in the Northwestern Hawaiian Islands (NWHI) (DLNR 2016). The endemic Hawaiian monk seal is one of the rarest marine mammals in the world (NOAA Fisheries 2016c) and is ESA listed endangered (due to population decline, it is considered critically endangered) though the population location in the main Hawaiian Islands has been increasing in recent years (NOAA Fisheries 2015a). Hawaiian monk seals haul out on sandy beaches and can occur year-round at any suitable shore and have been sighted in harbors on various islands. Most encounters in the main Hawaiian Islands involve solitary individuals, though a mother and pup could be encountered (NOAA Fisheries 2015a).

When seals are reported on beaches in the main islands, the NOAA Fisheries Pacific Island Regional Office (PIRO) works with state and local agencies to cordon off sections of beach around the seals. NOAA Fisheries also relies on volunteer groups to observe seals and educate the public about their endangered status and protection measures. On O'ahu, the Hawaiian Monk Seal Response Team is a team of over 50 volunteers who routinely assist NOAA Fisheries PIRO and the Pacific Island Fisheries Science Center (PIFC) in monk seal response issues.

The Hawaiian monk seal has a somewhat narrow hearing range and relatively low upper hearing limit compared with other pinnipeds. The hearing range is considered to be between 50 to 86 kilohertz (kHz) (NOAA Fisheries 2016c).

The monk seal could occur in the waters of the Project Area regularly year round but is not expected on the cable landing site shore terrestrial portion due to the rocky habitat present; this area is also not known or identified as a pupping location for Hawaiian monk seals.

Humpback Whale. The Hawaiian humpback whale was recently federally delisted (September 8, 2016) and is no longer endangered under the ESA (NOAA Fisheries 2016d). NOAA Fisheries revised the ESA listing for the humpback whale to identify 14 DPSs, and the Hawaiian population was considered no longer warranted for listing. It is not yet known if this stock will be considered as MMPA depleted since stocks designated as depleted will not be known until the 2016 NOAA Draft Species Stock Assessment Reports become available; they are currently in process. While this population of humpbacks was delisted, this final rule for humpback whale status also re-codified existing Hawaiian humpback whale approach regulations under the ESA; they still apply to all humpback whales found in Hawai'i. These approach regulations include the following rules (NOAA Fisheries 2016e):

- Prohibit "approaching within 100 yards (91.4 meters) of a humpback whale by any means, causing a vessel, person or other object to approach within 100 yards (91.4 meters) of a humpback whale, or approaching a humpback whale by interception (*i.e.,* placing an aircraft, vessel, person, or other object in the path of a humpback whale so that the whale approaches within a restricted distance."
- Prohibit the "disruption of normal behavior or prior activity of a humpback whale by any act or omission." This includes approach by interception (see above), also known as "leap frogging" where disruption of normal behavior can include, but is not limited to, a rapid change in direction or speed; escape tactics such as prolonged diving, underwater course changes, underwater exhalation, or evasive swimming patterns; interruptions of breeding, nursing, or resting activities; attempts by a whale to shield a calf from a vessel or human observer by tail swishing or by other protective movements; or the abandonment of a previously frequented area.
- The action area for this ruling is "limited to the waters within 200 nm (370.4 km) from shore of the islands of Hawaii" (including the northwestern Hawaiian Islands).

Approximately two-thirds of the entire North Pacific humpback whale population migrates to Hawai'i in winter to breed, calve, and nurse (NOAA Fisheries 2015b). The winter population of humpback whales in Hawai'i is more than 10,000 animals (NOAA Fisheries 2015b). Humpback whales occur throughout all the Hawaiian Islands from September through June with peak abundance between late February and early April (Mobley et al. 2001; NOAA Fisheries 2015b). Humpback whales prefer shallow waters usually less than 100 fathoms (shoreward of the 600-foot (183-meter) depth) during the breeding season (Mobley 2005); mother and calf pairs prefer very shallow water and occur in areas of water depth less than 60 feet (18 meters; Smultea 1994). Due to physiological constraints, calves surface to breathe more frequently than mothers, leaving them alone at the surface and therefore vulnerable to strikes (Cartwright and Sullivan 2009). As humpback whales are quite vulnerable to disturbance and to boat strikes, restrictions in Hawai'i prohibit boats from approaching within 100 yards (91 meters) of adult whales and within 300 yards (274 meters) of mother and calf pairs (NOAA Fisheries 2016f, 2016g). The Hawaiian Islands Humpback Whale National Marine Sanctuary reports that more than 80 strikes between vessels and humpback whales in Hawaiian waters have occurred from 1975 to present and over the last decade, reports of vessel collisions with humpback whales in Hawai'i have increased (NMS 2014).

It is often assumed that mammals can hear in the ranges of sounds they produce. Studies show humpbacks most likely have excellent low frequency hearing; they produce frequencies between 25 Hz to 10 kHz and may have sensitivity to frequencies between 40 Hz to 16 kHz (Au et al. 2000; NOAA Fisheries 2016h). Numerous studies have documented humpback whale responses to noise; they can change their behavior in response to noise, or avoid or leave an area (Richardson et al. 2013).

Humpback whales are known throughout Hawaiian waters in the winter and would be expected in the Project Area waters consistently from November through May with peaks in abundance from January through April (Mobley et al. 2001). Mothers and calves would be most abundant in February and March especially in nearshore waters out to the 100 fathom line (Smultea 1994). No critical habitat is designated for this species.

False Killer Whale. The false killer whale population of the Hawaiian Islands (known as the main Hawaiian Islands insular population) is listed as endangered under the ESA and depleted under the MMPA. Animals seen within 25 miles (40 km) of the main Hawaiian Islands between Hawai'i Island and O'ahu are considered to belong to the main Hawaiian Islands insular stock, which is estimated to include 151 individuals (NOAA Fisheries 2015c). Critical habitat has not been designated for this species. The false killer whale has been tagged and tracked in nearshore Hawaiian waters, including outside of harbors (Baird 2009). It is an active fast-moving delphinid (dolphin species). Group sizes vary from 1 to 2, to larger groups of 10 to 60, although larger groups with up to 300 individuals have been reported in deeper waters (Baird 2009). Although only rarely taken as a bycatch in fisheries (e.g., driftnets and purse seines), false killer whale often steal fish from longlines and do sometimes get caught on the hooks leading to mortality. They are also shot or killed by fishermen.

NOAA Fisheries (2016h) includes this species, along with all dolphins and toothed whales, as potentially a mid-frequency hearing cetacean. That is, they are expected to have a hearing range from 150 Hz to 160 kHz.

The false killer whale is known from nearshore waters around O'ahu and transits up or down the coast and is expected to occur regularly year round in the nearshore or offshore waters of the Project Area.

Spinner Dolphin. The spinner dolphin is protected under the MMPA and the species is not listed under the ESA. There are 6 stocks in the U.S. Exclusive Economic Zone (EEZ) of the Hawaiian Islands, one of which is the O'ahu/4 island stock of spinner dolphins. The Hawaiian spinners belong to a stock that is separate from those involved in the tuna purse seine fishery of the eastern tropical Pacific.

The Hawaiian spinner is common and abundant throughout the Hawaiian archipelago, though less abundant in the NWHI. Spinner dolphins occur year round throughout the Hawaiian Islands with primary occurrence from the shore to the 9,843-foot (3,000-meter) depth. This covers both inshore resting habitat and offshore feeding areas. There are an estimated 3,184 spinner dolphins within 28.8 miles (46.3 km) of the main Hawaiian Islands however these data are over 12 years old (NOAA Fisheries 2016i). This number is considered an underestimate of the overall population size since it does not include the NWHI. Spinner dolphin groups are frequently encountered along Oʻahu's leeward coast where they tend to rest, especially in nearshore or offshore areas with sandy bottoms; they are considered semi-residential in this area. They are often seen in large groups of over 400 animals, although there may be seasonal changes in abundance. The group's movement pattern around the islands has been well documented and is considered predictable and cyclical (Norris 1994; Lammers 2004). Spinner dolphins typically come into shallow nearshore waters during early morning and late afternoon periods to rest and socialize, then move further offshore in the late afternoon or early evening to forage. This period of rest is considered very important for overall health and also appears to be important in establishing or reaffirming social relationships (Lammers 2004). Spinner dolphins in general show a strong preference for waters generally shallow water sites both less than or near the 10-fathom (60-foot) isobath and are commonly found here between the early morning and late afternoon (Norris 1994; Lammers 2004). The population found in the Project Area waters is considered residential and is part of the Waiʻanae spinner dolphin group (Lammers 2004). The animals have been documented resting in the early mornings through early afternoon, recovering from the long feeding bouts that they engage in farther offshore at night. In the late afternoon, usually sometime after 3:00 PM and sometimes as late as 5:00 PM, the dolphins come out of their resting and milling mode to move into deeper waters to feed. At this time they commence a period of renewed social activity, moving rapidly and "spinning" (leaping) out of the water (Lammers 2004) while they gather in preparation of foraging. The animals move out of the bays in the late afternoon to feed in water at depths of 600 to 6,000 feet (180 to 1,800 meters). And likely minimize predation risks by occupying nearshore habitat during daylight hours.

Like the false killer whale, this species is considered a mid-frequency hearing cetacean. It is expected to have a hearing range from 150 Hz to 160 kHz (NOAA Fisheries 2016h).

Spinner dolphins are known from nearshore waters around the leeward side of Oʻahu and on and transits up or down the coast and are expected to occur regularly year round in the nearshore or offshore waters of the Project Area.

2.6.2 Environmental Impacts

2.6.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no direct or indirect adverse or beneficial effects on marine and nearshore biological resources.

2.6.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Coral Reef Habitat

Project actions include construction activities in nearshore marine waters adjacent to shallow-water coral reef habitat associated with the HDD punch-out (approximately 46-foot (14-meter) water depth), and cable laying on the seafloor surface seaward of the HDD punch-out location. The use of HDD will eliminate disturbance to corals, reefs, and benthic habitat in the shallower nearshore area. The HDD punch-out location is situated within a large sand patch, and is at least 164 feet (50 meters) from the nearest consolidated reef substrate. This distance is sufficiently far from the HDD activities that no physical impacts are anticipated, and only temporary impacts of transient turbidity created by the potential release of drilling fluid; and temporary impacts of shading from support vessels is likely.

The portion of the F/O cable that will be laid on the seafloor will contact or displace a very small area of seafloor habitat along the cable path. The Project Area intersects shallow water coral reef habitat that is substantially degraded relative to mean conditions on Oʻahu (Friedlander et al. 2008; Jokiel 2008), and dominated by sand and rubble. Most (84 percent) of the Project Area has coral cover under 10 percent, and nearly half (41 percent) of the Project Area has coral cover under 1 percent. At the request of NOAA Fisheries PIRO, the F/O cable route was microsited and shifted to the north to avoid and minimize potential impacts to areas with greater than 10 percent coral cover. Additionally, where possible and within safe diving limits, divers would attempt to position the cable so as to minimize potential impact to live coral colonies seaward of the HDD punch-out site (particularly in areas with 10 percent or more coral cover), and near patches of seagrass.

Lateral movements of the cable are not anticipated during construction. Preventing lateral sweeps across the habitat would constrain the effects to the very small area of corals, reefs, and benthic habitat.

Physical impact from construction and cable-laying activities is expected to be permanent and spatially constrained to approximately the width of the 1.5 inch (36 mm) diameter cable. Therefore, any long-term adverse effects to all types of coral reef habitat are expected to be very minor and localized. Because the construction is anticipated to be tightly spatially constrained, only an extremely small portion of the seafloor would be exposed to stressors of any kind. Other indirect impacts of turbidity or shading are expected to be temporary, lasting only during the construction period. Based on the above discussion, impacts on coral reefs habitat are expected to be minor, and therefore, less than significant.

Essential Fish Habitat

Project actions include construction activities within four EFH Management Unit Species groups along, essentially, the entire length of the proposed cable route: Bottomfish and Seamount Groundfish, Pelagic Species, Crustaceans, and Coral Reef Ecosystems (Table 2.6-4). The use of HDD will eliminate disturbance to areas inshore of the punch-out location. Physical impacts are expected to be minimal, limited to a few square meters. Thus, only temporary impacts of transient turbidity created by the potential release of drilling fluid during HDD punch-out, and temporary impacts of shading from support vessels are likely to affect EFH beyond the HDD punch-out location.

Table 2.6-4. Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) Occurrence with the Project Area and Anticipated Effects

Management Unit	Offshore cable surface-lay		Nearshore cable surface-lay		HDD corridor	
	EFH	HAPC	EFH	HAPC	EFH	HAPC
Bottomfish and Seamount Groundfish	T P	T P	T P	T P	T	T
Crustaceans	T P		T P		T	
Precious Corals[1]						
Coral Reef Ecosystems	T P		T P		T	
Pelagic	T P		T P		T	

T = Temporary effects of turbidity and shading; P = Permanent effects of occluding EFH underneath the cable
[1] Precious coral EFH does not coincide with proposed Project activities.

The portion of the F/O cable that will be laid on the seafloor would contact or displace a very small area of EFH along the cable path. As stated above, where possible and within safe diving limits, divers would attempt to position the cable so as to minimize potential impacts to live coral colonies seaward of the HDD punch-out site. Lateral movements of the cable are not anticipated during construction, and preventing lateral sweeps across the habitat would constrain the effects to the very small area directly under the F/O cable. Physical impact from construction and cable-laying activities is expected to be permanent but spatially constrained to approximately the width of the cable. Consequences to all types of EFH are expected to be long-term, minor, and adverse. Because the construction is anticipated to be tightly spatially constrained, only an extremely small portion of the seafloor would be exposed to stressors of any kind. Other indirect impacts of turbidity or shading are expected to be temporary, lasting only during construction. Based on the above discussion, impacts on EFH are expected to be minor, and therefore less than significant.

Reef and Nearshore Fish Species

Project actions include construction activities in nearshore marine waters where nearshore fishes or ESA-listed species may be exposed to stressors associated with HDD punch-out (approximately 46 feet [14 meter] water depth), cable-laying vessel movements at the surface, and cable laying on the seafloor surface in offshore waters (seaward of the HDD punch-out location), as well as onshore activities (indirectly through water quality impacts only; see Section 2.4 for additional discussion) associated with the operation of the cable system.

Nearshore reef habitats, hard bottom, seagrass, or other structured habitats may be present in the Project Area. Construction activities may result in temporary impacts on marine fishes resulting from the disturbance or alteration of habitat, increased total suspended solids on a temporary and localized basis within the Project Area. However, the use of HDD would eliminate the need for disturbance to those habitats and the fishes associated with those habitats. In the immediate vicinity of the HDD punch-out location, marine fishes may be exposed to elevated turbidity associated with isolated seafloor disturbance and potential release of drilling fluids during HDD punch-out. Measures for avoiding and minimizing the effects of accidental drilling fluid release in the marine environment are discussed in detail in Section 2.5.

Lighting of onshore facilities is not expected to contribute measurably beyond existing baseline lighting levels. There is a potential for reduced water quality from accidental spills or adverse effects to marine fishes from releases due to onshore activities; however, project-specific SPCC plans and BMPs would minimize this likelihood, which would be limited to the construction period only.

The portion of the 1.1 to 1.5 inch (29 millimeter to 36 millimeter) diameter F/O cable that would be laid on the seafloor would displace a very small area of seafloor habitat along the cable path. Although this small habitat loss would be permanent, the demersal species occupying that habitat would relocate to another suitable habitat near the cable location; therefore, the proportional loss of seafloor habitat to the cable placement would not result in any measureable displacement of marine fishes or population-level impacts. Additionally, cable sheathing typically becomes encrusted by natural processes or incorporated into the seafloor in areas. Encrusting organisms on the cable sheathing may contribute small amounts of demersal biomass to soft-bottom habitats. Impacts of habitat loss along the cable path are expected to be localized and minor and therefore less than significant.

Any potential impact from construction and cable-laying activities is expected to be temporary and not result in permanent impacts to marine fish populations. The Project is not expected to have a long-term impact on marine fish resources within the Project Area as a result of construction or operation. Exposure to construction and cable-laying activities is expected to be minor. Based on the above discussion, impacts on reef and nearshore fish species are expected to be minor, and therefore less than significant.

Echinoderms

Project actions include construction activities in nearshore marine waters where motile invertebrates may be exposed to project stressors. There is no overlap between stressor and receptor (susceptibility) for HDD punch-out, cable laying vessel movements at the surface, lighting, noise, or onshore activities associated with the operation of the cable system; and these stressors are not carried forward. Motile invertebrates are susceptible to the physical strike stressors associated with cable laying on the seafloor surface.

The portion of the F/O cable that will be laid on the seafloor will contact a very narrow area. The most likely consequence of physical stressors is mortality for any motile invertebrates struck by the cable or other equipment. Because the spatial footprint of physical stressors is so small compared with the local seafloor habitat, it is not possible that a significant proportion of motile invertebrates could be exposed. The area of seafloor habitat permanently displaced by the cable would not result in any measureable displacement of motile invertebrates or population-level impacts. Direct impacts and impacts of habitat loss along the cable path are expected to be minor and less than significant.

Sea Turtles and Marine Mammals

No impacts are expected to monk seal Critical Habitat, either terrestrial or marine. Project actions that may cause short-term and temporary impacts on sea turtles and marine mammals include actions from main cable laying and installation. There are no impacts expected from the nearshore landing operations on marine mammals, sea turtles, or on monk seal terrestrial Critical Habitat since neither the monk seal nor sea turtle species are considered likely to occur in the nearshore rocky habitat where HDD would occur. No impacts on marine mammals, sea turtles, or monk seal marine or terrestrial Critical Habitat are expected during operation of the cable system. The cable would be at the sea bottom, and once installed, there is no nexus for noise or strikes for marine wildlife. Given the durability of the system and proven F/O cable installation methods, the need for submarine cable repairs is unlikely but would consist of minimal ship time recovering and splicing damaged cable. Such incidents of cable damage are rare, with a very low likelihood of more than one or two incidents within the Hawai'i territorial waters over the estimated 25-year lifespan of the system. Therefore, the discussion below relates only to the main cable laying and installation portions of the Project actions.

Impacts from main cable laying and installation may include noise from the cable ship, support boats, or from shore operations; the potential for collision with the cable ship or support boats; and contact with the cable and/or cable floats during cable installation.

Noise

The submerged segment of the Hawaiki cable system would be installed using one of six special purpose TE SubCom Reliance Class cable ships, or equivalent alternative. Cable laying would be conducted 24 hours per day between the HDD subsea punch-out location, where the nearshore landing operation would occur, and offshore waters (anticipated to be complete in 0.5 day). The submarine portion of the F/O cable would be laid on the seabed; no trenching or burying would be required based on data from the route surveys. There may also be one or two support boats present to assist the cable ship during the nearshore landing operation (anticipated to be complete in one day). The support boats would be smaller vessels, sourced from local entities. Positioning of the cable ship near the subsea punch-out point would be accomplished using the vessel's thrusters.

Sea Turtles. Sea turtles hear in the range of 30 to 2,000 Hz, with their best sensitivity to sound between 200 and 800 Hz (Ridgeway et al. 1969; Lenhardt 2002). Even in the area of greatest sensitivity, the physiology of sea turtles makes them less at risk to adverse effects from noise than for example, marine mammals (Lenhardt et al. 1983). Noise production from Project actions is not expected to reach the injury level of 180 dB re 1 μPa. Therefore, green and hawksbill sea turtles immediately adjacent to the noise source may experience temporary, mild behavioral effects, and would be able to swim beyond this range or to the surface (Lenhardt et al. 1994) within a few seconds to minimize the potential for further disturbance. Therefore, no impacts from noise related to cable laying activities are expected. Additionally, with the implementation of observer protocols (see measures listed under Marine Mammals below) and other BMPs recommended in this EA, direct and indirect effects on sea turtles under Alternative 2 would be less than significant. Should any sea turtles be collocated with the short-term cable laying and landing operations, which are expected to take at maximum 1.5 days, and if they were close enough to the main ship, any effects would be localized, short-term, and minor.

Marine Mammals. Calls, vocalizations, and hearing are all critical aspects of marine mammal natural history. Each species makes use of sound in different ways to forage, orient, socially interact with other conspecifics (including for reproduction), detect or respond to predators, and in other behaviors. Harassment responses to anthropogenic sound in marine mammals are greatly influenced by the context of the exposure and the individual animal's level of habituation or exposure experience, condition, natural history status (if the animal is foraging, migrating, reproducing, resting, etc.) as well as the level of the sound, frequency, duration, amplitude, and sound characteristics (Ellison et al. 2012). While this leads to great variance in potential responses to a given sound, measurements of marine mammal sound production and hearing capabilities provide some basis for assessment of whether exposure to a particular sound source may affect a marine mammal behaviorally or physiologically. Marine mammals may react to man-made sounds in a variety of ways. Reactions can vary by species, by sound source, by number of sound sources in the same area, and/or based on the activity the animals are engaged in (feeding, mating, resting, nursing, travelling) at the time (Richardson et al. 2013; Wartzok et al. 2003; Southall et al. 2007; Wartzok 2009; Ellison et al. 2012). Response to an anthropogenic sound also depends on the frequency, duration, temporal pattern, and amplitude of the sound, as well as on the distance from the sound source and whether it is perceived as approaching or moving away from the animal (Ellison et al. 2012). For marine mammals, a review of responses to anthropogenic sound was first conducted by Richardson and others (1995, updated in 2013). Vessel noise is known to cause impacts. Many studies have documented short-term responses to vessel sound and vessel traffic (Watkins 1981; Baker et al. 1983; Magalhães et al. 2002) especially in whales. Unfortunately, it is not always possible to determine whether a marine mammal exhibiting a behavioral change is responding to the physical presence of the vessel itself, to the noise generated by the vessel, or to some unknown unrelated but synchronous factor. Most observations of behavioral responses of marine mammals to human-generated sounds have been limited to short-term behavioral responses, which include generally short-term disturbances to feeding, resting, or social interactions. Responses such as rapid diving, change in swim speed, or change in respiration rate can add stress on young animals. Overall, these changes are considered to be minor and short-term, and not biologically significant impacts.

New acoustic guidance for marine mammals was issued recently (NOAA Fisheries 2016h). In this guidance, thresholds have been updated and criteria now consider both the peak received pressure and the cumulative effects of noise impacts. This differs from the previous interpretation under the MMPA that provided absolute values considering instantaneous sound pressure levels at a given receiver location using the root-mean-square unit. Also, the previous thresholds did not cover variations among species. Under the new technical guidelines, marine mammals are categorized into different groups to account for an animal's hearing ability either for individual species or classes of species, and this therefore provides a measure of the potential of the sound to cause an effect.

Comparing the ship class to known ship acoustic profiles, the source level of the main cable-laying ship is likely between 171 and 174 dB re: 1 μPa. This would place the distance to the 160 dB isopleth threshold under 32 feet (10 meters), and the distance to the 120 dB isopleth threshold for behavioral harassment at approximately 6,561 to 9,852 feet (2,000 to 3,000 meters). This is an assumption and would vary with cavitation noise, which varies among different vessels, and based on the local environment which will have an influence on the sound level (factors that change sound propagation include: temperature of the water, salinity, water depth, thruster depth, and seafloor composition). Typical route mapping surveys utilize low to mid-energy mapping sonar equipment (e.g., swath multibeam, swath sidescan, narrow beam sub-bottom in the 4 kHz to 400 kHz range) that would have negligible effect on marine mammals.

HDD generally results in continuous noise and for this project would be of limited duration. Based on modeling studies, HDD is expected to produce low source levels during drilling (Gaboury and Carr 2009), resulting in minimal addition to underwater noise in the Project Area. Source levels are expected to be well below the Level A criterion of 180 dB re 1 μPa. While they may be in the range of Level B harassment, any impacts to marine mammals are expected to be short term and not adverse due to the low likelihood of marine mammals being collocated with the HDD construction at sea; sound exposures sufficiently intense (i.e., of a certain duration or within a close proximity) to cause physiological impacts are unlikely.

For several reasons, impacts from noise on marine mammals are considered less than significant and minor, and not biologically significant. The likelihood of one of the nearshore marine mammal species being collocated with the Project vessel during main cable laying is minimal, both because the process is of a very short duration, and, the mammals are mobile and can leave the area. Any impacts should they occur if the mammals were collocated would be short-term and minor adverse, and not biologically significant. The cable-laying vessel would only be in the Project Area waters up to a maximum of 0.5 day, during which it would travel from the territorial limit of the State of Hawai‘i waters to the subsea punch-out location. Cable installation is anticipated to take 1 day. With the implementation of proposed Project mitigation measures detailed in this EA, any such impacts would be further reduced. Mitigation measures would include procedures to avoid noise disturbances such as the monitoring of an Exclusion Zone (EZ) and Hazard Zone (HZ) for marine mammals. Any marine mammals in the EZ would result in project operations ceasing. A marine mammal safety zone implemented around the vessel and the inclusion of equipment shut-down procedures would be enforced in the event a whale enters the vessel safety zone. However, because the Project actions are expected to occur outside of the humpback whale winter migration (December– May), and would occur outside the true peak and highest mother/ calf concentration (February – March), shut-down mitigation is not expected to be needed. Overall, activities would be completed over a 1.5 days, during which the actual noise-producing activity would be intermittent (e.g., positioning the vessel, landing the cable, removing floats, etc.).

Marine mammal monitoring protocols, as agreed upon during pre-consultations efforts that would be in place during both transit and operations include the following:

1. The Applicants will maintain a watch for marine mammals at all times while vessels are underway.
2. The bridge officer is responsible for determining whether noise from vessel operations is adversely affecting any observed marine mammals, and to request that steps be taken if necessary to reduce noise, and to determine when the potential for disturbance has passed, and to request that the vessel be returned to normal operations following a potential noise disturbance.
3. The vessel Captain may reduce speed (if underway), to minimize the use of thrusters, and to shut down non-essential machinery to reduce noise if vessel noise is adversely affecting observed marine mammals or turtles.
4. Do not cut in front of a whale.
5. Do not separate a whale mother and calf pair.
6. If a whale is moving on a parallel course, maintain a steady speed and course but do not go faster than the whale.
7. While under way at transit speed, provide a wide berth from any seals or sea turtles.

Additional mitigation measures would be in place during this Project due to additional local restrictions, as follows:

1. If any humpback whales is observed within 100 yards (90 meters) during operations, the bridge and survey crew will begin taking actions to reduce operational noise whether any behavioral effects have been noted or not. This is a legal, regulatory set back distance in Hawai'i.
2. For other species of whales, dolphins, monk seals, and sea turtles, the distances for which this mitigation will be applied is 50 yards (45 meters) away. This is NOAA standard protocol for Hawaiian waters.

Based on the above discussion on noise as well as the mitigation measures identified above, impacts on marine mammals, sea turtles, and monk seal marine Critical Habitat are expected to be minor, and therefore less than significant.

Ship Strike

Sea Turtles. Impacts from ship strikes on sea turtles are considered to be unlikely. Vessel strikes would be reduced or eliminated due to the slow speeds of the ships in the Project Area. The probability of strikes on sea turtles is considered extremely low or negligible.

***Marine Mammals*.** Ship strikes are a known threat to whales (Laist et al. 2001; Vanderlaan and Taggart 2007; Carrillo and Ritter 2010) and less so but possible to other marine mammal (Stone and Yoshinaga 2000). All ESA-listed large whales that occur in Hawaiian waters are considered at risk for collision with ships (NMS 2014). The marine mammals most vulnerable to ship strikes may be those that swim slowly or spend extended periods of time at the surface (Carrillo and Ritter 2010), which includes humpback whale calves in the Hawaiian islands (as they have not developed respiratory capacity yet) and sperm whales (*Physeter macrocephalus*), which stay at the surface for long periods after long underwater dives. Species that are unresponsive to vessel sound (making them more susceptible to vessel collisions [Nowacek et al. 2004]) are also at risk. Animals that are slow moving may not be able to navigate away from oncoming vessels in time to prevent a collision. Smaller marine mammals, including dolphins or smaller toothed whales (such as false killer whales) and pinnipeds (monk seals) that can move quickly through the water column, are less susceptible to ship strikes that cause mortality; however, they are subject to propeller strikes, which can cause injury to animals that may have indirect long-term effects (Wells et al. 2008). False killer whales in Hawaiʻi are known to ride the bow or stern wake of vessels (Oleson et al. 2010); the latter could put them in proximity to propellers.

Humpback whales are not in the area during Project activities and would not therefore be collocated with the ships; therefore, impacts to humpback whales are not expected. The cable-laying ships for this Project are approximately 460 feet (140 meters) in length. During the main cable lay, the cable ship would operate at low speeds of up to 6 knots while in the State marine waters. At this speed, propeller wounds are not expected. Also, slow speeds under 10 knots are known to result in fewer strikes to marine mammals (Laist et al. 2001; Vanderlaan and Taggart 2007). Also since during the main lay the vessel moves at a consistent speed along the alignment, the vessel's movement is predictable and this maximizes the opportunity for marine mammals to stay out of the ship's path. The cable ship and support boats would comply with applicable federal and state regulations and conventions addressing navigational safety, safe operations, and pollution prevention measures. A Local Notice to Mariners will be prepared in accordance with USCG requirements, providing information on the presence of Project vessels within State of Hawaiʻi waters. The USCG will issue the notice to alert other vessels of the cable ship's presence, expected time in the area, and contact information.

For these reasons, impacts from ship strikes on marine mammals are considered minor, and therefore less than significant. The likelihood of one of the nearshore marine mammal species being collocated with the Project vessel during main cable laying is minimal, both because the process is of a very short duration and the mammals are mobile and can leave the area. The cable laying vessel would only be in the Project Area waters up to a maximum of 1.5 days, and the vessel would move slowly and consistently. With the implementation of the Project BMPs listed above, the likelihood of a ship strike would be further reduced. Project actions are expected to take place prior to the arrival of humpback whales.

In the event a strike should occur, it would be a take under the ESA and MMPA. All activities would cease. The injury of a single listed whale is considered to adversely affect the population. The captain as part of Project BMPs would have all the relevant contact numbers at the ready (listed in the wheel house) prior to Project start. The captain would notify NOAA PIRO in the event of a strike, collision, or any such incident. The captain would also call the NOAA Hotline if involved in a collision: 1-888-256-9840. Lastly, the USCG would be called on the marine radio on VHF channel 16 (156.8 megahertz) to notify other mariners and so that they can respond.

Based on the above discussion on ship strikes as well as the BMPs listed above, impacts on marine mammals, sea turtles, and monk seal marine Critical Habitat are expected to be minor, and therefore less than significant.

2.6.3 Best Management Practices and Mitigation Measures

2.6.3.1 Coral Reef Habitat and EFH

Efforts will be made to time the construction operations to avoid coral spawning season (mid-May through end of August). Where possible and within safe diving limits, divers would attempt to position the cable so as to minimize potential impact to live coral colonies seaward of the HDD punch-out site. Given the location, duration, and nature of Project stressors, the exposures to coral larvae are expected to be minimal. Therefore, no additional mitigation measures are proposed.

2.6.3.2 Reef and Nearshore Fish Species

As noted above, where possible and within safe diving limits, divers would attempt to position the cable so as to minimize potential impact to live coral colonies seaward of the HDD punch-out site.

2.6.3.3 Sea Turtles and Marine Mammals

For sea turtles and marine mammals, Project mitigations measures (including those described below) and are also included above in Section 2.6.2.2, Marine Mammals. Also, the marine mammal section lists additional measures recommended or required by law would be in place. Protected species BMPs and best practices would be followed by the Applicants to reduce the likelihood of any potentially harmful interactions with nearshore and marine biological resources.

Additional mitigation measures provided below would reduce impacts to marine mammals associated with HDD. These include the following:

- Implementing advanced planning measures for cable route identification to reduce sediment disturbance and avoid breeding areas or sensitive habitats;
- Utilizing the minimal number of crossings with other cables or pipelines to reduce the number of crossing structures;
- Operating during seasonal work windows when sea turtles or marine mammals are least likely to be in the area, as well as avoiding when they may be migrating, resting, or breeding; and
- Utilizing BMPs to pause work in the presence of any marine mammals or sea turtles near the HDD punch-out location.

2.7 TERRESTRIAL BOTANICAL RESOURCES

A pedestrian botanical survey was conducted at the onshore cable landing site by Tetra Tech to record common plant species, dominant vegetation types, and any state or federally listed or rare plant species (see Appendix E). Prior to the field survey, Tetra Tech also reviewed available scientific and technical literature with respect to biological resources, geospatial data, aerial photographs, and topographic maps of the area to identify any unique plant communities or features that could harbor federal or state listed species or other elements of interest. A survey of the HDD corridor (from the cable landing site to the HDD punch-out location in the Pacific Ocean) was not conducted because all disturbance would be below grade.

2.7.1 Existing Conditions

No federally or state-listed threatened, endangered, proposed listed, or candidate plant species for listing were found during the botanical survey of the onshore cable landing site. No designated or proposed critical habitat for threatened or endangered plant species occurs on or nearby the onshore cable landing site.

The vegetation at the onshore cable landing site is characterized as a non-native buffelgrass (*Cenchrus ciliaris*) grassland with scattered non-native kiawe (*Prosopis pallida*) trees reaching up to 8 meters (26 feet) high. Non-native koa haole (*Leucaena leucocephala*) trees, between 1 to 2.5 meters (4 to 8 feet) tall, are also broadly distributed. Other species widely scattered or occurring in a few small patches in the understory include the native ʻilima (*Sida fallax*), maʻo (*Gossypium tomentosum*), and hoary abutilon (*Abutilon incanum*), as well as non-native Guinea grass (*Urochloa maxima*) and hairy merremia (*Merremia aegyptia*).

In all, 17 plant species were observed during the botanical survey. Of these, five are native to the Hawaiian Islands and include alena (*Boerhavia acutifolia*), hoary abutilon, ʻilima, maʻo, and ʻuhaloa (*Waltheria indica*). Maʻo is an endemic species, meaning it is found only in the Hawaiian Islands. The other four native plant species found at the cable landing site are indigenous, that is, found in the Hawaiian Islands and elsewhere. None of the native plant species are federally or state-listed threatened, endangered, proposed listed, or candidate plant species for listing. Maʻo can be considered uncommon throughout the Hawaiian Islands. Appendix E provides a list of all plant species observed by Tetra Tech at the onshore cable landing site.

2.7.2 Environmental Impacts

2.7.2.1 Alternative 1 – No Action

Under the No Action Alternative, the proposed Project would not be constructed. Therefore, there would be no effect to terrestrial botanical resources.

2.7.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

The proposed Project would require ground disturbance and clearing of vegetation (including native plant species) at the cable landing site. No surface disturbance would occur as a result of the HDD activities. The vegetation type identified at the cable landing site during the survey is primarily non-native and not considered unique. Over 70 percent of the plant species seen at the cable landing site are not native to the Hawaiian Islands. No federally or state-listed threatened, endangered, proposed listed, or candidate plants were found during the botanical survey. Only one native species, the endemic maʻo, can be considered uncommon throughout the Hawaiian Islands; however, this plant is known to occur in coastal plains throughout Oʻahu including in the vicinity of the Project Area. No designated or proposed critical habitat for threatened or endangered plant species occurs on or nearby the onshore cable landing site.

With the implementation of the mitigation measures and BMPs proposed below, the Project is not expected to have a significant, adverse impact on botanical resources. This conclusion is further supported by previous biological surveys conducted for nearby proposed projects (Planning Solutions, Inc. 2014; R.M. Towill Corporation 2002).

2.7.3 Best Management Practices and Mitigation Measures

Native Hawaiian plants, or non-invasive plants, would be selected for landscaping to the maximum extent possible. Potential native species that may be appropriate for landscaping at the onshore cable landing site include maʻo, ʻilima, naupaka (*Scaevola taccada*), and pōhinahina (*Vitex rotundifolia*).

Although the onshore cable landing site is dominated by non-native weedy plants, minimization measures would be implemented during construction to avoid the unintentional introduction or transport of new terrestrial invasive species to Oʻahu:

- All construction equipment and vehicles arriving from outside Oʻahu would be inspected and cleaned before entering the cable landing site.
- Construction materials arriving from outside of Oʻahu would be inspected and cleaned (as appropriate) for excessive debris, plant materials, and invasive or harmful non-native species.
- When possible, raw materials (e.g., gravel, rock, soil) should be purchased from a local supplier on Oʻahu to avoid introducing non-native species not present on the island.

2.8 TERRESTRIAL WILDLIFE RESOURCES

A biological survey was conducted at the onshore cable landing site by Tetra Tech that included observations of birds, mammals, reptiles, amphibians, and invertebrate species (see Appendix E). The presence/absence of suitable foraging and roosting habitat for the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) was recorded during the survey. Similarly, presence of habitat for the state-endangered Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*; listed only for the Island of Oʻahu) was also recorded. Additional habitats or plants that could support other federal or state listed threatened, endangered, proposed listed, or candidate species were also identified if present (e.g., water features as potential habitat for Hawaiian waterbirds).

A biological survey of the HDD corridor (from the cable landing site to the punch-out location in the Pacific Ocean) was not conducted because all disturbance would be below grade. Prior to the field survey, Tetra Tech also reviewed available scientific and technical literature with respect to biological resources, geospatial data, aerial photographs, and topographic maps of the area to identify any unique plant communities or features that could harbor federal or state listed species or other elements of interest.

2.8.1 Existing Conditions

No federally or state-listed threatened, endangered, proposed listed, or candidate species for listing were found during the biological survey. The onshore cable landing site does not encompass any designated or proposed critical habitat for threatened or endangered species (see Section 2.6 regarding monk seal Critical Habitat).

Fauna recorded during the biological survey at the cable landing site are presented in Table 2.8-1. Species observed are nonnative to the Hawaiian Islands, with the exception of one indigenous insect. Although not observed, the endangered Hawaiian hoary bat may roost or forage in the terrestrial portion of the Project Area. Additionally, the Hawaiian short-eared owl, which is listed as endangered by the State of Hawaiʻi on the Island of Oʻahu, may occasionally be present in or traverse the area. In addition, two seabirds —the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and threatened Newell's shearwater (*Puffinus auricularis newelli*)—may fly over the Project Area at night and may be attracted to construction lights at night. These species are discussed in further detail below.

<u>Birds</u>

Nine bird species were documented during the biological survey (Table 2.8-1). All of these bird species are nonnative to the Hawaiian Islands and commonly found in urban or rural areas. Common myna was the most frequently seen bird species during the survey. Two bird species seen are protected by the Migratory Bird Treaty Act (MBTA)—the introduced cattle egret (*Bubulcus ibis*) and house finch (*Carpodacus mexicanus*).

Table 2.8-1. Fauna Recorded at the Onshore Cable Landing Site

Scientific Name	Common/Hawaiian Name(s)	Status[1]	State/ Federal Protection[2]
Birds			
Acridotheres tristis	common myna	NN	None
Bubulcus ibis	cattle egret	NN	MBTA
Carpodacus mexicanus	house finch	NN	MBTA
Columba livia	rock pigeon	NN	None
Gallus	red junglefowl	NN	None
Geopelia striata	zebra dove	NN	None
Padda oryzivora	Java sparrow	NN	None
Pycnonotus cafer	red-vented bulbul	NN	None
Zosterops japonicus	Japanese white-eye	NN	None
Insects			
Danaus plexippus	monarch butterfly	NN	None
Pantala flavescens	globe skimmer	I	None

[1] NN=Non-native, established species, I = indigenous.
[2] MBTA=Protected under the Migratory Bird Treaty Act

Mammals

Hawai‘i’s only native terrestrial mammal—the endangered Hawaiian hoary bat—could roost or forage in the Project Area. This bat species forages over a wide range of habitat and vegetation types (U.S. Department of Agriculture 2009) and typically roosts in woody vegetation over 15 feet (4.6 meters) tall (Bonaccorso et al. 2015) in a wide variety of native and introduced trees. Kiawe, which is present at the cable landing site, is a documented roost tree for the Hawaiian hoary bat.

Other introduced mammals, such as dogs (*Canis familiaris*), cats (*Felis catus*), house mice (*Mus musculus*), small Indian mongooses (*Herpestes auropunctatus*), and rats (*Rattus* spp.) are likely to occur within the terrestrial portion of the Project Area due to the proximity to the landfill and residences.

Insects

Two insect species were recorded at the cable landing site: the indigenous globe skimmer (*Pantala flavescens*) and the non-native monarch butterfly (*Danaus plexippus*).

2.8.2 Environmental Impacts

2.8.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, there would be no effect to terrestrial wildlife.

2.8.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Potential direct impacts to terrestrial wildlife from construction and operation of the Project would include injury or mortality (e.g., collision with construction equipment), habitat removal and alteration, and noise and disturbance. Indirectly, the Project has the potential to adversely impact terrestrial wildlife due to the introduction and spread of non-native plant and animal species. A general assessment of these potential impacts to fauna is provided below.

Injury or Mortality. Due to ability of most wildlife to avoid Project construction activities, the potential for direct mortality due to collision with equipment or vehicles is expected to be low for terrestrial wildlife. These potential effects would be localized and primarily restricted to the construction phase due to the minimal use of the cable landing site during operations. Potential direct impacts to listed species from collision is discussed in more detail below.

Habitat Removal and Alteration. Construction of the Project would grade up to 0.71 acres of vegetation at the cable landing site and potentially a small portion of the Au Trust parcel to the north. No unique or high quality wildlife habitats occur at the cable landing site, and the Project would not result in a substantial loss of wildlife habitat. The introduction and spread of invasive species can reduce habitat quality at the site and the vicinity. BMPs listed in Section 2.8.3 for invasive species prevention and control would help minimize Project-related introduction or spread of invasive species.

Noise and Disturbance. During construction, some heavy equipment and high levels of human activity would occur on the cable landing site resulting in increased onsite noise and human presence that could disturb wildlife. However, given the temporary nature of the construction period and the existing level of human activity in the area, construction of the Project would not preclude wildlife from using the cable landing site and at most, temporary displacement of individual animals would be expected. Low levels of noise and disturbance would occur during operations in association with routine activities. Given the temporary and localized nature of the noise and disturbance during operations, no long-term impacts to wildlife are anticipated as a result of noise and disturbance.

The following discusses more specific potential impacts to listed terrestrial wildlife and MBTA-protected wildlife as a result of construction and operation of the Project.

Hawaiian Hoary Bat

The Hawaiian hoary bat may occasionally forage or roost in the Project Area. Direct impacts to bats could occur if a juvenile bat that is too small to fly, but too large to be carried by a parent, was present in a tree that was cut down. Several kiawe trees are present on the cable landing site, and this tree species is a documented roost tree for the Hawaiian hoary bat. Although the chances of adversely affecting the Hawaiian hoary bat as a result of the proposed Project are small, the mitigation measures listed in Section 2.8.3 would be implemented to avoid all potential adverse impacts to the Hawaiian hoary bat.

Hawaiian Short-Eared Owl

Although the native Hawaiian short-eared owl was not seen nor heard during the biological survey, this species has the potential to forage or nest in the cable landing site due to the vegetation present. The Hawaiian short-eared owl is most common in open habitats and could be impacted if present at the cable landing site. These owls nest in the ground and can nest any time of the year. Owls could be displaced by the proposed Project if present, but are expected to find suitable habitat in the vicinity of the Project Area. Although the chances of adversely affecting the Hawaiian short-eared owl as a result of the proposed Project are small, the mitigation measure listed in Section 2.8.3 would be implemented, to avoid all potential adverse impacts to the Hawaiian short-eared owl.

Seabirds

The terrestrial portion of the Project Area does not provide suitable nesting or foraging habitat for the two listed seabirds (the endangered Hawaiian petrel and threatened Newell's shearwater); however, individuals may fly over the Project Area at night and may be attracted to construction lights at night. Disorientation and fallout as a result of light attraction could occur to seabird individuals attracted to nighttime construction lighting and unshielded nighttime facility lighting. Juvenile birds are particularly vulnerable to light attraction. Grounded birds are also more vulnerable to mammalian predators or vehicle strikes. The implementation of measures listed in Section 2.8.3 would avoid potential adverse impacts to seabirds.

MBTA Species

Two additional MBTA-protected birds (cattle egret and house finch) were seen during the biological survey. Construction at the cable landing site may temporarily displace individuals of these species, but long-term and population-level impacts are not expected. These birds (likely limited to a few individuals) are expected to find suitable foraging habitat at nearby areas. Furthermore, the USFWS has proposed a control rule to allow take of cattle egrets in Hawai‘i without a permit in order to manage the depredation threat these introduced species pose to listed species in Hawai‘i (USFWS 2013/ 78 Federal Register 65955 – 65959).

2.8.3 Best Management Practices and Mitigation Measures

The following mitigation measures would be implemented to avoid potential impacts to the Hawaiian hoary bat:

- Any fences that are erected as part of the Project would have barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire. No barbed wire fences at the cable landing site were observed during the biological survey; however, if fences are present, the top strand of barbed wire would be removed or replaced with barbless wire.
- No trees taller than 15 feet (4.6 meters) would be trimmed or removed as a result of this Project between June 1 and September 15, when juvenile bats that are not yet capable of flying may be roosting in the trees.

The following mitigation measure would be implemented to avoid potential impacts to the Hawaiian short-eared owl:

- Pre-construction surveys for Hawaiian short-eared owl nesting would be conducted by a qualified biologist prior to vegetation clearing. If Hawaiian short-eared owl are found nesting during construction, vegetation clearing would be suspended within 300 feet (91 meters) until young have fledged or the nest is no longer active.

The following mitigation measures would be implemented to avoid potential adverse impacts to listed seabirds.

- Although not anticipated, should nighttime construction be required, construction lighting will be shielded, directed downward, and fitted with non-white lights if construction safety is not compromised, to minimize the attractiveness of construction lights to seabirds and other wildlife. Furthermore, if nighttime construction occurs during the seabird peak fallout period (September 15-December 15), the construction contractor will also have a biological monitor in the construction area between approximately 0.5 hour before sunset to 0.5 hour after sunrise to watch for the presence of seabirds. Should a seabird be observed, and appears affected by the lighting, the monitor will notify the construction manager to reduce or turn off construction lighting until the individual(s) move out of the area.
- Operational on-site lighting at the CLS would consist of fixtures that would be shielded and/or directed downward to prevent upward radiation, triggered by a motion detector, and fitted with non-white light bulbs to the extent possible.

2.9 ARCHAEOLOGICAL AND HISTORIC RESOURCES

An archaeological inventory survey (AIS) was conducted at the onshore cable landing site by Garcia and Associates (GANDA). The results of the AIS are presented in the technical report entitled *Archaeological Inventory Survey Hawaiki Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, Hawai'i* (included in Appendix F). The AIS was prepared to support the Project's historic preservation review under Section 106, National Historic Preservation Act (NHPA), HRS Chapter 6E-42, and HAR Chapter 13-284. The survey included pedestrian surface survey and subsurface testing.

Prior to the survey, GANDA reviewed available literature with respect to the cable landing site environmental setting and cultural context including previous archaeological research in the area. No previous archaeology studies have been performed within the Project Area. However, an extensive number of archaeological studies have been conducted along the stretch of Farrington Highway that leads into Nānākuli.

A marine archaeological survey of the HDD corridor from the BMH to the punch-out exit point in the nearshore area was not conducted as the HDD would be located below the seafloor and is unlikely to affect archaeological or historic resources. The State Historic Preservation Division (SHPD) recommended a desktop analysis of potential nearshore resources. A desktop analysis of potential nearshore resources was undertaken by Tetra Tech and included a review of publically available data and consultation with local contacts as recommended by the SHPD. Information from this review is included as applicable below.

2.9.1 Existing Conditions

The onshore cable landing site is situated within an undeveloped parcel (TMK (1) 9-2-051:011) and, at the time of the survey (July 2016), the site was covered with relatively dense vegetation. The area of potential effect (APE) for the field survey was defined as the entirety of the onshore parcel, as well as the underground HDD conduit, which begins at the subject parcel and extends to an offshore location. The HDD conduit, however, is drilled at a very substantial depth, ranging from up to approximately 50 to 65 feet (15 to 20 meters) below surface. This is well below the possible depth for buried historic properties, and the linear extent of the HDD is therefore not considered to have a significant potential for effect and was not subject to a field survey or subsurface testing.

The primary objective of the AIS was to identify and document extant historic properties, including possible subsurface cultural deposits, within the subject parcel. Archaeological field survey of the APE included both systematic pedestrian surface survey and subsurface excavation. The surface survey revealed that modern rubbish from illicit dumping and squatting was present and that the middle and southwestern portions of the APE have been mechanically disturbed. No historic properties were identified on the parcel surface. Subsurface testing included mechanical excavation of ten backhoe trenches. These excavations revealed two stratigraphic layers: a disturbed alluvial sediment overlying undisturbed calcareous sand (present in the southwest portion of the parcel only). Prior mechanical disturbance appears to extend well below the ground surface with modern refuse and debris observed up to 3 feet (1 meter) deep. Subsurface excavations produced no evidence of traditional Hawaiian or early historic subsurface deposition. AIS investigations produced no evidence of surface or subsurface historic properties within the APE.

Background research identified numerous archaeological and historic resources within the vicinity of the parcel. Resources range from a variety of Pre-Contact sites including a fishing shrine site and traditional Hawaiian structures, to historic sites including military features and a possible World War II (WWII)-era encampment. Additionally, the parcel is located within 181 feet (55 meters) of a segment of track for the OR&L rail line. The section of the OR&L line between Honouliuli and Nānākuli, which includes the track near the cable landing site parcel, is listed in the Hawai‘i State Register of Historic Places (Site 50-80-12-9714) and the National Register of Historic Places (NRHP; No. 75000621). Currently, this portion of track supports tour rides operated by the Hawaiian Railway Society, running from ‘Ewa to Kahe Point.

Visual effects of the Project on the OR&L railway segment running past the property would be limited to a line of sight from the railway to the proposed one-story, 4,000-square-foot (372-square-meter) CLS building located towards the west side of the Project parcel. A significant elevation difference between the parcel and the railroad would limit the view to only the top of the building. Other structures, such as a proposed small outbuilding and oil storage tank, would be located behind the CLS building and would likely not be visible at all. Normally, a viewshed analysis would provide clear data on visibility, but unfortunately the small distances involved would make such analysis ineffective. Regardless, observations made at the site, from the perspective of the historic railway, indicate only limited visibility of the Project parcel and proposed construction elements.

As previously mentioned, an archeological survey was not undertaken in the nearshore environment as the HDD corridor is well below the possible depth for buried historic properties and is therefore not considered to have a significant potential for effect on archaeological or historic resources. A desktop analysis of the nearshore portion of the Project area was conducted using publically available information and consultation with local contacts. The desktop analysis did not identify any potential resources within the nearshore portion of the Project area; however, two underwater sites were identified by NOAA historian Hans Van Tilburg as being located nearby (within 0.25 to 0.50 mile [0.4 to 0.8 km]) of the Project Area (H. Van Tilburg, personal communication, September 8, 2016). These two sites include the shipwrecks of Vessel F6F-3 Hellcat and Vessel F2A-3 Buffalo.

Vessel F6F-3 Hellcat, squadron VF-100, was lost in 1945. The wreck location is based on archival records and has not been verified although the wreck location is designated as moderate to good accuracy. The site is located approximately 0.25 mile (0.4 km) northwest of the cable landing site. Vessel F2A-3 Buffalo, squadron VMF-212, was lost in 1942. The wreck location is approximately 0.5 mile (0.8 km) south of the cable landing site, although the NOAA record indicates the position estimate reliability as fair to poor (H. Van Tilburg, personal communication, September 8, 2016). The University of Hawaiʻi Marine Option Program and Cultural Surveys Hawaiʻi were also contacted regarding nearshore cultural resources within or adjacent to the Project Area, both sources produced no findings (D. Shideler, personal communication, September 6, 2016 and C. Hunter, personal communication, September 8, 2016).

2.9.2 Environmental Impacts

2.9.2.1 Alternative 1 – No Action

Under the No Action Alternative, the proposed Project would not be constructed. Therefore, there would be no effect to archaeological or historic resources.

2.9.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Based upon the findings of the AIS and the desktop analysis of the nearshore area, construction and operation of the Proposed Action would result in no impacts to onshore or offshore archaeological or historic resources.

2.9.3 Best Management Practices and Mitigation Measures

Best management practices would include developing an Unanticipated Discoveries Plan prior to the start of construction. In the case of an inadvertent discovery of an archaeological or historic resource during construction, the Unanticipated Discoveries Plan would be implemented to prevent further disturbance of the resource.

2.10 CULTURAL RESOURCES

Under Chapter 343 HRS, a Cultural Impact Assessment (CIA) is required as part of the HEPA process. Session Laws of Hawaiʻi Act 50, which amends HRS 343, requires consideration of the effects of a proposed action on "cultural practices." A CIA was conducted for the Project by GANDA and the results are presented in the technical report entitled *Cultural Impact Assessment Hawaiki Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupuaʻa, ʻEwa District, Island of*

Oʻahu, Hawaiʻi and is included as Appendix G. The following discussion summarizes the results of the CIA.

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 November 19, 1997. The purpose of the CIA is to identify any traditional cultural practices, beliefs, or places within the Project Area and vicinity, and assess any potential adverse effects of the Project 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.

2.10.1 Existing Conditions

Oʻahu was divided into six moku (districts)—ʻEwa, Kona, Koʻolau Loa, Koʻolau Poko, Waialua, and Waiʻanae—representing six chiefdoms. The Project is located within the moku of ʻEwa. Within the moku districts are smaller land divisions called ahupuaʻa. The Project is situated within the ahupuaʻa of Honouliuli. Honouliuli Ahupuaʻa is the largest ahupuaʻa on Oʻahu and its boundaries extend from a place called Pili o Kahe (at the boundary between Waiaʻnae and ʻEwa, 1.6 miles (2.5 km) north of the Project Area) to Pearl Harbor's West Loch, and upland to the top of the Waiʻanae Mountains near Schofield Barracks Military Reservation.

2.10.1.1 Background Research

Background research was conducted for the CIA as a means to provide context for interpreting the CIA results. This included a review of Pre- and Post-Contact Periods, as well as a review of previous archaeology studies.

<u>Pre-Contact</u>

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 Ahupuaʻa. These include various traditions, noted places, and references to Late Pre-Contact Period Hawaiian political consolidation associated with the ʻEwa plain and Pearl Harbor regions, which are quite distant from the Project.

Moʻolelo[3] specific to the Project Area and its immediate surroundings could not be found. Within Honouliuli, most Hawaiian myths or references to famous places are associated with the eastern portion of the ahupuaʻa. The nearest place to the Project Area mentioned in ancient legend is Pili-o Kahe and is approximately 1.6 miles (2.5 km) 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

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

game, they cast their stones to determine the boundaries of ʻEwa District. In an effort to include as much of the level ʻEwa Plain as possible, the gods hurled a stone as far as the Waiʻanae 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 ʻEwa, 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 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 an early historical maps suggests that the area had 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[4] 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 Mahele, Hawaiian chiefs and konohiki[5] 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 Hawaiian 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 Project cable landing site 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[6] 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

[4] 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.
[5] Head of ahupuaʻa who administers land under the chief.
[6] Kuleana lands are those parcels granted to commoners under the Kuleana Act of 1850.

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 William Castle by B.F. Dillingham who then subleased the land to the ʻEwa Plantation Company. Lands within Honouliuli Ahupuaʻa above 200 feet were leased to the Oʻahu Sugar Company.

The ʻEwa 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 ʻEwa Plantation Company continued to operate until 1970, when the Oʻahu Sugar Company took control of the ʻEwa Plantation lands.

The Oʻahu 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 Koʻolau 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 Oʻahu, through the Koʻolau 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 Oʻahu 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 lands that extended to a point southeast of the Project Area, most of the land within the western portion of Honouliuli Ahupuaʻa 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 Waiʻanae (Kuykendall 1967). After the Japanese attack on Oʻahu on December 7, 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 Hawaiian Railway Society was formed in 1970 in an effort to save and restore the remaining railways in Hawaiʻi. In 1974, the federal government donated the tracks and the right-of-way to the State of Hawaiʻi. The Hawaiian Railway Society was able to place the segment of the OR&L line running between the U.S. Navy's Pearl Harbor and Lualualei on the NRHP in 1975. The segment of OR&L line between Honouliuli and Nānākuli was also listed on the Hawaiʻi 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 tour rides that run from ʻEwa to Kahe Point.

2.10.1.2 Community Consultation

As part of the CIA process, individuals who might have knowledge of or concerns about traditional cultural practices at the Project Area or 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 Project is relatively small in scale covering a minimal footprint. Mr. Shad Kane and Mrs. Ginger Burch were the only consultants to respond to repeated requests for an interview. The results below are primarily 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 Hawaiian Civic Clubs, Mr. Kane serves as a knowledgeable consultant of the traditional cultural practices at the Project Area and its vicinity. If additional consultants respond to requests for an interview, their opinions and concerns will be incorporated into the Final EA and CIA.

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 Hawaiian 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 Hawaiians, 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 Hawaiians would be affected by project.

2.10.2 Environmental Impacts

2.10.2.1 Alternative 1 – No Action

Under the No Action Alternative, the proposed Project would not be constructed. Therefore, there would be no effect to cultural resources.

2.10.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

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.

2.11 UNEXPLODED ORDNANCE

The Hawaiian Islands have been used extensively over the years, particularly during WWII, for live-fire training exercises at onshore and offshore military ranges. In addition, there are military bases on the islands where munitions items have been loaded/unloaded, transported and transferred and there are offshore explosives dumping areas and spoils grounds that may contain unexploded ordnance (UXO) and discarded military munitions (DMM), collectively known as munitions and explosives of concern (MEC). Therefore, the presence of MEC should be considered for onshore and offshore construction projects in the islands.

The Department of Defense (DOD) is responsible for cleanup of properties that were once used for military training and testing. These sites are known as Formally Used Defense Sites (FUDS) and are managed by the U.S. Army Corps of Engineers (USACE). The FUDS sites located on Oʻahu, as well as charted Dumping Grounds and Explosives Dumping Grounds where MEC might be encountered, are shown in Figure 2.11-1; note that none of these sites are located within the Project Area.

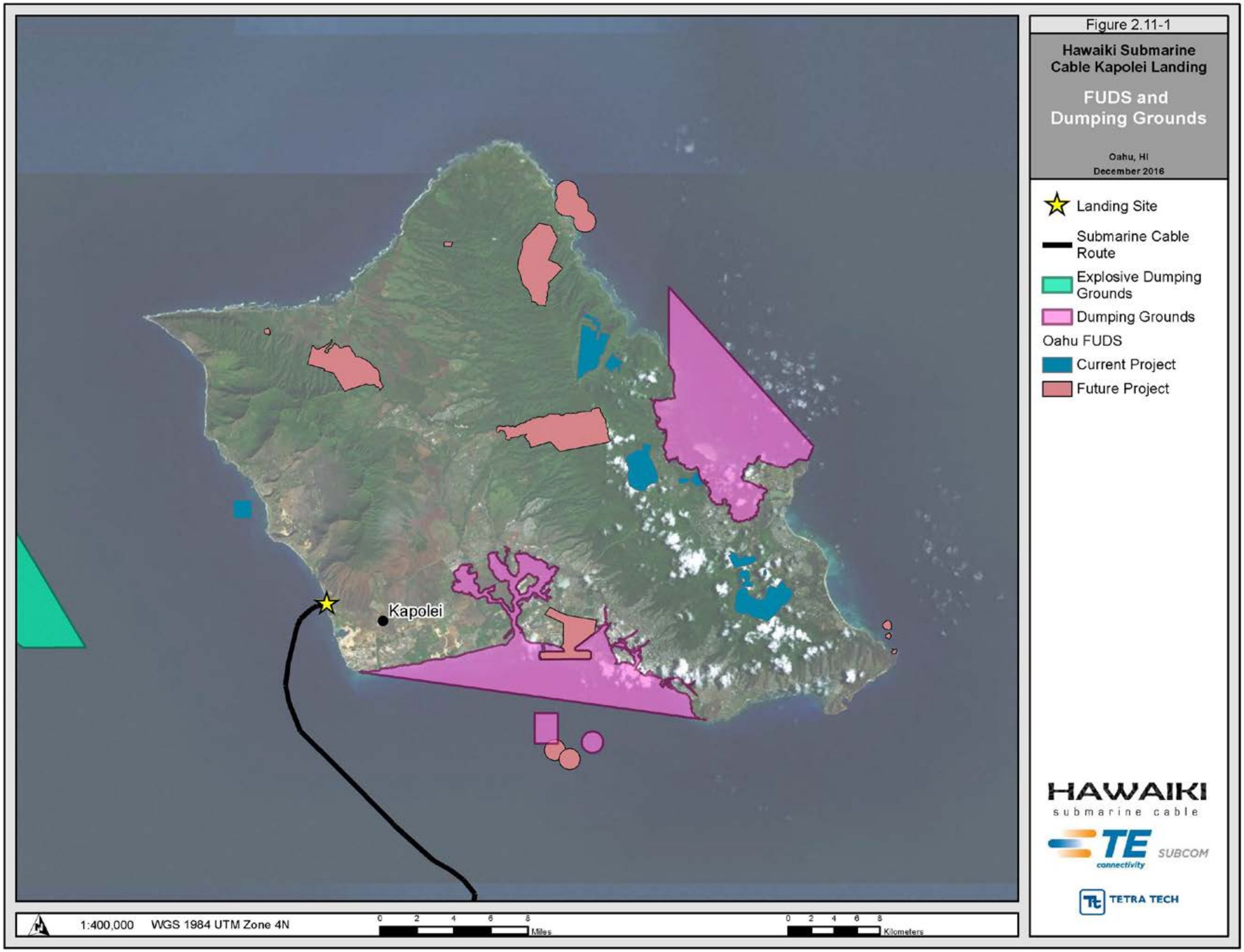
Figure 2.11-1
Hawaiki Submarine Cable Kapolei Landing
FUDS and Dumping Grounds
Oahu, HI
December 2016
Landing Site
Submarine Cable Route
Explosive Dumping Grounds
Dumping Grounds
Oahu FUDS
Current Project
Future Project
Kapolei
1:400,000 WGS 1984 UTM Zone 4N
0 2 4 6 8 Miles
0 2 4 6 8 Kilometers
HAWAIKI submarine cable
TE connectivity SUBCOM
TETRA TECH

2.11.1 Existing Conditions

The Project Area is not located in or near former or current military training ranges or charted Dumping Areas or Explosive Dumping Areas; therefore, encountering MEC during construction, installation and/or maintenance operations is not anticipated. This section is included in this EA to acknowledge an awareness of the potential for the presence of MEC items that could affect the Project.

2.11.2 Environmental Impacts

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

2.11.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, under Alternative 1 there would be no effects related to MEC.

2.11.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

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 a MEC item could be encountered during construction, installation, and maintenance of the submarine cable and onshore facilities.

MEC items on the seabed pose little to no risk to the cable or cable installation operations in the offshore area where the cable would be surface-laid. There is a slight risk of encountering MEC on the seabed during HDD and cable laying where operations would be in contact with the seabed. The consequences of an unexpected underwater detonation on field workers during HDD and cable laying are likely to be very small as long as they remain out of the water and on the support vessel.

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 within the cable landing site.

2.11.3 Best Management Practices and Mitigation Measures

Safety is a priority and workers should be aware of and follow the "3 Rs of Explosives Safety" if someone suspects he/she may have encountered a military munition:

- Recognize – when you may have come across a munition, and that munition(s) is dangerous;
- Retreat – do not approach, touch, move, or disturb the item, but carefully leave the area; and
- Report – call 911 and advise the police of what you saw and where you saw it (http://www.denix.osd.mil/uxo/index.cfm)

2.12 AIR QUALITY

Under the authority of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (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. The Clean Air Branch of the HDOH is responsible for implementing air pollution control in the state and has established additional Hawai'i ambient air quality standards (HAAQS).

2.12.1 Existing Conditions

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 that pass over the islands and the limited emission sources found on the islands (HDOH 2014b). The most recent publicly available information for Hawai'i regarding air quality is from 2014 (HDOH 2014b). Excluding the exceedances that were due to the Kilauea Volcano located on the Island of Hawai'i, the State of Hawai'i was in attainment of all NAAQS and HAAQS in 2014 (HDOH 2014b). The EPA considers volcanos to be natural uncontrollable events and the State of Hawai'i requests exclusion of any volcano-related exceedances on an annual basis.

The HDOH and EPA maintain a network of air quality monitoring stations throughout the islands. The closest air quality monitoring station to the Project Area is the Kapolei Station, which is located approximately 3 miles (5 km) from the Project Area in the Kapolei Business Park southeast of the Kapolei Fire Station. This station monitors for carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and particulate matter (PM_{10} and $PM_{2.5}$). Air quality monitoring records from the Kapolei Station shows that the Project Area is in attainment of all NAAQS and HAAQS. Other air quality monitoring stations on the Island of O'ahu include the Honolulu, Sand Island, and Pearl City Station stations (HDOH 2014b). Data collected from these monitoring stations indicate that criteria pollutant levels consistently remain well below NAAQS and HAAQS on the Island of O'ahu (HDOH 2014b).

2.12.2 Environmental Impacts

2.12.2.1 Alternative 1 – No Action

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

2.12.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Heavy equipment and vehicles 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 or excavating lands, mixing cement, vehicles traveling to and from the Project Area, removal of materials from work areas, and the cable installation process) could result in the generation of fugitive dust (which is measured as 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 travel routes to and from the Project Area.

Two diesel generators would be used to provide backup power to the CLS[7]. These generators would run for approximately one hour per month during normal business hours for test and

[7] The generators would be water-cooled diesel 4-stroke compression ignition engines with a rotation speed of 1500 rpm for 50 Hz or 1800 rpm for 60 Hz.

maintenances purposes. Although these generators would produce a minor amount of pollutants, the operation of two generators for approximately one hour per month would not produce enough emissions to result in the Project Area exceeding the NAAQS and HAAQS.

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 and HAAQS, 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 (see Section 2.14.3). Therefore, the Project is not expected to result in the air quality of the region exceeding the NAAQS and HAAQS.

2.12.3 Best Management Practices and Mitigation Measures

All Project vehicles and equipment (including the generators using during operation) would be maintained in proper working order and in compliance with state and federal vehicle and emission standards. This will ensure that the amount of pollutants emitted by the Project would be in compliance with established standards.

State and federal air pollutions control regulations require that fugitive dust levels be controlled at construction areas. Therefore, the Project would include a dust control plan that will include measures for controlling fugitive dust levels around the Project area. This could include 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, and covering "open-bodies" trucks.

2.13 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. "Noise" is defined as:

> *'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 unwanted sound. All sounds come from a sound source – a musical instrument, a voice speaking, or an airplane as it flies overhead. It takes energy to produce sound. The sound energy produced by any sound source is transmitted through the air in sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear.

A sound source is defined by a sound power level, which is independent of any external factors. By definition, sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts. A source's sound power level cannot be measured directly. It is calculated from measurements of sound intensity or sound pressure at a given distance from the source outside the acoustic and geometric near-field.

A sound pressure level is a measure of the sound wave fluctuation at a given receiver location, and can be obtained through the use of a microphone or calculated from information about the source sound power level and the surrounding environment. Sound pressure level is a measure of the sound pressure of a given noise source relative to a standard reference value (typically the quietest sound that a young person with good hearing can detect). Sound pressure levels are measured in decibels (abbreviated dB). Decibels are the logarithmic quantities – logarithms of the ratio of the two pressures, the numerator being the pressure of the sound source of interest, and the denominator being the reference pressure (the quietest sound we can hear).

Broadband sound includes sound energy summed across the entire audible frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum can be completed to determine tonal characteristics. The unit of frequency is hertz (Hz), measuring the cycles per second of the sound pressure waves. Typically the frequency analysis examines 11 octave bands ranging from 16 Hz (low) to 16,000 Hz (high). Since the human ear does not perceive every frequency with equal loudness, spectrally varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system, and is represented in dBA.

The Hawaiʻi noise limits (Table 2.13-1) are absolute (i.e., not relative to ambient conditions), are prescribed by receiving zoning class and time period, and are enforceable at the facility property boundaries. 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 2.13-1. 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 2.13-1. Hawaiʻi 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 dwellings, apartment, business, commercial, hotel, resort, or similar type.	60	50
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"

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 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 Area includes General Agriculture District (AG-2), General Preservation District (P-2) and Country District (considered rural residential land use). Both the General Preservation District 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, respectively apply.

With a variance (HAR § 11-46-7), construction activities emitting noise in excess of the 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 in excess of the limits on Sundays or holidays.

2.13.1 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, which has been measured to be at the order of 80 dBA, ocean surf, and residential, light commercial, and recreational uses.

2.13.2 Environmental Impacts

Depending upon the separation distance between sound sources and receivers, Project construction may result in temporary adverse noise impacts at nearby noise sensitive receptors. In particular, HDD activity may generate elevated sound levels. When the Project is operational, noise from on-site equipment, such as the proposed diesel generators, may result in minor noise impacts at nearby noise sensitive receptors.

2.13.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, the Alternative 1 would have no effects related to noise.

2.13.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Project-related construction activities would create noise that could affect nearby areas, including residences. The closest current residence is 234 feet (72 meters) from the cable landing site. During the construction phase of this Project, grading, HDD, and cable-laying 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 is expected to be the dominant sound source.

Operational sound sources primarily consist of the two diesel generators, which would be housed in a sound-dampened room adjacent to the CLS building. Anticipated noise impacts are minor; however, the nearest current residence is in close proximity at only a distance of 234 feet (72 meters) away. When the Project design and construction plans are finalized, noise impacts can be re-evaluated to ensure best practices are followed. Further modeling and/or mitigation would be required to make a full assessment.

2.13.3 Best Management Practices and Mitigation Measures

The Applicants would coordinate with the HDOH to ensure noise concerns are addressed prior to the start of Project construction. The Applicants 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; and
- 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.

Acoustic modeling would be used to determine whether additional noise mitigation measures will be necessary to comply with the applicable requirements. If compliance is not possible using reasonable noise mitigation measures, the Applicant may seek a variance from the HDOH.

2.14 INFRASTRUCTURE AND UTILITIES

2.14.1 Existing Conditions

2.14.1.1 Electric and Communications

The Hawaiian Electric Company (HECO) provides all electrical service for the Island of Oʻahu. Existing HECO joint-utility overhead pole lines are located on the mauka side of Farrington Highway adjacent to the Project Area. It is anticipated that this existing overhead line would have enough capacity to serve the proposed Project.

AT&T has underground facilities on the makai side of Farrington Highway, and Hawaiian Telecom and Oceanic Time Warner Cable have overhead facilities on joint poles on the mauka side of Farrington Highway. Hawaiian Telecom does not have facilities in the immediate vicinity and indicated that before attaching to the existing joint poles, pole-loading calculations would be required to determine if the poles can support the additional facilities (Belt Collins Hawaii LLC 2016). If the poles cannot support the additional facilities, new poles would need to be installed.

2.14.1.2 Potable Water

The Honolulu Board of Water Supply (HBWS) is the public agency supplying potable water to most of Oʻahu, including the Project Area vicinity. Currently, there is no water service to the cable landing site, but there is a 24-inch (61-centimeter) water transmission main within Farrington Highway approximately 35 feet (11 meters) west of the site (Belt Collins Hawaii LLC 2016).

2.14.1.3 Wastewater

Currently, there is no sewer service to the cable landing site. There are no public or private sewers in the immediate vicinity of the Project Area. The closest sewer manhole is located about 0.5 mile (0.8 kilometer) from the cable landing site. Per Section 713.4 of the 1997 Uniform Plumbing Code, adapted in Chapter 19 of the Revised Ordinances of Honolulu, connection to a public sewer is not required if the distance to the public sewer is greater than 200 feet (61 meters).

2.14.1.4 Stormwater Drainage

There is no developed stormwater infrastructure within the proposed cable landing site. Surface flows not captured by evapotranspiration are captured by a large concrete lined ditch along the makai boundary of the site (Belt Collins Hawaii LLC 2016). Additionally, a culvert exists under the proposed site access. Both the ditch and the culvert are located in the HDOT right-of-way.

2.14.1.5 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.

2.14.2 Environmental Impacts

2.14.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no effects on existing infrastructure and utilities.

2.14.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Electric and Communications

Construction and operation of the proposed Project would have a minimal effect on existing electric facilities. If existing telecommunications facilities are not able to support construction and operation of the proposed Project, new utility poles would need to be installed. Ultimately, the Project would have beneficial effects to telecommunications as it would provide direct telecommunications connectivity between Hawai‘i, the mainland U.S., American Samoa, New Zealand, and Australia. The Project would directly benefit Hawai‘i through increased telecommunications speed and reliability due to the advanced capacity and redundancy that would be provided.

Potable Water

Construction and operation of the proposed Project are not expected to adversely affect public potable water supplies or public potable water infrastructure systems. During construction, it is anticipated that water would come from an existing fire hydrant in close proximity to the cable landing site. The HBWS provides temporary metering for construction activities.

During operation, the Project is anticipated to require 2,416 gallons (9,146 liters) of potable water per day (Belt Collins Hawaii LLC 2016). This estimate is based on the water use standard for Light Industrial land uses defined in HAR § 11-62 as 4,000 gallons (15,142 liters) per acre per day and represents a preliminary, conservative estimate. It is anticipated that actual domestic water consumption during Project operation would be substantially less; however, HBWS uses these conservative standards to ensure the maximum water demand needed within this zoning district can be met. The HBWS indicated that water demands for the proposed Project could be met by utilizing the water transmission line west of the Project (Belt Collins Hawaii LLC 2016). A new water meter and service lateral for potable water and irrigation purposes would be required for the Project. Installation of a fire hydrant may be required at the cable landing site; however, this would be reviewed by and coordinated with the Honolulu Fire Department at the time a building permit application is submitted.

Wastewater

During construction, portable toilets would be provided for construction and Project-related personnel use which would generate a minor amount of wastewater. Portable toilets would be maintained by the contractor in accordance with HDOH and City and County of Honolulu health regulations.

During operation, facilities at the CLS would include a lunchroom, shower, and restroom which would be used during operation by one full-time staff member. Occasional (monthly) visits from various contractors would be required for operation and maintenance. Peak occupancy of the CLS would be 2 persons in a repair or repair simulation scenario, which would occur a maximum of 1 week per year. Thus, average daily wastewater storage during operation would be approximately 21 gallons (79 liters) per day and treatment capacity would be approximately 40 gallons (151 liters) per day (Belt Collins Hawaii LLC 2016). As noted above, these amounts are based on very conservative assumptions and actual waste water storage and treatment would be substantially less.

Given that there are no public or private sewers in the immediate vicinity of the Project Area, connection to a public sewer or construction and operation of an individual wastewater system for the proposed Project are not likely feasible. Therefore, a soil mound system, utilized for storage and evaporation, would be the most feasible means for wastewater disposal (Belt Collins Hawaii LLC 2016). Therefore, no adverse impacts to wastewater facilities are anticipated. This elevated mound or evapotranspiration system would need to be reviewed by the Director of the HDOH and must meet siting criteria specified in Chapter 11-62 Appendix G of the HDOH Administrative Rules.

Stormwater Drainage

Following construction of the proposed Project, approximately 60 percent of the cable landing site would be converted to impermeable surfaces, which would result in increased stormwater runoff. Final design of the cable landing site would need to limit the runoff to historic rates and provide BMPs in accordance with the City Storm Water Quality Guidelines (Belt Collins Hawaii LLC 2016). BMPs that would be implemented to minimize stormwater runoff are listed below in Section 2.14.3.

Solid Waste

Solid waste would be generated during construction and operation of the Project. Waste generated during construction would include green waste and construction and demolition waste. As stated above, operation and maintenance of the proposed Project would require one full time staff member, as well as occasional (monthly) visits from various contractors. Peak occupancy of the cable landing site facility would be 2 persons in a repair or repair simulation scenario which would occur a maximum of 1 week per year. Therefore, solid waste generated during operation is expected to be minimal.

Solid waste generated during construction of the Project would be taken to the City and County of Honolulu's Waimānalo Gulch landfill managed by Waste Management. Alternatively, construction wastes could be taken to the privately-owned PVT landfill. During operation, waste would be sorted for recycling and picked up by a commercial hauler for disposal (Belt Collins Hawaii LLC 2016).

The amount of solid waste generated during construction and operation of the Project is not expected to adversely impact existing waste management services or facility capacity. Solid waste would also be disposed of in accordance with State and City and County of Honolulu regulations.

2.14.3 Best Management Practices and Mitigation Measures

The Project would not have a significant effect on existing infrastructure and utilities, including electric and communications, potable water, wastewater, stormwater drainage, or solid waste. Therefore, no mitigation measures are required. The proposed Project would have the potential to increase stormwater runoff. BMPs that would be implemented to minimize stormwater impacts may include using pervious pavement in the parking area, subsurface detention, and building gutters for stormwater collection for reuse. A TESC Plan and an SWPPP, incorporating such measures, would be prepared for the Project to minimize stormwater impacts (see Section 2.4 for additional discussion).

2.15 SOCIOECONOMIC RESOURCES

2.15.1 Existing Conditions

The Project Area is located near Kahe Point in the ‘Ewa District on the southwest shore of O‘ahu. The closest communities to the Project Area include Barbers Point, which is approximately 3.7 miles (6 km) to the southeast, and Kapolei which is approximately 5 miles (8 km) to the southeast. According to the 2014 American Community Survey, the resident population of Kapolei numbered 16,890 people in 2012 (U.S. Census Bureau 2014). This is approximately two percent of the total population of the Island of O‘ahu, which was estimated at 975,690 in 2012 (U.S. Census Bureau 2014). There are no census data available for Barbers Point. According to the U.S. EPA Environmental Justice screening tool (EPA 2016), the Project does not occur within a minority or low income environmental justice populations.

The proposed cable landing site and BMH would be located on an approximately 0.6-acre privately owned parcel owned by Hawaiki. The parcel is currently vacant and no residences or commercial properties are located within the parcel. The cable landing site is bordered on the west by Farrington Highway (State Route 93), on north and east by privately owned agricultural land, and to the south by private residential land. Hawaiian Electric Company’s Kahe Electric Power Plant is located directly to the north and the Waimānalo Gulch Sanitary Landfill owned by the City and County of Honolulu and managed by Waste Management Inc. is located 1,280 feet (390 meters) to the southeast. In the vicinity of the Project Area are residential, resort (Ko ‘Olina Resort and Marina), recreational (at Makaīwa and Kahe beach parks), and industrial uses. The HDD conduit would pass under Farrington Highway (an HDOT divided highway), Kahe Beach Park, and the OR&L right-of-way.

The proposed cable landing site and the HDD conduit are located in the State Land Use Agricultural District. City and County of Honolulu Land Use Ordinance (LUO) zoning for the cable landing site parcel is Country, and the proposed location of the HDD conduit is zoned as General Agriculture and General Preservation (see Section 1.1.2). In addition, all terrestrial portions of the Project Area lie within the Special Management Area (SMA). Submerged lands surrounding the Hawaiian Islands are in the State Conservation district, which extends to the territorial limits of the State of Hawai‘i.

The proposed cable landing site will have one access point off the mauka side of Farrington Highway and can only be accessed by turning right off of the highway. All exiting vehicles must also turn right out of the driveway because of the concrete median in the highway. Farrington Highway is a four-lane divided State highway that provides the only access around the west side of O‘ahu from Kapolei to Mākaha. Existing traffic volume data was retrieved from the HDOT’s traffic count station nearest to the Project (near the Keone‘ō‘io Bridge). The most recent traffic count was conducted on Wednesday, January 28th, 2015. The morning peak hour (between 6:30 to 7:30 a.m.) had 3,160 total traffic volume (both directions) and the afternoon peak hour (between 3:00 and 4:00 p.m.) had 3,319 total traffic volume (both directions) (Belt Collins Hawaii LLC 2017). The 24-hour traffic volume was 48,602 (both directions) (Belt Collins Hawaii LLC 2017). Traffic volume taken by HDOT in this area during previous years was examined and shows that 2015 traffic data is in line with previous years. The morning peak has consistently been at the same hour, while the afternoon peak has been trending slightly earlier (Belt Collins Hawaii LLC 2017). The 24-hour volumes are showing an increase in traffic over the 10 years of available data (Belt Collins Hawaii LLC 2017).

2.15.2 Environmental Impacts

2.15.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no adverse effect on socioeconomic resources. However, Alternative 1 would also have no beneficial effect on the educational systems, communities, and businesses of O‘ahu due to the provision of broadband capacity, and the State of Hawai‘i would not benefit from the increased telecommunications speed and reliability that the proposed Project would provide.

2.15.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

The Proposed Action is not expected to have an adverse impact on the existing population of Kapolei or the population in the vicinity of the Project Area and no persons would be displaced by the Proposed Action. During construction, temporary employment opportunities would be created. However, as only two persons would be required to staff the Project during operations, the majority of the employment associated with the Proposed Action would be short-term, lasting through completion of Project construction. It is anticipated one person would be onsite during Project operation with occasional (monthly visits) from various local contractors for operation and maintenance visits. Peak occupancy of the cable landing site facility would be two persons in a repair or repair simulation scenario which would occur a maximum of 1 week per year. Therefore, although some new employment may be required, it would primarily be required during construction, and this increase is expected to be small and would have minimal impact on employment in the vicinity of the Project. Additionally, the Proposed Action would generate some new revenue associated with ongoing operations and maintenance costs through the use of local contractors for routine maintenance activities (HVAC, generator, electrical, and fire systems maintenance), fuel delivery, and security system maintenance which would benefit the economy in the vicinity of the Project or on the Island of O‘ahu.

A traffic impact analysis was completed by a traffic engineer to analyze the potential traffic impacts from Project construction and operation (Belt Collins Hawaii LLC 2017). The analysis calculated the following regarding construction related traffic:

- Total of 32 daytime vehicle trips which includes a total of 8 deliveries (3 concrete, 2 aggregate, 2 building components, and 1 miscellaneous) and 24 construction workers commuting to and from the site.

- Total of five AM peak hour trips (between 6:30 and 7:30 am) as most deliveries will occur during off-peak hours (two AM peak hour trips per day anticipated) and approximately 90% of construction workers will arrive to the site before morning peak hour and the remaining 10% during the peak (three AM peak hour trips anticipated per day).
- Total of 44 PM peak hour trips (between 3:00 and 4:00 pm) which assumes no material delivery during PM peak hour and 90% of the construction workers will leave the cable landing site during the pm peak hour and will be driving towards Honolulu and therefore their trips are counted twice as there is no left turn out of the cable landing site and workers will need to perform a U-turn to head east on Farrington Highway.

Project construction activities will result in minor, temporary impacts to traffic along Farrington Highway and are not expected to result in a substantial increase in traffic during peak hours as the anticipated number of peak hour vehicle trips is below the 100 new peak hour trips threshold set by HDOT's Best Practices for Traffic Impact Reports (Belt Collins Hawaii LLC 2017). Temporary restrictions applying to one northbound lane of travel along Farrington Highway may be required during construction of the proposed Project. However, impacts to travel along Farrington Highway would be temporary.

In regards to operational traffic from the Project, there will be one full-time operations and maintenance employee on site. The typical work hours would be between 7:00 am and 5:00 pm and would result in 3 trips per day (assuming employee's return trip will be towards Honolulu and therefore will require employee to perform a U-turn to head east on Farrington Highway). The total trips are not anticipated to significantly increase traffic on Farrington Highway. In regards to operational use of the Project's driveway off of Farrington Highway, the sight distance for vehicles looking to turn right onto the driveway was evaluated to ensure it meets standard safety requirements (Belt Collins Hawaii LLC 2017). Based on the American Association of State Highway and Transportation Officials *A Policy on Geometric Design of Highways and Streets*, 2011, 6th Edition, the required sight distance for vehicles turning right off a roadway with a design speed of 50 miles per hour is 480 feet (146 meters). The Project's traffic engineer concluded in their analysis that the existing Farrington Highway road right-of-way provides the required 480-foot (146-meter) line of sight distance to the Project's driveway (Belt Collins Hawaii LLC 2017).

No impacts to use of the OR&L right-of-way would occur during construction or operation.

As stated above, the proposed cable landing site would be located in the State Land Use Agricultural District and the City and County of Honolulu LUO Country designation, and the HDD conduit would pass beneath land located in the State Land Use Agricultural District and the City and County of Honolulu LUO General Agriculture and General Preservation zones. Communication installations are a permitted use in all of these designated zones. Conformance with land use plans and policies is discussed in detail in Chapter 5.

2.15.3 Best Management Practices and Mitigation Measures

Impacts to socioeconomic resources from the Proposed Action would be less than significant; therefore, no mitigation is required.

2.16 PUBLIC SERVICES AND FACILITIES

2.16.1 Existing Conditions

2.16.1.1 Police and Fire

Police and fire services on Oʻahu are provided by the City and County of Honolulu. The vicinity of the Project Area is served by District 8, Kapolei/ Waiʻanae, of the Honolulu Police Department. The closest police station to the Project Area is the Kapolei Police Station located at 1100 Kamokila Boulevard, Kapolei, Hawaiʻi, approximately 5.4 miles (8.7 km) to the southeast. A police substation, the Waiʻanae Substation, is located approximately 8.1 miles (13.0 km) to the north. The closest fire stations to the Project Area are the Makakilo Fire Station No. 35 located at 92-885 Makakilo Drive, Kapolei, Hawaiʻi and East Kapolei Fire Station No. 43 located at 85-645 Farrington Highway, Kapolei, Hawaiʻi. Each of these fire stations is approximately 7.1 miles (11.4 km) to the southeast from the Project Area.

2.16.1.2 Medical Services

The primary health service provider in the vicinity of the Project Area is Queen's Medical Center-West Oʻahu, located at 91-2141 Fort Weaver Road, ʻEwa Beach, Hawaiʻi, approximately 10.9 miles (17.5 km) east of the Project Area. Other medical health centers and clinics in the vicinity of the Project Area include Kapolei Health Care Center and Kaiser Permanente Kapolei Clinic in Kapolei and the Waiʻanae Coast Comprehensive Health Center and the Kaiser Permanente Nanaikeola Clinic located in Nānākuli.

Honolulu Emergency Medical Services has 20 advanced life support ambulances, one of which is stationed in the East Kapolei Fire Station, approximately 7.1 miles (11.4 km) southeast of the Project Area and another is located at the Waiʻanae Fire Station approximately 10.8 miles (17.4 km) north of the Project Area (City and County of Honolulu, EMS 2014). Additionally, there is a Rapid Response Paramedic unit that serves West Oʻahu and operates 16 hours a day between 7 AM and 11 PM (City and County of Honolulu, HESD 2010).

2.16.2 Environmental Impacts

2.16.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no effects on public services and facilities.

2.16.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

<u>Police and Fire</u>

The proposed Project is not expected to result in an increase in demand for police protection during construction or operation. Construction of the facilities associated with the cable landing site has the potential to increase the fire risk due to use of vehicles, electrical equipment, and human presence. Additionally, during operation faulty electronic equipment, backup emergency generator, and stored fuel supply could increase the risk of fire. To minimize the risk of fire hazard during operation, critical equipment rooms within the CLS would be equipped with an automatic fire detection and suppression system, including both ionic and infra-red smoke detectors, Very Early Smoke Detection apparatus, and automated gas suppression fire extinguishing systems. Generator and office spaces would be fitted with smoke detectors and fire sprinkler systems. If a fire is detected in an air-conditioned room, the HVAC unit would be automatically shut down. Additionally, no combustible packaging materials would be permitted within critical equipment rooms or generator rooms.

Medical Services

Construction and operation of the Project would have no direct impact to existing health care facilities and emergency services, and are not expected to place substantial additional demands on health care or emergency services in the area. The Project Area and vicinity are well served by a community hospital and emergency medical services. Should an incident occur during construction of the Project, response times would be short. The implementation of a Site Safety Plan and observance of safe working practices during construction are expected to substantially reduce the potential for serious accidents that could place an undue burden on the local health care facilities and emergency services.

2.16.3 Best Management Practices and Mitigation Measures

The implementation of a Site Safety Plan and observance of safe working practices during construction and operation are expected to substantially reduce the potential for serious accidents that could place an undue burden on the local health care facilities and emergency services. With implementation of these measures and observance of safe working practices during construction and operation, impacts to public services and facilities from construction and operation of the Project would be negligible; therefore, no additional mitigation measures are required.

2.17 RECREATIONAL RESOURCES

2.17.1 Existing Conditions

Recreational resources in the vicinity of the Project Area include publicly owned or managed areas, as well as privately owned recreation resources. Publicly owned recreation resources include Makaīwa Beach Park located directly south of the Project Area and Kahe Beach Park under the southern corner of which the HDD conduit would pass, as well as seven other beach parks located within 5.0 miles (8 km) of the Project Area. One publicly owned forest reserve, Nānākuli Forest Reserve, is located 3.8 miles (6.1 km) northwest of the Project Area. Additionally, 10 regional, community, and neighborhood parks are located within 5.0 miles (8.0 km) of the Project Area. These include Kapolei and Kalaeloa regional parks; Kamokila, Kapoei, Maili Kai, and Makakilo community parks; Makakilo, Makakilo Heights, Maukalani, and Kapolei neighborhood parks; and one public golf course, Kapolei Golf Course located approximately 4.4 miles (7.1 km) east of the Project Area.

Privately owned recreation resources include Ko ʻOlina Resort and Ko ʻOlina Golf Club located approximately 0.8 mile (1.3 km) southeast of the Project Area, Hoakalei Country Club located approximately 6.1 miles (9.8 km) southeast of the Project Area, and Barbers Point Golf Course located approximately 6.0 miles (9.7 km) southeast of the Project Area.

2.17.2 Environmental Impacts

2.17.2.1 Alternative 1 – No Action

Under the No Action Alternative, the Project would not be constructed. Therefore, Alternative 1 would have no effects on recreational resources.

2.17.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

Construction of the proposed CLS would have no direct impacts to recreational resources in the area and would not cause a direct loss of opportunity to any recreational resource in the area. No Project infrastructure would be placed within any existing recreation resource area and the HDD would be installed below ground within a borehole/drill pipe conduit that would cause no disturbance or impact aboveground.

Some indirect impacts to recreation resources in the vicinity of the Project Area along Farrington Highway due to Project-related traffic may occur during construction; however, this impact would be temporary and minor. Additionally, construction of the Project would create noise that may affect nearby recreational resources including Makaīwa Beach Park, Kahe Beach Park, and Ko ʻOlina Golf Club. Construction noise, however, would be temporary, intermittent and would likely have a minor to negligible effect on these nearby recreational resources.

Potential temporary impacts to recreationalists using offshore waters may occur when HDD construction activities reach the nearshore punch-out location, which is approximately 2,520 feet (768 meters) from the shoreline, and during installation of the F/O cable system by the cable laying ship. One cable ship, approximately 460 feet (140 meters) in length, and potentially one or two support boats would be required for cable laying and installation. Collectively, cable laying to the territorial limit of State of Hawaiʻi waters and the nearshore installation of the F/O cable into the HDD punch-out point would take approximately 1.5 days to complete. Nearshore activities would occur during daylight hours. Ocean waters would not need to be closed to ocean activities such as boating, surfing, diving, and swimming, during the cable laying or cable installation process, including the area between the shoreline and punch-out location. However, the area immediately around the punch-out location would be patrolled by small boats during the cable install into the HDD conduit. A notice of operations would be published and mariners would be advised to avoid this area (see Section 1.3.4 for additional detail). Once the cable is installed, there would be no further disruption to the area's recreational resources.

2.17.3 Best Management Practices and Mitigation Measures

Impacts to recreation resources from construction and operation of the proposed Project would be negligible; therefore, no additional mitigation measures are proposed.

2.18 SCENIC AND AESTHETIC RESOURCES

2.18.1 Existing Conditions

The Project Area is located in the southwestern portion of Oʻahu. The visual setting surrounding the Project Area consists of the moderate to steep ridges of the Waiʻanae Range and the Project Area is flanked on its northeast boundary by a small steep hill that is part of the Waiʻanae Range (Tetra Tech 2015). The coastline is approximately 450 feet (137 meters) east of the proposed cable landing site. Elevations within the cable landing site range between 10 and 200 feet (3 and 61 meters) amsl (Tetra Tech 2015).

The cable landing site is bordered on the west by Farrington Highway, on the north and east by privately owned agricultural land, and to the south by private residential land. The HECO Kahe Electric Power Plant is located directly to the north and the Waimānalo Gulch Sanitary Landfill owned by the City and County of Honolulu and managed by Waste Management Inc. is located 1,280 feet (390 meters) to the southeast. Existing infrastructure, which includes exhaust stacks up to 400 feet (122 meters) tall, associated with the Kahe Electric Power Plant, is highly visible in the vicinity of the Project Area.

The ʻEwa 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 2013). Additionally, the Plan includes "views of the ocean from Farrington Highway between Kahe Point and the boundary of the Waiʻanae Development Plan Area" in its list of ʻEwa's significant historic and cultural resources (City and County of Honolulu, Department of Planning and Permitting 2013). Further, the shoreline adjacent to the Project Area 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 2013).

All terrestrial portions of the Project Area lie within the SMA where development must be reviewed by the City and County of Honolulu under the SMA provisions set forth in the Revised Ordinances of Honolulu (ROH) Chapter 25. Under ROH Section 25-3.2(c)(4), the City Council of the City and County of Honolulu must seek to minimize, where reasonable, any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast.

2.18.2 Environmental Impacts

2.18.2.1 Alternative 1 – No Action

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

2.18.2.2 Alternative 2 – Proposed Action (Kapolei Landing)

As stated above, the ʻEwa Development Plan lists views of the ocean from Farrington Highway between Kahe Point and the boundary of the Waiʻanae Development Plan area as a significant view and vista that should be preserved. In addition, under 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.

A visual impact analysis was conducted to determine whether the CLS building would obstruct a driver's line of sight towards the sea while driving north or south on Farrington Highway. Figure 2.18-1a shows a photo taken from a point approximately 600 feet (183 meters) south of the proposed cable landing site driveway looking north towards the ocean. This viewpoint was chosen at a location along Farrington Highway where the CLS building could potentially block a driver's view of the ocean due to the curvature of the highway and coastline. The results of the visual simulation provided in Figure 2.18-1b show that due to the location of the CLS building on the cable landing site and existing vegetation, there will be no impacts to the line of sight to the ocean from Farrington Highway when driving north. Figure 2.18-2 shows a photo taken from a point approximately 600 feet (183 meters) north of the proposed cable landing site driveway looking south towards the ocean. Based on the location of the CLS building being mauka of the highway and due to the existing vegetation, the CLS building will not be visible to a driver heading south on Farrington Highway until the driver is passing immediately in front of the site. There will be no impacts to the line of sight to the ocean from Farrington Highway when driving south. Based on the results of the visual impact analysis, construction and operation of the CLS facilities would not affect views of the ocean from Farrington Highway. During installation of the F/O cable, there would be temporary impacts on ocean views due to the presence of a cable ship and support vessels; however, this impact would be short-term, lasting up to approximately 1 day.

During construction of the proposed Project, there would be temporary impacts on views mauka of Farrington Highway, including from the use of a HDD drilling rig located within the cable landing site. Once construction is completed, all equipment no longer necessary to the site would be removed with no further disturbance to the scenic resources of the area.

2.18.3 Best Management Practices and Mitigation Measures

The Project architect will address the potential for visual impacts associated with construction of the CLS. The CLS, located mauka and above Farrington Highway, will be partially visible to motorists. Existing vegetation and new landscaping will be used to obscure and enhance views of the parking area and building. The CLS will be an approximately 15-foot-tall (5-meter-tall), 4,000 square foot (372-square-meter) modular or typical concrete structure, colored to be consistent with the earth tones of the surrounding site. Impacts to scenic and aesthetic resources from the Proposed Action would be less than significant; therefore, no mitigation is required.

Figure 2.18-1a. Existing View from Farrington Highway Looking North towards the Ocean, Approximately 600 feet South of Cable Landing Site.

Figure 2.18-1b. Simulation of CLS Building from Farrington Highway Looking North towards the Ocean, Approximately 600 feet South of Cable Landing Site.

Figure 2.18-2. Existing View from Farrington Highway Looking South towards the Ocean, Approximately 600 feet North of Cable Landing Site (view of proposed CLS building would be blocked by existing vegetation).

3.0 CUMULATIVE AND SECONDARY IMPACTS

Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency or person undertakes such actions" (HAR § 11-200-2). Cumulative impacts can result from additive or interactive effects that would collectively create significant impacts over time. Secondary impacts are defined as impacts that "may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density of growth rate, and related effects on air and water and other natural systems, including ecosystems" (HAR § 11-200-2). The ongoing and reasonably foreseeable actions considered in this cumulative impacts analysis are those that would overlap in time and space with the effects of construction and/or operation of the Project. These include ongoing vessel traffic, marine recreation and commercial fishing, and road and other construction traffic.

The Project would utilize a currently vacant parcel for the proposed cable landing site and would provide direct and affordable telecommunications connectivity between Hawai'i, the mainland United States, Australia, New Zealand as well as American Samoa, and potentially other Pacific islands. The Project would also improve infrastructure critical to the State of Hawaii's advancement in education, health, public safety, research and innovation, economic diversification and public services. The proposed Project is anticipated to result in only temporary, localized effects to some natural resources during construction and installation, and would have no effect on other resources. Resources and existing conditions include: ambient noise; geology, topography, and soils; natural hazards; onshore water resources and hydrology; marine water quality; terrestrial botanical and wildlife resources; archaeological and historic resources; cultural resources; unexploded ordnances; infrastructure and utilities; socioeconomic resources; public services and facilities; and scenic and aesthetic resources. Therefore, the direct and indirect effects of the Project would not contribute to cumulative effects to these resources.

Current and reasonably foreseeable actions including ongoing vessel traffic, marine recreation and commercial fishing, and road and other construction traffic in the vicinity of the Project are anticipated to result in only very minor contributions to greenhouse gas emissions. Additionally, the Project's contribution to greenhouse gas emissions (e.g., exhaust emissions generated by vehicles and equipment) would be minimal. Therefore, the cumulative effects of the proposed Project in conjunction with these ongoing and reasonably foreseeable actions will not result in any significant effect upon the global or regional climate. Similarly, current and ongoing road and construction traffic in the vicinity of the Project would have only minor contributions to pollutant and dust levels, and the low level of pollutants and dust anticipated from the proposed Project combined with these ongoing activities is not expected to result in the air quality of the region exceeding NAAQS and HAAQS requirements. The Project would result in a minor amount of construction traffic and would potentially require short-term traffic control measures along Farrington Highway during construction. However, this would make a negligible contribution to the cumulative traffic levels on the highway.

Marine and nearshore biological resources, including coral and reef habitat, EFH, reef and nearshore fish species, sea turtles and marine mammals, have the potential to be impacted by Project construction. Coral reef habitat and EFH have the potential to be impacted by transient turbidity created HDD activities and temporary shading from support vessels during F/O cable installation. Additionally, placement of the F/O cable along the seafloor could impact coral reef habitat and EFH. However, coral cover along most of the proposed cable installation route is less than 10 percent, with much of the route having less than 1 percent cover of coral (see Appendix D). Additionally, only a small area of EFH occurs along the cable route. Therefore, the Project is anticipated to have only very minor impact on coral reef habitat and EFH. When viewed in conjunction with ongoing and foreseeable future activities, such as marine recreation and commercial fishing, the contribution of the Project to cumulative effects on coral reef habitat and EFH is minimal.

Reef and nearshore fish species could be affected by temporary physical stressors (isolated habitat loss, lighting, or turbidity) during Project construction, with no permanent effects during operation of the cable. Current and ongoing recreational and commercial fishing would also contribute to impacts to reef and nearshore fish populations; however, the incremental contribution of the Project to cumulative impacts would be negligible.

Existing and ongoing risks to sea turtles are primarily from entanglement in fishing gear, effects from commercial fishing practices, human disturbance, and degradation of habitat (particularly of nesting beaches) from changes in benthic habitat, water quality, and human activity. Installation and laying of the F/O cable during Project construction has the potential to impact sea turtles due to noise; however, noise production would be temporary and underwater sound levels resulting from the Project would not significantly affect sea turtles. Impacts to sea turtles during Project construction could also occur in the event of a vessel strike; however, this is considered very unlikely. Therefore, the Project's contribution to cumulative effects to sea turtles would be minor or negligible.

The greatest and ongoing existing risks to marine mammals are from vessel strikes, entanglement in fishing gear, noise, and disturbance. Of these threats, vessel strikes and noise can also be associated with Project construction. However, the potential for impact to marine mammals from vessel strikes or noise associated with Project construction are anticipated to be less than significant. Increased vessel traffic could add to the existing but low risk of ship strikes; however, cumulative effects of ship strikes on marine mammals are expected to be negligible. As a result, the contribution of the Project action to cumulative effects on marine mammals resulting from noise or vessel strikes would be negligible.

The Project could result in minor impacts to marine recreational resources. Importantly, ocean waters would not need to be closed to ocean activities such as boating, surfing, diving, and swimming, or cable installation process, including the area between the shoreline and punch-out point. However, the area immediately around the punch-out point would be patrolled by small boats during the cable install into the HDD conduit. These impacts would be temporary, lasting for a period of 1 day during the cable installation process; public access to the area would resume following cable installation. As a result, the Project would not contribute to significant cumulative impacts to recreational resources.

As discussed above, the Project would have a beneficial direct effect on the economic and social welfare of the existing communities and businesses of Oʻahu and the State of Hawaiʻi as a result of the availability of increased bandwidth, and associated increased telecommunications speed and reliability. The Project would contribute to the broadband infrastructure in Hawaiʻi provided by the existing transpacific cables, increasing trans-Pacific connectivity as well as connectivity to other Pacific islands. These beneficial effects are not anticipated to result in new population growth. The related additional demands on public facilities, associated changes in land use patterns, and the natural environment are expected to be minimal or negligible. As a result, the Project would not result in substantial secondary impacts.

4.0 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

This section describes alternatives that were considered but eliminated from detailed study in this EA. These include selection of an alternative landing site on Maui or Hawai'i Island, an alternative landing site on O'ahu, and an alternative cable route extending from the main trunk line.

4.1 ALTERNATIVE CABLE LANDING SITE ON MAUI OR HAWAI'I ISLAND

The Applicants initially considered using a cable landing site that was to be developed by the State of Hawai'i under the Hawai'i Broadband Initiative. In 2012, the Hawai'i State Legislature passed HB2012, allocating $2.2 million for initial planning to create privately-managed, shared, open-access submarine F/O cable landing stations statewide (Wilt et al. 2013). The State's objective is to improve broadband diversity, resiliency and security. To achieve this objective, the State would develop one or two submarine cable landing sites in Hawai'i to attract cable projects and to encourage developers not to bypass the Hawaiian Islands. A dozen sites were evaluated by the State of Hawai'i and two locations on the south coast of O'ahu (Barber's Point and Kaka'ako), a site on Maui (Kihei), and a site on the Island of Hawai'i (Kona) were all considered by the Applicants. Both the Kihei and Kona sites were eliminated from further consideration as the Applicants determined that the Project would need to land on the Island of O'ahu as the landing sites on O'ahu offer a simpler and more cost effective interconnection with most other international and Hawai'i – continental U.S. (CONUS) cables. Also, landing the cable on O'ahu would better position the Project to access the Hawai'i-CONUS capacity market and help the Project compete with other submarine F/O cables connecting to the State of Hawai'i.

4.2 ALTERNATIVE CABLE LANDING SITE ON O'AHU

The proposed cable landing site at Kapolei presents the culmination of several years of investigatory work conducted by Hawaiki. Hawaiki initially identified ten cable landing options on O'ahu, including Barber's Point, Kaka'ako, and Sandy Beach (one site with two land route options associated with different landing partners) on the southern shore, and Kapolei (two sites with two landing partners), Mākaha Beach (one site with three land route options associated with different landing partners), Nānākuli, and Wai'anae on the western shore. In 2013, these sites were evaluated to determine their viability based on the following major criteria:

- **Land Availability, Cost, and Onshore Infrastructure**. The availability and cost of land for cable landing station construction and/or availability of existing onshore telecommunications infrastructure determine the economic feasibility of landing a cable at a particular site. Ideally a cable landing site provides access to onshore infrastructure that will minimize the need for additional construction and infrastructure development. It will also be easily accessible during construction and operation. Potential cable landing sites were eliminated if the cost of land acquisition was considered prohibitive or if a CLS location on a particular property was unavailable. Sites with existing onshore telecommunications infrastructure may avoid the construction of new facilities, such as a CLS and BMH; however, such sites were eliminated if significant upgrades were required to accommodate the Project. The availability of utilities required for operation of the CLS, such power and water, was also considered.

- **Access to Onshore Fiber Optic Networks and Backhauls**. Within a telecommunications network the backhaul portion of the network provides intermediate connection between the submarine cable termination and the core or backbone networks. Connection to an existing backhaul network is required to integrate the proposed submarine F/O cable with existing terrestrial telecommunications infrastructure on Oʻahu. Both distance to the backhaul network as well as the suitability and resiliency of the network were considered in selecting a cable landing site. Cable landing sites not located near a backhaul network incur greater construction costs, and may also result in greater environmental impacts, than sites located closer to a backhaul network due to the need for longer land cable routes between the BMH and the CLS.
- **Cable Landing Feasibility**. Subsea cable landing sites are typically located as much as possible in proximity to deep ocean water (i.e., 5,000 feet [1,500 meters] sea depth) to maintain long-term cable protection and avoid disturbance to other ocean uses such as fishing and recreation. Proximity of water depths of 50 to 65 feet (15 to 20 meters) also enables the cable ship approach the shoreline, avoiding the need for a separate shore end landing operation. Distance to deep ocean water and presence of vessel activity in the shallow water portion down to about 1,300 feet (400 meters), indicative of potential anchoring, were also considered in selecting a cable landing site.

  Additionally, the Applicants have selected HDD as the preferred shore crossing method. The use of HDD enables the avoidance of sensitive features in the marine environment such as coral outcrops and reefs, and minimizes the potential for damage to the cable; however, HDD is expensive to implement and can be cost prohibitive. Several potential cable landing sites were eliminated in part due to the need for long HDD routes.

- **Proximity to Existing Submarine Cables**. The proposed Project is intended to provide additional capacity and diversity to the Hawaiʻi broadband network. Adequate separation from submarine cables connecting the same destinations (Australia, New Zealand, American Samoa, and the U.S. mainland) was considered in selecting a cable landing site. This is to ensure that if a failure in one cable were to occur due to an unforeseen circumstance enough redundancy would be provided by other cables to minimize the likelihood of a disruption in service. Alternately, adequate proximity to other submarine cables was also considered to facilitate restoration agreements. This is one reason a location on the west coast of Oʻahu was selected in order to enable easy interconnection through existing terrestrial fiber optics networks with cables connecting other destinations such as Guam (to provide back up for traffic to Australia and New Zealand) and California (to provide back up for traffic to Oregon). Route selection represents an optimization of these two factors.

- **Agreement with Landing Partners**. Landing partners are the service providers responsible for operation of the CLS. To meet the Project's purpose and need, the landing partner for the Project had to be amenable to operating a "carrier neutral," open access system (see Chapter 1 for additional discussion). Potential cable landing sites were eliminated from further consideration if agreement on system operation could not be reached with the prospective landing partner.
- **Environmental Impacts**. Other potential environmental factors considered in the selection of a cable landing site include presence of marine sanctuaries and associated seasonal constraints on submarine cable installation; potential visual impacts of the CLS; potential exposure to tsunami damage; and impacts to archaeological resources.

Through this evaluation Hawaiki narrowed the list of potential O'ahu cable landing sites to Sandy Beach and Kapolei. The advantages of the Sandy Beach site were the presence of existing onshore infrastructure associated with several existing interisland submarine cables that land there, and that this site would allow adequate separation from other submarine cables connecting the same locations (providing telecommunications diversity). However, the disadvantages of the Sandy Beach site were that costs of land to be acquired were prohibitive; it is not located in proximity to suitable existing terrestrial F/O networks or backhauls; the location of the cable landing site did not minimize the extension of submarine cable on land (up to 2 miles [3 km] of land cable route); the submarine cable route to this location would cross a marine sanctuary and the presence of existing domestic interisland cables on the site would make it more difficult to land other future cables on the site.

The proposed Kapolei site requires no upland cable route; does not require crossing of the marine sanctuary; is located in proximity to existing backhauls; and is located in proximity to deep ocean waters. In addition, the Kapolei landing site would more easily accommodate the landing of other future submarine cables. Therefore, the Sandy Beach site was not carried forward for further consideration.

4.3 ALTERNATE CABLE ROUTE

Selection of the proposed cable alignment takes into account the geological and geophysical characteristics of the seafloor, potential obstructions, environmentally sensitive areas such as marine sanctuaries, sensitive habitats such as coral outcrops and reefs, cable landing feasibility (see above), and areas with high levels of marine traffic or recreation. The proposed cable route is based on data collected during bathymetric, geophysical, geotechnical and diver surveys, and is intended to provide an optimal approach to the cable landing site. Therefore, no alternative cable route to the proposed cable landing site at Kapolei was considered further.

5.0 LAND USE PLAN AND POLICY CONFORMANCE

Federal, State of Hawai'i, and City and County of Honolulu land use plans, policies, and land use controls are established to guide development pursuant to established priorities. At all levels of government, such land use controls are promulgated to address immediate and long-term social, economic, and environmental needs. This section discusses the relationship of the Project to relevant land use plans, policies, and controls.

5.1 FEDERAL

Key federal statutes relevant to the Project are discussed below.

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 a permit from the USACE for construction of any structure, such as a subsea F/O cable, in or over any navigable waters of the United States. Navigable waters are "subject to the ebb and flow of the tide and/or presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 CFR 325.5(c)(2)).

In Hawai'i, a Section 10 permit is administered by the USACE, Honolulu District. For this Project, the Applicants obtained Section 10 authorization from the Honolulu District under a Nationwide Permit (NWP) on March 17, 2017. NWPs are general permits (as opposed to individual permits) issued nationwide to authorize categories of similar activities with minor impacts. NWP-12 Utility Line Activities authorizes the construction of F/O cables for the transmission for any purpose of telephone, radio, and television communication in all waters of the United States. The NWP-12 authorization includes the Project HDD installation and use of a cable ship for cable laying, as well as the Project's upland components such as the CLS. As part of the NWP-12 permit review process, the USACE served as lead federal agency and consulted with other cooperating federal agencies, including NOAA Fisheries PIRO and Federal Highways Administration (FHWA), as required.

The submittal of a Pre-Construction Notification for a NWP-12 permit did not require a NEPA-compliant EA, but resulted in a NWP-12 verification issued pursuant to Section 10 from the USACE, Honolulu District, in coordination with other federal agencies. NWP General Conditions and Project-specific Special Conditions were imposed as part of the NWP-12 authorization. Coordination with the USACE, Honolulu District is on-going, as the Applicants will need to participate in an on-site preconstruction conference (or conference call) at least one month prior to the start of Project construction to ensure that all affected parties fully understand the requirements of the NWP-12 authorization. Additionally, notification regarding the Applicants' intent to proceed with the authorized in-water work will be given to the USACE, Honolulu District at least 72-hours in advance of commencement.

5.1.2 Clean Water Act

The CWA (33 U.S.C. §§ 1251 to 1387) is the principal law governing protection of the nation's surface waters. The CWA provides the basic structure for regulating discharges of pollutants into U.S. waters.

This Project obtained Section 10 authorization from the USACE, as CWA 404 was not applicable.

5.1.2.1 Section 401, Water Quality Certification and Section 402, National Pollutant Discharge Elimination System Permit

Sections 401 and 402 of the CWA require permits for actions that involve wastewater discharge or discharge of dredged or fill material into WoUS, including marine waters. The EPA has delegated responsibility for implementing the CWA to the states. In Hawai‘i, the HDOH CWB is responsible for issuing or denying Section 401 WQC. The Section 401 WQC informs the HDOH CWB about how each Project-related activity (e.g., marine fiber optic cable installation) would be conducted as well as the physical, chemical, and biological environmental conditions of the areas and waters within the defined Project area, out to 3 nautical miles (the limit of HDOH's jurisdiction).

A blanket Section 401 WQC is required for the USACE NWP-12 authorization due to the HDD that would terminate in nearshore waters of the State, and the likelihood that a very small volume of material and processing water would enter into these waters. The USACE, Honolulu District and the HDOH CWB were consulted to identify permitting requirements pertaining to their jurisdiction under the CWA, Section 401. The HDOH CWB received the e-Permitting NWP Blanket WQC Form on February 3, 2017 and concurred on February 6, 2017 that the Project verification is covered under the Blanket Section 401 WQC for NWP-12.

In addition, a National Pollutant Discharge Elimination System permit pursuant to the CWA, Section 402, will be filed for construction stormwater run-off or other potential construction related discharges. See Section 2.5.3 for mitigation proposed during HDD and cable-laying activities.

5.1.3 Endangered Species Act, Section 7 Consultation

The ESA and its implementing regulations in 50 CFR 17 prohibit the take of any fish or wildlife species that is federally-listed as threatened or endangered without prior approval pursuant to either Section 7 or Section 10 of the ESA. ESA Section 7(a)(2) requires each federal agency to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat (16 U.S.C. § 1536 (a)(2)). If the actions of a federal agency are not likely to jeopardize the continued existence of any endangered or threatened species, but could adversely affect the species or result in a take, the action must be addressed under Section 7 of the ESA (16 U.S.C. § 1536 (a)(2)). The ESA is administered by the U.S. Department of the Interior through the USFWS, and the U.S. Department of Commerce through the NOAA. Section 7 of the ESA requires that federal agencies consult with NOAA Fisheries and USFWS prior to undertaking or approving an activity that may adversely affect endangered species. NOAA Fisheries and USFWS are required to review the project with regard to potential impacts to endangered species and critical habitat. The federal agency (the "action agency") is required to issue a Biological Opinion and Incidental Take Statement (ITS), if it is determined that there is potential for impacts to federally-listed species.

Other applicable federal laws include the MMPA of 1972 and the MBTA of 1918. The MMPA of 1972, as amended (16 U.S.C. §§ 1361-1421(H) et seq.), prohibits, with certain exceptions, the take of marine mammals in U.S. waters and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the U.S. Under the MBTA of 1918, as amended (16 U.S.C. §§ 703 712 et seq.), taking, killing, or possessing migratory birds is unlawful. Birds protected under this act include most native birds, including their body parts (e.g., feathers), nests, and eggs. Unless permitted by regulations, under the MBTA it is unlawful to pursue, hunt, take, capture, or kill; attempt to take, capture, or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product.

Consultation was conducted by the USACE, Honolulu District during the processing of the NWP-12 application for the HDD and F/O cable installation. The proposed Project is not expected to impact federally-listed plants or animals, marine mammals, or migratory birds and is therefore considered consistent with the ESA, MMPA, and MBTA. A terrestrial flora and fauna survey to assess possible project effects on biological resources was conducted by Tetra Tech, Inc. (see Appendix E). Based on the biological study, the Project would have no adverse effects on terrestrial threatened or endangered species; therefore no mitigation measures are proposed. See Sections 2.8 and 2.9 for more information on the existing terrestrial biological resources in the Project Area and a discussion of potential environmental impacts.

A biological survey to assess potential impacts of the Project on marine resources was conducted by Tetra Tech, Inc. (see Appendix E) in September 2016. Based on the results of the marine biological survey, Tetra Tech concluded that the Project would have less than significant impacts on marine and nearshore resources and would avoid direct impacts to sensitive marine biota through the use of BMPs, including environmental protection specifications and endangered species protection. See Section 2.7 for more information on the existing marine and nearshore biological resources in the Project Area and a discussion of potential environmental impacts.

During interagency consultation pursuant to Section 7 of the ESA, the USFWS and NOAA Fisheries were consulted for concurrence with the determinations that the proposed Project would not adversely affect threatened or endangered species. A Biological Opinion was not prepared by NOAA Fisheries due to the fact that a Biological Assessment for the Project was not deemed necessary. Consultation with NOAA Fisheries has been completed.

5.1.4 National Historic Preservation Act (NHPA), Section 106 Consultation

Section 106 of the NHPA of 1966, as amended (NHPA; 16 U.S.C. § 40 et seq.), requires federal agencies to take into account the effects of a proposed action on properties eligible for inclusion in the NRHP and, if applicable, develop plans to avoid, minimize, or mitigate adverse effects to the historic properties. "Properties" are defined as "cultural resources", which include prehistoric and historic sites, buildings, and structures that are listed on or eligible for listing in the National Register of Historic Places. Under Section 106, a federal action (or undertaking) is defined as a 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; those requiring a federal permit, license or approval; and those subject to State or local regulation administered pursuant to a delegation or approval by a federal agency. The U. S. Department of Interior, National Park Service, and the Advisory Council on Historic Preservation administer the NHPA. At the State level, the State Historic Preservation Officer (SHPO), the State Historic Preservation Division (SHPD) of DLNR implements the NHPA.

An archaeological inventory survey report (AIS) was prepared by Garcia and Associates to support the Project's historic preservation review under Section 106, NHPA, HRS Chapter 6E-42, and HAR Chapter 13-284 (Appendix F). The AIS supports Project-related historic preservation consultation among federal and state agencies, interested Native Hawaiian Organizations, community groups, and individuals. The AIS investigations produced no evidence of surface or subsurface historic properties within the area of potential effect (APE). The APE has been identified as a 1.83-acre area comprised of:

- a 0.6 acre cable landing site (TMK [1] 9-2-051:011) upon which facilities will be built;
- two adjacent parcels (1.1 acres) that may be utilized temporarily as a construction staging area (TMK [1] 9-2-051:010 and 001 por.); and
- a 909-meter-long by .25-m-wide (.06-acre) subterranean HDD borehole (TMKs [1] 9-2-049:001, 002, and 005 and Farrington Highway).

The cable landing site is located within 180 feet (55 meters) of a segment of track for the OR&L rail line. The section of the OR&L line between Honouliuli and Nanakuli, which includes the track near the cable landing site, is listed in the Hawai'i State Register of Historic Places (Site 50-80-12-9714) and the National Register of Historic Places (No. 75000621). The proposed HDD conduit would be drilled at least 60 feet (18 meters) below the OR&L right-of-way and would not impact the historic resource in any way. However, because the Project will "cross" the OR&L right-of-way, the Project is requesting a Use and Occupancy Permit from HDOT, the owner of the right-of-way. The Use and Occupancy Permit requires authorization from not only HDOT, but also FHWA due to requirements specified in the deed allocating ownership rights of the OR&L right-of-way from the U.S. General Services Administration to HDOT. Authorization of use and occupancy of the OR&L right-of-way by the FHWA is considered a federal action and an undertaking as defined by the NEPA. FHWA issued a no historic properties affected determination for the OR&L right-of-way on March 13, 2017. HDOT is coordinating with FHWA to request a no effect determination under Section 7 of the Endangered Species Act and issuance of a Categorical Exclusion pursuant to 23 CFR 771.117(c)(2).

The SHPD was consulted for the proposed Project under both NHPA Section 106 and HRS Chapter 6E-42. The USACE and the FHWA both requested SHPO's concurrence with their determination of no historic properties affected by the Project. In a March 16, 2017 letter from SHPD to USACE and FHWA, the SHPO approved the use of the OR&L right-of-way and concurred with the USACE and FHWA's determination of no historic properties affected by the Project. Additionally, in a March 15, 2017 letter to Hawaiki, SHPD accepted the final AIS report as adequately meeting the requirements of HAR § 13-276-5.

A community consultation effort was undertaken as a component of the CIA investigation (Appendix G). Per the conclusions in the AIS and CIA, no culturally sensitive sites were identified in the APE.

5.1.5 Magnuson-Stevens Fishery Conservation and Management Act

The purpose of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 *et seq*.), as amended by the Sustainable Fisheries Act, Public Law 104-297, is to foster the long-term biological and economic sustainability of U.S. marine fisheries out to 200 nm (379 km) from the shore. In the Hawaiian Islands, waters out to 200 nm (379 km) are under the jurisdiction of the WPRFMC. The WPRFMC has authority over the federally managed fisheries and oversees conservation and management through the implementation of five Fisheries Ecosystem Plans, two of which apply to the Project Area. These include the Hawaiʻi Fishery Ecosystem Plan (WPRFMC 2009) and the Pelagic Fishery Ecosystem Plan (WPRFMC 1986), both of which are currently undergoing revision. The WPRFMC has also identified "Habitat Areas of Particular Concern". As defined in the 1996 amendments to the Act, these habitats are a subset of EFH that are "rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area." EFH is defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity."

A marine biological survey to assess possible Project effects on marine resources was conducted by Tetra Tech, Inc. in September 2016 (see Appendix D). The Project Area includes EFH for four Management Unit Species groups: Bottomfish and Seamount Groundfish, Pelagic Species, Crustaceans, and Coral Reef Ecosystems (WPRFMC 2009). The use of HDD will eliminate disturbance to areas inshore of the punch-out location. Physical impacts to EFH would be minimal; limited to a few square meters around the HDD punch-out location, and very short-term turbidity during the actual punch-out phase of the operation. See Section 2.6 for a discussion of the minimal impact to EFH and proposed mitigation.

5.2 STATE OF HAWAIʻI

State of Hawaiʻi statute, plans, and policies relevant to the Project are discussed below.

5.2.1 Environmental Impact Statement Law, Chapter 343, Hawaiʻi Revised Statutes

HRS Chapter 343 establishes a system of environmental review that ensures environmental concerns are given appropriate consideration along with economic and technical considerations in the decision making process of existing planning procedures of the State and counties. This EA has been prepared in compliance with Chapter 343, HRS. Actions that trigger the requirement for environmental review are set forth in HRS § 343-5. The need for Chapter 343 environmental review is due to the proposed use of submerged lands under the jurisdiction of the State DLNR OCCL and proposed use within the State's rights-of-way (OR&L and Farrington Highway), State of Hawai'i lands, and City and County of Honolulu lands (Kahe Beach Park) under which the HDD conduit would pass. As part of the EA process, a pre-consultation process was conducted with various federal, state, and county agencies and organizations. Pre-consultation comment letters and responses are included in Appendix A of this EA. In addition, a 30-day comment period upon publication of the original Draft EA in the Office of Environmental Quality Control's *The Environmental Notice* is a component of the EA process. A second 30-day public comment period occurred following publication of the Second Draft EA. Comment letters received on the original Draft EA and Second Draft EA are included in Appendix H of this EA.

5.2.2 State Land Use Law, Chapter 205, Hawai'i Revised Statutes

The State of Hawai'i Land Use Law (Chapter 205, HRS) established the State Land Use Commission (LUC) and authorizes the LUC to designate all State lands into one of four Land Use Districts: Urban, Rural, Agricultural, or Conservation. Permitted uses within each district are listed under HRS Chapter 205 and the State LUC's Administrative Rules (HAR Title 15, Chapter 15, Subchapter 3).

The Project Area crosses multiple State land use districts (Figure 1-5). The proposed cable landing site and BMH, as well as the subterranean portion of the HDD conduit, would be located within the State Agricultural District. The submerged portion of the Project is located within the State Conservation District.

The State Agricultural District was established to provide protection to lands with a high capacity for intensive cultivation. Permitted land uses within the State Agricultural District are a function of the productivity rating designation specific to the underlying land. The productivity of agricultural lands is rated by the University of Hawai'i Land Study Bureau (LSB) Detailed Land Classification. Agricultural soils have been classified as Category A, B, C, D, or E, with Category A representing the most productive soils and Category E the least productive soils. LSB A- and B-rated agricultural lands are considered to be of high value and have special protections set forth in state regulations. All agricultural lands underlying the project are Category E.

Pursuant to HAR 15-15-25(b), permissible land uses within agricultural lands with productivity rating classes of C, D, and E include those identified in HRS 205-2(d) and 205-4.5. Statutory land uses relevant to the Project are identified under HRS 205-4.5(a)(7) and include:

> *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.*

Therefore, the proposed Project is a permissible land use in the State Agricultural District.

The underlying City and County of Honolulu zoning associated with the State Agriculture District is P-2 General Preservation. The Project components would be compatible with the provisions and standards set forth in the City and County of Honolulu Land Use Ordinance (LUO). Compatibility with City and County of Honolulu land use controls is discussed in Section 5.3.3.

The submerged portion of the Project is located within the State Conservation District, Resource Subzone. The State Conservation District was established with the purpose of conserving, protecting, and preserving the important natural and cultural resources of the State through appropriate management and use to promote their long-term sustainability and the public's health, safety, and welfare. The Resource Subzone, which encompasses all lands and state marine waters between the shoreline and the extent of the State's jurisdiction, has the objective of ensuring, with proper management, the sustainable use of the area's natural resources.

Land uses within the State Conservation District require approval from the State of Hawaiʻi DLNR OCCL. The Project components within the Conservation District include portions of the HDD conduit, the conveyance of F/O cable through the HDD borehole, and the laying of F/O cable from the HDD punch-out to the seaward extent of Hawaiʻi State jurisdiction. The most applicable land use is identified HAR § 13-5-24, identified land uses in the resource subzone, R-5, Marine Construction (D-1): *Dredging, filling, or construction on submerged lands, including construction of harbors, piers, marinas, and artificial reefs*. Pursuant to HAR 13-5-24 (c)(4), land uses identified by the letter D require a Conservation District Use Permit (CDUP) from the BLNR. With an approved CDUP, the components of the Project would be consistent with State of Hawaiʻi Land Use Law.

5.2.2.1 Conservation District Use Permit

HRS, Chapter 183C, directs the DLNR and BLNR to conserve, protect, and preserve the important natural resources of the State through appropriate management and use and to promote their long-term sustainability and the public's health, safety and welfare. The DLNR and BLNR manage and regulate activities on lands within the Conservation District.

The Conservation District includes all submerged lands in the State from the shoreline to the extent of Hawaiʻi's territorial jurisdiction. Five subzones have been established within the Conservation District. As stated in Section 3.2.2, the submerged portion of the Project is located within the State Conservation District, Resource Subzone and pursuant to HAR 13-5-24 (c)(4), land uses identified by the letter D require a CDUP from the BLNR. A public hearing will be included in the CDUP application process. A right-of-entry and the granting of an easement from the Department of Parks and Recreation, City and County of Honolulu for the HDD crossing below Kahe Beach Park, TMK (1) 9-2-049: 001, located at 92-301 Farrington Highway will be required. Additionally, a right-of-entry and the granting of an easement for the submerged lands will be required from the BLNR for HDD activities and the placement and operation of the F/O cable in state submerged lands. The CDUP and easement will be sought concurrently.

5.2.3 State Environmental Policy, Chapter 344, Hawai‘i Revised Statutes

The State Environmental Policy (Chapter 344 HRS) establishes a State policy to:

> *Encourage productive and enjoyable harmony between people and their environment, promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity, and enrich the understanding of the ecological systems and natural resources important to the people of Hawaii.*

Guidelines are set forth in HRS § 344-4. The following is a discussion of the applicable policy guidelines.

(4) Parks, recreation, and open space.

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

The Project has been sited and designed so that it would not significantly impact scenic, historic, cultural, park, and recreational areas. Improvements that are located within such areas would be situated below grade and on the seafloor. At the completion of HDD, when the drill punches out on the seafloor and during the installation of the F/O cable by the cable laying ship, marine traffic in the vicinity of the construction activities would be controlled to maintain safe distances, and such activities would be limited in duration to one or two days only.

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

The Project has been designed as to avoid impacts to the shoreline. The HDD conduit from the BMH seaward would pass down to approximately 60 feet (18 meters) below ground level/seabed. Thus, there would not be construction activity or improvements at grade in the shoreline area. Similarly, construction and operation of the Project would not interrupt or impact upon shoreline activities in any manner whatsoever.

(5) Economic development.

(A) Encourage industries in Hawaii which would be in harmony with our environment.

The Project would increase broadband access for residents of Hawai‘i. The Project would provide the full bandwidth capacity of the cable system. In addition to providing bandwidth, the Project would provide network redundancy, thus building on the resilience of the submarine data network serving Hawai‘i. High-speed internet access is critical for many industries and the robustness of information networks, in terms of total bandwidth and redundancy, is important for fostering economic development. Furthermore, as detailed in the discussion on impacts to natural resources, Section 2 of this document, the proposed Project has been designed to have minimal environmental impact and would therefore be in harmony with Hawai‘i’s environment.

(9) Education and culture.

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

High-speed internet access is critical for transmitting information and is especially necessary for education. The Project would improve upon Hawai‘i’s internet infrastructure, therefore the Project would provide opportunities for formal and informal education through the provision of broadband to homes and schools.

5.2.4 Coastal Zone Management Act, Chapter 205A, Hawai‘i Revised Statutes

The Hawai‘i Coastal Zone Management (CZM) Program (HRS § 205A, Part I) complies with the federal Coastal Zone Management Act (CZMA) of 1972 (16 U.S.C. §§ 1451-1456). It is designed to protect valuable and vulnerable coastal resources and evaluates federal actions for consistency with state regulations and policies for coastal zone management. Federal agencies cannot act without regard for, or in conflict with, state policies and related resource management programs that have been officially incorporated into a federally-approved state CZM program. All lands of the State, and extending seaward to the State’s territorial limit, are within the CZM area. As a result, the proposed Project lies within the CZM area. Policies and objectives of the CZM Program are set forth in HRS § 205A-2. Because activities authorized under the NWP-12 have received state coastal zone management consistency concurrence, it is not necessary for the Project to obtain an individual state coastal zone management consistency determination from the Hawai‘i Office of Planning (see 33 CFR 330.4(d)). A concurrence with the state’s CZM program is implicit under the General and Regional Conditions of a NWP-12.

For further explanation, the following section discusses the Project’s consistency with applicable objectives and policies of the CZM Program.

5.2.4.1 Recreational Resources

Objective:

Provide coastal recreational opportunities accessible to the public.

Policies:

Improve coordination and funding of coastal recreational planning and management; and;

Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management 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 will 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: The Project Area consists of at-grade improvements, all of which are situated on the cable landing site, and subterranean and submarine actions. The shoreline crossing would be achieved through HDD and the F/O cable would be installed within the HDD conduit, which would be located up to approximately 60 feet (18 meters) below ground level/seabed until it punches out approximately 2,520 feet (768 meters) offshore at a depth of approximately 46 feet (14 meters) below the surface.

Project construction and operation would not impact in any way the ongoing and continual use of the shoreline or inland recreational areas. Because the Project would utilize HDD for cable installation, the Project would not impact the beach and shoreline. When the HDD drill bit punches out on the seafloor at the conclusion of the boring and during the installation of the F/O cable by the cable-laying ship, access to the work area and around the vessels would be controlled to maintain safe distances between the marine recreational public and the active area of work. Activity in nearshore waters (e.g., from the subsea punch-out exit point shoreward) would be preceded by published notice advising boaters to avoid the area and any restricted access would be of one or two days in duration only. Accordingly, any impacts to marine recreation would be temporary and minimal.

5.2.4.2 Historic Resources

Objective:

Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian 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: An AIS, which included a pedestrian survey and subsurface testing, was conducted for the Project. The AIS (Appendix F) consisted of a systematic pedestrian survey conducted by one SHPD-permitted principal investigator and one archaeological field technician, and excavation of 10 test trenches with a miniature tracked excavator. The surface survey revealed that modern debris from illicit dumping and squatting was present and that the middle and southwestern portions of the APE have been mechanically disturbed. Subsurface trenching sectioned two stratigraphic layers, both devoid of non-modern cultural deposits. AIS investigations produced no evidence of surface or subsurface historic properties within the APE; therefore the Project would not have an effect on historic properties. No mitigation is needed or recommended and the Project is in keeping with the CZM objective and policies regarding historic resources.

Pursuant to HRS, Chapter 6E and the requirements of the DLNR SHPD, should any historic resources, including human skeletal and significant cultural remains, be identified during Project activities, work would cease in the immediate vicinity of the find, the find would be protected from any additional disturbance. The SHPD would be contacted immediately for further instructions including the conditions under which Project activities may resume.

5.2.4.3 Scenic and Open Space Resources

Objective:

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 areas;

Ensure that new developments are 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: Project design has taken into consideration the preservation of the quality of coastal scenic and open space resources. The ‘*Ewa Development Plan* has identified views of the ocean from Farrington Highway in the corridor from Kahe Point to the Wai‘anae Development Plan area as a significant public view. Although south of Kahe Point and hence outside the ‘significant public view’ area, all above-ground components associated with the Project would be located on the cable landing site, mauka of Farrington Highway, and thus would not have any impact on public view from Farrington Highway toward or along the shoreline (See figures in Section 2.18). The CLS building would not alter public views of the ridgeline and slopes which are behind the CLS when viewed from the front of the property on Farrington Highway as the CLS building would be one story in height. With an exterior façade designed to fit in with the surrounding land uses, the CLS would not alter the nature of the area in which it is located. Furthermore, installation of the F/O cable using HDD would ensure coastal landforms would remain unaltered and the Project would not impact public views toward the ocean and/or along the shoreline.

5.2.4.4 Coastal Ecosystems

Objective:

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 proposed Project is not expected to have any adverse effects on coastal ecosystems. A potential temporary impact on marine biological resources from the proposed Project could occur when the HDD drill bit punches out on the seafloor at the conclusion of the boring and during the installation of the F/O cable by the cable-laying ship. However, marine surveys undertaken for the proposed Project were used in identifying a route and design to minimize the potential for impacts to coral reefs and disruption or degradation of coastal water resources. The F/O cable route has been sited to avoid impacts to coral reefs, and the HDD punch-out location is situated within a large sand patch at least 164 feet (50 meters) from the nearest coral reef resource.

Although HDD is considered the preferred method for cable landing due to the ability to avoid sensitive features and resources, there is some potential for an inadvertent release of drilling fluid, or "frac-out," during HDD activities. Frac-outs can be caused by blockage of the return flow around the drill pipe, and when natural fractures or unconsolidated materials are encountered. While the drilling fluid (bentonite) is non-toxic, the fine particles have the potential to smother invertebrates, plants, fish, and other aquatic organisms if large amounts are released. The potential of a frac-out during HDD activities is considered very low as the type of geological material identified at the CLS is considered suitable for HDD, and proper drilling depth for the soil conditions would be maintained in order to protect against inadvertent frac-out. Frac-outs have the highest likelihood of occurring at drill entry, drill exit, and during shallow drilling. The majority of the drilling would be greater than 60 feet (18 meters) below ground surface, which is expected to be sufficient to prevent frac-outs. Finally, the Project's Inadvertent Drilling Fluid Release (IDFR) and Contingency Plan (Appendix C) outlines measures and protocols that would be implemented to prevent, identify, contain, and properly respond to any inadvertent releases.

Construction activities at the CLS (e.g., soil disturbance, material stockpiling) have the potential to result in sediments and other pollutants onsite to be conveyed by stormwater runoff into nearby marine waters. However, the likelihood of activities on the CLS impacting marine water quality is very low due to the small disturbance area and implementation of BMPs that would prevent and minimize adverse impacts. Additionally, a detailed water quality sampling program would be developed as part of the Section 401 WQC, and water quality sampling would occur prior to, during, and following construction. The Project would also follow appropriate measures recommended by the NOAA Fisheries Protected Resources Division and USFWS.

5.2.4.5 Economic Uses

Objective:

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

Policies:

Concentrate coastal dependent development in appropriate areas;

Ensure that coastal dependent development such as harbors and ports, visitor industry facilities and energy generating facilities are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area;

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: As the Project is coastal dependent, it must be located in proximity to the shoreline. The Project has been designed to minimize adverse social, visual, and environmental impacts in the CZM area. The cable landing site parcel is part of a subdivision that created a cluster of twelve relatively small lots of less than one acre [0.4 hectare] each, on which similar uses are permitted. Additionally, the CLS would be one story in height, which would not alter public views of the ridgeline and slopes behind the station. The use of HDD for the installation of the F/O cable would further reduce environmental effects because it would allow for an F/O cable landing without altering landforms and reefs, and with considerably less impact to water resources than direct trenching. The Project would result in increased bandwidth to Hawai'i and the U.S. west coast, and would provide system redundancy, which would help with overall reliability of telecommunication connectivity with the U.S. mainland and Hawai'i. Additionally, the Project would increase direct data connections with the South Pacific markets, including American Samoa. As the Project would increase competition in international and Hawai'i-U.S. mainland broadband and create direct links to overseas markets, the Project would have positive impacts on the economy. To this end, during the pre-consultation period, Oceanic Time Warner Cable acknowledge the importance of the Project due to the need for more broadband connections between Hawai'i and the U.S. mainland (see Appendix A). The company noted that of the four transpacific cables connecting Hawai'i to the U.S. mainland, one has reached the end of its lifespan, and two are more than half way through their anticipated lifespans, with the newest having only 5 terabits of bandwidth. These factors emphasize the need for additional broadband capacity and redundancy in Hawai'i.

5.2.4.6 Coastal Hazards

Objective:

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;

Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

Prevent coastal flooding from inland projects.

Discussion: The cable landing site is located within the FIRM Zone D, an area where flood hazards are undetermined but possible. The proposed HDD corridor is located within Flood Hazard Zone D and within Flood Hazard Zone VE. Zone VE includes areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action.

The CLS would be located outside the tsunami evacuation zone, as designated by O‘ahu Tsunami Evacuation Map 15, Inset 1. The CLS is located in the Extreme Tsunami Evacuation zone, in which in the unlikely event of a major tsunami, waves would move more inland. The CLS site would be graded to ensure adequate drainage for local runoff is provided and the Project is not expected to increase the potential for flooding. Additionally, erosion control measures will be employed during construction.

5.2.4.7 Managing Development

Objective:

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 will undergo a number of statutory and voluntary processes to ensure that it is developed appropriately from both environmental and developmental perspectives. HRS 343 provides the framework for environmental review. The environmental review process commenced with the solicitation of input from public agencies. Pre-consultation comment letters and responses are included in Appendix A of this EA. In addition, the original Draft EA was published in the State Office of Environmental Quality Control Bulletin, *The Environmental Notice*. A 30-day public comment period was initiated upon publication of the first Draft EA (December 23, 2016 to January 23, 2017). Another 30-day public comment period commenced on February 23, 2017 with the publication of the Second Draft EA. Comment letters received on both Draft EAs are included in this Final EA.

In addition to the HRS 343 review, the Project will be subject to a number of development permits issued by the City and County of Honolulu including a SMA Major permit for construction of the Project within the SMA, and a shoreline setback variance (SSV) as the HDD conduit and F/O cable would be installed below the shoreline area. Both the SMA and SSV will require a public meeting. The Project will also be required to obtain a BLNR-approved CDUP from the DLNR OCCL, which is responsible for administering lands and managing development within the State Conservation District, which is inclusive of all submerged lands seaward of the shoreline. In reviewing and approving the CDUA, the OCCL and BLNR will review the appropriateness and impacts of the Project. The CDUA process also includes a public meeting.

5.2.4.8 Public Participation

Objective:

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: As discussed above, several statutorily-triggered public comment periods have concluded and public meetings associated with the various state and county permit approvals will be required. In addition to the required public engagements, the Applicants have independently sought public involvement in the Project. The Applicants have engaged local stakeholders, including adjacent property owners, neighborhood boards in the local and surrounding neighborhoods, and community associations, in order to disseminate information on the Project, establish dialog with community members, and solicit input prior to and independently of statutorily-required public meetings and review periods.

5.2.4.9 Beach Protection

Objective:

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;

Minimize the construction of public erosion-protection structures seaward of the shoreline;

Prohibit private property owners from creating a public nuisance by inducing or cultivating the private property owner's vegetation in a beach transit corridor; and

Prohibit private property owners from creating a public nuisance by allowing the private property owner's unmaintained vegetation to interfere or encroach upon a beach transit corridor.

Discussion: The Project has been sited and designed to avoid any impact to beach resources. The CLS and BMH are both located inland of the shoreline and would not interfere with natural shoreline processes. Installation of the F/O cable using HDD would allow the Project to cross approximately 60 feet (18 meters) below the shoreline without impacting the shoreline area. Additionally, BMPs implemented during construction would include erosion and stormwater control measures.

5.2.4.10 Marine Resources

Objective:

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

Policies:

Ensure 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 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: The proposed Project is not expected to have any significant adverse effects on marine resources. A potential temporary impact on marine biological resources from the proposed Project could occur when the HDD drill bit punches out on the seafloor at the conclusion of the boring and during the installation of the F/O cable by the cable laying ship. However, marine surveys undertaken for the proposed Project were used in identifying a route and design to minimize the potential for impacts to coral reefs and disruption or degradation of coastal water resources. The F/O cable route has been sited to avoid impacts to coral reefs, and, at the conclusion of HDD, the drill bit would punch out within a sandy ocean bottom at least 164 feet (50 meters) from the nearest coral reef resource.

Although HDD is considered the preferred method for cable landing due to the ability to avoid sensitive features and resources, there is some potential for an inadvertent release of drilling fluid, or "frac-out," during HDD activities. Frac-outs can be caused by blockage of the return flow around the drill pipe and when natural fractures or unconsolidated materials are encountered. While the drilling fluid (bentonite) is non-toxic, the fine particles have the potential to smother invertebrates, plants, fish, and other aquatic organisms if large amounts are released. The potential of a frac-out during HDD activities is considered very low because the type of geological material identified at the CLS is considered suitable for HDD, and proper drilling depth for the soil conditions would be maintained to protect against inadvertent frac-out. Frac-outs have the highest likelihood of occurring at drill entry, drill exit, and during shallow drilling. The majority of the HDD would be greater than 60 feet (18 meters) below ground surface, which is expected to be sufficient to prevent frac-outs. Finally, the Project's IDFR and Contingency Plan (Appendix C) outlines measures and protocols that would be implemented to prevent, identify, contain, and properly respond to any inadvertent releases. Details of the IDFR and Contingency Plan are also described in Section 2.5.2.

Construction activities at the cable landing site (e.g., soil disturbance, material stockpiling) have the potential to result in sediments and other pollutants onsite to be conveyed by stormwater runoff into nearby marine waters. However, the likelihood of activities on the cable landing site impacting marine water quality is very low due to the small disturbance area and BMP implementation that would be incorporated to prevent and minimize adverse impacts. Additionally, a detailed water quality sampling program has been developed as part of the Blanket Section 401 WQC, and water quality sampling would occur prior to, during, and following Project construction. The Project would also follow appropriate measures recommended by the NOAA Fisheries Protected Resources Division and USFWS.

5.2.5 Hawaiʻi State Plan, Chapter 226, Hawaiʻi Revised Statutes

The Hawaiʻi State Plan (Chapter 226, HRS) serves as a guide for the future long-range development of the State and sets forth goals, objectives, policies, and priorities that serve as a guide for governmental action. Considerations of the plan include economic development, protection of the natural and physical environment, the provision of public facilities and socio-cultural advancement. An analysis of the applicability of the Hawaiʻi State Plan's objectives, policies, and priority guidelines to the proposed Project is provided in Table 5-1 below. A discussion of the Project's compatibility with the applicable objectives, policies, and priority guidelines from the Hawaiʻi State Plan follows Table 5-1.

Table 5-1. Hawai'i State Plan Applicability to the Proposed Project

Hawai'i State Plan Objectives, Policies, and Priority Guidelines	Applicability to the Proposed Project
Objectives and Policies	
§226-5 Objectives and policies for population	Not Applicable
§226-6 Objectives and policies for the economy – in general	Not Applicable
§226-7 Objectives and policies the economy – agriculture	Not Applicable
§226-8 Objectives and policies for the economy – visitor industry	Not Applicable
§226-9 Objectives and policies for the economy – federal expenditures	Not Applicable
§226-10 Objectives and policies for the economy – potential growth and innovative activities	**Applicable**
§226-10.5 Objectives and policies for the economy – information industry	**Applicable**
§226-11 Objectives and policies for the physical environment – land based shoreline and marine resources	**Applicable**
§226-12 Objectives and policies for the physical environment – scenic, natural beauty, and historic resources	**Applicable**
§226-13 Objectives and policies for the physical environment – land, air, and water quality	**Applicable**
§226-14 Objectives and policies for facility systems – in general	**Applicable**
§226-15 Objectives and policies for facility systems – solid and liquid wastes	Not Applicable
§226-16 Objectives and policies for facility systems – water	Not Applicable
§226-17 Objectives and policies for facility systems – transportation	Not Applicable
§226-18 Objectives and policies for facility systems – energy	Not Applicable
§226-18.5 Objectives and policies for facility systems – telecommunications	**Applicable**
§226-19 Objectives and policies for socio-cultural advancement – housing	Not Applicable
§226-20 Objectives and policies for socio-cultural advancement – health	Not Applicable
§226-21 Objectives and policies for socio-cultural advancement – education	Not Applicable
§226-22 Objectives and policies for socio-cultural advancement – social services	Not Applicable
§226-23 Objectives and policies for socio-cultural advancement – leisure	Not Applicable
§226-24 Objectives and policies for socio-cultural advancement – individual rights and personal well-being	Not Applicable
§226-25 Objectives and policies for socio-cultural advancement – culture	Not Applicable
§226-26 Objectives and policies for socio-cultural advancement – public safety	Not Applicable
§226-27 Objectives and policies for socio-cultural advancement – government	Not Applicable
Priority Guidelines	
§226-103 Economic priority guidelines	Not Applicable
§226-104 Population growth and land resources priority guidelines	Not Applicable
§226-105 Crime and criminal justice	Not Applicable
§226-106 Affordable housing	Not Applicable
§226-107 Quality education	**Applicable**

5.2.5.1 HRS 226-10: Objective 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 Hawaii's economic base.

Policies:

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

(7) Enhance and promote Hawaii'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 will enhance Hawaii's ability to attract and develop economic activities of benefit to Hawaii;

(13) Foster a broader public recognition and understanding of the potential benefits of new or innovative growth-oriented industry in Hawaii;

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

Discussion: The Project would facilitate expanded access to telecommunications services which would help with the policy goals relating to the State's economy as presented above. The Project is intended to improve the capacity and robustness of long-distance telecommunications systems and to reinforce Hawaiʻi's role as a hub in trans-Pacific telecommunications networks, thus contributing to the future economic development of the State. Furthermore, by providing direct telecommunications access to Australia, New Zealand and select South Pacific Islands, the Project would help promote Hawaiʻi's role as a center for international relations and would open up opportunities in key Pacific economies to Hawaiʻi.

The Project would support the increased research and development of businesses and services in the telecommunications and information industries. The high operating bandwidth of the Project would help in the development of innovative, growth-oriented industry in Hawaiʻi.

5.2.5.2 HRS 226-10.5: Objectives and policies for the economy – information industry.

Objective:

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 Hawaii and the world, and make high speed communication available to all residents and businesses in Hawaii;

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

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

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

Discussion: The Project supports the above-stated objective, which recognizes that broadband communication capability and infrastructure is foundational for an innovative economy and seeks to position Hawai'i as a leader in broadband communications in the Pacific region. The Project is a private-sector "carrier-neutral" innovation to provide a service that would feed both the private and public sectors and directly benefit Hawai'i's residents and visitors. The Project would also directly benefit the State through increased telecommunications speed and reliability, due to the advanced broadband capacity and redundancy to the existing trans-Pacific cables that would be provided. As the first alternative "carrier neutral" and open access cable system of its kind in Hawai'i, the Project would also bring much needed telecommunications competition to the region. The Project would assist Hawai'i in becoming a broker, creator, and processor of information in the Pacific.

5.2.5.3 HRS 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 Hawaii'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, which represents a coastal-dependent development and involves both land-and water-based activities, has been sited in a manner that would allow for the beneficial use of natural resources and environs while minimizing any impact. When siting the Project, the Applicants took into consideration physical attributes of the area in order to meet Project parameters and to minimize any potential impact associated with its development and operation. The cable landing site is collocated with other similar uses. The Project would be compatible with surrounding land uses, activities, and natural resources due to the design of the CLS and the method of installing the F/O cable.

5.2.5.4 HRS 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 Hawaii'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 Hawaii's ethnic and cultural heritage.

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

Discussion: The cable landing site is located mauka of Farrington Highway, and therefore construction and operation of the CLS facilities would not affect views of the ocean from Farrington Highway. During installation of the F/O cable, there would be temporary impacts on ocean views due to the presence of a cable ship and support vessels; however, this impact would be short-term, lasting up to approximately one day. Therefore, the Project would maintain the scenic assets of the surrounding area and the natural beauty of the island. No archaeological resources occur within the Project Area or would be impacted by the Project (see the AIS in Appendix F). Additionally, there are no specific traditional cultural properties, valued resources, or any traditional and customary practices identified that would be impacted by the Project (see the CIA in Appendix G).

5.2.5.5 HRS 226-13: Objective and policies for the physical environment – land, air, and water quality.

Objective:

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

(2) Greater public awareness and appreciation of Hawaii's environmental resources.

Policies:

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

(2) Promote the proper management of Hawaii's land and water resources.

(3) Promote effective measures to achieve desired quality in Hawaii'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 Hawaii'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 Hawaii'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 Hawaii's people, their cultures and visitors.

Discussion: Minor, localized emissions would result from Project construction and operation of two diesel generators. BMPs would be implemented to minimize fugitive dust levels during construction, and compliance with all air quality standards would be maintained. Water resources could be impacted through the conveyance of soils or hazardous materials (e.g. fuel) or through inadvertent release of drilling fluid (i.e., bentonite clay) during HDD activities (frac-out) into the marine environment. BMPs to protect water quality would be outlined in an SWPPP and TESC plan, and 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. Additionally, measures implemented for the safe transport, handling, and storage of hazardous materials would be outlined in an SPCC plan. As a result, the Project would maintain the quality of water resources in the vicinity of the Project.

5.2.5.6 HRS 226-14: Objective and policies for facility systems – in general.

Objective:

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

Policies:

(1) Accommodate the needs of Hawaii'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 would be in-line with statewide social, economic, and physical objectives. The Project would increase the flexibility and reliability of the State's telecommunication capabilities and expand the capacity of telecommunications capabilities, resulting in long-term positive social and economic benefits.

5.2.5.7 HRS 226-18.5: Objectives and policies for facility systems – telecommunications.

Objectives:

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.

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 is intended to increase bandwidth and reliability between Hawaiʻi and the mainland U.S. and to create a direct link with Australia, New Zealand, and islands in the South Pacific. The Project represents a private-sector "carrier-neutral" effort to expand telecommunications networks in Hawaiʻi, thereby providing an overall increase in dependability, competition and market availability, while supporting the above policies and objectives. As stated above, the Project would also directly benefit the State through increased telecommunications speed and reliability, due to the advanced broadband capacity and redundancy to the existing transpacific cables that would be provided.

5.2.5.8 HRS 226-107: Quality education.

Priority guidelines to promote quality education:

(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 bolster telecommunications capabilities between Hawaiʻi and the U.S. mainland, American Samoa, Australia, New Zealand, and other Pacific Islands and enhance data transmission speeds and reliability. Such improvements would enable significantly enhanced use of information technology in education and the exchange of information for educational purposes.

5.3 CITY AND COUNTY OF HONOLULU

Ordinances, plans, and policies established by the City and County of Honolulu, as applicable to the Project, are discussed below.

5.3.1 General Plan for the City and County of Honolulu

The *General Plan for the City and County of Honolulu* (Department of General Planning, City and County of Honolulu 1992, amended in 2002; General Plan) is the comprehensive set of policies and objectives aimed at directing the long-term development of O‘ahu and setting forth strategies for achieving them. The General Plan, adopted in 1992 and amended in 2002, describes general conditions to be sought over the approximately 20-year planning period and is intended to coordinate action by bodies within the City and County of Honolulu government, to guide ordinance, to influence budget decisions, and to inform policymakers and decision makers at all levels of government, private enterprise, and the general public.

The City and County of Honolulu guides and directs land use and growth through a three-tier land use planning and management system, which is inclusive of objectives, policies, planning principles, guidelines, and regulations. The General Plan forms the first tier of this system and is the guiding document for long-range development of the Island of O‘ahu. The General Plan describes general conditions to be sought over the 20-year planning horizon and outlines policies to help direct attainment of the plan’s objectives. An update to the General Plan is currently underway that will look at the critical issues of growth, development, and quality of life that island residents are most concerned about, including regional population, economic health, affordable housing, and sustainability. The General Plan includes a list of county-wide goals, objectives, policies, and implementing actions and those most applicable to the Project are discussed below.

5.3.1.1 Economic Activity

Objective A: To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.

Policy 1: Encourage the growth and diversification of Oahu's economic base.

Policy 3: Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature.

Policy 4: Encourage the development of local, national, and world markets for the products of Oahu-based industries.

Objective G: To bring about orderly economic growth on Oahu.

Policy 1: Direct major economic activity and government services to the primary urban center and the secondary urban center at Kapolei.

Discussion: The Project is in harmony with Economic Activity Objectives A and G as the Project would support Oʻahu's economic growth by improving telecommunications capabilities between Hawaiʻi and the mainland U.S. Broadband has been recognized as critical infrastructure to the State of Hawaiʻi's advancement in education, health, public safety, research and innovation, economic diversification and public services (Hawaii Broadband Taskforce 2009). The Project would create direct telecommunication connections to countries in the Pacific Rim and would assist with developing world markets for products of Hawaiʻi-based industries. Furthermore, the Project would be located in a place that balances environmental concerns, existing compatible development, and concerns related to security and system resilience and is thus in line with Objective A, Policy 3, listed above.

5.3.1.2 Natural Environment

Objective A: To protect and preserve the natural environment.

> *Policy 1: Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development.*

Objective B: To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

> *Policy 2: Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas.*
>
> *Policy 3: Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea.*

Discussion: Environmental due diligence conducted to date includes a comprehensive biological survey of the cable landing site to identify native habitats, wetlands and streams, and threatened and endangered species (see Appendix E). The Project does not coincide with any terrestrial natural reserves or other sensitive areas. A marine biological survey was also conducted by divers to assess possible Project effects on marine resources (see Appendix D). Based on the results of the marine survey, the Project would have no adverse effects on marine resources and would avoid direct impacts to sensitive marine biota through the use of BMPs, including environmental protection specifications and endangered species protection.

The location and design of the Project will minimize impacts to visual resources. All Project components makai of the cable landing site, including the HDD conduit, will be located below ground or below the surface of the ocean. Accordingly, the Project will not in any way obstruct views of the sea. The CLS will be located mauka of Farrington Highway and will consist of below-grade improvements and the construction of a one-story landing station and generator room that will be clad in a façade designed to fit in with the surrounding land uses. Hence, the Project components within the cable landing site will have a minimal impact on views toward the slopes behind the cable landing site as would be viewed from Farrington Highway.

5.3.1.3 Transportation & Utilities

Objective C: To maintain a high level of service for all utilities.

Policy 1: Maintain existing utility systems in order to avoid major breakdowns.

Objective D: To maintain transportation and utility systems which will help Oahu continue to be a desirable place to live and visit.

Policy 3: Encourage the study and use of telecommunications as an alternative to conventional transportation facilities.

Discussion: As a high operating bandwidth telecommunications system providing data connections to the U.S. mainland and the South Pacific, the Project would enable existing telecommunications systems to meet growing data demands. The Project would also increase the redundancy of submarine telecommunications systems serving the State and improve overall reliability. As the Project would increase internet bandwidth in Hawai'i, the Project would facilitate the use of telecommunications as an alternative to conventional transportation facilities.

5.3.1.4 Physical Development and Urban Design

Objective A: To coordinate changes in the physical environment of Oahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.

Policy 7: Locate new industries and new commercial areas so that they will be well related to their markets and suppliers, and to residential areas and transportation facilities.

Objective C: To develop a secondary urban center in Ewa with its nucleus in the Kapolei area.

Objective D: To maintain those development characteristics in the urban-fringe and rural areas which make them desirable places to live.

Policy 1: Develop and maintain urban-fringe areas as predominantly residential areas characterized by generally low rise, low density development which may include significant levels of retail and service commercial uses as well as satellite institutional and public uses geared to serving the needs of households.

Objective E: To create and maintain attractive, meaningful, and stimulating environments throughout Oahu.

Policy 2: Integrate the City and County's urban- design plan into all levels of physical planning and developmental controls.

Policy 9: Design public structures to meet high aesthetic and functional standards and to complement the physical character of the communities they will serve.

Discussion: The Project has been planned, engineered, and designed to be in compliance with the physical and urban design goals of the General Plan. Considerations included siting the Project near Kapolei in the 'Ewa district. The Project represents a permitted use in this area and will be designed to blend in with the character of the surrounding uses.

5.3.2 'Ewa Development Plan

The second tier of the land use planning and management system is formed by Development Plans and Sustainable Community Plans, referred to collectively as development plans (DPs). The City and County of Honolulu is divided into eight regional areas. The various DPs have been created for areas where population growth and development activity is to be directed over the next 25 years while Sustainable Community Plans have been created for the areas which are envisioned as relatively stable and which public action will focus on supporting existing populations. DPs are required by City Charter and administered by the Department of Planning and Permitting (DPP). The plans are intended to help guide public policy, investment, and decision-making through the 2020 planning horizon (City and County of Honolulu 2012).

The Project is located within the ‘*Ewa Development Plan*. The overarching narrative of the ‘*Ewa Development Plan* is that the area will be developed into a second urban center for O‘ahu, with its nucleus in the City of Kapolei. The horizon for the development goals extends to the year 2035 while broader development trends are projected further out. In order for the vision to be implemented, the ‘*Ewa Development Plan* includes land use controls, such as growth boundaries, land use districts, and identified or otherwise protected land features; land use policies and guidelines, which focus on types of land uses and geographic locations with the DP area; and policies and guidelines for public facilities and infrastructure. The relevant land use controls, policies, and guidelines as presented in the ‘*Ewa Development Plan*, and the Project's compliance with them, are presented below.

5.3.2.1 Land Use Controls

The ‘*Ewa Development Plan* establishes several land use controls as defined in conceptual maps. The Community Growth Boundary represents the area in which urban development will be confined while providing adequate land for future urban development. All lands within the DP are further classified by land uses, representing both current and projected land uses. Land uses include Agricultural Areas, Preservation Areas, Urban Areas, Golf Courses, and Parks. The Urban Areas are further delineated into more specific use categories. Panoramic views are also identified in the ‘*Ewa Development Plans* and generally include public view corridors of either the mountains or the ocean.

Discussion: The Project is located within the Community Growth Boundary and therefore is in concert with the intent of the Community Growth Boundary. The Project area is located in Preservation land use areas. Instead of permitting or restricting specific uses, land uses in the DP are descriptive of the land conditions and generally reflect existing uses or influence future changes to LUO zoning districts. The Project's conformance with the LUO and land use zoning is discussed in the following section.

The Project area is in the vicinity of one panoramic view defined in the ‘*Ewa Development Plan:* "Views of the ocean from Farrington Highway between Kahe Point and the boundary of the Wai‘anae Development Plan Area" (City and County of Honolulu 2012). This panoramic view corridor is located just north of the cable landing site and is oriented from Farrington Highway towards the ocean, away from the cable landing site. All above-grade improvements would be mauka of Farrington Highway so the Project would not impact the panoramic view.

5.3.2.2 Open Space Preservation and Development

General Policies

Use open space to:

- *Protect scenic views and natural, cultural, and historic resources*

Guidelines

Shoreline Areas

- *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.*

Discussion: Project components makai of Farrington Highway would be constructed and installed below grade. The Project would not have impacts on the identified view corridor of the ocean from Farrington Highway. The CLS would include a single-story building and accessory features designed to blend in with the surrounding development and would not impact views of the Waiʻanae Range. No cultural or historic resources would be impacted by project components.

While the Project is coastal-dependent and the HDD conduit and F/O cable would pass under the shoreline setback area, all improvements would be below grade. The HDD conduit would be located approximately 60 feet (18 meters) below ground level/seabed and would not be subject to erosion hazards.

5.3.2.3 Historic and Cultural Resources

General Policies:

- *Preserve significant historic features from the plantation era and earlier periods.*
- *Retain significant vistas whenever possible*

Guidelines

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

- *To allow connectivity within the region, accommodate cross-traffic at appropriate intervals along the right-of-way, and at sufficient distances from one another to prevent impeding normal locomotive operations.*
- *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: Project components makai of Farrington Highway, including the area within the OR&L right-of-way, would be constructed below grade, with no surface disturbance or above-grade improvements. The Project would not have impacts on the identified view corridor of the ocean from Farrington Highway, nor would it impact operations of the locomotive. The CLS will include a single-story building and accessory features designed to blend in with the surrounding development and would not impact views of the Waiʻanae Range. The buildings would be set back more than 50 feet (15 meters) from the OR&L right-of-way.

5.3.2.4 Natural Resources

General Policies:

- *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: Light at the CLS will be shielded and downward facing, activated by a motion detector or as needed to reduce effects of artificial light at night.

5.3.3 City and County of Honolulu Zoning

The third tier of the City and County of Honolulu's land use planning and management system is composed of municipal ordinance and regulation. The LUO, comprising Chapter 21 of the ROH establishes zoning districts, defines appropriate land uses within each zoning district, classifies Oʻahu's lands within the zoning districts, sets forth development standards, and provides other regulations pertaining to land use. The purpose of the LUO, according to §21-1.20:

> *...is to regulate land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the Oahu general plan and development plans, and to promote and protect the public health, safety and welfare.*

The proposed Project is a privately owned telecommunications facility and fits within the definition of a utility installation. As the impacts on adjacent land uses would be minimal, the Project would be a Type A Utility Installation. Conversely, Type B utility installations (as defined by LUO Article 10) are those with potential major impact, by virtue of their appearance, noise, size, traffic generation or other operational characteristics. As the Project would not have major impacts on surrounding land uses, it is not considered a Type B Utility Installation.

The Project would be located within three zoning districts: C Country, AG-2 General Agricultural, and P-2 General Preservation (Figure 1-6). The CLS and BMH are located on TMK (1) 9-2-051:011, which is completely within the C Country District. This is the only zoning district in which above-grade Project components would be developed.

The portion of the Project that would pass below the Farrington Highway right-of-way is within the AG-2 General Agriculture District. Between the shoreline and the Farrington Highway right-of-way, the land is designated as P-2 General Preservation District. According to LUO Article 3, Table 21-3, Type A Utility Installations are a permitted use in the C Country District and a permitted use subject to standards set forth in Article 5, LUO in the AG-2 Agricultural District and the P-2 Preservation District.

LUO Article 5 standards pertaining to Utility Installations, Type A in Agricultural and Preservation districts are described in LUO § 21-5.650(b). However, this standard only applies to Type A Utility Installations involving a transmitting antenna. The Project does not utilize a transmitting antenna.

5.3.4 Special Management Area (SMA)

The SMA is a regulated zone extending inland from the shoreline to the landward boundary as designated by the City and County of Honolulu. Within the SMA, no development may be permitted without review under the SMA guidelines and determination of the significance of the development. Pursuant to HRS Chapter 205A, authority for implementing the SMA is delegated to the counties. The City and County of Honolulu's SMA provisions are set forth in ROH Chapter 25, and the DPP administers the SMA.

All terrestrial portions of the Project are located within the SMA. As the valuation of the Project exceeds $500,000, an SMA Use Permit - Major would be required for the Project, in accordance with ROH Chapter 25. The SMA Major permit involves review by the DPP and includes a public hearing that would be held in the vicinity of the Project. Findings of the DPP are transmitted to the Honolulu City Council for final approval.

5.3.5 Shoreline Setback Variance (SSV) Permit

HRS Chapter 205A establishes shoreline setbacks in which certain activities and development are prohibited. Chapter 205A authorizes counties to administer and enforce shoreline setback rules. The shoreline setback rules for the City and County of Honolulu are set forth in ROH Chapter 23, with the purpose:

> *to protect and preserve the natural shoreline, especially sandy beaches; to protect and preserve public pedestrian access laterally along the shoreline and to the sea; and to protect and preserve open space along the shoreline.*

ROH Chapter 23 establishes the shoreline setback line, which is generally 40 feet (12 meters) inland from the certified shoreline, and establishes standards, criteria, and procedures for the granting of a variance from the shoreline setback prohibitions. SSVs are reviewed and granted by the DPP and the standards for granting an SSV are listed in ROH § 23-1.8. The standards for granting an SSV under ROH § 23-1.8(b) include:

- Shoreline-dependent Facility Standard;
- Public Interest Standard; and
- Hardship Standard.

The proposed Project would require an SSV to address the use of land for HDD within the 40-foot (12-meter) setback of the certified shoreline as determined by the State Survey Office, DLNR. An SSV application will be submitted to the DPP upon submittal of the Final EA and issuance of a Finding of No Significant Impact (FONSI) by the Chair of BLNR. A shoreline survey has been conducted by a registered land surveyor and submitted to the State Land Division for certification. A public hearing will be required for the SSV permit and will likely be conducted in conjunction with the SMA Use Permit application.

The proposed Project meets two of the three standards defined under ROH § 23-1.8(b) as criteria for granting a variance: the "Shoreline-dependent Facility Standard" and the "Public Interest Standard". The shoreline-dependent facility standard specifies under ROH § 23-1.8(b)(1) that "a variance may be granted for an activity or structure that is necessary for or ancillary to a shoreline-dependent facility or improvement, including drainage facilities and boating, maritime or ocean sports recreational facilities; provided that the proposal is the practicable alternative which best conforms to the purpose of the shoreline setback rules." The proposed Project meets this standard based on the following discussion points:

- The proposed Project would be a shoreline-dependent facility given that the trans-Pacific submarine F/O cable is required to physically cross the shoreline setback area to connect to the cable landing site.
- Alternative cable landing sites were investigated in detail on O'ahu (see Section 4.2) and ultimately the Applicants narrowed the alternative sites to the Sandy Beach site and the Kapolei site (see Section 4.2 for more detail regarding the alternatives considered but eliminated from detailed study). The Kapolei landing site was ultimately selected because it avoids crossing a marine sanctuary, requires no upland cable route, is located in proximity to existing backhauls, and is located in proximity to deep ocean waters thus avoiding disturbance to ocean uses such as fishing and recreation. Additionally, the Kapolei landing site would more easily accommodate the landing of future submarine cables.
- Landing the Project's F/O cable at an already established CLS was not a viable option given the Project's purpose and need to provide direct and affordable telecommunication connectivity between Hawai'i, the mainland U.S., Australia, New Zealand, and other Pacific islands and to provide additional cable redundancy to the Hawai'i submarine cable network. Increased redundancy is provided through the Kapolei landing site as it accommodates a cable route to the south of the Island of O'ahu when most existing cables are routed to the north of the island.

The public interest standard specifies under ROH § 23-1.8(b)(2) that "a variance may be granted for an activity or structure that is necessary for or ancillary to facilities or improvements by a public agency or by a 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 which best conforms to the purpose of this chapter and the shoreline setback rules." The proposed Project is a private facility undertaken by a private entity and would be considered "clearly in the public interest" based on the following discussion points:

- The proposed Project will serve the public interest by providing enhanced communication capability necessary to support the growing demand for telecommunication services and will respond to the needs identified under the Hawai'i Broadband Initiative by contributing to the development of broadband infrastructure in the State and providing additional international connectivity, thereby facilitating the State's global competitiveness and promoting Hawai'i's role as a center for international relations, trade, finance, technology, education, culture and arts among Australia, New Zealand, American Samoa, Hawai'i, and the U.S. mainland.

- The proposed Project would also benefit the State through increased telecommunication speed and reliability, due to the provision of advanced broadband capacity and redundancy to the existing transpacific cables. The Project facilitates at least 25 years of broadband connectivity for Hawai'i.
- The proposed Project would also be the first "carrier neutral" and open access cable system of its kind in Hawai'i and would bring much needed telecommunications competition to the region. Due to Hawai'i's remote location and small market, there is limited competition among broadband service providers and transpacific cable operators that provide connectivity to points outside of Hawai'i (Hawai'i Department of Commerce and Consumer Affairs 2012). This presents few options for Hawai'i consumers and reduces cost competitiveness. Additionally, with advances in fiber optic technology enabling longer fiber spans, several cables already directly connect the U.S. mainland to Asia or the South Pacific and bypass Hawai'i, further reducing cost competitiveness amongst the existing transpacific cable systems serving Hawai'i. DRFortress has been selected by Hawaiki as their landing and operating partner in Hawai'i. This key appointment is entirely consistent with Hawaiki's open access principles, as DRFortress is the only carrier-neutral datacenter and cloud services provider operating in Hawai'i.
- As stated above, the proposed Kapolei landing site is the alternative which best conforms to the purpose of the shoreline setback rules and regulations.

5.4 APPROVALS AND PERMITS

A table of permits and approvals required for the Project (anticipated and acquired) is presented below in Table 5-2.

Table 5-2. Acquired and Anticipated Approvals and Permits

Permit / Approval	Responsible Agency
Federal	
Cable Landing License	Federal Communications Commission
Nationwide Permit 12 under Section 10 of the Rivers and Harbors Act of 1899	USACE, Honolulu District
Standard Local Operating Procedures for Endangered Species in the Central and Western Pacific Region (Pac-SLOPES)	USACE, Honolulu District
National Historic Preservation Act Section 106 Consultation	SHPD, FHWA, and HDOT Highways Division
ESA Section 7 Consultation	NOAA Fisheries, Pacific Islands Regional Office and USFWS
Magnuson-Stevens Fishery Conservation and Management Act Consultation, inclusive of EFH Assessment	NOAA Fisheries, Habitat Conservation
State of Hawai'i	
HRS 343 Environmental Assessment	DLNR, OCCL, and SHPD
Conservation District Use Permit	DLNR, OCCL
Right-of-Entry and Grant of Submarine Easement within State Waters	DLNR, BLNR

Table 5-2. Acquired and Anticipated Approvals and Permits (continued)

Permit / Approval	Responsible Agency
Coastal Zone Management Consistency Certification	Hawaiʻi Office of Planning and USACE, Honolulu District
Blanket CWA Section 401 Water Quality Certification	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
Permit to Discharge into the State Highways Drainage System	HDOT Highways Division
City and County of Honolulu	
Special Management Area Use Permit (Major)	DPP Land Use Permits Division
Shoreline Setback Variance	DPP Land Use Permits Division
Grading Permit	DPP Site Development Division
Right-of-Entry and Grant of Easement within Park (Kahe Beach Park)	Department of Parks and Recreation
Building Construction Permit	DPP Building Division

6.0 UNAVOIDABLE ADVERSE IMPACTS

Construction may result in unavoidable short-term, localized adverse impacts to soils, biological and wildlife resources, noise, water quality, air quality, and scenic and aesthetic resources. However, construction-related impacts are temporary and will be mitigated through implementation of BMPs (see Chapter 2). No long-term unavoidable adverse impacts are anticipated; rather, the Project would result in beneficial long-term impacts by providing direct telecommunications connectivity between Hawaii, American Samoa, the mainland United States, Australia, and New Zealand and possibly, other Pacific Islands. The Project will directly benefit Hawai‘i through increased telecommunications speed and reliability, due to the advanced capacity and redundancy that would be provided.

7.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

A commitment of resources is irreversible when the primary or secondary impacts limit the future options for a resource. An irretrievable commitment refers to the use, or consumption, of resources that are neither renewable nor recoverable for future use.

The Project Area, including the cable landing site and HDD conduit, is zoned for agricultural land uses. Currently, the cable landing site is vacant and is dominated by plant species not native to the Hawaiian Islands. After construction is completed, the onshore portion of the Project Area would be restored as much as possible to its pre-construction conditions around the new construction. No nearshore or ocean waters would need to be permanently closed to ocean activities such as boating, surfing, diving and swimming as a result of Project construction and operations. As a result, no irreversible commitments of resources are anticipated.

Project construction would require the commitment of fiscal, human, and material resources. However, impacts to these resources are negligible and are outweighed by the beneficial long-term impacts of providing improved telecommunications service.

8.0 FINDINGS AND DETERMINATION

To determine if construction and operation of the Project may have a significant impact on the physical and human environments, the expected consequences of the Project have been evaluated, including potential primary, secondary, short-term, long-term, and cumulative impacts. Based on this evaluation, OCCL as the Accepting Authority determined a Finding of No Significant Impact (FONSI). The supporting rationale for this finding is presented in this chapter.

8.1 SIGNIFICANCE CRITERIA

The discussion below evaluates the significance of the Project's impacts based on the significance criteria set forth in the HAR § 11-200-12.

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

Discussion: The Project will not result in an irrevocable commitment to loss or destruction of any natural or cultural resources. The onshore portion of the Project Area (i.e., the cable landing site) is dominated by plant species not native to the Hawaiian Islands, and does not provide suitable habitat for listed and/or rare plant species. After construction is completed, the cable landing site will be restored as much as possible to its pre-construction conditions around the new construction. No unique or high quality wildlife habitats occur at the cable landing site, and the Project would not result in a substantial loss of wildlife habitat. Although there is some potential to impact terrestrial wildlife including the Hawaiian hoary bat, Hawaiian short-eared owl, Hawaiian petrel, and Newell's shearwater, adverse impacts would be avoided through implementation of the mitigation measures identified in Chapter 2 such as conducting pre-construction clearance surveys for Hawaiian short-eared owl nests and using down shielded lighting during construction and operation to minimize seabird attraction and disorientation.

Similarly, impacts to marine and nearshore biological resources would be avoided and minimized through the BMPs and mitigation measures described in Chapter 2 such as timing construction to avoid coral spawning season; avoiding construction in reef and nearshore fish, sea turtle and marine mammal breeding areas or other sensitive habitats; monitoring an Exclusion Zone and Hazard zone to avoid noise disturbances; pausing construction near the HDD punch-out location when marine mammals or sea turtles are present; reducing vessel operational noise if humpback whales are observed within 100 yards (90 meters) or if other species of whales, dolphins, monk seals, and sea turtles are observed within 50 yards (45 meters) during operations; and reducing the number of cable crossing structures. The submarine portion of the cable would be laid on the seabed, requiring no trenching or burying, and the use of HDD would minimize disturbance to benthic habitat. Some impacts resulting from increased turbidity, noise, and ship traffic may occur at the HDD punch-out site and as a result of Project vessel operations; however, these impacts are expected to be localized, short-term, and minor, and not result in significant adverse effects or the loss or destruction of natural resources.

One culturally significant site, a traditional Hawaiian fishing shrine located approximately 295 feet (90 meters) south of the Project Area, was documented during research for the Project. Fishing and the gathering of marine resources were identified as the dominant traditional Hawaiian activities in the area historically. The Project would not affect the culturally significant site, and continued collection of marine resources would not be affected by the Project because the coastline would not be impacted by the Project (see the CIA in Appendix G for additional detail).

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

Discussion: The Project would not curtail the range of beneficial uses of the environment. The cable landing site is currently vacant.

During installation an approximately 328-foot (100-meter) safe zone will be created around the installation area. This area will be patrolled by the use of small boats or jet skis, to keep patrons and vessels out of the work area. Additionally a Local Notice to Mariners will be issued prior to the arrival of the vessel to the area. However, public access to the area would resume following cable installation. No nearshore ocean waters would need to be closed between the shoreline and the subsea punch-out point, and no ocean waters would need to be closed to ocean activities such as boating, surfing, diving, and swimming during the approximately 1.5-day cable-laying and installation process. Because the cable would be installed below grade by HDD between the punch-out point and the CLS, the Project would have no adverse impacts on continued use of the shoreline environment. The materials used, including naturally occurring clay lubricants such as bentonite, would be environmentally benign and have no adverse impact on the environment. The 0.6-acre (0.2-hectare) cable landing site would include permanent infrastructure such as the CLS building, two diesel generators, a parking area, and a subterranean BMH, which would preclude use of the site for other purposes.

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;***

Discussion: The Project is consistent with the State's environmental polices established in Chapter 344, HRS, which are to conserve natural resources and enhance the quality of life.

The Project is consistent with the following Chapter 344 guidelines:

(3) Flora and fauna.

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

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

(4) Parks, recreation, and open space.

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

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

(10) Citizen participation.

(A) Encourage all individuals in the State to adopt a moral ethic to respect the natural environment; to reduce waste and excessive consumption; and to fulfill the responsibility as trustees of the environment for the present and succeeding generations; and

(B) Provide for expanding citizen participation in the decision making process so it continually embraces more citizens and more issues.

4. Substantially affects the economic or social welfare of the community or State;

Discussion: The Project would not substantially affect the economic or social welfare of the community or State.

The Project would have a beneficial effect on the economic and social welfare of the communities and businesses of Oʻahu and the State of Hawaiʻi as a result of the increased telecommunications speed and reliability that would be provided. In addition, the Project would create temporary construction jobs and two permanent jobs on the southwest shore of Oʻahu.

5. Substantially affects the public health;

Discussion: The Project, with the implementation of BMPs and mitigation measures identified in Chapter 2, including designing Project structures to meet or exceed current building code requirements for seismic risk on Oʻahu; preparation of a Site Safety Handbook; minimizing noise impacts by optimizing hours of operation for loud procedures, enforcing access road speed limits, using electrically-powered equipment, where feasible and equipping combustion engines with noise-reducing features; locating stockpile, equipment staging, parking, and maintenance areas away from noise-sensitive receptors; using noise-producing signals for safety warning purposes only; and implementing a dust control plan, would not substantially affect public health. Construction-related impacts to air quality and noise would be temporary and minor, and the Project would be developed in compliance with all federal, state, and local rules and regulations related to public health. Construction and operation of the Project would have no direct impact to existing health care facilities and emergency services and is not expected to place substantial additional demands on health care or emergency services in the area.

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

Discussion: Impacts associated with this Project are related to installation activities and are therefore anticipated to be temporary. Although the Project would contribute to the beneficial effects associated with the availability of increased bandwidth, this is not anticipated to result in new population growth and the related additional demands on public facilities and associated changes in land use patterns and the natural environment. As a result, the Project would not result in substantial secondary impacts including population changes and effects on public facilities.

7. *Involves a substantial degradation of environmental quality;*

Discussion: The Project would not involve a substantial degradation of environmental quality. The Project's environmental impacts are anticipated to be temporary and localized. The undeveloped portions of the CLS site would be restored as much as possible to its pre-construction conditions, including planting with native Hawaiian plants or non-invasive plants, and construction-related impacts to soils, biological and wildlife resources, noise, water quality, air quality, and scenic and aesthetic resources would be temporary, and would be avoided and minimized through implementation of BMPs and mitigation measures (see Chapter 2 and discussion under numbers 1 and 5 above and number 10 below).

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

Discussion: The Project would neither result in considerable cumulative effects on the environment nor involve a commitment for larger actions. Reasonable foreseeable actions that overlap in time and space with construction and/or operation of the Project, and have the potential to cumulatively affect the environment, include ongoing vessel traffic, marine recreation and commercial fishing, and road and other construction traffic. However, Project impacts are anticipated to be short-term and localized, and not result in considerable effects on the environment when considered together with these actions.

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

Discussion: No rare, threatened, or endangered plant species or their habitat would be impacted by the Project. The onshore portion of the Project Area does contain suitable habitat for rare, threatened, or endangered wildlife species, including potential foraging and roosting habitat for the Hawaiian hoary bat, and potential foraging and nesting habitat for the Hawaiian short-eared owl. Additionally, although the onshore portion of the Project Area does not provide suitable nesting or foraging habitat for two listed seabirds (the endangered Hawaiian petrel and threatened Newell's shearwater), individuals may fly over the Project Area at night and may be attracted to construction lights at night. However, impacts to these four terrestrial wildlife species would be avoided through implementation of BMPs and mitigation measures, including avoiding removal of large trees that may contain juvenile Hawaiian hoary bats, conducting pre-construction surveys for nesting Hawaiian short-eared owl, and using down shielded lighting for nighttime construction, although not anticipated, during seabird peak fallout period (see Chapter 2).

Similarly, impacts to rare, threatened, and endangered sea turtles and marine mammals would be avoided and minimized through the BMPs and mitigation measures described in Chapter 2 and under number 1 above. Some impacts resulting from increased turbidity, noise, and ship traffic may occur at the HDD punch-out site and as a result of Project vessel operations; however, these impacts are expected to be localized, short-term, and minor, and not expected to substantially affect rare, threatened, or endangered marine species or their habitats. No impacts would occur to monk seal Critical Habitat, either terrestrial or marine.

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

Discussion: The Project would not detrimentally affect air or water quality or ambient noise.

Construction activities such as use of heavy equipment and vehicles would result in the release of some air pollutants, and the clearing and excavating of land could result in the generation of fugitive dust. However, the elevated air pollutant and fugitive dust levels would occur at relatively low levels, would primarily occur during construction, and BMPs such as maintaining vehicles and equipment in proper working order; complying with state and federal vehicle and emission standards; and preparing and implementing a dust control plan to control fugitive dust levels would minimize the magnitude and extent of these emissions. Onshore construction activities also have the potential to result in sediments and other pollutants onsite being conveyed by stormwater runoff into nearby marine waters. However, the likelihood of these activities impacting marine water quality is low due to the small disturbance area and BMPs that would be incorporated to prevent and minimize adverse impacts, such as preparing and implementing a TESC Plan and SWPPP for the Project.

During construction, the use of grading, boring, and cable laying equipment would result in a temporary increase in noise, especially associated with the HDD drilling rig. However, this increased noise level would be short-term and localized. Operational noise sources would primarily consist of the two back-up diesel generators housed in a sound-dampened room adjacent to the CLS building; as a result, noise impacts from operation are anticipated to be minor.

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;

Discussion: All building structures associated with the Project would be built to meet or exceed current building code requirements, and thus no impacts to the Project from hurricanes, tropical storms, earthquakes, or seismicity are anticipated.

The HDD conduit is located within a high risk flood area and tsunami evacuation zone; however, the conduit would be installed below ground and therefore would not be impacted in the event of a flood or tsunami. Otherwise, the majority of the Project Area is located within an area where analysis of flood hazards has not been conducted and flood hazards are undetermined; thus, flood risks to the Project are unknown. However, the implementation of stormwater runoff measures as discussed in Chapter 2 and described under number 10 above would minimize the potential for flood events.

The onshore portion of the Project is located within the extreme tsunami evacuation zone, meaning evacuation is only recommended during an extreme tsunami warning generated by a very large earthquake with a magnitude of 9 or more. The probability of an extreme tsunami event during construction and operations of the Project is minimal. Therefore, the probability of impacts to the Project resulting from tsunamis is low.

12. Substantially affects scenic vistas and view planes identified in County or State plans or studies; or;

Discussion: The Project would not substantially affect scenic vistas and view plans identified in County or State plans or studies. The Project would involve the temporary presence of vessels and equipment during construction that would be visible to beach users, but would not substantially affect the vista or viewplane. Vessels and construction equipment would be removed upon completion of the installation, and thus have no permanent effect on vistas or viewplanes. Permanent Project infrastructure such as the parking lot, BMH, and CLS are not expected to impact the existing scenic vistas or view planes of the area.

13. Requires substantial energy consumption.

Discussion: The Project would not require substantial energy consumption. Construction activities would result in a short-term increase in energy consumption, including fueling construction vehicles, equipment, and vessels; however, this increase would be temporary and is not anticipated to be substantial.

8.2 DETERMINATION

Pursuant to Chapter 343, HRS, OCCL, as the Accepting Authority, determines a FONSI for this EA. This finding is founded on the basis of impacts and mitigation measures examined in this document and public comments received during the pre-consultation and public review phases and analyzed under the above criteria.

9.0 CONSULTATION

In the course of planning for the Project, community meetings were held and pre-assessment consultation letters were mailed to solicit comments to be addressed in the EA. These efforts are summarized in the following subsections.

9.1 COMMUNITY MEETINGS

Community outreach for the Project began in October 2016. The Applicants hosted four community meetings for the purpose of introducing the Project, providing an overview of the planning process, and meeting with community members. These included:

- Two stakeholder meetings held in Kapolei on October 8, 2016, with members from the Kapolei Community Development Corporation, Kapolei Hawaiian Homestead Association, and Ko Olina Cultural Practitioners invited;
- A stakeholder meeting held in Wai‘anae on October 8, 2016, with members from Ahupua‘a O Nānākuli Homestead Association, Nānākuli Hawaiian Homestead, Kahanu Hawaiian Homestead Association, Wai‘anae Hawaiian Homestead Association, Maili Hawaiian Homestead Association, other leaders in the area invited; and
- A stakeholder meeting held in Kapolei on October 9, 2016, with members of West O‘ahu Hawaiian Civic Clubs invited.

The stakeholder meetings were attended by representatives of Hawaiki, TE SubCom, DRFortress, and Tetra Tech and included presentations and facilitated question and answer sessions. Comments were informally collected from meeting attendees to identify issues for consideration as the subject of future community meetings. A fact sheet with Project information was provided at the meetings.

The Applicants provided presentations to the Wai‘anae Coast, Nanakuli/Maili, and Makakilo/Kapolei/Honokai Hale Neighborhood Boards. Six presentations have been conducted to date. These include:

- A presentation on October 13, 2016 at the regularly scheduled meeting of the Waianae Coast Neighborhood Board Housing and Development Committee;
- A presentation on October 26, 2016 at the regularly scheduled meeting of the Makakilo/Kapolei/Honokai Hale Neighborhood Board;
- A presentation on November 1, 2016 at the regularly scheduled meeting of the Waianae Coast Neighborhood Board;
- Two presentations on November 15, 2016, and January 17, 2017, at the regularly scheduled meeting of the Nanakuli/Maiki Neighborhood Board; and
- A presentation on January 18, 2017, at the regularly scheduled meeting of the Villages of Kapolei Neighborhood Board.

Attendance at these meetings provided additional opportunities to keep the community informed about the status of the Project and opportunities for public involvement.

9.2 PRE-ASSESSMENT CONSULTATION

A total of 57 pre-assessment consultation letters were mailed on June 13, 2016, prior to preparation of the Draft EA. The purpose of the pre-assessment consultation is 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 pre-assessment consultation letters is used to inform the content of the Draft EA. A total of 18 submissions were received in response to the pre-assessment letters. A list of the agencies and other stakeholders to whom pre-assessment consultation letters were sent is provided in Table 9-1. Copies of the written comments and responses are included in Appendix A.

Table 9-1. Company and Agency Early Consultation Correspondence

Company/Agency
U.S. Army Corps of Engineers, Honolulu District Regulatory Office
U.S. Coast Guard, Honolulu Sector
U.S. Department of Transportation, Federal Highways Administration
U.S. Fish and Wildlife Service, Pacific Islands Field Office
National Oceanic and Atmospheric Administration National Marine Fisheries Service , Endangered Species Branch
U.S. Navy Region Hawaii (N4 / NAVFAC Hawaii)
Mazie Hirono, US Senator
Brian Schatz, US Senator
Office of Rep. Mark Takai, Hawaii 1st US Congressional District
Tulsi Gabbard, Hawaii 2nd US Congressional District
State of Hawaiʻi Department of Agriculture
State of Hawaiʻi Department of Business, Economic Development, and Tourism, Office of Planning
State of Hawaiʻi Department of Hawaiian Home Lands
State of Hawaiʻi Department of Health
State of Hawaiʻi Department of Health, Clean Water Branch
State of Hawaiʻi Department of Health, Environmental Planning Office
State of Hawaiʻi Department of Land and Natural Resources
State of Hawaiʻi Department of Land and Natural Resources, Commission on Water Resource Management
State of Hawaiʻi Department of Land and Natural Resources, Division of Aquatic Resources
State of Hawaiʻi Department of Land and Natural Resources, Office of Conservation and Coastal Lands
State of Hawaiʻi Department of Land and Natural Resources, State Historic Preservation Division
State of Hawaiʻi Department of Transportation
Office of Hawaiian Affairs
State Representative, District 42
State Representative, District 43
State Senator, District 20
State Senator, District 21
City and County of Honolulu, Board of Water Supply
City and County of Honolulu, Department of Budget and Fiscal Services

Table 9-1. Company and Agency Early Consultation Correspondence (continued)

Company/Agency
City and County of Honolulu, Department of Design and Construction
City and County of Honolulu, Department of Environmental Services
City and County of Honolulu, Department of Facility Maintenance
City and County of Honolulu, Department of Parks and Recreation
City and County of Honolulu, Department of Planning and Permitting
City and County of Honolulu, Department of Transportation
City and County of Honolulu, Fire Department
City and County of Honolulu, Police Department
Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34
Nānākuli-Māʻili Neighborhood Board No. 36
Kimberly Marcos Pine, Honolulu City Council, District 1,
Hawaiian Electric Company
Hawaiian Telcom
Oceanic Time Warner Cable
Ahahui Siwila Hawaii O Kapolei
Hui Waʻa Kaukahi Kayak Club of Hawai'i
Kalaeloa Heritage and Legacy Foundation
Kapolei Community Development Corp.
Ko ʻOlina Marina
Ko ʻOlina Ocean Adventures
Ko ʻOlina Resort Association
Nanaikapono Hawaiian Civic Club
Nānākuli Homestead Association
Paradise Cove Luau
Sandwich Isles Communication, Inc.
Villages of Kapolei Association
Western Pacific Fisheries Management Council
Wet'n'Wild Hawaii

9.3 DRAFT ENVIRONMENTAL ASSESSMENT

The original Draft EA was published for public review in the December 23, 2016, issue of the State OEQC's bulletin, *The Environmental Notice*. Subsequent refinements in the Project design shifted the punch-out exit point and HDD conduit to the north, adding two new Tax Map Key parcels to the Project. A Second Draft EA was published February 23, 2017, to inform stakeholders of modifications to the proposed Project made since the publication of the original Draft EA. A 30-day public comment period was initiated with the publication of the original Draft EA, running from December 23, 2016, to January 23, 2017 and with the publication of the Second Draft EA, running from February 23, 2017 to March 28, 2017. The purpose of the public comment period is to solicit input from the public on the scope and content of the analysis.

A total of 18 submissions were received on the original Draft EA and 11 submissions were received on the Second Draft EA. A list of comment letters received during the public comment periods is provided in Table 9-2. Copies of the comments received and the written responses addressing the comments are included in Appendix H. Of the 29 total comments letters received, 6 involved no comments, 18 had comments that did not require edits to the EA, and 5 required minor revisions or clarifications to the EA. Table 9-2 includes a reference to the EA sections where comments were addressed.

Table 9-2. Comments Received During the Draft EA Public Comment Periods and Final EA Section Reference

No.	Commenter	Date of Letter	Final EA Section Reference
ST-1	State of Hawaii Office of Planning	1/23/17	Section 2.5, Section 5.2.5
ST-2	Hawaii Department of Health, Clean Water Branch	1/4/17	Section 2.4, Section 2.5
ST-3	Hawaii Department of Health, Environmental Planning Office	1/9/17	--
ST-4	Department of Land and Natural Resources (DLNR), Division of Aquatic Resources	1/18/17	--
ST-5	DLNR, Division of Boating and Ocean Recreation	12/21/17	--
ST-6	DLNR, Land Division	12/21/17	--
ST-7	State of Hawaii Dept. of Hawaiian Homelands	1/12/17	--
ST-8	DLNR, Commission on Water Resource Management	1/30/17	Section 2.4.1
ST-9	DLNR, Engineering Division	2/10/17	--
ST-10	Hawaii Department of Transportation, Highways Planning Branch	2/7/17	Section 2.15, Section 5.1.4
ST-11	Hawaii Department of Health, Environmental Planning Office	3/14/17	--
ST-12	DLNR, Land Division	3/22/17	--
ST-13	DLNR, Division of Boating and Ocean Recreation	3/21/17	--
ST-14	DLNR, Engineering Division	3/21/17	--
ST-15	DLNR, State Historic Preservation District	3/23/17	--
ST-16	Hawaii Department of Transportation, Highways Planning Branch	2/7/17	Section 2.15, Section 5.1.4
CO-1	City and County of Honolulu, Department of Transportation Services	1/18/17	--
CO-2	City and County of Honolulu, Police Department	1/4/17	--
CO-3	City and County of Honolulu, Department of Facility Maintenance	1/10/17	--
CO-4	City and County of Honolulu, Department of Budget and Fiscal Services	1/10/17	--
CO-5	City and County of Honolulu, Dept. of Planning and Permitting	1/24/17	Section 1.3, Section 2.5.2, Section 2.18, Section 5.3.5

Table 9-2. Comments Received During the Draft EA Public Comment Periods and Final EA Section Reference (continued)

No.	Commenter	Date of Letter	Final EA Section Reference
CO-6	City and County of Honolulu, Board of Water Supply	1/23/17	--
CO-7	City and County of Honolulu, Honolulu Fire Department	1/27/17	--
CO-8	City and County of Honolulu, Department of Parks and Recreation	3/13/17	--
CO-9	City and County of Honolulu, Honolulu Fire Department	3/14/17	--
CO-10	City and County of Honolulu, Police Department	3/8/17	--
CO-11	City and County of Honolulu, Department of Design and Construction	3/14/17	--
CO-12	City and County of Honolulu, Board of Water Supply	3/13/17	--
ORG-1	Kalaeloa Heritage and Legacy Foundation	1/19/17	--
ORG-2	Hawaiian Electric Company	3/16/17	--

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APPENDIX A

PRE-CONSULTATION COMMENTS AND RESPONSES

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

July 7, 2016

Ms. Megan Higgins
Tetra Tech
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

Subject: Your Letter Dated June 13, 2016 Requesting Comments on the Environmental Assessment for the Proposed Hawaiki Submarine Cable Landing Project in Kapolei – Tax Map Keys: 9-1-057: 026, 9-1-056: 001, 9-2-049: 001, 9-2-049: 002, 9-2-049: 005, 9-2-051: 011

Thank you for the opportunity to comment on the proposed project.

The existing water system is adequate to accommodate the proposed submarine cable landing project. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The construction drawings should be submitted for our review, and the construction schedule should be coordinated to minimized impact to the water system.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

TETRA TECH

October 5, 2016

Ernest Y.W. Lau, P.E.
City and County of Honolulu
Board of Water Supply
530 South Beretania Street
Honolulu, Hawai‘i 96843

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Lau:

Thank you for your letter dated July 7, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom (the Applicants), please see the following responses to your comments.

Thank you for confirming that the existing water system is adequate to accommodate the proposed Project. We also understand that the Board of Water Supply reserves the right to change this position up until the final approval of the building permit application for the proposed Project and that the final decision on availability of water will not be confirmed until the building permit application is submitted for approval. We further understand that when water is made available, the Applicants will be required to pay the Board of Water Supply Water System Facilities Charges for resource development, transmission, and daily storage. Per your request, construction drawings and construction schedule will be submitted to the Board of Water Supply for review as part of the building permit application process.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

July 1, 2016

Tetra Tech
Attn: Megan Higgins
737 Bishop Street, Suite 2340
Mauka Tower
Honolulu, HI 96813

Dear Ms. Higgins

Subject: Pre- Consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Hawaii, TMKs: (9) 1-057:026, (9) 1-056:001, (9) 2-049:001, (9) 2-049:002, (9) 2-049:005, and (9) 2-051:011

The Department of Design and Construction, Facilities Division has the following comments.

> The description of the project indicates that the cable will pass under the shoreline and have a beach manhole in the vicinity of the Kahe Point and Makaiwa Beach Parks. Tetra Tech will need to clarify the exact impacts to these parks. They will be required to obtain approval for an easement if this project crosses through the City's park property.

Thank you for the opportunity to review and comment. If there are any further questions about this issue, please call Clifford Lau at 768-8483.

Sincerely,

for M. Yonamine

Robert J. Kroning, P.E.
Director

RJK:ms(656110)

TETRA TECH

October 5, 2016

Robert J. Kroning, P.E.
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-049:005, (1) 9-2-051-010, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Kroning:

Thank you for your letter dated July 1, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

Thank you for confirming that approval for an easement would be required if the Project crosses through Kahe Point or Makaiwa Beach Parks. We also understand that you would like clarification regarding impacts to Kahe Point or Makaiwa Beach Parks from the proposed Project. No adverse impacts to either Kahe Point or Makaiwa Beach Park are anticipated from the proposed Project because the beach manhole would be located on an upland parcel mauka of Farrington Highway on land owned by Hawaiki Submarine Cable LP. Additionally, horizontal directional drilling (HDD) activities would result in underground installation of the fiber optic cable within a borehole/drill pipe conduit with no disturbance or effect to the surface. Impacts from the proposed Project, including any potential impacts to Kahe Point and Makaiwa Beach Parks, will be detailed in the Draft Environmental Assessment being prepared for this Project.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, THIRD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHAEL D. FORMBY
DIRECTOR

MARK N. GARRITY, AICP
DEPUTY DIRECTOR

TP6/16-656486R

July 8, 2016

Ms. Megan Higgins
Project Manager
Tetra Tech, Inc.
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

SUBJECT: Pre-Consultation Draft Environmental Assessment (DEA), Hawaiki Submarine Cable Landing Project, Kapolei, Oahu, Hawaii

This is in response to your letter dated June 13, 2016, requesting our review and comments for the Hawaiki Submarine Cable Landing Project. We do not have any comments at this time.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Renee Yamasaki of my staff at 768-8383.

Very truly yours,

Michael D. Formby
Director

TETRA TECH

October 5, 2016

Michael D. Formby
City and County of Honolulu
Department of Transportation Services
650 South King Street, Third Floor
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-049:005, (1) 9-2-051-010, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Formby:

Thank you for your letter dated July 8, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, we acknowledge your comment that you have no concerns from a transportation services standpoint.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

July 1, 2016

Ms. Megan Higgins, Project Manager
Tetra Tech, Inc.
737 Bishop Street, Suite 2340
Mauka Tower
Honolulu, Hawaii 96813

Dear Ms. Higgins:

Subject: Preconsultation for the Proposed Hawaiki Submarine Cable Landing Project
Kapolei, Hawaii
Tax Map Keys: 9-1-056: 001
9-1-057: 026
9-2-049: 001, 002, and 005
9-2-051: 011

In response to your letter dated June 13, 2016, regarding the above-mentioned subject, the Honolulu Fire Department determined that there will be no significant impact to fire department services.

Should you have questions, please contact Battalion Chief Terry Seelig of our Fire Prevention Bureau at 723-7151 or tseelig@honolulu.gov.

Sincerely,

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/SY:bh

TETRA TECH

October 5, 2016

Socrates D. Bratakos
City and County of Honolulu
Honolulu Fire Department
636 South Street
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-049:005, (1) 9-2-051-010, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Bratakos:

Thank you for your letter dated July 1, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, we acknowledge your comment that the City and County of Honolulu Fire Department has no concerns regarding the Project.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
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DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

July 20, 2016

Ms. Megan Higgins, Project Manager
Tetra Tech, Incorporated
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

SUBJECT: Pre-Consultation for the Proposed Hawaiki Submarine Cable Landing Project Kahe Point Beach Park, Oahu

Thank you for the opportunity to review and comment at the Pre-Consultation stage of the environmental impact statement for the subject project.

The Department of Parks and Recreation has no comment at this time other than to remind you that the City will require that a request for a Grant of Easement for any cable lines or equipment that will affect City owned property be submitted.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(656218)

cc: Dexter Liu, Department of Parks and Recreation
Glenn Kajiwara, Department of Parks and Recreation

TETRA TECH

October 5, 2016

Michele K. Nekota
City and County of Honolulu
Department of Parks and Recreation
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Ms. Nekota:

Thank you for your letter dated July 20, 2016 on the proposed Hawaiki Submarine Cable Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

Thank you for confirming that the City will require submission of a request for a Grant of Easement for any cable lines or equipment that will affect City-owned property. We also acknowledge your comment that you have no concerns from a parks and recreation standpoint.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

GEORGE I. ATTA, FAICP
DIRECTOR

ARTHUR D. CHALLACOMBE
DEPUTY DIRECTOR

2016/ELOG-1549(ST)

July 13, 2016

Ms. Megan Higgins, AICP
Project Manager
Tetra Tech, Inc.
737 Bishop Street, Suite 2340 (Mauka Tower)
Honolulu, Hawaii 96813

Dear Ms. Higgins:

Subject: Pre-consultation for a Draft Environmental Assessment
Hawaiki Submarine Cable Landing
Makaiwa Beach - Kapolei
Tax Map Key: 9-1-57: 26

This is in response to your letter dated June 13, 2016, regarding the proposed to cable landing of a transcontinental submarine cable at the above referenced site.

Based on the information provided, we find that a Shoreline Setback Variance will be required to the cross the shoreline near Makaiwa Beach Park despite the fact that horizontal directional drilling will allow the cable conduit to be installed under the 40-foot shoreline setback area. While we recognize that adverse impacts to the shoreline may be minimal, the shoreline area which is protected pursuant to Chapter 23, Revised Ordinances of Honolulu includes the vertical column below the surface of the setback area. Admittedly, at some depth, the potential for impacts to the surface and nearshore waters of the shoreline become miniscule. However, at this point in time, that depth has not been determined.

If you have any questions, please contact Steve Tagawa of our staff at (808) 768-8024.

Sincerely yours,

for George I. Atta, FAICP
Director

cc: / DLNR-Office of Conservation & Coastal Lands
(OCCL)

TETRA TECH

October 5, 2016

George I. Atta, FAICP
City and County of Honolulu
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Atta:

Thank you for your letter dated July 13, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

Thank you for confirming that a Shoreline Setback Variance would be required to cross the shoreline near Makaiwa Beach Park even though horizontal directional drilling (HDD) will allow the cable conduit to be installed under the 40-foot shoreline setback area. We understand that the shoreline area protected pursuant to Chapter 23, Revised Ordinances of Honolulu includes the vertical column below the surface of the setback area. A Shoreline Setback Variance application will be submitted for the Project, following the completion of the HRS Chapter 343 environmental review process.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

LOUIS M. KEALOHA
CHIEF

MARIE A. McCAULEY
CARY OKIMOTO
DEPUTY CHIEFS

OUR REFERENCE MT-DK

June 22, 2016

Ms. Megan Higgins, Project Manager
Tetra Tech, Inc.
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

This is in response to your letter of June 8, 2016, requesting comments on a Pre-Consultation, Draft Environmental Assessment, for the proposed Hawaiki Submarine Cable Landing Project in Kapolei.

Based on the information provided, this project should have no significant impact on the services or operations of the Honolulu Police Department at this time.

If there are any questions, please call Major Sean Naito of District 8 (Kapolei) at 723-8403.

Thank you for the opportunity to review this project.

Sincerely,

LOUIS M. KEALOHA
Chief of Police

By
for MARK TSUYEMURA
Management Analyst VI
Office of the Chief

Serving and Protecting With Aloha

October 5, 2016

Mark Tsuyemura
City and County of Honolulu
Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Tsuyemura:

Thank you for your letter dated June 22, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, we acknowledge your comment that the City and County of Honolulu Police Department has no concerns regarding the Project.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

DEPARTMENT OF BUDGET AND FISCAL SERVICES
CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET, ROOM 208 • HONOLULU, HAWAII 96813
PHONE: (808) 768-3900 • FAX: (808) 768-3179 • INTERNET: www.honolulu.gov

KIRK CALDWELL
MAYOR

NELSON H. KOYANAGI, JR.
DIRECTOR

GARY T. KUROKAWA
DEPUTY DIRECTOR

June 30, 2016

Ms. Megan Higgins
Project Manager
Tetra Tech Inc.
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

Subject: Proposed Hawaiki Submarine Cable Landing Project
Kahe Point Beach Park, TMK: 9-1-049:001

In response to your letter dated June 13, 2016 regarding the above-mentioned subject, the City will require that a request for a Grant of Easement for any cable lines or equipment that will affect the City-owned property be submitted. Specific terms and conditions of the easement grant will be determined after a formal request is received by our Director and is reviewed by the various City agencies, including the Department of Parks and Recreation, which has jurisdiction of the parcel.

Please contact Tammy Namihira at 768-3942 should you have any questions or need further assistance.

Sincerely,

Wendy K. Imamura
Purchasing Administrator

WKI/tn

cc: Department of Parks and Recreation

TETRA TECH

October 5, 2016

Wendy K. Imamura
City and County of Honolulu
Department of Budget and Fiscal Services
530 South King St., Room 208
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Ms. Imamura:

Thank you for your letter dated June 30, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

Thank you for confirming that the City will require submission of a request for a Grant of Easement for any cable lines or equipment that will affect City-owned property. The proposed Project will not cross over or under any City-owned property, including Kahe Point Beach Park, and therefore would not require a Grant of Easement from the City.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Ulu'ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 16-513

July 11, 2016

Ms. Megan Higgins, Project Manager
Tetra Tech, Incorporated
737 Bishop Street, Suite 2340
Mauka Tower
Honolulu, Hawaii 96813

Dear Ms. Higgins:

SUBJECT: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii
TMKs: (9)1-057:026, (9)1-056:001, (9)2-049:001, (9)2-049:002, (9)2-049:005, and (9)2-051:011

Thank you for the opportunity to review and comment on your letter dated June 13, 2016, on the above subject.

We have no comments at this time, as we do not have any facilities or easements on the subject property.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

Ross S. Sasamura, P.E.
Director and Chief Engineer

TETRA TECH

October 5, 2016

Ross S. Sasamura, P.E.
City and County of Honolulu
Department of Facility Maintenance
100 Ulo`ohia Street, Suite 215
Kapolei, Hawaii 96707

Re: Comments on the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Sasamura:

Thank you for your letter dated July 11, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, thank you for confirming that the Department of Facilities Maintenance has no facilities or easements on the subject property.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON
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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 6/29/16
DAR # 5320

MEMORANDUM

TO: Bruce S. Anderson, DAR Administrator
DATE: June 29, 2016
FROM: Paul Murakawa, Aquatic Biologist
SUBJECT: Pre-Consultation for the Proposed Hawaiki Submarine Cable Landing Project

Comment	Date Request	Receipt	Referral	Due Date
	6/13/16	6/15/16	6/16/16	7/13/16

Requested by: Megan Higgins, Tetra Tech Inc.

Summary of Proposed Project

Title: Pre-Consultation for the Proposed Hawaiki Submarine Cable Landing Project

Project by: Megan Higgins, Tetra Tech Inc. for Hawaiki Submarine Cable LP and TE SubCom)

Location: Kapolei, Oahu TMKs: (9)1-057:026, (9)1-056:001, (9)2-049:001, (9)2-049:002, (9)2-049:005, and (9)2-051:011

Brief Description:

The Hawaiki Cable System is an approximately 9,320 mile long submarine fiber optic cable consisting of a route extending from Oregon to Australia with a connection in Kapolei, Hawaii. The proposed cable landing site is located in Kapolei near the Waimanalo Gulch Landfill and HECO's Kahe Power Plant. The cable will be laid on the seafloor along a predetermined route and landed via construction of up to two sub-oceanic horizontal directionally drilled (HDD) bore pipes. The HDD portion of the route will extend from a punch out point in approximately 50-65 feet and underneath Farrington Highway to a beach manhole.

Comments:

DAR has reviewed the proposed project and has the following comments. DAR would recommend a complete biological (fish, mobile invertebrates and corals) survey conducted at the proposed punch out location(s) and along the route of the fiber optic cable out to the limit of State waters (3 nautical miles).

The results of the biological survey will determine if long-term monitoring will be required. DAR recommends that Best Management Practices (BMPs) be developed for the HDD to prevent petroleum based products and any lubricants used during the drilling from entering the ocean environment. DAR recommends BMPs be developed to prevent runoff and/or sediment, from the construction of the proposed upland features (beach manhole, cable landing station, and parking area) of project, from entering the ocean environment.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plans; DAR requests the opportunity to review and comment on those changes.

TETRA TECH

October 5, 2016

Bruce S. Anderson
State of Hawaii
Department of Land and Natural Resources, Division of Aquatic Resources
1151 Punchbowl Street, Room 330
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Anderson:

Thank you for your letter dated June 29, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

Marine biological surveys have been conducted for the proposed punch-out location and along the route of the fiber optic cable within State waters out to a safe diver depth (approximately 30 meters depth). The results of these surveys and the potential impacts to marine and nearshore biological resources will be addressed in the Draft Environmental Assessment being prepared for the Project. Habitat mapping was also conducted during the survey to assist with the Project's Essential Fish Habitat (EFH) consultation. We also understand that the results of these biological survey will determine if long-term monitoring would be required.

We acknowledge that the Division of Aquatic Resources recommends that Best Management Practice (BMPs) be developed for construction of the upland features (cable landing station, beach manhole, and parking area) to prevent runoff, sediment, and/or petroleum based products from entering the ocean environment. Prior to construction, site-specific measures will be developed and outlined in the Project's temporary erosion and sediment control plan and Storm Water Pollution and Prevention Plan (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. Additionally, a Spill Prevention, Containment, and Countermeasure (SPCC) Plan will be prepared prior to construction which will include measures for the safe transport, handling, and storage of hazardous materials.

We also acknowledge the Division of Aquatic Resources' recommendation to develop BMPs for Horizontal Directional Drilling activities to minimize potential impacts to marine waters. The Project's Inadvertent Drilling Fluid Release and Contingency Plan (or "Frac-out" Plan) will outline measures that would be implemented to prevent, identify, contain, and properly respond to any inadvertent releases of drilling fluids. Detailed BMPs and mitigation measures related to water quality will be developed during the Clean Water Act Section 404, 401, and 402 permit processes, as well as other applicable county, state, and federal regulations.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 16-220

June 23, 2016

Ms. Megan Higgins
Tetra Tech Inc.
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813
Email: Megan.Higgins@tetratech.com

Dear Ms. Higgins:

SUBJECT: Pre-consultation (PC) for the Proposed Hawaiki Submarine Cable Landing Project Kapolei, Oahu TMK: (9)1-057:026, (9)1-056:001, (9)2-049:001, (9)2-049:002, (9)2-049:005, and (9)2-051:011

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your PC to our office.

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments. EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: http://health.hawaii.gov/epo/egis.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

We suggest you review the requirements of the CWB (HAR, Section 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch, Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared.

In order to better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

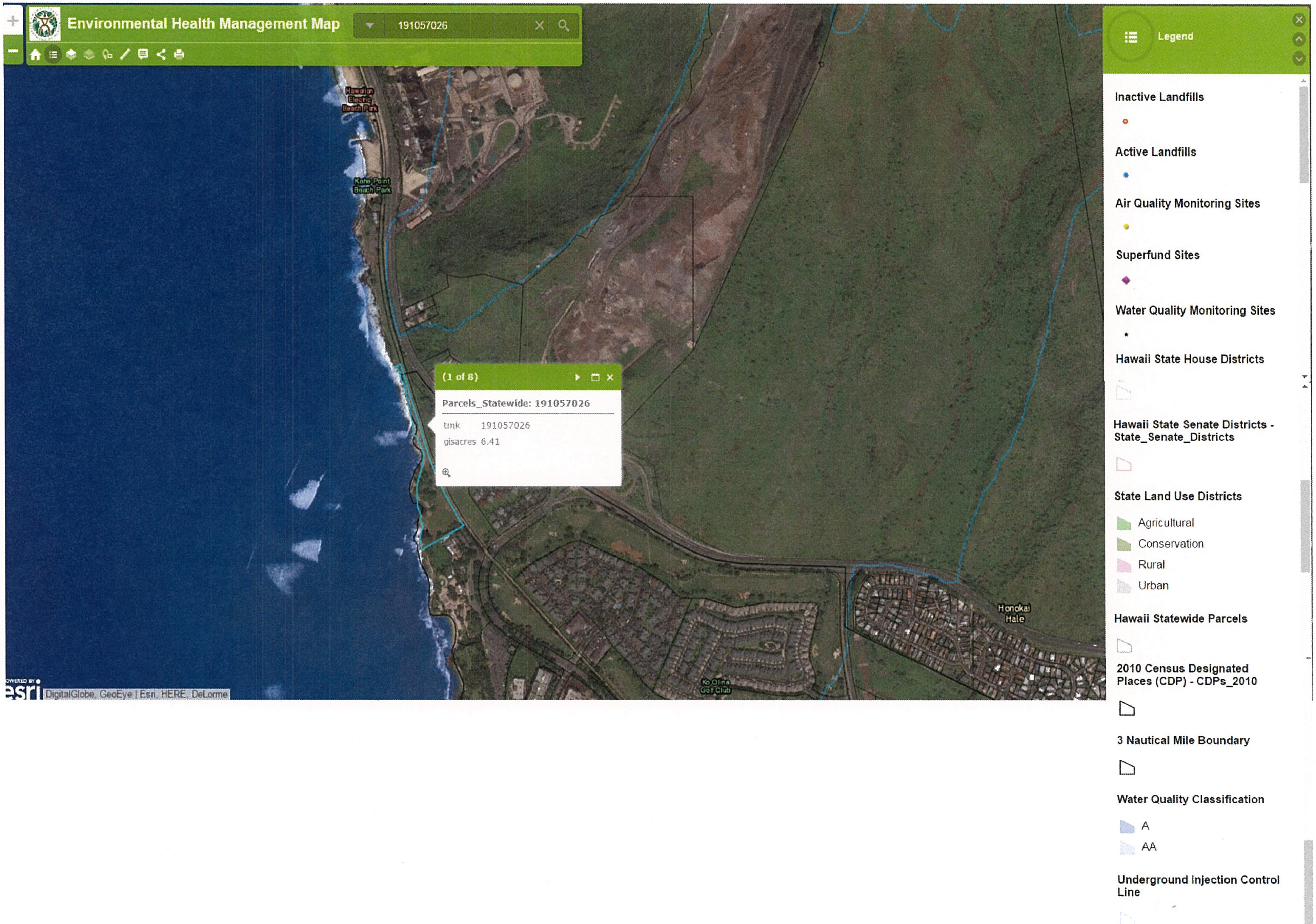
Mahalo nui loa,

Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

LM:nn

Attachment: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis

c: DOH: CWB {via email only}



Environmental Health Management Map
191057026
Hawaiian Electric Beach Park
Kahe Point Beach Park
(1 of 8)
Parcels_Statewide: 191057026
tmk 191057026
gisacres 6.41
Honokai Hale
Ko Olina Golf Club
POWERED BY esri
DigitalGlobe, GeoEye | Esri, HERE, DeLorme
Legend
Inactive Landfills
Active Landfills
Air Quality Monitoring Sites
Superfund Sites
Water Quality Monitoring Sites
Hawaii State House Districts
Hawaii State Senate Districts - State_Senate_Districts
State Land Use Districts
Agricultural
Conservation
Rural
Urban
Hawaii Statewide Parcels
2010 Census Designated Places (CDP) - CDPs_2010
3 Nautical Mile Boundary
Water Quality Classification
A
AA
Underground Injection Control Line

TETRA TECH

October 5, 2016

Laura Leialoha Phillips McIntyre, AICP
Department of Health
Environmental Planning Office
P.O. Box 3378
Honolulu, Hawaii 96801-3378

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Ms. Phillips McIntyre:

Thank you for your letter dated June 23, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

We understand that the Department of Health (DOH), Environmental Planning Office (EPO) strongly recommends regular review of state and federal environmental health land use guidance during the development and implementation of the proposed Project. Additionally, we reviewed the standard comments on your website and the following provides a response to the applicable standard comments:

1. Clean Air Branch

   The Project would be constructed in compliance with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. The contractor will implement measures to control fugitive dust, as needed, during construction of the Project which may include watering areas of exposed soils 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, and covering "open-bodies" trucks. These measures will be incorporated into the EA.

2. Clean Water Branch

   Standard best management practices would be implemented to avoid and minimize impacts to surface and ground water quality and quantity associated with Project construction and operation to ensure compliance with State Water Quality Standards. Best Management Practices and mitigation measures with regards to water resources will be developed during the Clean Water Act (CWA) Section 404, 401, and 402 permit processes and will be incorporated into a Project-specific Temporary Erosion and Sediment Control (TESC) Plan and Stormwater Pollution Prevention Plan (SWPPP) plans. The Applicants are currently consulting with the Army Corp of Engineers, Regulatory Branch to verify permit requirements.

3. Hazard Evaluation & Emergency Response Office

   A Phase I ESA was conducted in the Project Area in 2015. No recognized environmental conditions (REC), controlled REC, or historical REC were found within the Project Area.

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

4. Indoor and Radiological Health Branch
    a. The Project will comply with the provisions of HAR §11-39 Air Conditioning and Ventilating; §11-45 Radiation Control; and §11-46 Community Noise Control.
    b. Construction of the Project will not introduce, and is not anticipated to require handling of any asbestos-containing material.
5. Safe Drinking Water Branch

    The Project does not involve providing a new source of potable water or a new public water system. Additionally, the Project does not involve construction of a new injection well.
6. Solid and Hazardous Waste Branch
    a. The Project will comply with HAR §11-260 to §11-280 Hazardous Waste Management.
    b. Solid waste generation from the Project is anticipated to be minimal. Solid waste will be disposed of properly and delivered to permitted solid waste management facilities.
    c. The Project does not involve construction of an underground storage tank.
7. Wastewater Branch

    Wastewater produced during construction would be accommodated by portable bathroom facilities that would be serviced at regular intervals. The Project would likely use an elevated soil mound or evapotranspiration system would likely be required for the Project, as there is currently no sewer service to the Project site. This wastewater system would comply with HAR §11-62.

We also acknowledge that the EPO encourages the use of the Hawaii Environmental Health Portal, encourages review the Office of Environmental Quality Control viewer, and encourages utilization of the U.S. Environmental Protection Agency's environmental justice mapping and screening tool (EPA EJSCREEN).

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850

JUL 11 2016

In Reply Refer To:
01EPIF00-2016-TA-0360

Ms. Megan Higgins
Tetra Tech Inc.
737 Bishop Street, Suite 2340
Honolulu, Hawai'i 96813

Subject: Technical Assistance for the Proposed Hawaiki Submarine Cable Landing Project and Transpacific Mapping Survey, Kapolei, O'ahu

Dear Ms. Higgins:

The U.S. Fish and Wildlife Service (Service) received your letter on June 15, 2015, requesting our comments on your proposed Proposed Hawaiki Submarine Cable Landing Project (Project) located at Kapolei, on the island of O'ahu [TMK(s): (9) 1-057:026; (9) 1-056:001; (9) 2-049:001; (9) 2-049:002; (9) 2-049:005; and (9) 2-051:011]. Hawaiki Submarine Cable LP (Hawaiki) and TE SubCom are proposing to install a fiber optic submarine cable system spanning two continents and three countries. This portion of the Project consists of the Hawai'i segment of a proposed submarine fiber optic telecommunications cable system linking the United States to Australia. We understand that because the Project occurs within State of Hawai'i marine waters under the jurisdiction of the Hawai'i Department of Land and Natural Resources Office of Conservation and Coastal Lands (OCCL), it must comply with the Hawai'i Revised Statutes Chapter 343 Environmental Review process. OCCL is the approving agency for an Environmental Assessment and, with approval from the Board of Land and Natural Resources, the agency to grant a marine waters lease for the portion of the cable located in State of Hawai'i waters.

The Hawaiki Cable System is an approximately 9,320 mile long (15,000 km) submarine fiber optic cable consisting of a route extending from Pacific City, Oregon to Coogee Beach, Sydney, Australia; with connections to Kapolei, O'ahu, Hawai'i; Tafuna, American Samoa; and Mangawhai Heads, New Zealand. We understand you are currently investigating other potential connections in the South Pacific. The trunk cable would pass through the United States' Exclusive Economic Zone out to 200 nautical miles, with the Hawai'i connection moving inland through State waters and making landfall in Kapolei, near the Waimānalo Gulch and Hawaiian Electric Company's Kahe Power Plant on the southwest shore of O'ahu.

The system is designed for 42 terabytes of traffic, with all trans-Pacific capacity transiting through the Kapolei landing site. The cable is a "carrier neutral", allowing for interconnection between multiple telecommunication carriers and/or colocation providers. The Project will enable Oceanic Time Warner Cable, Hawaiian Telecom, and AT&T (and potentially Level 3 Communications) to utilize the cable. This will drive competition in Hawai'i for local connectivity to the international cables and will contribute to the overall broadband development in Hawai'i. The Project will be the first carrier neutral landing facility to stimulate competition among the telecommunications providers for the benefit of users of the Hawaiki system and customers in Hawai'i.

The cable will be laid on the seafloor along a predetermined route from the Kapolei site and landed via construction of up to two sub-oceanic horizontal directionally drilled (HDD) bore pipes for accommodation of fiber optic cables and a single beach manhole (BMH). The HDD portion of the route will extend from a punch out point in approximately 50-65 feet (15-20 meters) sea depth, under the following TMKs: (9) 1-057:026; (9) 1-056:001; (9) 2-049:001; (9) 2-049:002; (9) 2-049:005; and Farrington Highway to a BMH located on TMK: (9) 2-051:011. The HDD portion of the route will traverse under the highway and O'ahu Railway and Land Company right-of-way. The upland features of the Project consist of the BMH, CLS, generators, and parking area (located on approximately 0.6 acres at 92-384 Farrington Highway. Installation is tentatively scheduled for July 2017, with system operation anticipated in December 2017.

Our response is in accordance with section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 *et seq.*). We have reviewed the information you provided and pertinent information in our files, including data compiled by the Hawai'i Biodiversity and Mapping Program. Our data indicate the federally threatened green turtle (*Chelonia mydas*) and endangered hawksbill Turtle (*Eretmochelys imbricata*), collectively referred to as sea turtles, may be present in the vicinity of the proposed Project. There is no proposed or designated critical habitat located in the area. We offer the following comments to assist you in your proposed Project.

<u>Sea Turtles</u>
Sea turtles come ashore to nest on beaches from May through September, peaking in June and July. Optimal nesting habitat is a dark beach free of barriers that restrict movement. Nesting turtles may be deterred from approaching or laying successful nests on lighted or disturbed beaches. If they do come ashore, they may become disoriented by artificial lighting, leading to exhaustion and placement of a nest in an inappropriate location (such as at or below the high tide line where nests are unlikely to be successful). Hatchlings that emerge from unprotected nests may be disoriented by artificial lighting, move inland instead of toward the ocean, and not make it successfully to the ocean.

To minimize potential impacts to sea turtles that may utilize beaches in the project vicinity, no light from the proposed project should be visible from the beach. We recommend installation of shielded lighting at construction sites near beaches and around shoreline developments. Shielded lights reduce the direct and ambient lighting of beach habitats within and adjacent to the project site. Effective light shields should be completely opaque, sufficiently large, and positioned so that light from the shielded source does not reach the beach.

The Service consults on sea turtles and their use of terrestrial habitats (beaches where nesting and/or basking is known to occur), whereas the National Marine Fisheries Service (NMFS) consults on sea turtles and their use of off-shore and open ocean habitats. We recommend that you consult with NMFS regarding the potential impacts from the proposed project to sea turtles in off-shore and open ocean habitats.

Hawaiian Monk Seal

The endangered Hawaiian monk seal (*Monachus schauinslandi*) may use beach habitat in the vicinity of the proposed project. NMFS is the Federal agency that consults on potential impacts to monk seals, both in their on-shore and ocean habitats. Therefore, we did not review the proposed project for potential project impacts to monk seals. We recommend that you contact NMFS regarding the presence of monk seals in the area and potential impacts to the species from the project.

We appreciate your efforts to conserve listed species. If you have questions about our comments, please contact Jiny Kim, Fish and Wildlife Biologist (phone: 808-792-9400, email: jiny_kim@fws.gov).

Sincerely,

Vikki Carey (for)

Aaron Nadig
Island Team Manager
O'ahu, Kaua'i, Northwestern Hawaiian Islands, and
American Samoa

TETRA TECH

October 5, 2016

Aaron Nadig
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Nadig:

Thank you for your letter dated July 7, 2016 on the proposed Hawaiki Submarine Cable Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

Thank you for the information regarding sea turtle terrestrial habitats and nesting. Any exterior lights at the cable landing site during construction will be shielded so that the light source does not reach the beach, minimizing impacts to sea turtles.

We acknowledge your comment regarding the jurisdictional differences between the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (NMFS). A pre-consultation letter was also sent to the NMFS providing an opportunity to comment on the draft environmental assessment.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

BA/G

July 11, 2016

Ms. Megan Higgins
Tetra Tech Inc.
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

Subject: Proposed Hawaiki Submarine Cable Landing Project

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Should HECO have existing easements and facilities on the subject property, we will need continued access for maintenance of our facilities.

We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Hawaiki Submarine Cable Landing Project comes to fruition, please continue to keep us informed. We have recognized the project is in the vicinity of some of our existing fiber cables to our Kahe Power Plant. Further along in the design, we will be better able to evaluate potential impacts to our fiber cables and the effects on our system facilities.

If you have any questions, please call me at 543-7245

Sincerely,

Rouen Q.W. Liu
Permits Engineer

RL:kmk

Cc: Alan Oshima

TETRA TECH

October 5, 2016

Rouen Q.W. Liu
Hawaiian Electric
P.O. Box 2750
Honolulu, Hawaii 96840-0001

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Liu:

Thank you for your letter dated July 11, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom, please see the following responses to your comments.

Thank you for your comment that you have no objection to the Project. There are no HECO easements or facilities in the Project area; however, there are existing HECO overhead utility lines located on the mauka side of Farrington Highway adjacent to the Project Area Company's and, as noted in your letter, the Kahe Electric Power Plant is nearby. The Applicants will continue to coordinate with HECO throughout the design of the Project.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

OCEANIC TIME WARNER CABLE

June 27, 2016

Megan Higgins
Tetra Tech Inc.
737 Bishop Street Suite 2340
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (9)1-057:026, 9)1-056:001, (9)2-049:001, (9)2-049:002, (9)2-049:005, and (9)2-051:011

Dear Ms. Higgins:

Oceanic Time Warner Cable (OTWC) received your letter dated June 13, 2016 which was addressed to Mr. Bob Barlow. Mr. Barlow retired from OTWC a couple of years ago. In follow up to your request as part of the EA process and on behalf of Hawaiki Submarine Cable LP and TE Subcom, OTWC is happy to provide our input on the proposed Project.

OTWC is well aware of the importance of the Hawaiki Project as it impacts the need for more internet capacity to the US mainland for the State of Hawaii. As such we are also aware there are currently four undersea cables between Hawaii and the US mainland. One has reached its end of life; two are more than half of their life which will require renewal with regard to additional capacity and the newest cable has only 5 terabits of bandwidth and will soon reach its threshold.

OTWC is very interested in purchasing capacity on the Hawaiki System as its own threshold will soon be reached. With Hawaiki's ready for service scheduled for the middle of 2018, it aligns perfectly with OTWC's forecast for acquiring more capacity.

We also are aware that possibly Hawaiki Submarine cable could bypass Hawaii should acquiring the Environmental Assessment and other permits impact Hawaiki's proposed schedule in a negative way.

Sincerely,

Norman P. Santos
Vice President, Engineering
Oceanic Time Warner Cable
200 Akamainui St.
Mililani, HI 96789
(808) 625-8341
Email: norman.santos@twcable.com

TETRA TECH

October 5, 2016

Norman P. Santos
Oceanic Time Warner Cable
200 Akamainui St.
Mililani, Hawaii 96789

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Santos:

Thank you for your letter dated June 27, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom (the Applicants), please see the following responses to your comments.

Thank you for the information regarding the existing cables landing on Oahu. The Applicant's acknowledge your support for the Project and interest in purchasing capacity on the Hawaiki system.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
STP 8.1993

July 15, 2016

Ms. Megan Higgins
Project Manager
Tetra Tech, Incorporated
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

Subject: Hawaiki Submarine Cable Landing Project
Pre-Consultation for Environmental Assessment
Kapolei, Oahu, Hawaii
TMK: (1) 9-1-057:026, 9-1-056:001, 9-2-049:001, 9-2-049:002, 9-2-049:005 and 9-2-051:011

Our Department of Transportation's (DOT) comments on the subject project are as follows:

Harbors Division

The subject project will not impact our commercial harbor facilities. However, because cable laying activities may impact the shipping lanes of maritime vessels, we recommend the applicant also consult with the U.S. Coast Guard and the maritime industry.

Highways Division (DOT-HWY)

DOT-HWY is still reviewing the subject project. Supplemental comments will be sent as soon as the review is completed.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Sincerely,

FORD N. FUCHIGAMI
Director of Transportation

October 5, 2016

Ford N. Fuchigami
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 91-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Fuchigami:

Thank you for your letters dated July 15, 2016 and August 8, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project) which provide comments from the Harbors Division and Highways Division, respectively. On behalf of Hawaiki Submarine Cable LP and TE SubCom (the Applicants), please see the following responses to your comments.

Thank you for confirming that the Project will not impact commercial harbor facilities. It is understood that cable laying activities may impact shipping lanes. As recommended, the Applicants will consult with the U.S. Coast Guard and the maritime industry.

Thank you for confirming that horizontal directional drilled (HDD) bore pipes and fiber optic cable under Farrington Highway should not have a significant impact on the highway. The Applicants will work with HDOT to obtain all necessary permits and approvals, including construction plan approvals and Use and Occupancy Agreements, for the installation of the HDD bore pipes and fiber optic cables where these facilities cross under or within the Farrington Highway and OR&L railroad rights-of-way.

Again, thank you for your letter, which will be included in the Draft Environmental Assessment, and we look forward to your department's involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

Tetra Tech, Inc.
737 Bishop St., Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://planning.hawaii.gov/

Ref. No. P-15225

July 8, 2016

Ms. Megan Higgins
Project Manager
Tetra Tech, Inc.
737 Bishop Street, Suite 2340
Honolulu, Hawaii 96813

Dear Ms. Higgins:

Subject: Pre-Consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii; TMK: (1) 9-1-057:026; 9-1-056:001; 9-2-049:001; 9-2-049:002, 9-2-049:005, and 9-2-051:011

Thank you for the opportunity to provide comments on the pre-assessment consultation request for a Draft Environmental Assessment (Draft EA) on the Hawaiki Submarine Cable Landing project. The pre-consultation review material was transmitted to our office via letter dated June 13, 2016.

It is our understanding that this undersea fiber-optic cable telecommunication project calls for a cable landing station located along the Waianae Coast, near the Waimanalo Gulch and the Hawaiian Electric Kahe power plant. The cable will be pulled through horizontally directional drilled boreholes, through a beach manhole, and into a cable landing station inland of Farrington Highway, along the Waianae Coast.

The submarine telecommunication fiber-optic cable will link the mainland U.S. with Australia making landfall along the southwest shore of Oahu. The proposed system is designed for 42 terabytes of traffic, which will enable companies such as Oceanic Time Warner Cable/Spectrum, Hawaiian Telecom, and AT&T to utilize this facility to enhance their telecommunication systems.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. Pursuant to Hawaii Administrative Rules (HAR) § 11-200-10(4) – general description of the action's technical, economic, social, and environmental characteristics; this project must demonstrate that it is consistent with a number of State environmental, social policies, economic goals, and policies. OP provides technical assistance to

State and county agencies in administering the statewide planning system in Hawaii Revised Statutes (HRS) Chapter 226, the Hawaii State Plan. The Hawaii State Plan provides goals, objectives, policies, and priority guidelines for growth, development, and the allocation of resources throughout the State in areas of state interest including but not limited to the economy, agriculture, the visitor industry, federal expenditure, the physical environment, facility systems, socio-cultural advancement, climate change adaptation, and sustainability.

The Draft EA should include an analysis that addresses whether the proposed project conforms to or is in conflict with the goals, objectives, policies, and priority guidelines listed in the Hawaii State Plan. This analysis should address all of these themes. If any of these are not applicable, the Draft EA should state that these are "not applicable." The most efficient method is summarizing these in tabular form, followed by discussion passages.

2. The coastal zone management (CZM) area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" (see HRS § 205A-1 definition of "coastal zone management area").

   HRS § 205A-5(b) requires all State and county agencies to enforce the CZM objectives and policies. The Draft EA should include an assessment as to how the proposed project conforms to the CZM objectives and its supporting policies set forth in HRS § 205A-2. The assessment on compliance with HRS § 205A-2 is an important component for satisfying the requirements of HRS Chapter 343. These objectives and policies include recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

3. The submarine cable makes landfall within the navigable waters of the United States. If this project requires a permit by a federal agency (e.g., U.S. Army Corps of Engineers), then this project may also require a Federal Consistency Review.

   The national Coastal Zone Management Act requires that any Federal action be consistent with approved state coastal zone management program's enforceable policies. Federal actions are defined by this act as activities performed by a Federal agency; activities not performed by a Federal agency, but require federal permits or approval; or State and local government projects that receive Federal financial assistance.

OP is the lead state agency with the authority to conduct Federal Consistency Review. In the event of the need of a federal permit, please contact our office on the policies and procedures for this review.

4. The area that the cable landing site, beach manhole, and generator facilities are situated upon is within the Special Management Area (SMA) delineated by the City and County of Honolulu.

   Furthermore, since the cables make landfall near the Waianae Coast shoreline, this project could be subject to the rules and regulations governing the SMA and the shoreline setback. Please consult with the Department of Planning and Permitting, City and County of Honolulu, for the requirements of SMA use and shoreline setbacks.

5. Pursuant to HAR § 11-200-10(6) – identification and summary of impacts and alternatives considered; in order to ensure that the coastline and water resources along the Waianae Coast remain protected, the negative effects of stormwater inundation ensuing from development activities should be evaluated in the Draft EA.

   The cable landing site is mauka of Farrington Highway and is within close proximity to the Waianae coastline. Therefore any cumulative runoff from this area may impact coastal and marine resources. The weather along the Leeward Coast is typically arid in nature, however, during heavy storm or flooding events, coastal resources may be vulnerable to stormwater inundation resulting from the cumulative effect of manmade structures near the coastline, and thus potentially affecting Leeward Coast marine resources.

   The Draft EA should examine potential benefits and/or negative impacts resulting from this project on coastal and marine resources. Issues that may be examined in the Draft EA include, but are not limited to, project site characteristics in relation to flood prone areas and stormwater control drainage systems. These items, as well as the marine water quality classification, should be considered when developing potential mitigation measures to protect the coastal ecosystem.

   The Draft EA should examine the cumulative impact on coastal resources from land-based polluted runoff. It should take into account any of the natural features in the area, undeveloped open spaces, down-sloping topography, hardened non-permeable surfaces that have a cumulative effect on the volume and speed of storm runoff, and soil absorption rates.

In preparation for the Draft EA on this project, please consider conducting a stormwater impact assessment. This assessment may be useful in the development of a stormwater mitigation strategy. This analysis can be used to identify and evaluate information on hydrology, stressors, sensitivity of aquatic and riparian resources, and management measures to control runoff, as well as consider secondary and cumulative impacts to the area. Guidance on conducting a stormwater impact assessment can be viewed or downloaded from the OP website at http://files.hawaii.gov/dbedt/op/czm/initiative/stomwater_imapct/final_stormwater_impact_assessments_guidance.pdf

If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

Sincerely,

Leo R. Asuncion
Director

October 5, 2016

Leo R. Asuncion
State of Hawaii
Office of Planning
235 South Beretania Street, 6th Floor
Honolulu, Hawaii 96813

Re: Pre-consultation for the Proposed Hawaiki Submarine Cable Landing Project located at Kapolei, Oahu, Hawaii, TMKs: (1) 9-2-051-010, (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001

Dear Mr. Asuncion:

Thank you for your letter dated July 8, 2016 on the proposed Hawaiki Submarine Cable Kapolei Landing (Project). On behalf of Hawaiki Submarine Cable LP and TE SubCom (the Applicants), please see the following responses to your comments.

As noted in your comment letter, the Project must comply with the Hawaii State Plan (Hawaii Revised Statutes [HRS] Chapter 226) and Coastal Zone Management law (HRS Chapter 205A). A discussion of conformance with all applicable land use plans and policies, including the Hawaii State Plan and Coastal Zone Management law, will be included in the Draft Environmental Assessment (EA).

It is anticipated that the Project will qualify for a Nationwide Permit from the U.S. Army Corp of Engineers. The Applicants will coordinate with the Office of Planning on a federal consistency review, as necessary.

As noted in your letter the proposed cable landing site is within the Shoreline Management Area (SMA), and therefore will require an SMA permit. The Applicants will coordinate with the City and County of Honolulu Department of Planning and Permitting with respect to requirements of SMA use and shoreline setbacks.

Regarding stormwater, potential stormwater impacts and associated best management practices will be discussed in the Draft EA. Impacts to both onshore (both surface and ground water) and marine water resources will be evaluated.

Again, thank you for your letter, which will be included in the Draft EA, and we look forward to your department’s involvement on the Project. If you have any questions, please contact me at 808.441.6652 or by email at megan.higgins@tetratech.com.

Sincerely,

TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins, Project Manager

cc: Greg Pintarelli, TE SubCom
Catherine Brady, TE SubCom
Richard Howarth, Hawaiki Submarine Cable LP
Alex Roy, Department of Land and Natural Resources, Office of Coastal and Conservation Lands

APPENDIX B

HDD BORE TEST REPORT

Hirata & Associates
Geotechnical Engineering
Hirata & Associates, Inc.
99-1433 Koaha Pl
Aiea, HI 96701
tel 808.486.0787
fax 808.486.0870

September 8, 2016
W.O. 16-5997

Ms. Rosa White
Hawaiki Submarine Cable
c/o DR Fortress
3375 Koapaka Street, Suite D198
Honolulu, Hawaii 96819
via email: rosa@drfortress.com

Dear Ms. White:

RE: Drilling and Laboratory Testing Services
Hawaiki Cable Landing Station
Kapolei, Oahu, Hawaii
TMK: 9-2-051: 11

This letter presents the results of our drilling and laboratory testing services for the above referenced project. Our services were performed in general conformance with the scope of services presented in our proposal dated August 24, 2016.

Project Description

The proposed project will consist of a new cable landing station and an HDD (horizontal directional drilling) installed pipeline from the cable landing station site to about 3,000 feet offshore. Our scope of services was limited to drilling one boring to a depth of about 50 feet. Our services also included limited laboratory testing consisting of moisture and density tests and soil classification tests. The general location of the project site is shown on the enclosed Location Map, Plate A1.1, while the location of the boring is shown on the enclosed Boring Location Plan, Plate A1.2.

Drilling Services

One exploratory test boring was drilled to a depth of about 50 feet with a Mobile B-80 truck-mounted drill rig on August 31 and September 1, 2016. During drilling operations, the soils were continuously logged by our field engineer and classified by visual examination in accordance with the Unified Soil Classification System. The boring logs indicate the depths at which the soils or their characteristics change, although the change could actually be gradual. If the change occurred between sample locations, the depth was interpreted based on field observations. Classifications and sampling intervals are shown on the boring logs. A Boring Log Legend is presented on Plate A2.1. The Unified Soil Classification and Rock Weathering Classification Systems are shown on Plates

A2.2 and A2.3, respectively. The soils encountered are described on the Boring Logs, Plates A3.1 and A3.2.

The location of our boring was limited by the accessibility of our truck-mounted drill rig to the project site. A topographic survey map was not available at the time of this report. The boring location was surveyed in the field with a hand-held GPS unit, and verified using Google Earth Overlay. The accuracy of the boring location shown on Plate A1.2 is therefore approximate, in accordance with the field method used.

Representative soil samples were recovered from the boring for selected laboratory testing and analyses. Representative samples were recovered by driving 3-inch O.D. split tube sampler a total of 18 inches with a 140-pound hammer dropped from a height of 30 inches. The number of blows required to drive the sampler the final 12 inches are recorded at the appropriate depths on the boring logs, unless noted otherwise.

Core samples were obtained by drilling with NX and HQ core barrels having an inside diameter of 2.1 and 2.5 inches, respectively. Recovery percentages for each core run are shown on the enclosed Boring Logs. The rock quality designation (RQD) for the core runs are also shown on the boring logs. This is a modified core recovery percentage that takes into account the number of fractures observed in the core samples. Only pieces of core 4 inches in length or longer, as measured along the centerline, were included in the determination of this modified core recovery percentage. Fractures caused by drilling or handling were ignored.

The following is a general correlation between RQD percentages and rock quality.

RQD (%)	Description of Rock Quality
0 - 25	Very Poor
25 - 50	Poor
50 - 75	Fair
75 - 90	Good
90 - 100	Excellent

Reference: Tunnel Engineering Handbook, Second Edition, edited by J.O. Bickel, T.R. Kuesel, and E.H. King, 1996

Laboratory Testing

***Classification* –** Field classification was verified in the laboratory in accordance with the Unified Soil Classification System. Laboratory classification was determined by visual examination, Atterberg Limit tests performed in general accordance with ASTM D 4318, and Sieve Analysis tests performed in general accordance with ASTM D 422. The results of the Atterberg Limit tests are plotted on Plate A2.2. The final classifications are shown at the appropriate locations on the Boring Logs, Plates A3.1 and A3.2.

***Moisture and Density* –** Representative samples were tested for field moisture content and dry unit weight. The dry unit weight was determined in pounds per cubic foot while the moisture content was determined as a percentage of dry weight. Samples were obtained using a 3-inch O.D. split tube sampler. Test results are shown at the appropriate depths on the Boring Logs, Plates A3.1 and A3.2.

***Sieve Analyses* –** Sieve analyses tests were conducted in general accordance with ASTM D 422 on samples obtained from boring B1 at varying depths. The test is used to determine the grain size distribution. Test results are presented on Plate A5.1.

Soil Description – Exploratory Boring

Our boring encountered surface soil classified as grayish brown silty clay. The silty clay was in a stiff condition and extended to a depth of about 4 feet below ground surface. Underlying the silty clay was tan silty sand in a medium dense to dense condition, extending to a depth of about 18 feet. The silty sand was mixed with coralline gravel from a depth of about 10 feet. The silty sand was underlain by grayish brown highly weathered basalt in a dense condition and extended to a depth of about 27 feet. Underlying the highly weathered basalt was gray moderately weathered basalt in a medium hard condition, extending to the maximum depth drilled. NX and HQ coring resulted in core recoveries of 100 percent, and RQD values ranging from about 27 to 77 percent. The lower RQD values were recorded while coring through fractured sections of the basalt. Photographs of the recovered core samples are provided on Plates A4.1 and A4.2.

Groundwater was encountered at a depth of about 29.5 feet. The depth to groundwater level is expected to vary with tidal fluctuations.

Limitations

The boring log indicates the approximate subsurface soil conditions encountered only at that time and location where our boring was made, and may not represent conditions at other times and locations.

This letter was prepared specifically for Hawaiki Submarine Cable and DR Fortress. The boring log and laboratory test results are presented for information purposes only. The services performed for this project were performed in a manner consistent with that level of care, skill, and competence ordinarily exercised by members of the profession in good standing, currently practicing under similar conditions. We will not be responsible for the interpretation by others of the information developed. No warranty is made regarding the services performed under this agreement, either express or implied.

We appreciate this opportunity to be of service. Should you have any questions concerning this letter, please feel free to call on us.

Respectfully submitted,

HIRATA & ASSOCIATES, INC.

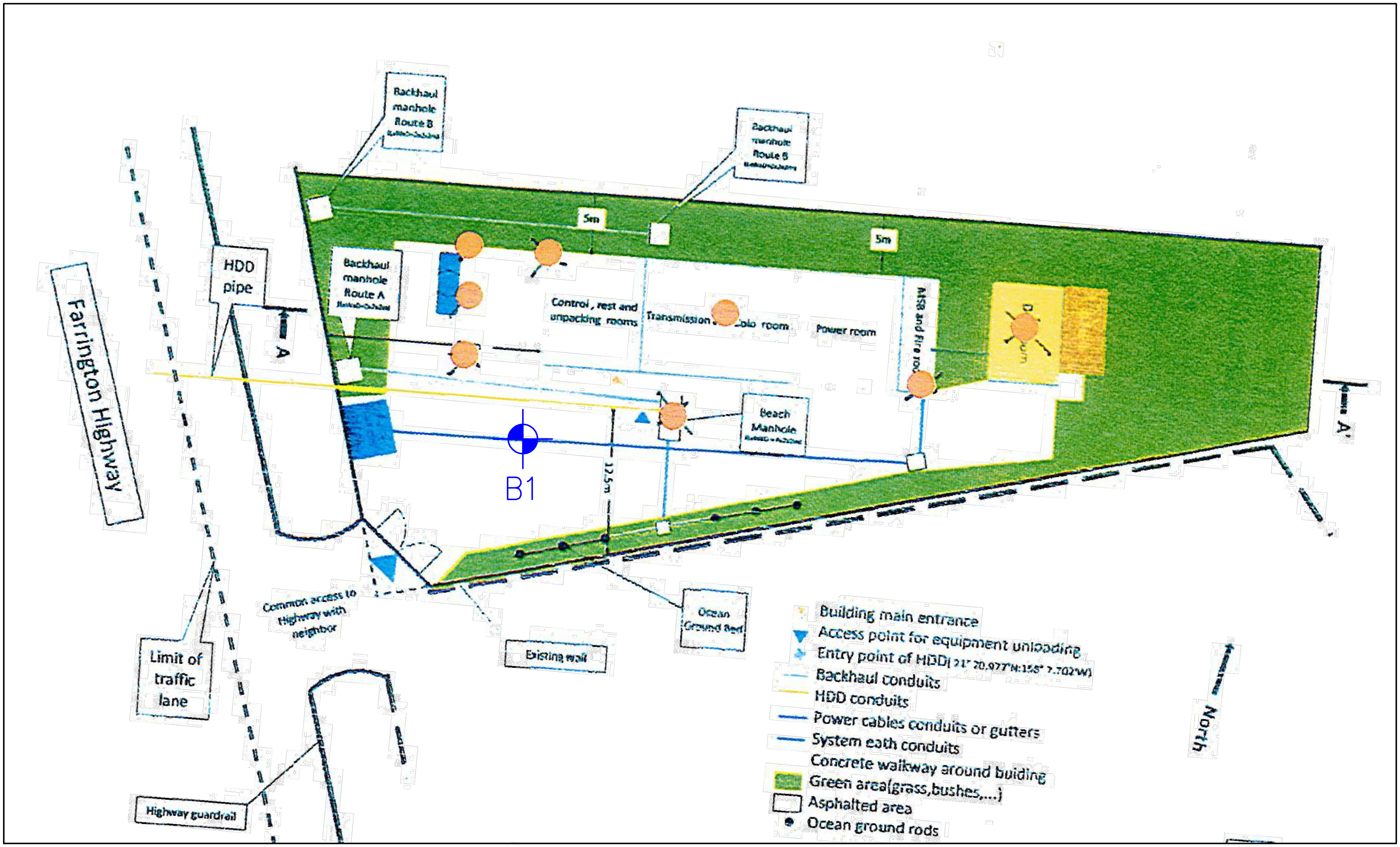
Rick Yoshida, Project Manager

RIKY: EY

Attachments:
- Location Map...Plate A1.1
- Boring Location Plan..Plate A1.2
- Boring Log Legend..Plate A2.1
- Unified Soil Classification System..........................Plate A2.2
- Rock Weathering Classification System....................Plate A2.3
- Boring Logs..Plates A3.1 and A3.2
- Rock Core Samples..Plates A4.1 and A4.2
- Sieve Analyses Test...Plate A5.1

Reference: Topographic Quadrangle Map prepared by the United States Department of the Interior Geologic Survey
Oahu Island, Hawaii. 1970.

Hawaiki Cable Landing Station		
HIRATA & ASSOCIATES, INC. Geotechnical Engineering	**LOCATION MAP**	Plate A1.1
W.O. 16-5997		



LEGEND

Approximate location of borings

GRAPHIC SCALE:

0 20 40 80 FT.

1" = 40'

Reference: Site Plan provided by Light Wave Exchange on August 16, 2016.

	Hawaiki Cable Landing Station		
	HIRATA & ASSOCIATES, INC. Geotechnical Engineering	**BORING LOCATION PLAN**	Plate A1.2
	W.O. 16-5997		

MAJOR DIVISIONS			GROUP DIVISIONS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of the material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines.)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines.)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines.)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines.)	SM	Silty sands, sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of the material is SMALLER than No. 200 sieve size.)	SILTS AND CLAYS (Liquid limit LESS than 50.)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of high plasticity, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50.)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic silts.
FORMATIONS				FRESH TO MODERATELY WEATHERED BASALT
				VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT
				CORAL

SAMPLE DEFINITION

2" O.D. Standard Split Spoon Sampler	Shelby Tube	RQD: Rock Quality Designation
3" O.D. Split Tube Sampler	Core Sample	Water Table

Hawaiki Cable Landing Station

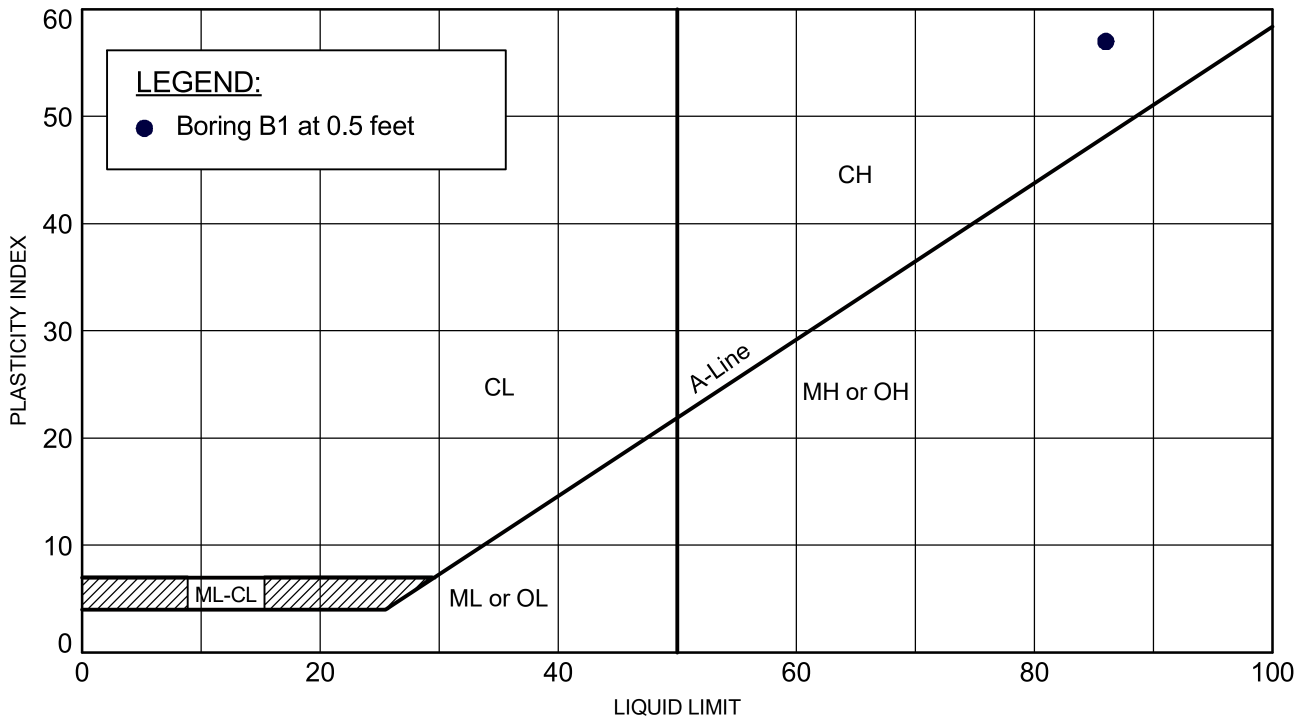
HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 16-5997

BORING LOG LEGEND

Plate A2.1

PLASTICITY CHART



GRADATION CHART

COMPONENT DEFINITIONS BY GRADATION	
COMPONENT	SIZE RANGE
Boulders	Above 12 in.
Cobbles	3 in. to 12 in.
Gravel	3 in. to No. 4 (4.76 mm)
Coarse	3 in. to 3/4 in.
Fine Gravel	3/4 in. to No. 4 (4.76 mm)
Sand	No. 4 (4.76 mm) to No. 200 (0.074mm)
Coarse Sand	No. 4 (4.76 mm) to No. 10 (2.0 mm)
Medium Sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine Sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

Grade	Symbol	Description
Fresh	F	No visible signs of decomposition or discoloration. Rings under hammer impact.
Slighly Weathered	WS	Slight discoloration inwards from open fractures, otherwise similar to F.
Moderately Weathered	WM	Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock but cores cannot be broken by hand or scraped by knife. Texture preserved.
Highly Weathered	WH	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct but fabric preserved.
Completely Weathered	WC	Minerals decomposed to soil but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	RS	Advance state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Reference: Soil Mechanics, NAVFAC DM-7.1, Department of the Navy, Naval Facilities Engineering Command, September, 1986.

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GEOTECHNICAL ENGINEERING

Boring No.
B1

BORING LOG

PROJECT NAME Hawaiki Cable Landing Station
WORK ORDER NO. 16-5997 DRIVING WT. 140 lb. START DATE 8/31/16
SURFACE ELEV. N/A DROP 30 in. END DATE 9/1/16

REMARKS/ OTHER TESTS	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
									Silty CLAY (CH) - Grayish brown, moist, stiff.
			25	64	38				
			21	92	14	5			Silty SAND (SM) - Tan, moist, medium dense.
			65	85	8				Dense from 8 feet.
						10			Increased gravel content from 10 feet.
			75/10"	94	22				
						15			
			86/10"	85	9				BASALT (WH) - Grayish brown, slightly moist, dense, highly weathered.
						20			
			25/11" 10/No Penetration	104	9				
						25			
Begin NX coring at 28 feet	100	63							BASALT (WM) - Gray, medium hard, fractured, vesicular, moderately weathered.
Begin HQ coring at 30 feet						30			Groundwater encountered at 29.5 feet on 9/1/16 at 11:55 am.
	100	42							
						35			

Plate A3.1

(Continued Next Page)

Hirata & Associates, Inc.
GEOTECHNICAL ENGINEERING

Boring No.
B1
(continued)

BORING LOG

PROJECT NAME Hawaiki Cable Landing Station
WORK ORDER NO. 16-5997 DRIVING WT. 140 lb. START DATE 8/31/16
SURFACE ELEV. N/A DROP 30 in. END DATE 9/1/16

REMARKS/ OTHER TESTS	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
									BASALT (WM) - Gray, medium hard, fractured, vesicular, moderately weathered. (continued)
	100	27							
						40			
	100	65							
						45			
	100	77							
						50			End boring at 50.0 feet.
						55			
						60			
						65			
						70			

Boring B1, 28 - 30 feet

Boring B1, 30 - 40 feet

Hawaiki Cable Landing Station		
HIRATA & ASSOCIATES, INC. Geotechnical Engineering	**ROCK CORE SAMPLES**	Plate A4.1
W.O. 16-5997		

Boring B1, 40 - 50 feet

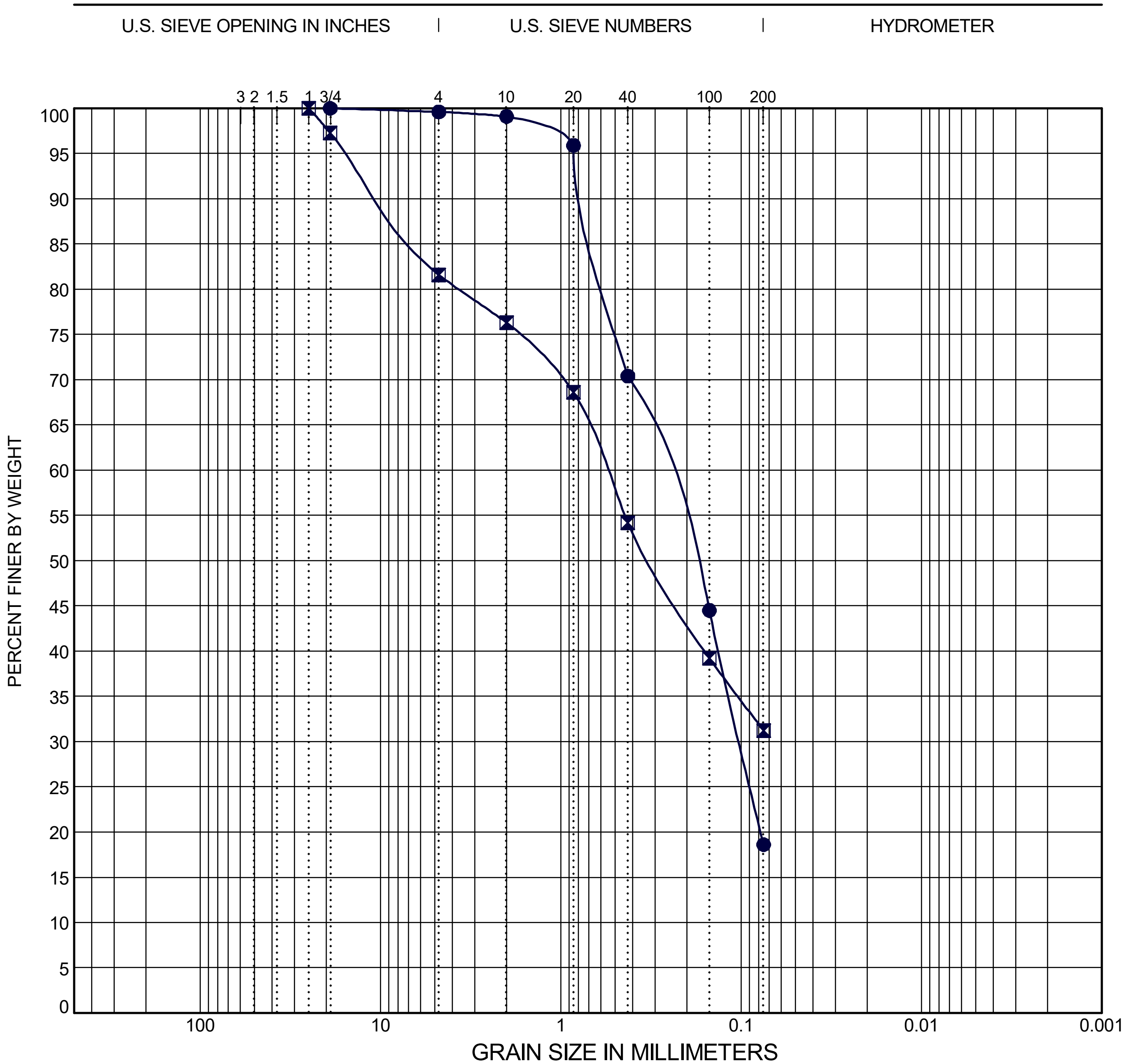
Hawaiki Cable Landing Station

HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 16-5997

ROCK CORE SAMPLES

Plate A4.2



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Sample Location	Classification	%Gravel	%Sand	%Fines
●	Boring B1 at 4 feet	Tan silty coraline sand	0.4	81.0	18.6
⌧	Boring B1 at 13 feet	Tan silty coraline sand with gravel	18.4	50.4	31.2

	Sample Location	D100	D60	D30	D10	Cc	Cu
●	Boring B1 at 4 feet	19	0.3	0.1	*	*	*
⌧	Boring B1 at 13 feet	25	0.6	*	*	*	*

Hawaiki Cable Landing Station

HIRATA & ASSOCIATES, INC.
Geotechnical Engineering

W.O. 16-5997

SIEVE ANALYSIS TEST

ASTM D422

Plate A5.1

APPENDIX C

IDFR & CONTINGENCY PLAN

INADVERTENT DRILLING FLUID RELEASE (IDFR) CONTINGENCY PLAN

FOR HAWAIKI'S KAPOLEI SHORE END LANDING Horizontal Directionally Drill (HDD)

Hawaiki Submarine Cable USA (Hawaiki) – January 2017

Project Overview:

The Kapolei Shore End Landing Horizontal Directionally Drilled (HDD) bore involves the installation of 4" ID offshore drill pipe as a permanent conduit for the Hawaiki submarine cable. The HDD bore pipe is to be installed using a maxi-HDD rig supported by a mud pump and recycling system.

The HDD bore commences within Cable Landing Site land parcel along Farrington Highway (TMK (9)2-051:011) in Kapolei, Hawaii. The exit point is at 2860ft (872m) from the entry point at 16 m water depth, (WGS84) N21 20.8447, W158 08.1920.

The directionally drilled outfall is expected to largely encounter basalt along its path following a geotechnical investigation which confirmed basalt was encountered consistently from 18ft to 50ft depth.

Drilling will be performed using a bentonite drilling fluid: to facilitate the drilling, as stabilisation of the borehole and for the return of the cuttings. Bentonite is a non-toxic, naturally occurring clay commonly used in farming practices; however, if large volumes of bentonite are discharged to waterways it can cause environmental degradation by smothering benthic invertebrates, aquatic plants and fish and their eggs.

During boring operations, it is possible that fractures in the underlying rock substrate may potentially result in the inadvertent release of bentonite clay into the environment. This event is described as an Inadvertent Drilling Fluid Release and typically occurs in highly fractured soils or if the bore path is extremely shallow.

Plan Objectives

- Minimize the potential for IDFR's.
- Provide the timely detection of any IDFR's that could enter or otherwise compromise or impact any sensitive cultural, environmental or biological resources, surface facilities or features.
- Facilitate notification of all appropriate agencies immediately and documentation of any incident.
- Facilitate proper response, containment and clean-up in the event an IDFR occurs.

Responsibilities

- Monitoring for hydraulic pressures during the performance of the work.
- Minimize potential for an IDFR.
- Detection of any IDFR's at surface

- Containment of the IDFR's.
- Clean-up of the IDFR's.
- Documentation of the IDFR.
- Notification of the IDFR to the permitting agencies and stakeholders.

Pre-Construction IDFR Prevention

Experienced Crew

IDFR prevention begins well before the mobilization of the drilling equipment to the project site. To this end, the nominated drilling company will employ skilled, competent workers who are familiar with HDD construction and have performed many crossings of multiple complexities and are well versed in monitoring for IDFR's and the warning signs that are often a precursor to a IDFR.

Drilling Profile Design

The profile of the drill path will be designed to gain depth as soon as possible and will then maintain a minimum depth of cover below ground or seabed level of greater than 50ft which is much deeper than the depth at which frac-outs usually occur (i.e. less than 20ft enters the risk region for a potential IFDV).

Casing Pipe at Entry

A Geotechnical survey has been undertaken identifying a substrate of firm clay over firm sand before encountering basalt at 18ft. The consistency of the clay/sand substrate appears well suitable to the low pressure of drilling fluid required but will be assessed by the drilling contractor once onsite. Following site set-up, a casing pipe may be installed to the appropriate depth (as identified by the Geotechnical survey) where the drilling contractor is absolutely confident that substrate is capable of holding the hydraulic pressure of the drilling fluid.

Drilling Fluid Selection

The Drilling fluids will dominantly consist of water and a high yield bentonite clay. It is not anticipated that any other additives will be necessary to safely accomplish this crossing, however if it is determined that some would be beneficial, MSDS will be submitted prior to their use.

The basic drilling fluid properties of concern include:

- Viscosity
- Fluid Density
- Sand (solids) content
- Mud weight

Lost Circulation Material (LCM) *may* be used in case of an IFDR or loss of circulation. LCM products are used to "bridge" fractured ground and fissures allowing a foundation for bentonite to form a waterproof filter cake against fracture zones and stop fluid flowing into the "frac out" zone. Once lodged in the problem voids it will swell up to 200 times its original size thus bridging the "frac out" and allowing it to be sealed off with bentonite. LCM can also be spotted into caving zones to prevent collapse. MSDS for LCM will be submitted if needed.

Drilling Exit Point

The exit point has been selected to minimise the length of the HDD while optimising the clearance from outcropping rock and is positioned at the closest position to shore at which the cable ship as able to safely undertake landing of the cable into the borepipe.

The location where the drill bit will daylight has also been selected by side-scan and diver survey to be positioned in the centre of a large section of sand covered, hard bottom substrate. As the drill bit emerges from the hard substrate, the blanketing effect of the >2m of sand cover will filter and capture any emergent drilling fluid, and the release of any sediments and turbidity.

Construction IDFR Monitoring

Project Site Monitoring

Monitoring of the project site provides the primary HDD good practice necessary to minimize the IDFR potential. The frequency of monitoring may be increased or decreased depending on the conditions of the work and phase of the work (i.e. increased monitoring during period of lost circulation or reduced when HDD activities have been demonstrated to consistently produce anticipated results)

Drilling Fluid Pressure Monitoring

The drilling company will maintain drilling fluid monitoring equipment on site (and crew members who are proficient in their use) 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 in order to achieve a more stable borehole, improve cuttings return, and/or to reduce the IDFR potential during difficult drilling circumstances.

Pump pressures will 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 will be logged for each joint drilled, in the "Drillers 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.

Standpipe pressure may increase and decrease depending on the strength of the formation being drilled at any given time but it is anticipated mud pressures would range from 500-700 psi.

In addition, the drilling company will 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, reducing the chances for a frac-out from occurring. Annular pressures of 50 - 125 psi may be anticipated for this bore with annular pressures expected to increase gradually as the length of the drill increases.

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.

Plugging of the bore-hole annulus or the presence of a major formation fracture can lead to partial or full loss of drilling fluid circulation. It is possible to monitor fluid loss by watching for significant differences between the fluid rate being pumped downhole and the rate of returns flowing into the surface containment pits. The presence of back pressure in the drill pipe when unscrewing from the down-hole work string, is also a warning of a plugged annulus which could lead to a Frac-out.

In accordance with this plan, the drilling company will monitor the drilling fluid pump rate, the solids control tank level, visually observe the rate of drilling fluid returns to the containment pits and back pressures. As drilling progresses, the driller will be kept appraised of whether back pressure is present or if high volumes of drilling fluid are being lost down-hole, 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, he will immediately implement the following procedures:

1. Temporarily cease drilling operations and shut off the mud pumps.
2. Dispatch observers to inspect the area between the entry point and the bit, along the bore alignment, for evidence of drilling fluid on the surface or in the water.
3. If no drilling fluids are seen on the ground surface or in the water, the mud pumps will be started and volumes gradually increased as the drill pipe is pulled back, rotating the drill string to wipe the bore-hole annulus and encourage flow.

Depending on the success of this procedure, the properties of the drilling fluid may be altered to aid in restoring circulation. Observers will continuously monitor the area for IDFR's as long as the mud pumps remain on.

If circulation is re-established, drilling will proceed as usual and monitoring for IDFR's will become more routine as long as circulation is maintained. If circulation is not re-established, monitoring will continue while the pumps are on.

Often times in the course of drilling the bore hole, circulation may be temporarily lost as the bit is advanced through more permeable sections of the formation and fluid pressures are at a maximum. Under these circumstances, the loss of fluid circulation alone may be temporary. As the pilot bit advances beyond the zone of lost circulation, fluid pressure may return back to normal and circulation within the borehole re-established.

Seabed exit of HDD

At a suitable distance prior to the exit point (as defined by the seabed geology) the use of drilling mud will be curtailed. The borehole will be flushed with fresh water to bring all free mud not maintaining the borehole integrity back to the surface.

The borehole will be completed to the punch-out point using either fresh water or a bio-degradable, non-solids, biopolymer fluid such as Xantham Gum to minimum release of bentonite onto the seabed. Xanthan Gum is an industry standard drilling fluid where solids free systems are a requirement. Xanthan gum is considered non-hazardous and suitable for use in environmentally sensitive locations and applications.

IDFR Response

Land Based Release

If IDFR's are observed on the ground surface, at a location other than the bore containment pits, the following procedures will be implemented.

4. Cease drilling operations
5. Notify all required parties.
6. Document the event with photographs.
7. 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.
8. If possible, excavate a small sump pit at the fracture location and provide a means of containment or 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).
9. Clean-up affected area using vacuum unit, brooms, shovels, etc., once release is contained. Clean-up shall include removal of all visible drilling fluid located in accessible areas. Removal methods will vary based on the volume of the release and the site specific conditions. Removal equipment may include vacuum trucks, loader and track hoe buckets, small pumps, shovels and buckets. After removal of the released drilling fluid, the release area will be returned as close to the original condition as possible.
10. Document the cleaned up area with photographs.
11. Adjust drilling fluid properties to inhibit flow through the fracture and wipe the hole by tripping out drill pipe to wipe the bore-hole annulus.
12. Determine the suitability of placing (LCM) in the hole.
13. After tripping the drill string back, allow the formation to "rest" for a suitable period, continue drilling while monitoring the Frac-out location and transferring fluids as necessary.
14. Forward reaming of the bore-hole up to the Frac out location may be considered to relieve annular pressures.
15. Continue drilling with minimum fluid.
16. Consider drilling a vertical relief well over the bore hole in order to relieve borehole pressures and encourage flow to a known source where it can be managed.

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

Water Body Release

If an IFDR is observed offshore, the following procedures will be implemented.

1. Cease drilling operations
2. Notify all required parties.
3. Document the event with date and time stamped photographs.
4. In cases of inadvertent releases to open water, it is usually impractical to contain the release due to the fact that the release does not necessarily occur of the bore path, and the action of waves and ocean swell quickly dispersing the IDFR. Removal by vacuum truck may be attempted at the shoreline if reachable from shore and deemed appropriate.
5. Water sampling equipment will be available for use by site inspectors to evaluate turbidity levels.
6. Once dissipated, again document the event with date and time stamped photographs.
7. Adjust drilling fluid properties to inhibit flow through the fracture and wipe the hole by tripping out drill pipe to wipe the bore-hole annulus.
8. Determine the suitability of placing (LCM) in the hole.
9. After tripping the drill string back, allow the formation to “rest” for a suitable period, continue drilling while monitoring the Frac-out location and transferring fluids as necessary.
10. Forward reaming of the bore-hole up to the Frac out location may be considered to relieve annular pressures.
11. Continue drilling with minimum fluid increasing drilling fluid gradually whilst continuously monitoring for any further IFDR.
12. It should be noted that often times drill cuttings generated as a result of the drilling process will naturally bridge and subsequently seal fractures or voids in the formation as drilling progresses, thus providing another means to re-established lost circulation.

The decision to proceed with the drilling operation will be made mutually between the drilling site supervisor and the on-site Client Representative after all practical methods to seal off the location of the discharge have been attempted.

IDFR Control Equipment

In accordance with good HDD practices, the following Frac-out containment and clean-up equipment should be present on or near the project site for an IDFR.

- Heavy weight sealed plastic bags filled with sand or gravel

- Splash board: three layers of heavy plastic
- Several 5 gallon plastic buckets
- One wide heavy- duty push broom
- Flat blade shovels
- Silt fence, T-posts and or straw bales
- Straw logs (wattles) At least two ten foot rolls
- Portable trash pumps with a minimum of 500 feet of discharge hose.
- Pre-construction seawater sample as baseline for any testing following an offshore IDFR.
- Seawater sampling kits
- Offshore dive vessel available on-call in case of offshore IDFR

A minimum of one vacuum unit on site and access to a vacuum truck within one hour of the job site.

APPENDIX D

MARINE HABITAT CHARACTERIZATION

MARINE HABITAT CHARACTERIZATION

TABLE OF CONTENTS

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LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

AAUS	American Academy of Underwater Sciences
BMH	beach manhole
COTS	crown of thorns seastar
EANx	enriched air nitrox
EFH	Essential Fish Habitat
F/O	fiber optic
Hawaiki	Hawaiki Submarine Cable USA
HDD	horizontal directionally drilled
km	kilometer
LPI	Line Point Intercept
nm	nautical mile
NOAA	National Oceanic and Atmospheric Administration
Project	Hawaiki Submarine Cable Kapolei Landing project
TE SubCom	Tyco Electronics Submarine Communications

1.0 INTRODUCTION

Hawaiki Submarine Cable USA (Hawaiki) and Tyco Electronics Subsea Communications LLC (TE SubCom) propose to construct the Hawaiki cable system, an approximately 14,988-kilometer [km]-long (9,313-mile-long) submarine fiber optic (F/O) telecommunications cable consisting of a trunk route extending from Pacific City, Oregon, to Coogee, Australia, with branches connecting to Kapolei, O‘ahu, Hawai‘i; Tafuna, American Samoa; and Mangawhai Heads, New Zealand. The Hawai‘i portion of this system, the Hawaiki Submarine Cable Kapolei Landing project (Project), includes installation of subsea F/O cable and associated telecommunications infrastructure at Kapolei, ‘Ewa District, Island of O‘ahu, Hawai‘i.

The Project cable would be laid on the seafloor along a predetermined route from the territorial limit of the State of Hawai‘i waters (out to 3 nautical miles [nm]) to Kapolei, crossing State of Hawai‘i submerged lands. Beyond the territorial limits of State of Hawai‘i waters, the Hawai‘i segment of the Hawaiki cable system would extend out 19 nm (35.2 km) where it would connect with the cable trunk route at a sea-floor located Branching Unit. The proposed cable landing station (CLS) is located between the Waimanalo Gulch and Hawaiian Electric Company’s Kahe Power Plant on O‘ahu’s southwest shore, approximately 6 km (3.7 miles) northwest of Barbers Point and 33 km (20.5 miles) west of Honolulu along Farrington Highway.

The cable would be landed via construction of a horizontal directionally drilled (HDD) bore pipe extending from a beach manhole (BMH) on land to a subsea punch-out exit point, located approximately 768 meters (2,520 feet) seaward from the shoreline, into which the F/O cable would be installed.

Tetra Tech marine biologists planned and completed a benthic characterization survey for the Project. The central goal of the diver survey effort was to satisfy anticipated needs of the Essential Fish Habitat (EFH) consultation, Hawaiian Environmental Policy Act Environmental Assessment, and to inform other state and federal agency consultations. The diver surveys may also be used to provide information to other aspects of the project and assist with avoidance or minimization of potential impacts. Activities comply with applicable sections of Occupational Safety and Health Administration Standard (29 Code of Federal Regulations 1910.120), the American Academy of Underwater Sciences (AAUS) Standards, and Tetra Tech’s Scientific Diving Standards and Safety Manual (Scientific Diving Manual).

2.0 METHODS

All diving activity was conducted on September 7 and 8, 2016. Selection of methods for this survey was guided by the typical data needs for consultation with National Marine Fisheries Service on potential coral reef and EFH impacts. One relevant guidance document is from National Oceanic and Atmospheric Administration (NOAA) Pacific Islands Regional Office (2011).

2.1 SURVEY AREA

The Survey Area included the original HDD punch-out location (N21 20.8232, W158 08.1920), the nearby revised HDD punch-out location (N21 20.8447, W158 08.1920), and the cable corridor between the HDD punch-out location and the 30-meter (98-foot) depth contour. The revised punch-out location is approximately 44 meters (144 feet) north of the original punch-out point. Data-collection intensity was two-tiered. Coarse-resolution habitat mapping was representative of the entire 31-hectare (77-acre) Survey Area. Moderate-resolution quantitative sampling of reef habitat was approximately representative of a 100-meter (330-foot) radius around the original HDD punch-out location and 10 meters (33 feet) on either side of the proposed cable centerline – across the dominant habitat types.

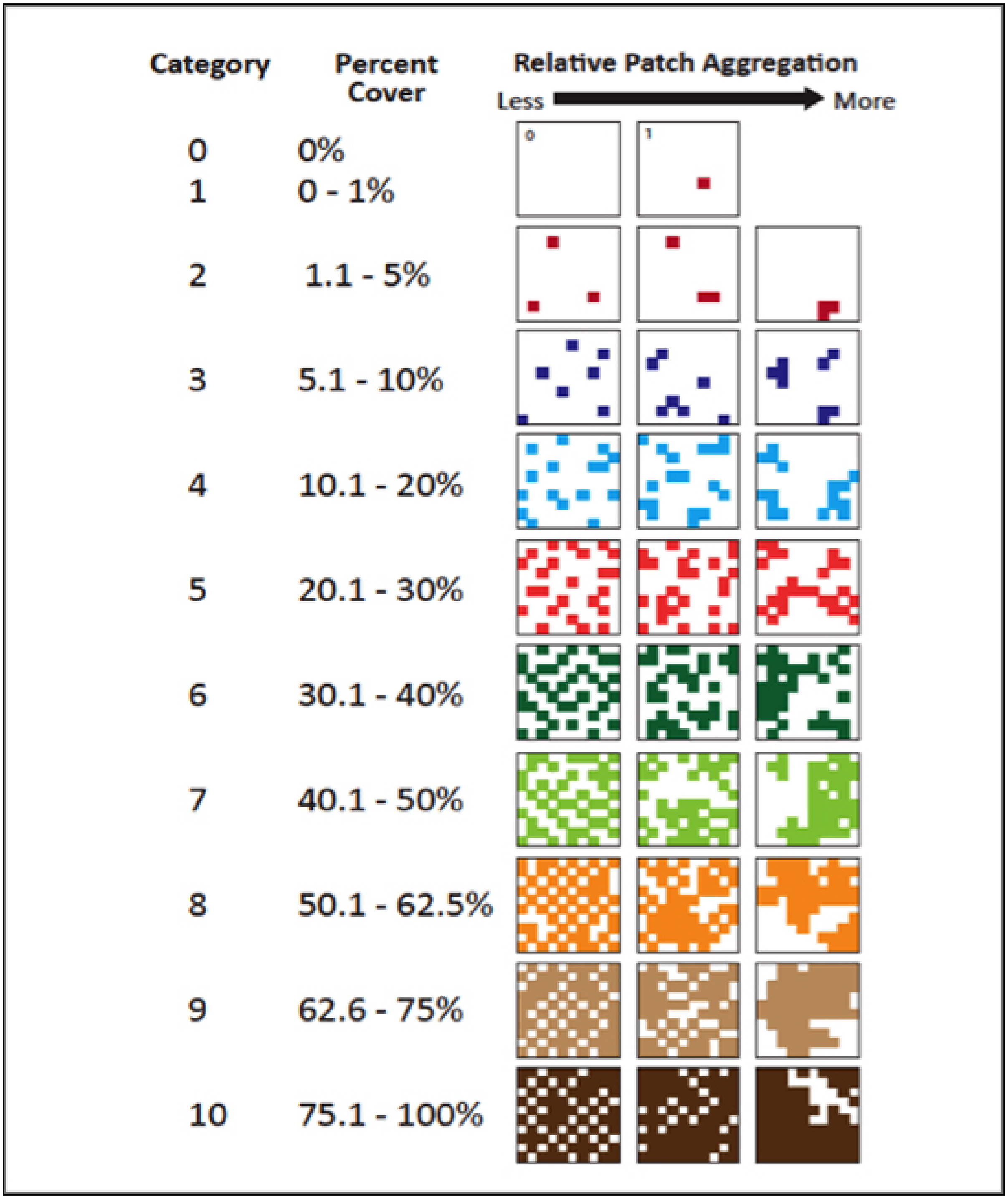
2.2 HABITAT MAPPING

Habitat mapping was conducted throughout the entire survey area using towed-divers. The towed-diver protocol was modified from the method used by NOAA in prior towboard surveys of the Hawaiian and Mariana Islands (Brainard et al. 2012; NOAA 2016). The two independent towed scientific divers were set with the same lay-back from the boat (approximately 60 meters [197 feet]), and maintained depths of 5-10 meters (5-11 feet) above the seafloor. Both had wired voice communications with another biologist on the support vessel. One diver towed the Global Positioning System (GPS) unit, maintaining its position directly above the pair; the other diver reported percent cover and topographic complexity.

Several modifications to the NOAA method were employed for habitat mapping. Towed-diver #1 assessed percent cover of coral, fleshy macroalgae, sand, and rubble on the 10-step scale (Figure 2-1), and topographic complexity on the 6-step scale (Figure 2-2). This was reported as a single numeric sentence; for example, "2, 2, 2, 2, 1" would indicate percent cover class of 2 for coral, fleshy macroalgae, sand, and rubble, and low topographic complexity. Divers reported information approximately every 30 seconds (approximately every 15 meters [49 feet] if towing at 1 knot). Data were cross-referenced with the track line, time, and speed so that the actual areas and locations can be linked with the ecological data.

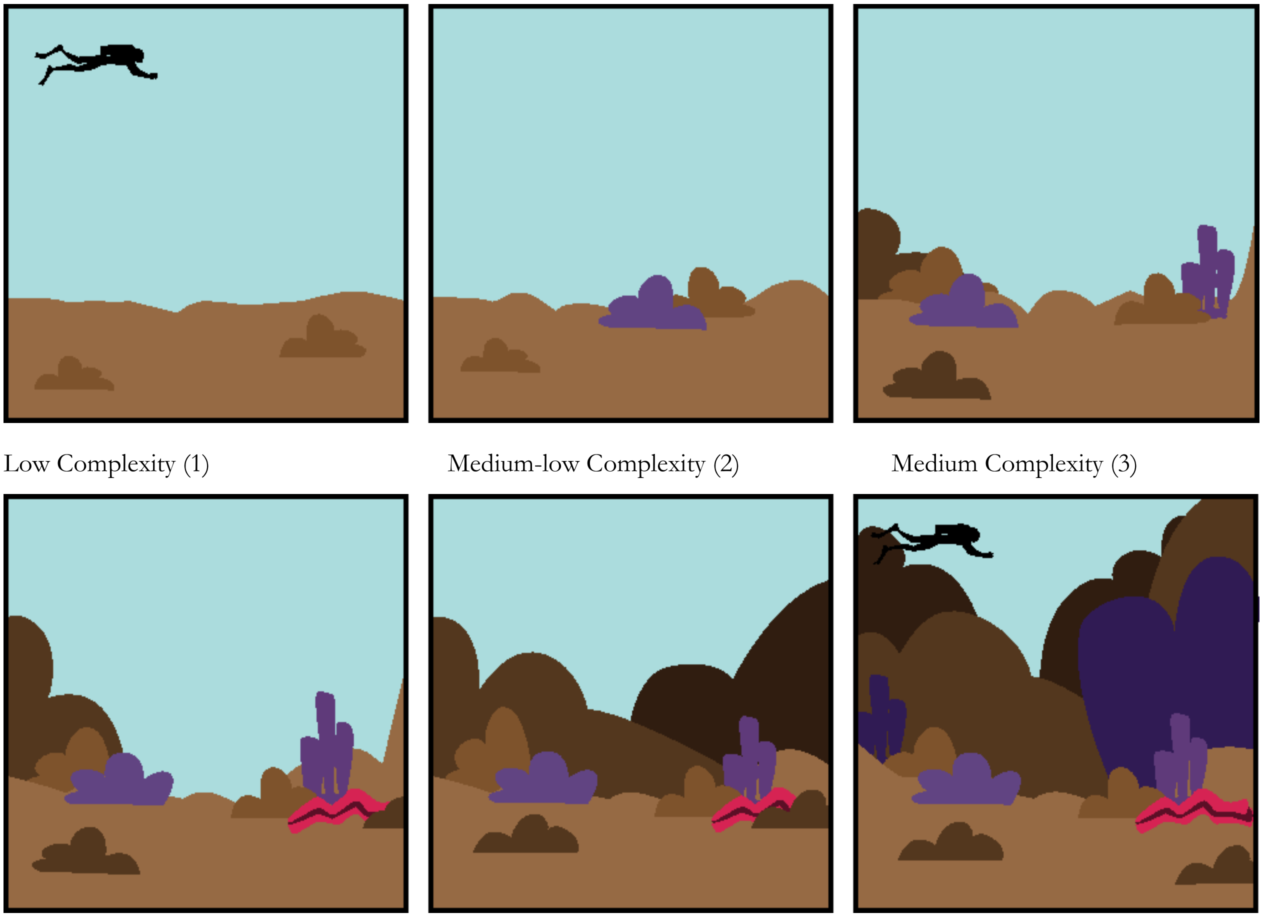
Towed diver #2 was principally tasked with error-checking of diver #1, and with secondary observation tasks including:

- Coral disease
- Coral predators (crown of thorns seastar [COTS], Drupella)
- Physical damage
- Coralline algae disease
- Invasive species (Terpios)
- Protected vertebrates (mammals, sea turtles, Endangered Species Act-listed fish)
- Noteworthy features
- Debris



Note: From NOAA (2016)

Figure 2-1. Visual Representation of Benthic Towed-diver Categories Used to Assess Percent Cover of Coral, Fleshy Macroalgae, Sand, and Rubble



Low Complexity (1) Medium-low Complexity (2) Medium Complexity (3)

Medium-high Complexity (4) High Complexity (5) Very High Complexity (6)

Notes: From Brainard et al. (2012). Examples of the 6 categories used to classify habitat complexity: low, medium-low, medium, medium-high, high, and very high. As they regularly encounter multiple habitat types, towed-divers report the estimated average complexity with each 30-second observation segment 15 x 50 m (~ 750 m^2).

Figure 2-2. Visual Representation of the Topographic Complexity Categories

The towed-divers also collected representative georeferenced video transects. All data were collected by voice annotation, hand-written notes, or photo-video. In general, divers used only one data collection mode to minimize mental distractions.

2.3 CORAL, SEAGRASS, AND REEF HABITAT QUANTIFICATION

2.3.1 Transect Layout and Sampling Approach

Twelve transects were sampled within the Survey Area. Transect locations were chosen to efficiently characterize habitat in and around the HDD punch-out location and the cable centerline, with a moderate sampling intensity. Each transect was 20 meters (66 feet) long. Sampling on all transects was identical, and was deployed at the locations indicated in Figure 2-3. Five semi-overlapping methods were conducted on each transect (detailed in the following sections). The partial overlap on the three benthic sampling methods will help future efforts to constrain spatial heterogeneity, if needed.

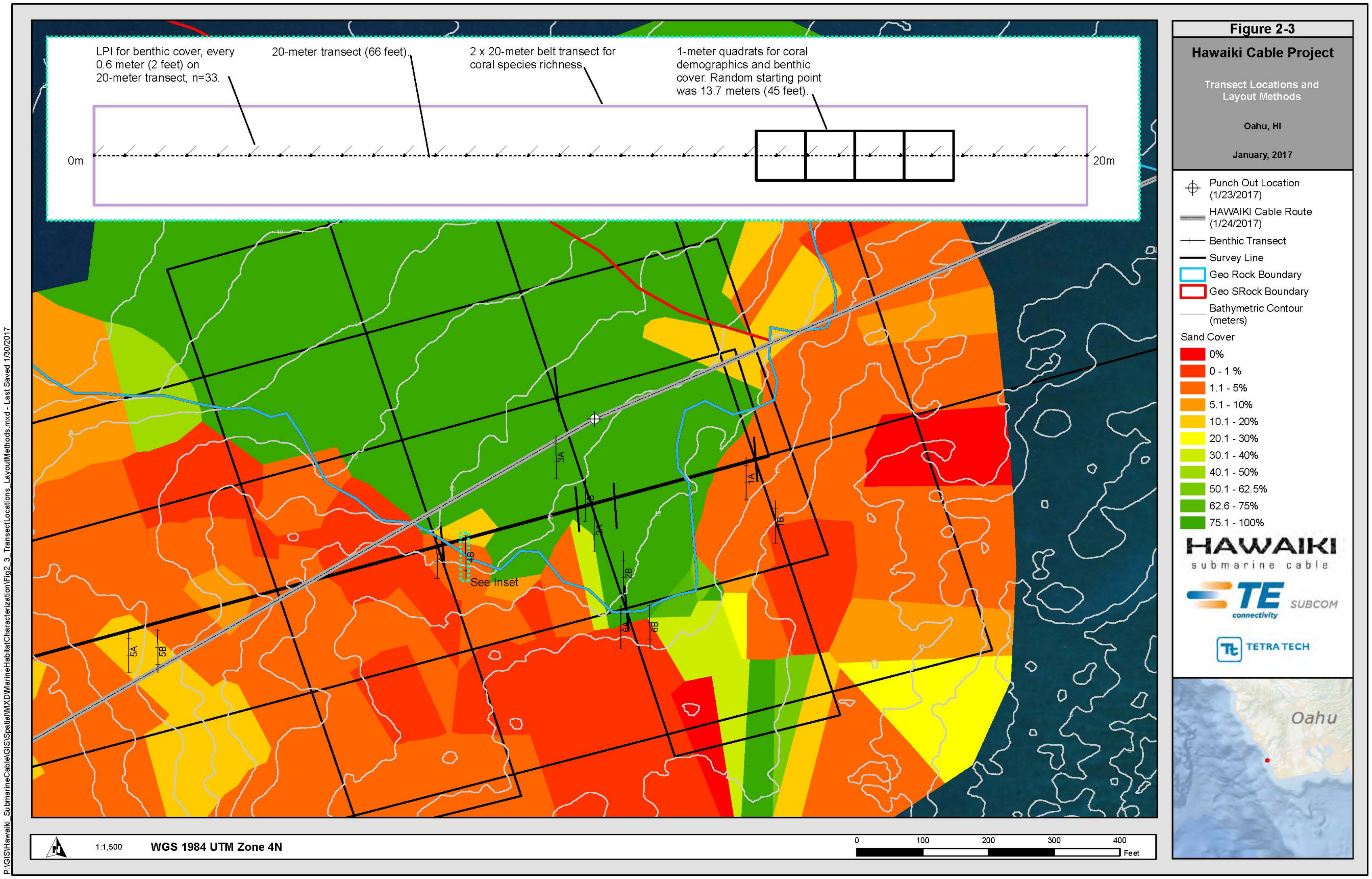


Figure 2-3. Transect Locations and Layout Methods

2.3.2 Line Point Intercept (LPI) surveys for percent cover

Line Point Intercept (LPI) surveys were used as shown in Figure 2-3. LPI methods were modified from standard approaches (Loya 1978; Maynard et al. 2015). Benefits of LPI results are the specificity of a high-resolution benthic survey at a spatial scale that samples the entire transect, rather than sampling portions as in quadrat surveys. The cost of the LPI method is that percent cover values represent a probability distribution function rather than a discrete bin or category as in the towed-diver and the quadrat surveys.

2.3.3 Quadrat Surveys for Percent Cover

Quadrat surveys for percent cover were used as shown in Figure 2-3. A total of 48, 1 square meter (10.7 square foot) quadrats were used to assess percent cover (4 quadrats on each of the 12 transects). Percent cover assessment methods were modified from standard approaches using category definitions consistent with ReefCheck, amplified by greater specificity for minor benthic organisms (Hodgson et al. 2002; Makowski et al. 2009). The cost of the quadrat method is logistical —only a small number of independent samples (quadrats) can practicably be collected. The size of quadrats and layout can skew representation of spatial heterogeneity on scales smaller than a transect.

2.3.4 Quadrat Surveys for Coral Demographics

Quadrat surveys for coral demographics (ID, density, size, and condition) were used as shown in Figure 2-3. Assessment methods were modified from standard approaches using category definitions consistent with standard approaches (McManus and McManus 2012; NOAA 2016). The 1 square meter quadrat is the worldwide standard for assessments of coral density and demographics. The cost of the quadrat method is logistical—only a small number of independent samples (quadrats) can practicably be collected. The size of quadrats and layout can skew representation of larger individuals, and spatial heterogeneity on scales smaller than a transect. This survey adapted the best practices for moderate-low energy Pacific reefs as recommended by McManus and McManus (2012); four contiguous 1 square meter quadrats on each transect. The location of quadrat placement was determined randomly, and the same random number was used for all transects (see Figure 2-3).

Methods to determine coral density and demography establish baseline knowledge about coral reef ecosystems and the quality of the EFH at surveyed locations. This deployment is a moderate-resolution assessment resulting in sampling intensity that may be less than statistically representative of particular habitat sub-types. Data collected allow quantification of:

- Location, habitat type (zone), and depth
- Species identification
- Species density
- Size frequency distribution
- Maximum diameter (nearest 1 centimeter for colonies greater than 5 centimeters (2 inches)
- Dimension orthogonal to the maximum diameter (nearest 1 centimeter for colonies greater than 5 centimeters (2 inches)
- Health (notations and photographs of observed disease, bleaching or observed predation)

Corals were included in each 1 square meter quadrat if the colony center was within the quadrat frame. All colonies within the frame were identified to species, and demographic data were collected from each. Colonies smaller than 5 centimeters were pooled into a single class, and for the purposes of maintaining the size frequency distributions these smallest colonies were arbitrarily given dimensions 4 x 4 centimeters, though most were smaller than this.

Colony size is a useful approximation of biomass, and particular dimensions are recommended for community-scale assessments (McManus and McManus 2012). Measuring a single dimension (e.g., the maximum diameter) assumes the colony size can be approximated by the area of a circle. Measuring two dimensions (e.g., the maximum dimension and the dimension orthogonal to the maximum dimension at its midpoint) assumes the colony size can be approximated by the area of an ellipse. The latter, plus growth form, is recommended as the best practice for community assessments (McManus and McManus 2012). The elliptical area was calculated using the formula for the area of a regular ellipse (i.e., $A = \pi r_1 r_2$) and presented as square centimeters. The results present colony size as elliptical area and convert these sizes to approximate circular diameter only for casual comparisons on figures. See Table 3-10 for a quick-reference guide to these conversions, but most colonies are poorly approximated by circular diameters. Elliptical areas were used for all quantitative comparisons.

2.3.5 Belt Transects for Coral Species Richness

Belt transects for coral species richness were used as shown in Figure 2-3. The survey area of each belt transect was 2 x 20 meters, or 40 square meters. The coral richness assessment method was adapted with small modifications from standard approaches (Loya 1978; Porter et al. 2002). Timed swims of 10 minutes per transect were devoted to searching for coral species. A cumulative list was maintained for all transects, pooled.

2.3.6 Roving Survey for Fish Species Richness

A cumulative species list for the survey area was approximated using the roving diver approach (Caldwell et al. 2016). Timed, roving-diver swims recording the number of species observed at a particular location within a known amount of time. The area surveyed during this type of survey is unconstrained, but a typical approximation was 20 meters on each side of the transect. The fish species list generated by in-water observations was enhanced by review of video and still imagery.

2.4 QUALITY ASSURANCE

Quality assurance was accomplished with a series of active and passive controls. During data collection, observers regularly conferred on identification and quantity estimates. This occurred both on the surface and underwater. Field identifications and visual estimates of categories or quantities were backed-up with imagery for later reference and review. Validation of quantity estimates among methods compared independent metrics for the same parameter (e.g., coral cover as assessed by towed-diver, LPI, and quadrat methods). Data entry was cross-checked by re-verification of approximately 10 percent of all field annotations. Quantity estimates were arithmetically-screened for duplicates, missing data, outliers, and overestimates. Finally, the report products were subject to two rounds of technical review.

3.0 RESULTS

The two field days of work entailed 17.7 staff-hours underwater, among 31 dives. Working depths ranged from 13 to 25 meters (43 to 82 feet), and data collection included habitat at depths from 11 to 30 meters (36 to 98 feet). Dive teams used SCUBA and enriched air nitrox (EANx) 32 under AAUS standards, and there were no injuries or incidents during the survey period.

First impressions of the Survey Area should be informed by Figure 3-1. The vicinity of the HDD punch-out area is nearly 100 percent sand, and the seafloor resources along the alignment are rubble fields (unconsolidated pebble and cobble-sized fragments) interspersed with moderate density relict reefs.

Figure 3-1. View from the Center of the original HDD Punch-out Point which is representative of large sandy area, including the revised punch-out point (left). View towards the HDD Punch-out Point from the Adjacent Moderate-density Relict Reefs (right).

Relict reefs have coral growth but do not have vertical or lateral accretion (Montaggioni and Braithwaite 2009; Riegl et al. 2008). Relict reefs usually have homogenous or patchy distributions of living corals, and are not biologically or topographically complex. The corals growing atop older reef structures cannot create net-positive carbonate deposition, and relict reefs usually have net-negative carbonate budgets (i.e., they are eroding faster than they are deposited) (Alvarez-Filip et al. 2009; Jokiel 2008). Most modern-day Hawaiian reefs are relict reefs, and the last time they were actively accreting was 5000-7000 years ago (Fletcher et al. 2008; Friedlander et al. 2008; Kittinger 2010).

All quantitative and qualitative data are summarized in the section below. GIS files and copies of data and imagery are available electronically, by request.

3.1 WEATHER AND SITE CONDITIONS

Observed weather onsite was well correlated with the actual observations from the nearest official NWS weather station (PHNL). On-site weather observations were noted each morning and afternoon (Table 3-1).

Table 3-1. Weather Observations during Work

Observations are Morning/Afternoon	Wed 7 Sept 2016	Thu 8 Sep 2016
Wind Direction and Speed (kts)	E 15 / E 20	E 15 / E 25 Gusty
Wind Waves (m)	Nil / 0.3	Nil / 0.6
Dominant Swell Direction and Period (s)	SSW 15 / SSW 15	SSW 14 / SSW 14
Current Direction and Speed (kts)	S 0.7 / N 0.5 *	S 0.7 / S 0.3 **
Sun	Partly Sunny / Partly Sunny	Full Sun / Full Sun
Rain	Occasional showers before 2 pm	Morning shower
Underwater Horizontal Visibility (m)	20*** / 20	30 / 30
Underwater Vertical Visibility (m)	10 / 20	20 / 20

Notes: * Reversal at the mid-afternoon low tide, ** Brief reversal at the mid-afternoon low tide, *** Visibility decreased during showers

Sources: Direct observations for all but swell period and current speed. Swell period observations were inferred from NDBC station 51203. Current Speed was inferred from a PacIOOS model (http://www.pacioos.hawaii.edu/currents/model-southoahu/)

3.2 TOWED-DIVER HABITAT MAPPING

Towed-diver habitat mapping covered 77 acres including habitat at depths from 11 to 30 meters (36 to 98 feet). The areas covered by each category (sand, rubble, coral, macroalgae, and topographic complexity), summary statistics for the area, and another figure focused on the HDD punch-out area are presented in sequence. Sand Cover—Figure 3-2, Table 3-2, and Figure 3-3; Rubble Cover—Figure 3-4, Table 3-3, and Figure 3-5; Coral Cover—Figure 3-6, Table 3-4, and Figure 3-7; Macroalgae Cover—Figure 3-8, Table 3-5, and Figure 3-9; and Topographic Complexity Cover—Figure 3-10, Table 3-6, and Figure 3-11. Additional data collected during towed-diver surveys are presented in Figure 3-12 and Figure 3-13. The legends of these figures and tables have matching color ramps to facilitate referencing between a figure and its corresponding summary table. The color ramps do not share the same pattern. Green was selected to represent conditions that would minimize environmental impact (i.e., 100% sand and 100% rubble are green). Likewise, 0 percent coral and 0 percent algae are green.

The vicinity of the HDD punch-out area is nearly 100 percent sand. The 100 percent sand area is v-shaped, and the nearest hard substrates are 50 meters from the HDD punch-out point. The habitat resources along the alignment are a patchwork of moderate-cover of rubble and sand, interspersed with moderate density relict reefs. This patchwork habitat becomes less rich and less complex just to the north of cable alignment. Beyond the 24-meter contour is a clear decrease in habitat complexity with greater sand and rubble cover and less coral cover.

One seagrass species – the indigenous *Halophila decipiens* – was observed. A total of approximately 10 patches were observed at three locations (Figure 3-13). All patches were 1 to 5 square meters with a Braun-Blanquet score of 2 or 3.

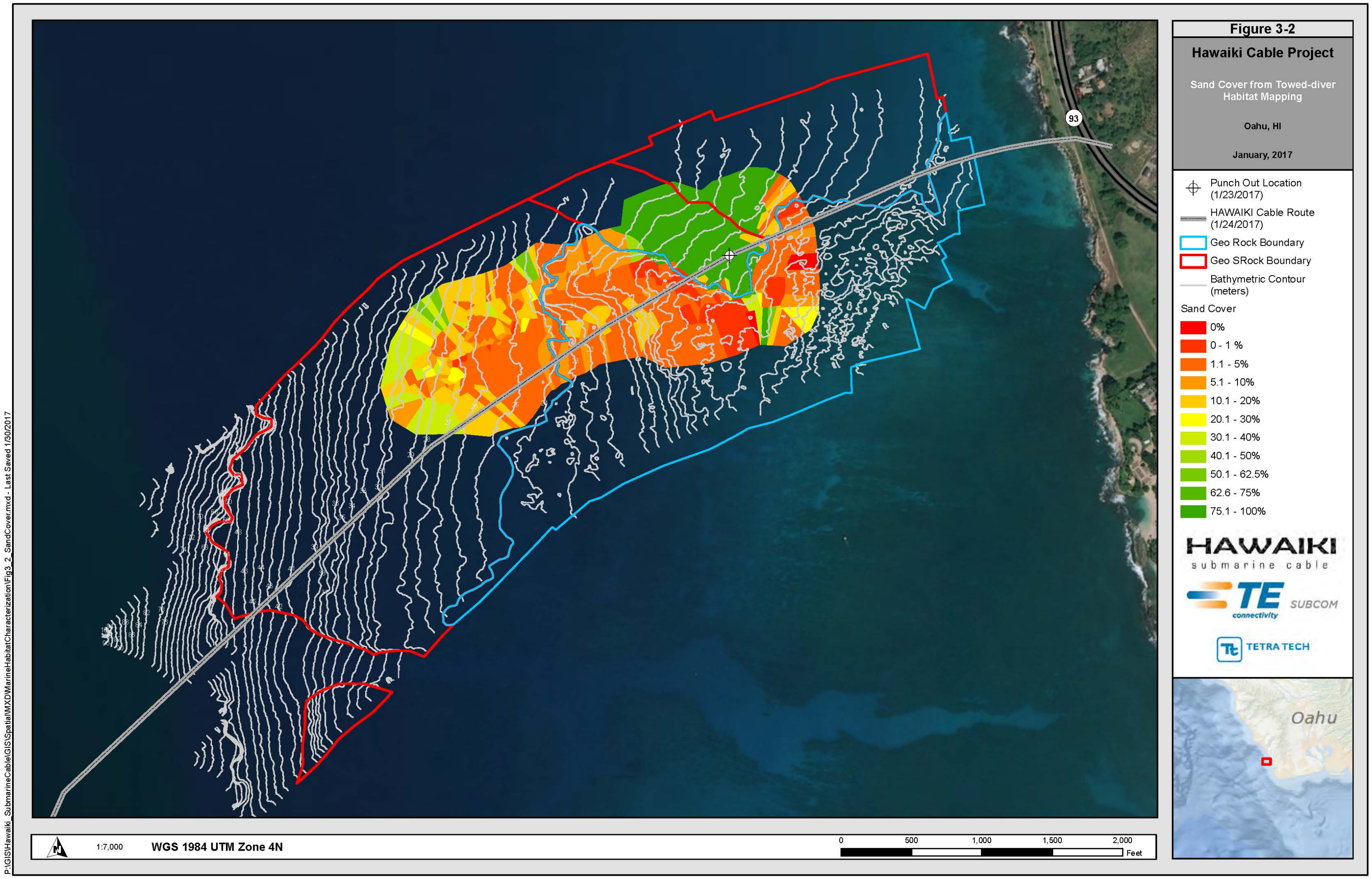


Figure 3-2. Sand Cover from Towed-diver Habitat Mapping

Table 3-2. Sand Cover from Towed-diver Habitat Mapping, Summary Statistics

Sand Percent Cover	m^2	ft^2	acre	hectare	Cumulative Percentage
0	3,197	34,409	0.8	0.3	1%
0-1	20,092	216,268	5.0	2.0	6%
1.1-5	121,831	1,311,373	30.1	12.2	39%
5.1-10	31,380	337,776	7.8	3.1	10%
10.1-20	43,777	471,214	10.8	4.4	14%
20.1-30	6,879	74,047	1.7	0.7	2%
30.1-40	21,410	230,453	5.3	2.1	7%
40.1-50	1,609	17,320	0.4	0.2	1%
50.1-62.5	4,957	53,358	1.2	0.5	2%
62.6-75	238	2,566	0.1	0.0	0.1%
75.1-100	59,251	637,775	14.6	5.9	19%
Total	**314,622**	**3,386,559**	**77.7**	**31.5**	**100%**

Note: color ramp matches Figure 3-2.

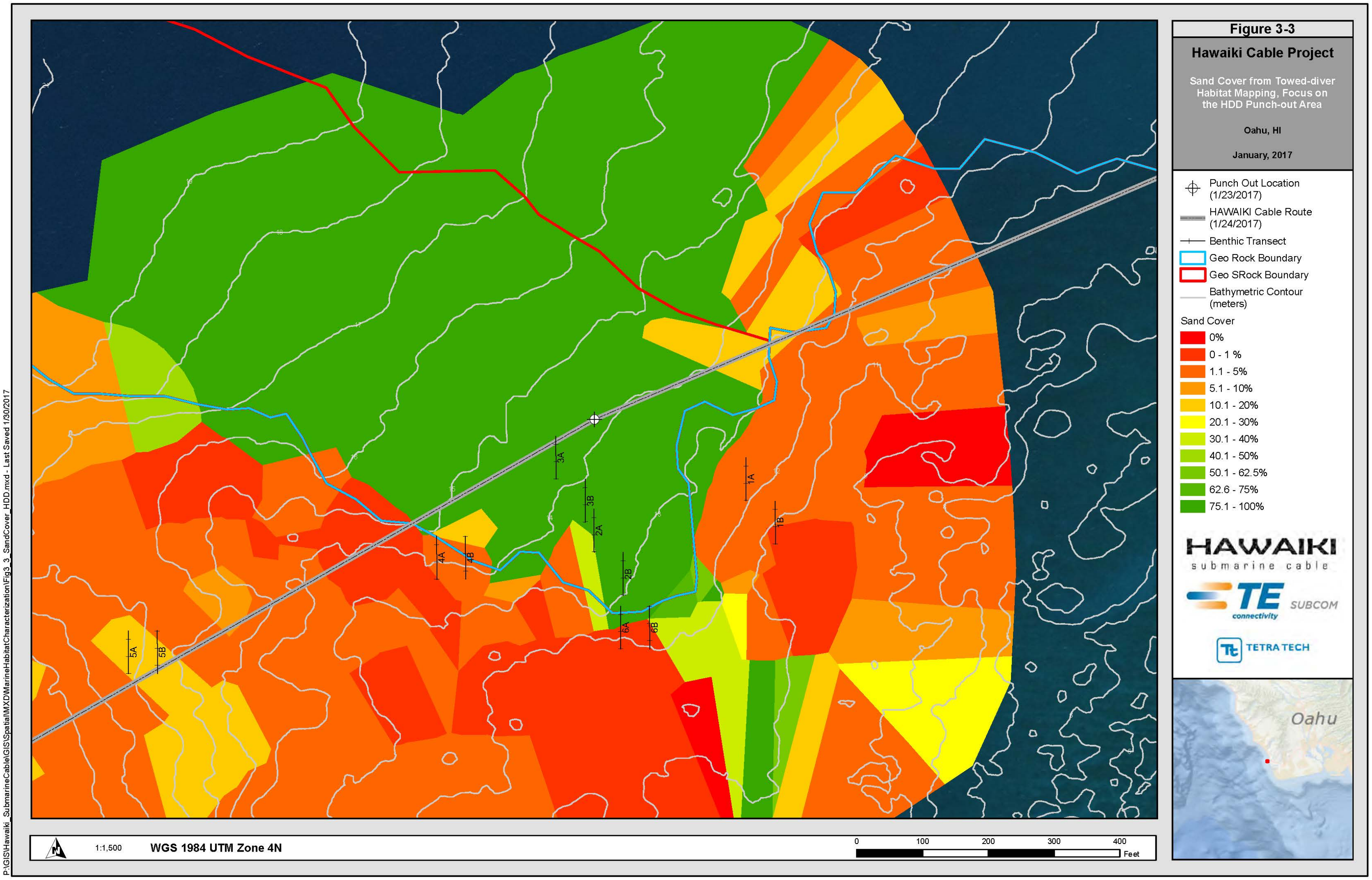


Figure 3-3. Sand Cover from Towed-diver Habitat Mapping, Focus on the HDD Punch-out Area

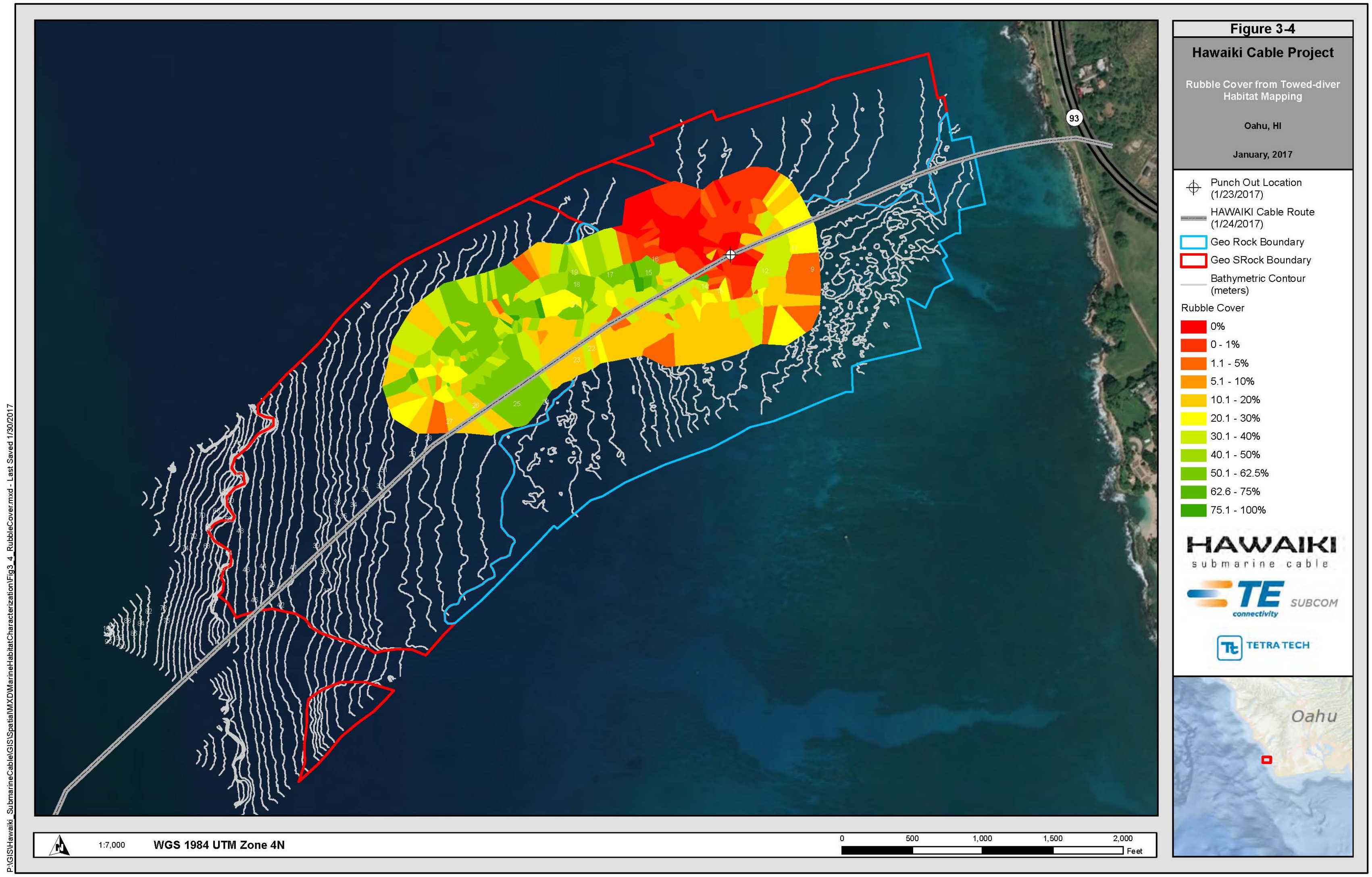


Figure 3-4. Rubble Cover from Towed-diver Habitat Mapping

Table 3-3. Rubble Cover from Towed-diver Habitat Mapping, Summary Statistics

Rubble Percent Cover	m^2	ft^2	acre	hectare	Cumulative Percentage
0	20,246	217,930	5.0	2.0	6%
0-1	33,987	365,829	8.4	3.4	11%
1.1-5	26,361	283,749	6.5	2.6	8%
5.1-10	1,418	15,259	0.4	0.1	0.5%
10.1-20	80,216	863,437	19.8	8.0	25%
20.1-30	26,968	290,279	6.7	2.7	9%
30.1-40	54,874	590,659	13.6	5.5	17%
40.1-50	15,007	161,530	3.7	1.5	5%
50.1-62.5	52,427	564,322	13.0	5.2	17%
62.6-75	883	9,508	0.2	0.1	0.3%
75.1-100	2,235	24,058	0.6	0.2	1%
Total	**314,622**	**3,386,559**	**77.7**	**31.5**	**100%**

Note: color ramp matches Figure 3-4.

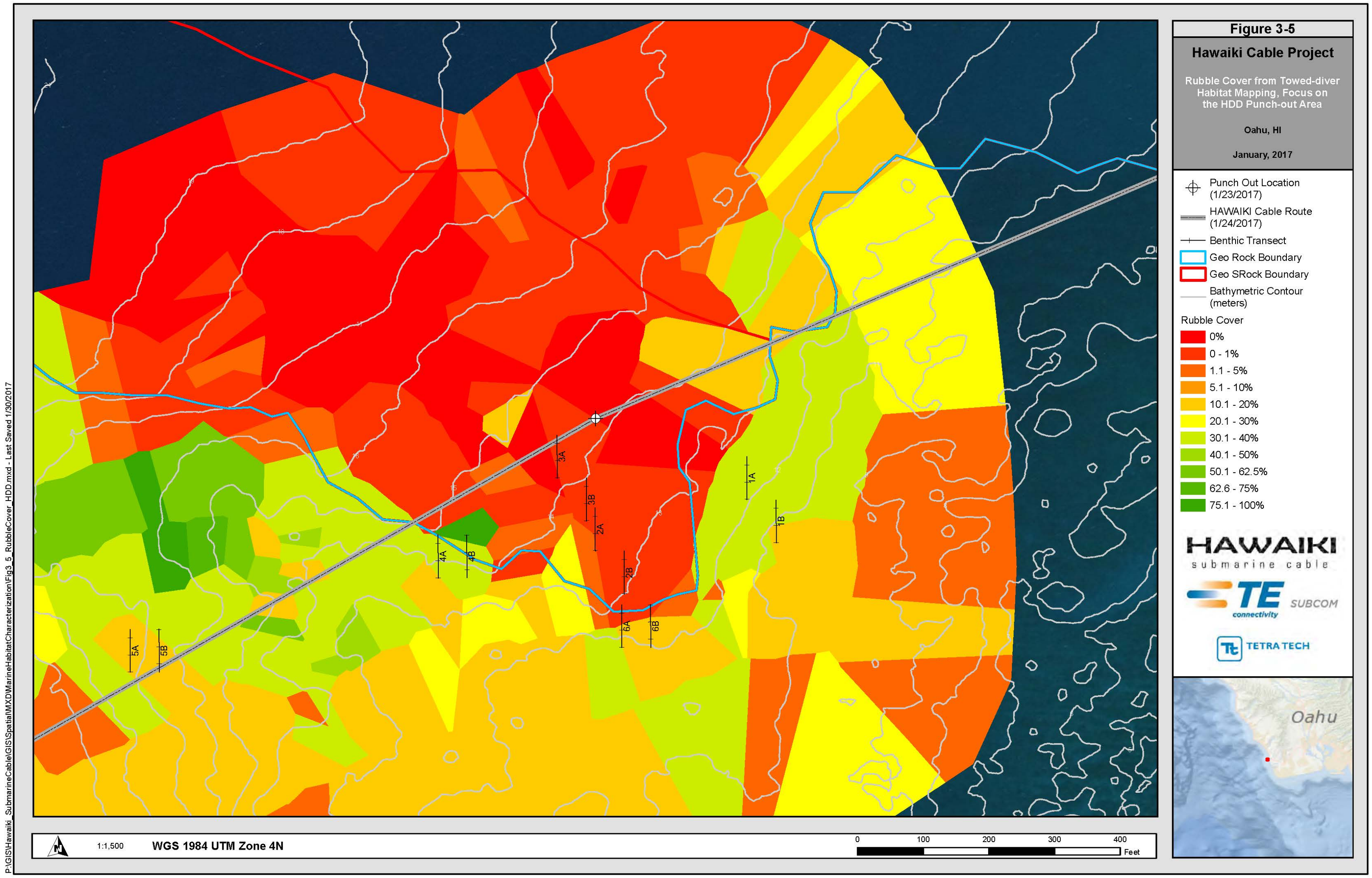


Figure 3-5. Rubble Cover from Towed-diver Habitat Mapping, Focus on the HDD Punch-out Area

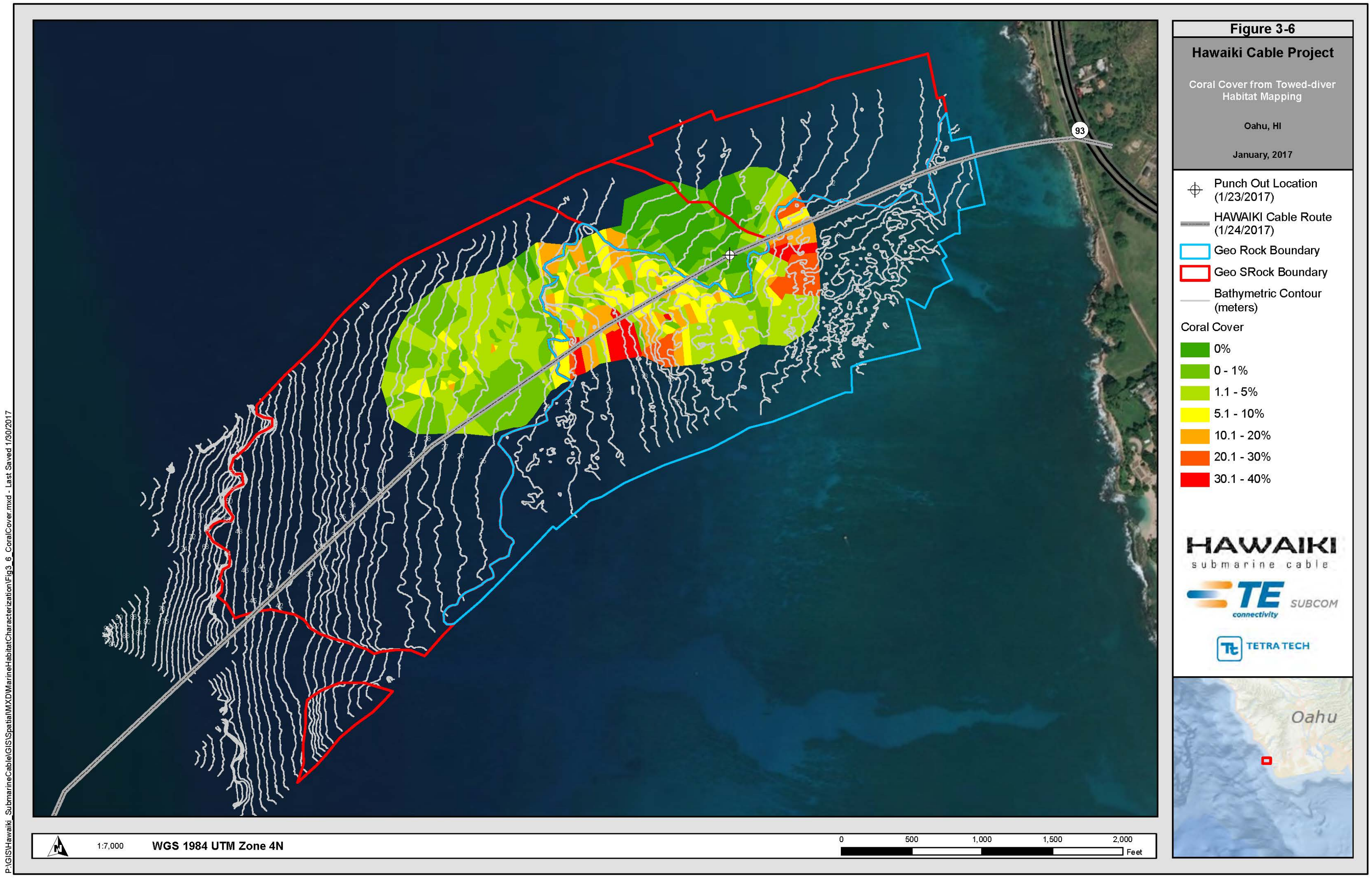


Figure 3-6. Coral Cover from Towed-diver Habitat Mapping

Table 3-4. Coral Cover from Towed-diver Habitat Mapping, Summary Statistics

Coral Percent Cover	m^2	ft^2	acre	hectare	Cumulative Percentage
0	41,809	450,029	10.3	4.2	13%
0-1	88,652	954,242	21.9	8.9	28%
1.1-5	101,217	1,089,491	25.0	10.1	32%
5.1-10	33,616	361,835	8.3	3.4	11%
10.1-20	26,783	288,285	6.6	2.7	9%
20.1-30	13,484	145,138	3.3	1.3	4%
30.1-40	9,062	97,540	2.2	0.9	3%
40.1-50	0	0	0.0	0.0	0%
50.1-62.5	0	0	0.0	0.0	0%
62.6-75	0	0	0.0	0.0	0%
75.1-100	0	0	0.0	0.0	0%
Total	**314,622**	**3,386,559**	**77.7**	**31.5**	**100%**

Note: color ramp matches Figure 3-6.

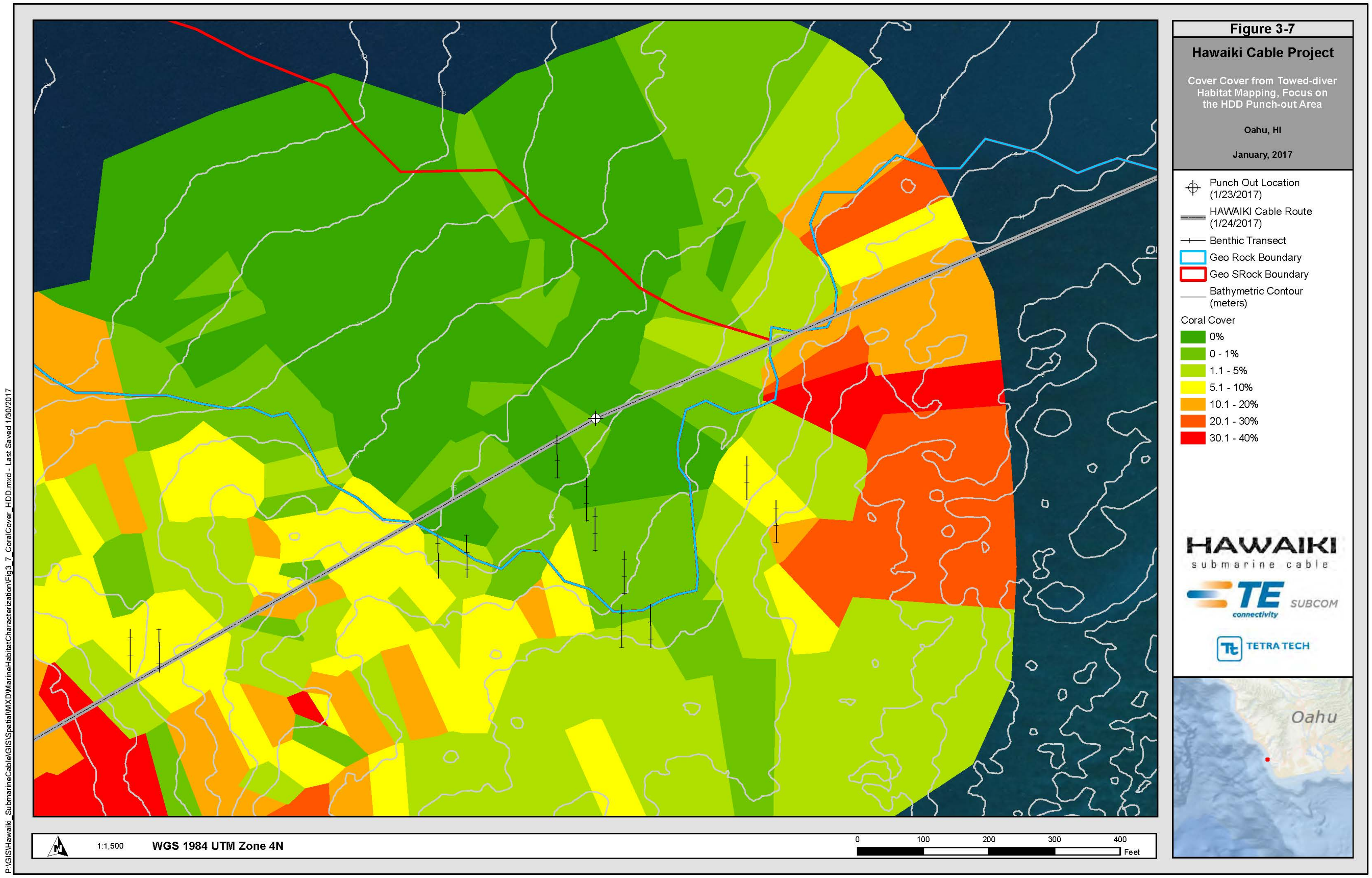


Figure 3-7. Coral Cover from Towed-diver Habitat Mapping, Focus on the HDD Punch-out Area

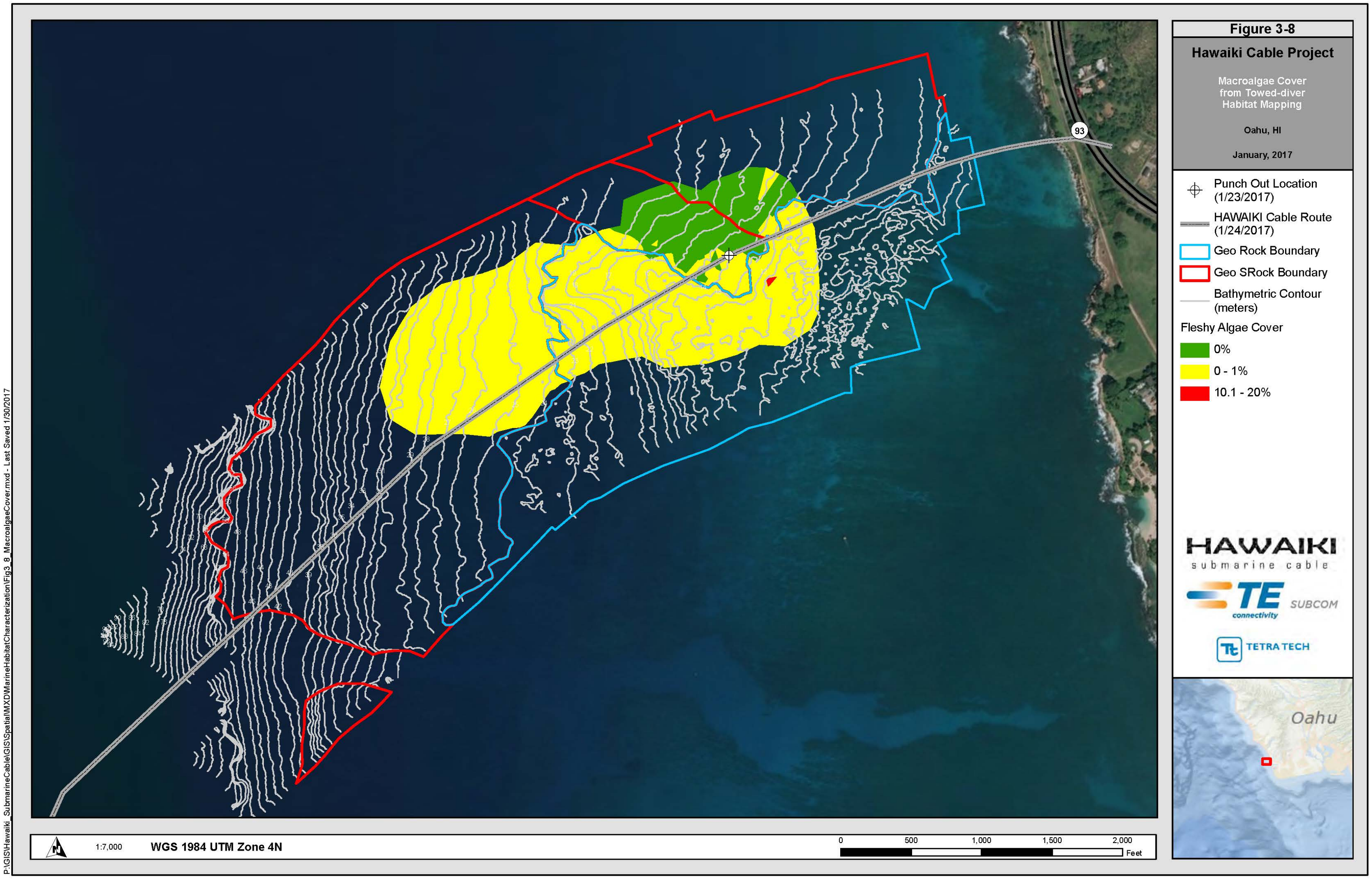


Figure 3-8. Macroalgae Cover from Towed-diver Habitat Mapping

Table 3-5. Macroalgae Cover from Towed-diver Habitat Mapping, Summary Statistics

Macroalgae Percent Cover	m²	ft²	acre	hectare	Cumulative Percentage
0	53,199	572,629	13.1	5.3	17%
0-1	261,173	2,811,245	64.5	26.1	83%
1.1-5	0	0	0.0	0.0	0%
5.1-10	0	0	0.0	0.0	0%
10.1-20	249	2,685	0.1	0.0	0.1%
20.1-30	0	0	0.0	0.0	0%
30.1-40	0	0	0.0	0.0	0%
40.1-50	0	0	0.0	0.0	0%
50.1-62.5	0	0	0.0	0.0	0%
62.6-75	0	0	0.0	0.0	0%
75.1-100	0	0	0.0	0.0	0%
Total	**314,622**	**3,386,559**	**77.7**	**31.5**	**100%**

Note: color ramp matches Figure 3-8.

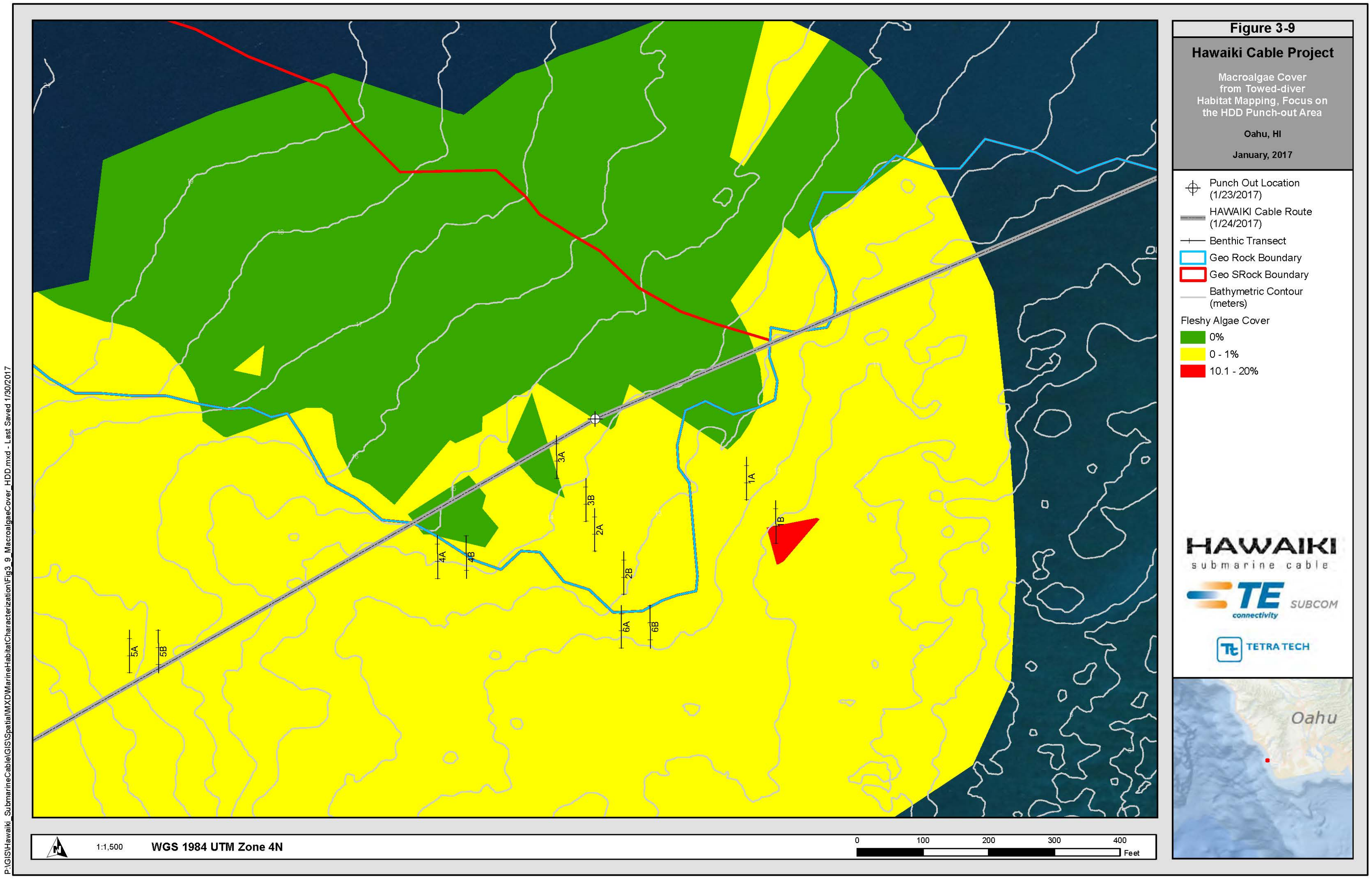


Figure 3-9. Macroalgae Cover from Towed-diver Habitat Mapping, Focus on the HDD Punch-out Area

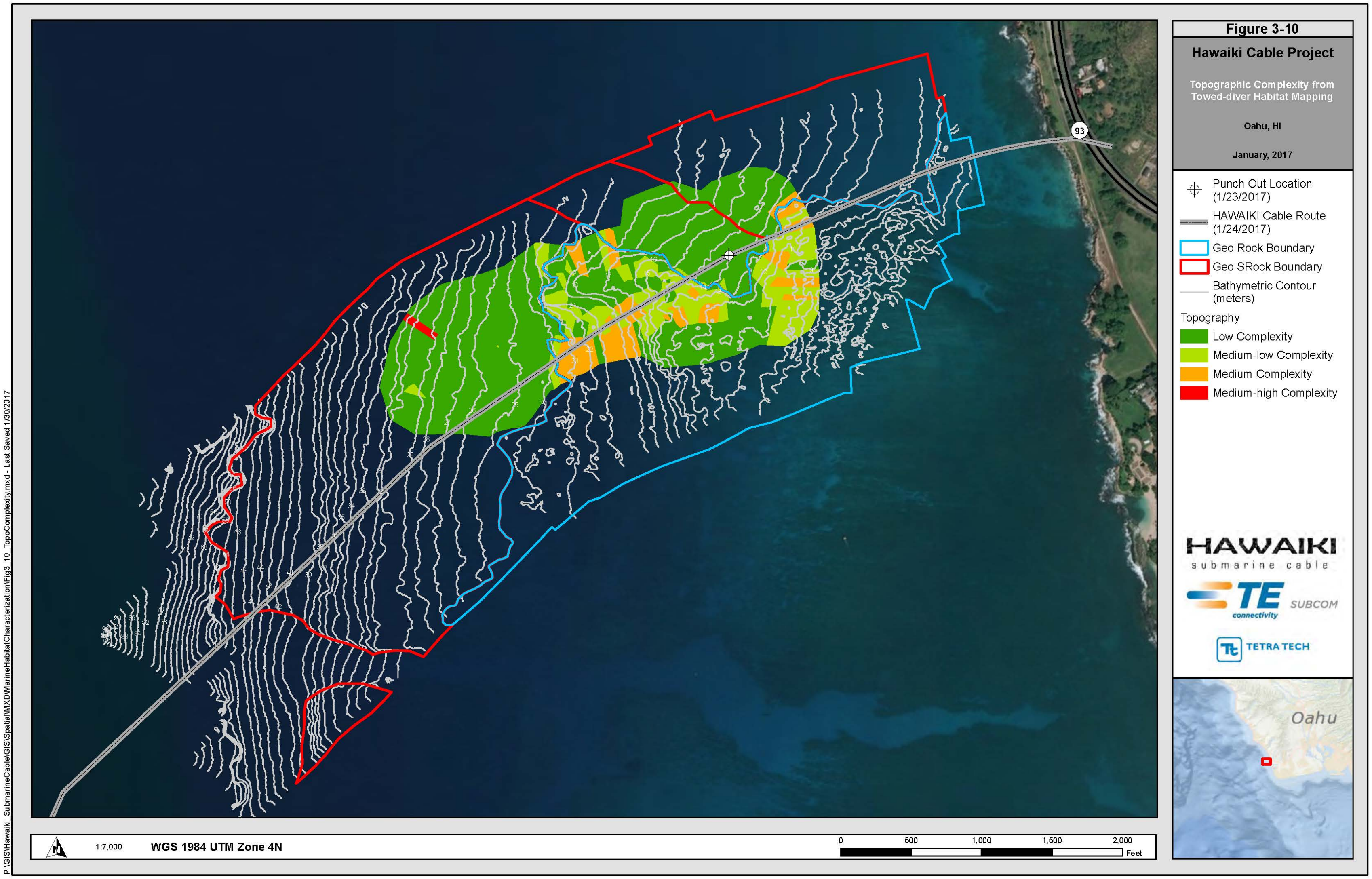


Figure 3-10. Topographic Complexity from Towed-diver Habitat Mapping

Table 3-6. Topographic Complexity Cover from Towed-diver Habitat Mapping, Summary Statistics

Topographic Complexity	m^2	ft^2	acre	hectare	Cumulative Percentage
1.0	229,879	2,474,399	56.8	23.0	73%
2.0	53,462	575,464	13.2	5.3	17%
3.0	29,849	321,290	7.4	3.0	9%
4.0	1,431	15,406	0.4	0.1	0.5%
5.0	0	0	0.0	0.0	0%
6.0	0	0	0.0	0.0	0%
Total	**314,622**	**3,386,559**	**77.7**	**31.5**	**100%**

Note: color ramp matches Figure 3-10.

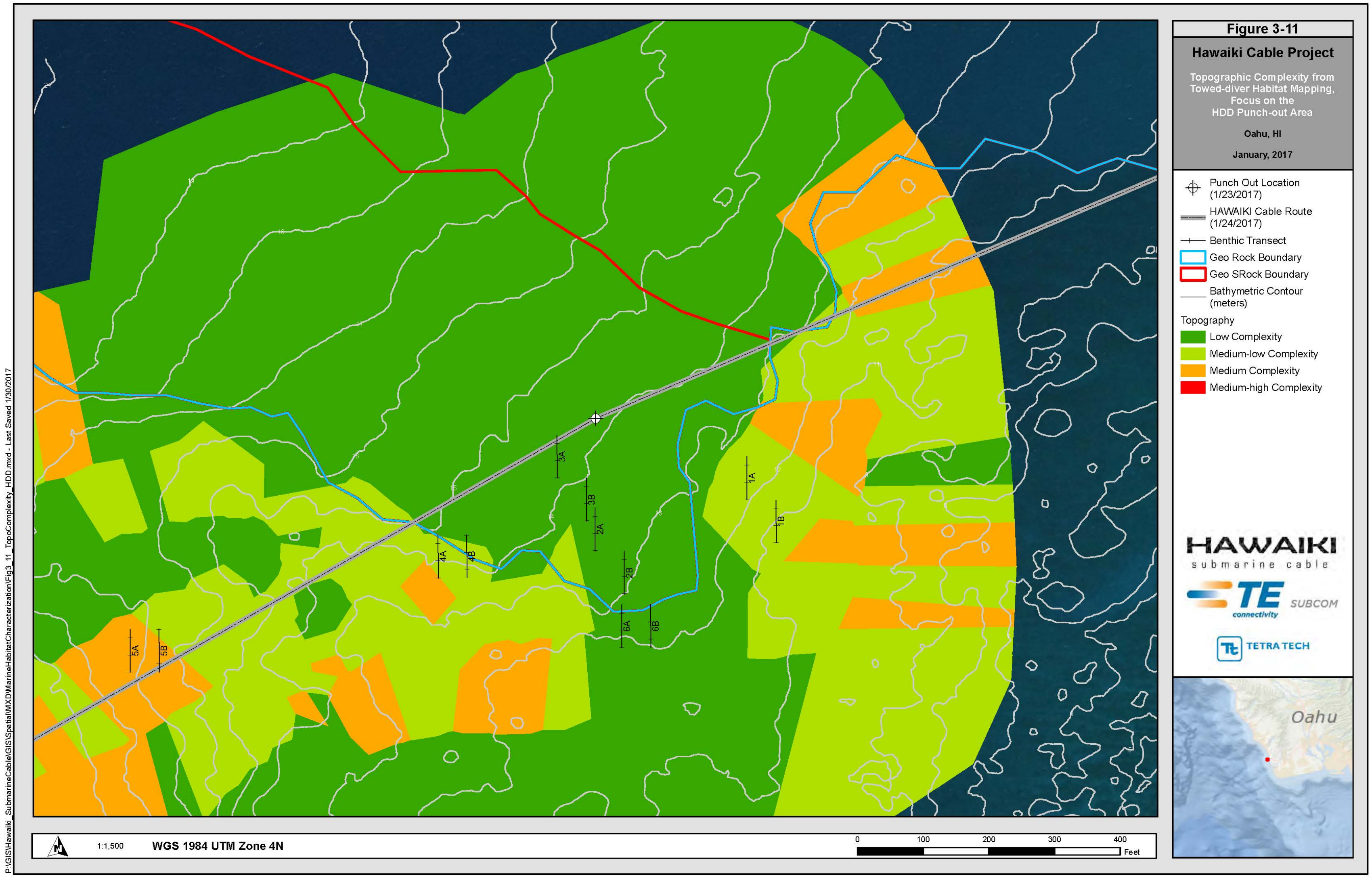


Figure 3-11. Topographic Complexity Cover from Towed-diver Habitat Mapping, Focus on the HDD Punch-out Area

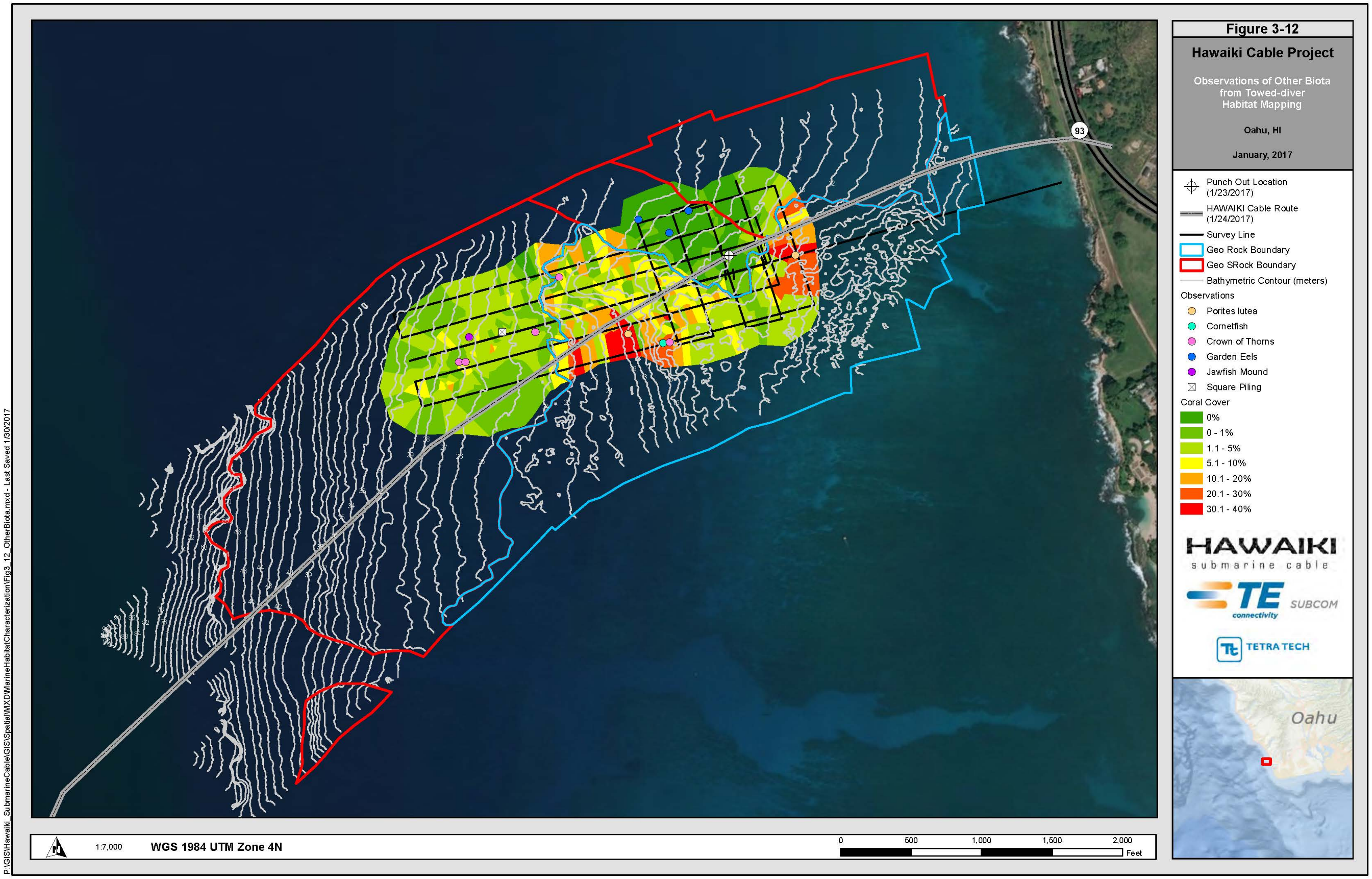


Figure 3-12. Observations of Other Biota from Towed-diver Habitat Mapping

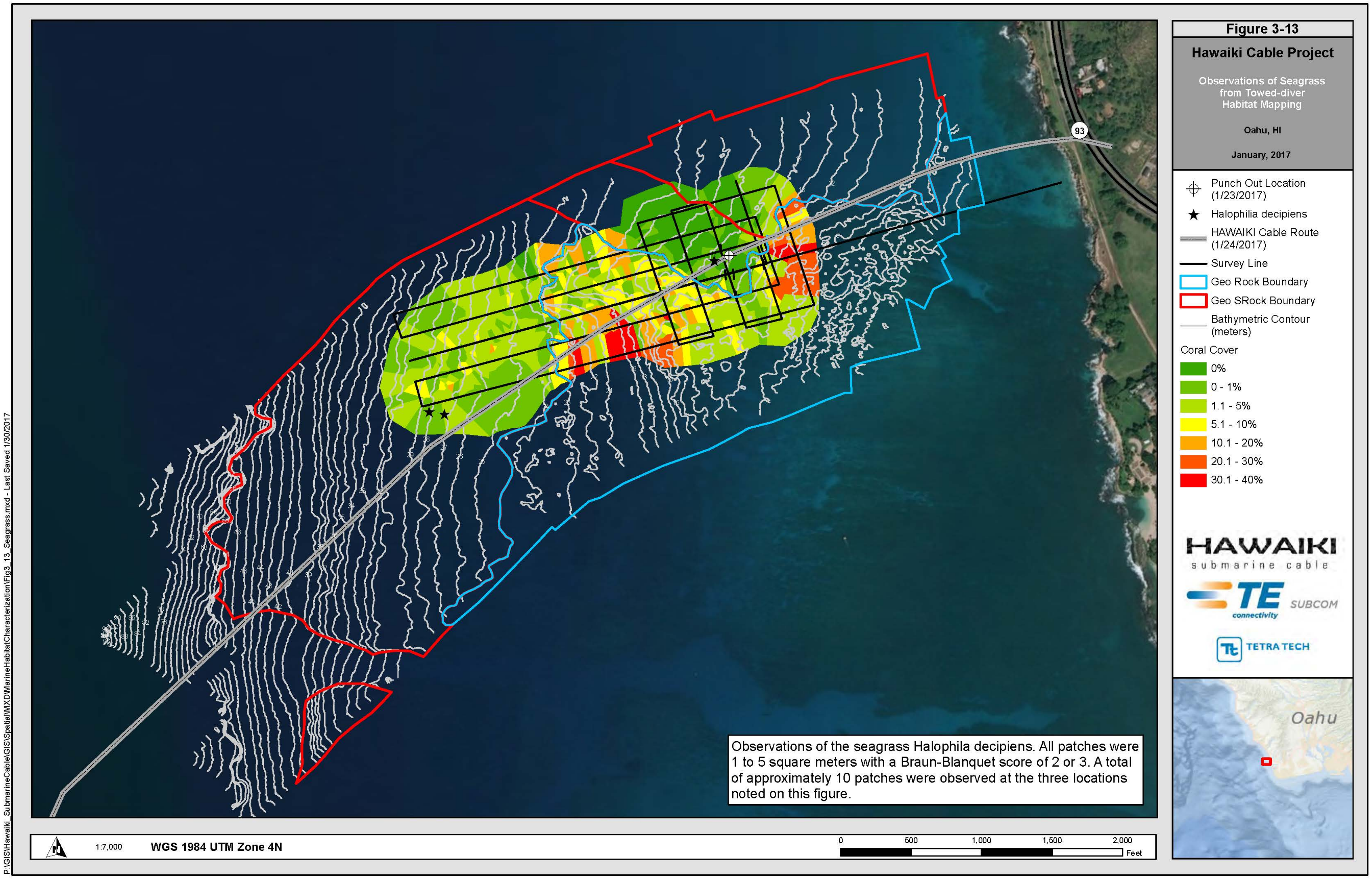


Figure 3-13. Observations of Seagrass from Towed-diver Habitat Mapping

3.3 PERCENT COVER FROM LINE POINT INTERCEPT

LPI results provide the specificity of a benthic survey at a spatial scale that samples the entire transect, rather than sampling portions – as in the quadrat surveys. Percent cover from LPI (Table 3-7) is a very good representation of characteristics in the vicinity of each transect. The transects cross three habitat types. One is very high sand cover (greater than 80%), one is mixed sand, rubble, and rock (approximately even distributions), and one is reef with moderate coral cover (5-20% coral cover).

3.4 PERCENT COVER FROM QUADRAT SAMPLING

Quadrat percent cover results provide specificity and precision that is superior to towed-diver and LPI surveys. Because they sample the same area (Figure 2-3), results of the quadrat percent cover sampling were similar to the LPI transects. The distribution of habitat types was essentially bimodal. Sand cover was the single-greatest percent cover category on 6 of the 12 transects. Quadrats on transects crossing sand had little or zero biota, and quadrats on transects crossing the moderate-density relict reef patches had macrobiota averaging 10 percent cover (Table 3-8). Macroalgae taxa observed in the quadrats included *Caulerpa taxifolia*, *Caulerpa urvilleana*, *Neomeris annulata*, Filamentous red, Fleshy red, *Dasya* sp, *Laurencia* sp, and *Dictyota* sp.

3.5 CORAL DEMOGRAPHICS FROM QUADRAT SAMPLING

Each transect was sampled with four quadrats arrayed as shown in Figure 2-3. A total of nine species of corals fell within quadrats. The most abundant coral species was *Porites lobata*, with an estimated density of 4.15 colonies per square meter (Table 3-9). Most colonies are smaller than 10 centimeters; approximate circular diameter (Table 3-10); however, *Porites compressa* attained maximum sizes approaching 55 centimeters; approximate circular diameter. In total, 267 corals were counted within 48 quadrats; the average quadrat contained about 5 coral colonies. However, most of the quadrats on transects crossing sand had few or zero colonies, and quadrats on transects crossing the moderate-density relict reef patches had coral colony densities of about 10 colonies per square meter (Table 3-9).

3.6 CORAL SPECIES RICHNESS FROM BELT TRANSECT SURVEYS

Coral richness concentrated at the most topographically complex relict reef patches. The coral species identified during timed belt transect surveys are presented in Table 3-11. The total richness based on this survey is 14. At least one other species was observed outside the belt transect areas. To put this richness in context, a survey inside the nearby commercial harbor (Kalaeloa) found 17 coral species (U.S. Fish and Wildlife Service 2014).

3.7 FISH SPECIES RICHNESS FROM ROVING DIVER SURVEYS

Fish richness and abundance was surprisingly low, even at the most topographically complex relict reef patches. The fish species identified during roving diver surveys are presented in Table 3-12. The total richness based on this survey is 28. This substantially underestimates the likely true species richness, principally because gobies and blennies were not conspicuous enough to be included. Other drivers of this underestimation include: biases of the method, time limitations, surveying only during midday hours, and observer limitations.

Table 3-7. Results of Line Point Intercept Survey

Transect Name	1A	1B	2A	2B	3A	3B	4A	4B	5A	5B	6A	6B
Max Depth	47	47	48	48	53	53	42	42	60	60	44	44
Sand	84%	23%	100%	88%	94%	94%	30%	45%			42%	
Rubble	9%	42%		9%	6%	6%	58%	24%	56%	55%	18%	25%
Hard Coral									6%	19%		
Fleshy Algae												
Soft Coral												
Sponge												
Rock (with turf)	6%	35%		3%			12%	30%	38%	19%	39%	41%
Recently Killed Coral												
Calcareous Algae										6%		
Other*												34%

Note: * = Bare pavement with a veneer of sand 1-4 cm thick. Points per transect n = 33. Minimum reportable cover = 3%.

Table 3-8. Percent Cover from Quadrats

Transect	Sand	Rubble	Hard Coral	Macroalgae*	Calcareous Algae	Sponge	Other Biota*	Rock w/Turf	Bare
1A	76%	6%	4%	1%	1%	1%	1%	20%	
1B	50%	44%	2%	1%	1%		1%	6%	
2A	99%			1%				2%	
2B	100%								
3A	98%		2%	1%	0%		1%	3%	
3B	100%	1%							
4A	7%	40%	10%	1%	1%		1%	43%	
4B	91%	5%		1%					15%
5A	9%	20%	9%	1%	1%	1%	1%	59%	62%
5B	15%	40%	34%		3%	4%		51%	22%
6A	5%	47%	4%	1%	1%	1%	1%	57%	28%
6B	95%	3%	1%	1%	1%			4%	2%
Overall Average	64%	28%	10%	1%	1%	2%	1%	28%	27%

Note: *Macroalgae taxa included: *Caulerpa taxifolia*, *Caulerpa urvilleana*, *Neomeris annulata*, Filamentous red, Fleshy Red, *Dasya* sp, *Laurencia* sp, *Dictyota* sp. (striated). **Other biota included: Hydroid and Worm.

Table 3-9. Coral Community Demographics from Transects

Ts		Cyphastrea ocellata	Leptastrea purpurea	Montipora capitata	Montipora patula	Pocillopora damicornis	Pocillopora meandrina	Porites compressa	Porites lobata	Porites solida	Grand Total
1A	Density			0.25		1.25			4		5.5
	Avg Size			138		13			21		25
	Max Size			138		16			39		138
	Min Size			138		13			13		13
1B	Density		0.25	0.25					0.5		1
	Avg Size		20	16					24		21
	Max Size		20	16					42		42
	Min Size		20	16					5		5
3A	Density	0.25		0.25			0.25		0.75		1.5
	Avg Size	47		47			94		14		38
	Max Size	47		47			94		16		94
	Min Size	47		47			94		13		13
4A	Density			3.25	0.25	1			20.5		25
	Avg Size			16	13	13			21		20
	Max Size			39	13	13			318		318
	Min Size			12	13	13			12		12
5A	Density			1.25		0.5		0.75	9.5		12
	Avg Size			13		13		52	38		35
	Max Size			13		13		79	742		742
	Min Size			13		13		31	12		12
5B	Density			0.5		0.25	1	1.25	9.75	0.25	13
	Avg Size			13		13	218	1008	79	628	186
	Max Size			13		13	295	2592	942	628	2592
	Min Size			13		13	59	153	8	628	8
6A	Density			2.25	0.5	1			4.5	0.25	8.5
	Avg Size			47	13	13			41	236	43
	Max Size			314	13	13			157	236	314
	Min Size			13	13	13			12	236	12

Table 3-9. Coral Community Demographics from Transects (continued)

Ts		Cyphastrea ocellata	Leptastrea purpurea	Montipora capitata	Montipora patula	Pocillopora damicornis	Pocillopora meandrina	Porites compressa	Porites lobata	Porites solida	Grand Total
6B	Density								0.25		0.25
	Avg Size								47		47
	Max Size								47		47
	Min Size								47		47
Total	Density	0.02	0.02	0.67	0.06	0.33	0.10	0.17	4.15	0.04	5.56
	Avg Size	47	20	29	13	13	193	650	37	432	59
	Max Size	47	20	314	13	16	295	2592	942	628	2592
	Min Size	47	20	12	13	13	59	31	5	236	5

Note: Sizes shown in square centimeters, calculated as the elliptical area of the two major diameters.

Table 3-10. Quick-reference Conversion from Area to Approximate Circular Diameter

Area (cm^2)	20	80	320	1,280	2,900	5,100	7,900
Approximate Circular Diameter (cm)	5	10	20	40	61	81	100

Notes: cm = centimeter; cm^2 = square centimeter. Ts = Transect

Table 3-11. Coral Species Identified in the Survey Area

Coral Species
Cyphastrea ocellata
Leptastrea purpurea
Leptastrea bewickensis
Montipora capitata
Montipora patula
Pocillopora damicornis
Pocillopora eydouxi
Pocillopora ligulata
Pocillopora meandrina
Pocillopora verrucosa
Porites compressa
Porites lobata
Porites solida
Psammocora nierstraszi

Table 3-12. Fish Species Identified

Taxa	Common Name
Abudefduf abdominalis	Hawaiian sergeant
Acanthurus nigrofuscans	Brown surgeonfish
Aetobatus ocellatus	Spotted eagle ray
Bodianus albotaeniatus	Hawaiian hogfish (juvenile, subadult, and adult)
Canthigaster jactator	Hawaiian whitespotted toby
Centropyge loriculus	Flame angelfish
Chaetodon multicinctus	Mutiband butterflyfish
Chromis ovalis	Oval chromis
Chromis vanderbilti	Blackfin chromis
Coris gaimard	Yellowtail coris (juvenile)
Ctenochaetus strigosus	Goldring surgeonfish
Dascyllus albisella	Hawaiin dascyllus (adult and juvenile)
Fistularia commersonii	Smooth coronetfish
Fistularia commersonii	Trumpetfish
Forcipiger flavissimus	Longnose butterflyfish
Gorgasia hawaiiensis	Hawaiian garden eel
Gymnothorax eurostus	Stout moray
Labroides phthirophagus	Hawaiian cleaner wrasse
Lutjanus kasmira	Bluestripe snapper
Melichthys vidua	Pinktail durgon
Paracirrhites arcatus	Arc-eye hawkfish
Parupeneus multifasciatus	Manybar goatfish
Parupeneus pleurostigma	Sidespot goatfish
Plectroglyphidodon johnstonianus	Blue-eye damselfish
Sufflamen bursa	Lei triggerfish
Thalassoma duperrey	Saddle wrasse (terminal phase)
Zanclus cornutus	Moorish idol
Zebrasoma flavescens	Yellow tang

3.8 QUALITATIVE OBSERVATIONS OF OTHER BIOTA

Other biota were noted during transect surveys and during the towed-diver surveys. A noteworthy observation of absence is the invasive octocoral *Carijoa riisei*. No colonies were observed in the 77-acre survey area.

3.8.1 Echinoderms

Six species of sea urchins (Echinoidea) were noted across all of the methods. Their densities were not high enough to be incidentally quantified during the methods targeting substrate characteristics. Overall, urchin density is on the order of 1 per 100 square meters, but on the most topographically complex relict reef patches urchin density is on the order of 1 per square meter.

- *Echinostrephus aciculatus*
- Long-spined urchin (*Diadema sp.*)
- Banded urchin (*Echinothrix calamaris*)
- Slate pencil urchin (*Heterocentrotus mamillatus*)
- Rough-spined urchin (*Chondrocidaris gigantea*)
- Blue-black urchin (*Echinothrix diadema*)
- Pale rock boring urchin (*Echinometra mathaei*)

Activity of urchins is apparent on the more topographically complex relict reef patches – the substrate is highly bioeroded by boring urchins (Figure 3-14). Many *Echinothrix calamaris* were hidden in this relict reef outcrop.

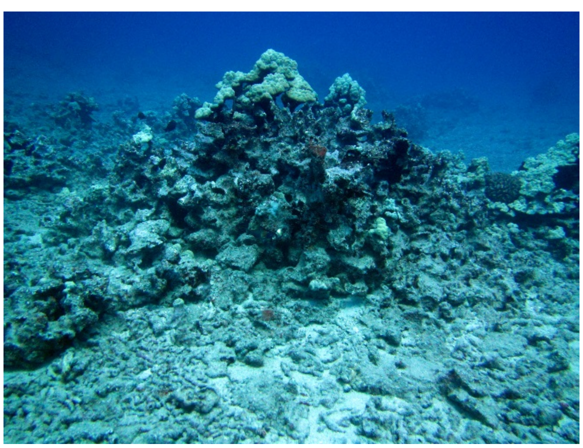


Figure 3-14. Advanced State of Bioerosion (mostly mediated by urchins)

Four species of sea stars (Asteroidea) were noted across all methods. Their densities were not high enough to be incidentally quantified during the methods targeting substrate characteristics. Only four COTS (*Acanthaster planci*) individuals were observed within the 77-acre survey area. One sign of recent predation by COTS was observed on a *Pocillopora verrucosa* during the surveys.

- Cusion star (*Culcita novaeguineae)*

- Crown-of-thorns seastar (*Acanthaster planci*)
- Red velvet star (*Leiaster glaber*)
- Green linckia (*Linckia guildingi*)

Three species of sea cucumbers (Holothuria) were noted across all methods. Their densities were not high enough to be incidentally quantified during the methods targeting substrate characteristics.

- Hawaiian spiky sea cucumber (*Stichopus sp.*)
- Teated sea cucumber (*Holothuria whitmaei*)
- Black sea cucumber (*Holothuria atra*)

3.8.2 Protected Species

Four individuals of green sea turtles (*Chelonia mydas*) were observed from the surface during the two-day effort. None were observed during towed-diver or benthic surveys.

Dolphins were observed only by their calls, late afternoon on Wednesday 7 September. Interviews with snorkel-tour boat crews operating in the vicinity confirmed these as spinner dolphins (*Stenella longirostris*), observed well inshore of the HDD punch-out area.

There were no observations of sharks, turtles, or marine mammals other than the two species mentioned above.

4.0 DISCUSSION AND SUMMARY

There are three distinct habitat types in the survey area: sand, relict reef patches with moderate coral abundance, and rubble fields with very low coral abundance (Figure 4-1 and Table 3-9).

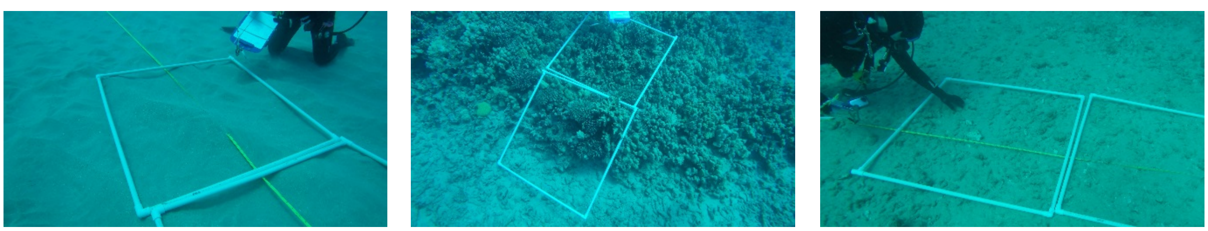
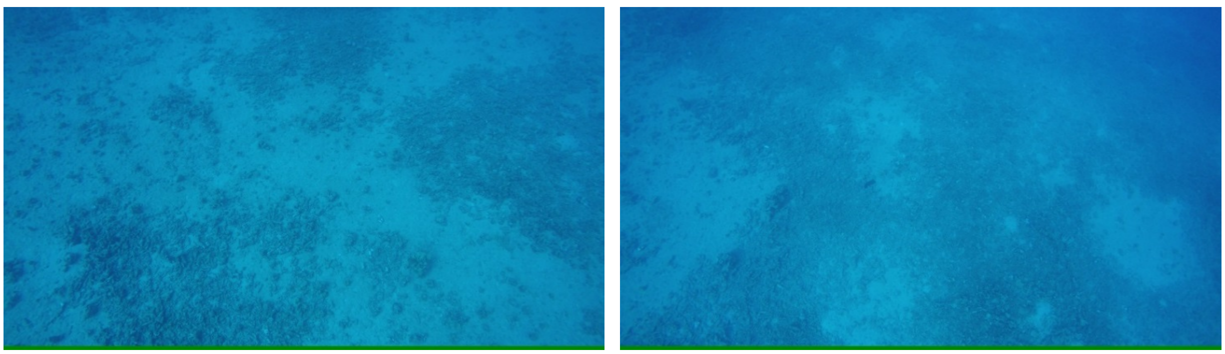


Figure 4-1. The Three Principal Habitat Types in the Survey Area: Sand, Relict Reef Patches, and Rubble Fields

Validation of the towed-diver habitat maps using compared metrics across independent methods showed excellent concurrence. Agreement between the remotely-sensed data and the towed-diver habitat mapping was very good. For example, note the boundaries between deep sand and hardbottom in the vicinity of the HDD punch-out location as measured by the geophysical and the diver surveys (Figure 3-2 and Figure 3-4). Agreement between coral percent cover across three methods showed concurrence plus or minus one category. For example, one location may be assessed as 5-10 percent or 10-20 percent cover, but greater divergence was not encountered. This serves as an important quality assurance assessment for the spatial accuracy of the towed-diver mapping.

Sand cover (Figure 3-2) shows 100 percent cover in the vicinity of the HDD punch-out point. This is an ideal alignment between the planned construction and the habitat that avoids environmental impact (Figure 3-2 and Figure 3-6). The HDD punch-out point is at least 50 meters from the nearest reef or hardbottom resource (Figure 3-1). This degree of isolation is ideal to minimize potential impacts to reef resources during the drilling and installation process.

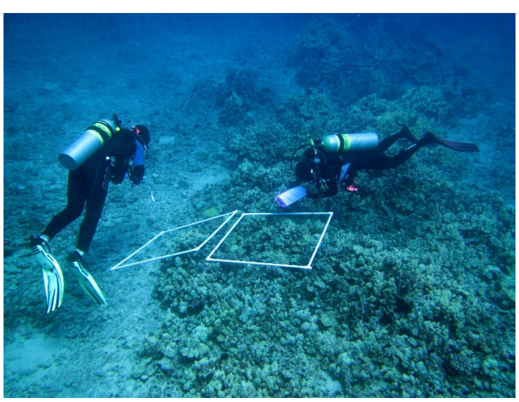
Rubble cover (Figure 3-4) shows moderate rubble cover shallower than the 24-meter contour and high to very high rubble cover deeper than the 24-meter contour. Most of the surface-lay cable corridor is dominated by moderate to high cover of rubble (Figure 4-2 and Table 3-3). The rubble fields show clear signs of occasional mobilization, indicating that even at 20-30 meters depth, the energy in the water is great enough to move limestone cobbles and pebbles.



Note moderate cover of sand and moderate cover of rubble. (Field of view in left image is approximately 5 meters wide, field of view in right image is approximately 15 meters wide)

Figure 4-2. Typical Views Representative of Most of the Surface-lay Corridor.

Areas of moderate density relict reef are sparse, generally linear, generally isolated by 5-10 meters, and relatively small (typically 4 x 10 meters). Within these features, coral are abundant (Figure 3-6 and Figure 4-3), but in the larger context average cover is typically less than 10 percent (Figure 3-6, Table 3-4, Table 3-7, and Table 3-8).



Note the features are approximately linear and relatively small (4 meters wide).

Figure 4-3. Typical High-density Reef Patch. This example is from transect 5A.

Seagrass is present. Small isolated patches of *Halophila decipiens* were observed (Figure 3-13 and Figure 4-4). Within the total survey area, divers observed fewer than 10 patches, each smaller than 5 square meters. Braun-Blanquet scores within patches were 2 or 3 (5-25% or 25-50%). Seeing 10 or fewer patches within the 77-acre survey area indicates that the area is not particularly suitable for seagrass colonization.

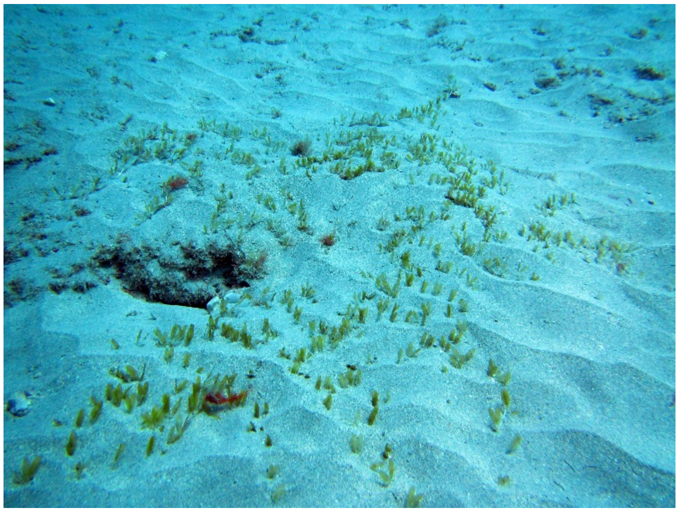


Figure 4-4. Typical Small Patch of the Seagrass *Halophila decipiens,* Depth is 46 feet. This patch is an example of a Braun-Blanquet score of 2 (5-25%).

In summary, the cable alignment within the divers' survey area crosses sand, rubble, and patches of relict reef habitat. Corals and other biota are occasionally dense on these patches of relict reef habitat, but the majority of the survey area is relatively low-quality habitat. Habitat quality generally decreases to the north of the proposed cable centerline, and increases to the south. The HDD punch-out point is in sand, and isolated from surrounding reef by at least 50 meters in all directions.

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APPENDIX E

TERRESTRIAL BIOLOGICAL SURVEY REPORT

TETRA TECH

MEMO

To:	Hawaiki Submarine Cable LP
From:	Tiffany Agostini, Tetra Tech, Inc.
Date:	Monday, October 03, 2016
Subject:	Hawaiki Submarine Cable Project – Cable Landing Station Biological Survey Memorandum

1.0 INTRODUCTION

Hawaiki Submarine Cable LP (Hawaiki) is proposing the Hawaiki Submarine Cable Project (Project), a fiber optic telecommunications cable system that will link Australia, New Zealand, American Samoa, Hawai‘i, U.S.A., and Oregon, U.S.A. The Project would pass through Hawai‘i state waters and make landfall at 92-384 Farrington Highway (TMK: 1-9-2-051-011) on the Island of O‘ahu (hereafter referred to as the Survey Area). The Survey Area encompasses a 0.25 hectare (0.62-acre) parcel located near Kahe Point on O‘ahu's leeward coast approximately 6 kilometers (3.5 miles) northwest of Barbers Point and 33 kilometers (20.5 miles) west of Honolulu (Figure 1). Hawaiian Electric Company's Kahe Electric Power Plant is located to the north, and the Waimānalo Gulch Sanitary Landfill is located to the east. Proposed Project components at the Survey Area include a cable landing station (CLS), beach manhole, and an annex consisting of two diesel generators and a fuel tank.

Hawaiki contracted Tetra Tech, Inc. (Tetra Tech) to conduct a biological survey of the Survey Area to support the environmental assessment (EA) for the Project pursuant to Hawaii Revised Statutes (HRS) Chapter 343 and the Hawaii Environmental Policy Act (HEPA). This technical memorandum summarizes the results of the biological survey conducted at the Survey Area on June 14, 2016.

2.0 METHODS

Prior to the field survey, Tetra Tech conducted a review of available scientific and technical literature with respect to biological resources in and near the Survey Area. This review included scientific journals and reports, environmental assessments and environmental impact statements, National Wetlands Inventory data, and available unpublished data that were likely to contain information relevant to the natural history and ecology of the area. In addition, Tetra Tech reviewed available geospatial data, aerial photographs, and topographic maps of the area to identify any unique plant communities or features that could harbor federal or state listed species or other elements of interest.

Flora

A pedestrian survey was conducted to record common plant species and dominant vegetation types, as well as rare or listed plant species. Areas more likely to support native plants (e.g., rocky outcrops and shady

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areas) were more intensively examined. A comprehensive list of all plant species present in the survey area was not within the scope of this survey.

Plants recorded during this survey are indicative of the season and environmental conditions at the time of the survey. Plants are dynamic and influenced by seasonal and temporal changes; therefore, there may be additional species that occur on site but which were not present during this survey.

The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999, 2012), and Wagner and Herbst (2003). Common/Hawaiian names are provided first, followed by scientific names in parentheses. If no common or Hawaiian name is known, only the scientific name is provided.

Fauna

Fauna surveys consisted of observations of birds, mammals, reptiles, amphibians, and invertebrate species during a pedestrian survey in the morning hours (8:45 AM–10:00 AM) when wildlife are most likely active. All species detected by sight and sound were recorded. Scientific nomenclature for fauna follows AOU (1998) for birds, Tomich (1986) for mammals, and Nishida (2002) for insects.

Acoustic bat detectors for the endangered Hawaiian hoary bat or ʻōpeʻapeʻa (*Lasiurus cinereus semotus*) were not deployed as part of the survey; however, the presence/absence of suitable bat foraging and roosting habitat was noted. Similarly, presence of habitat for the state-endangered Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*; listed only for the Island of Oʻahu) was also recorded. Additional habitats or plants that could support other federal or stated listed threatened, endangered, proposed listed, or candidate species were also identified if present (e.g., water features as potential habitat for Hawaiian waterbirds).

3.0 RESULTS

No federal or state listed threatened, endangered, proposed listed, or candidate species for listing were found during the biological survey. The Survey Area does not encompass any designated or proposed critical habitat for threatened or endangered species. Although not observed, the endangered Hawaiian hoary bat may roost or forage in the Survey Area. Additionally, the Hawaiian short- eared owl, which is listed as endangered by the State of Hawaiʻi on the Island of Oʻahu, may be present or transverse the area. These species are discussed in further detail below. Representative photographs from the site visit are presented in Appendix A.

Flora

Seventeen plant species were observed during the biological survey. Of these, five are native to the Hawaiian Islands and include: alena (*Boerhavia acutifolia*), ʻilima (*Sida fallax*), maʻo (*Gossypium tomentosum*), hoary abutilon (*Abutilon incanum*), and ʻuhaloa (*Waltheria indica*). Maʻo is endemic, meaning it is found only in the Hawaiian Islands. This species can be considered uncommon throughout the Hawaiian Islands. The other four native plant species are indigenous, that is found in the Hawaiian Islands and elsewhere. None of the indigenous plants are considered rare throughout the Hawaiian Islands (Wagner et al. 1999). Appendix B provides a list of plant species observed by Tetra Tech in the Survey Area.

The vegetation in the Survey Area is primarily a buffelgrass (*Cenchrus ciliaris*) grassland with scattered non-native kiawe (*Prosopis pallida*) trees reaching up to 8 meters (26 feet) high. Non-native koa haole (*Leucaena leucocephala*) trees, between 1 to 2.5 meters (4 to 8 feet) tall, are also broadly distributed. Other common species widely scattered or occurring in a few small patches in the understory include ʻilima, maʻo, hoary abutilon, Guinea grass (*Urochloa maxima*), and hairy merremia (*Merremia aegyptia*).

Fauna

Fauna observed within the Survey Area are non-native to the Hawaiian Islands, with the exception of one indigenous insect (see below). Fauna observed during the survey are presented in Appendix C.

In all, nine bird species were documented during the survey. All of these bird species are non-native to the Hawaiian Islands, and are species commonly found in urban or rural areas. Common myna was the most frequently seen bird species during the survey. Two bird species seen are protected by the Migratory Bird Treaty Act (MBTA)—the introduced cattle egret (*Bubulcus ibis*) and house finch (*Carpodacus mexicanus*). Although the native Hawaiian short-eared owl was not seen or heard, this species has the potential to forage or nest in the Survey Area due to the vegetation present.

Hawai‘i's only native, extant terrestrial mammal—the endangered Hawaiian hoary bat—could roost or forage in the Survey Area. This bat species forages over a wide range of habitat and vegetation types (U.S. Department of Agriculture 2009). Hawaiian hoary bats typically roost in woody vegetation over 15 feet tall (Bonaccorso et al. 2015) in a wide variety of native and introduced trees. Kiawe, which is present in the Survey Area, is a documented roost tree for the Hawaiian hoary bat.

Other introduced mammals, such as dogs (*Canis familiaris*), cats (*Felis catus*), house mice (*Mus musculus*), small Indian mongoose (*Herpestes auropunctatus*), and rats (*Rattus* spp.) are likely to occur within the Survey Area due to the proximity to the landfill and residences.

Two insect species were recorded in the Survey Area, the indigenous globe skimmer (*Pantala flavescens*), and the non-native monarch butterfly (*Danaus plexippus*).

4.0 CONCLUSIONS AND RECOMMENDATIONS

Flora

No threatened or endangered plants were found, and no designated plant critical habitat occurs nearby. The vegetation type identified during the survey is primarily non-native and not considered unique. Over 70% of the plant species seen in the Survey Area are not native to the Hawaiian Islands. Only one native species, the endemic ma‘o, can be considered uncommon throughout the Hawaiian Islands; however, this plant is known to occur in coastal plains throughout O‘ahu including in the vicinity of the Survey Area. Thus, the proposed Project is not expected to have a significant, adverse impact on botanical resources. This conclusion is further supported by previous biological surveys conducted for nearby proposed projects (Planning Solutions, Inc. 2014; R.M. Towill Corporation 2002).

If landscaping is required as part of the Project, Tetra Tech recommends that native Hawaiian plants, or non-invasive plants, be employed for landscaping to the maximum extent possible. Potential native species that may be appropriate for landscaping at the Survey Area include ma‘o, ‘ilima, naupaka (*Scaevola taccada*), and pōhinahina (*Vitex rotundifolia*).

Fauna

The Survey Area does not contain any designated or proposed critical habitat for listed animal species. Although no federal or state listed species were observed during the survey, the endangered Hawaiian hoary bat and the state listed Hawaiian short-eared owl have the potential to use portions of the Survey Area. In addition, two seabirds —the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and threatened Newell's shearwater (*Puffinus auricularis newelli*) —may fly over the Survey Area at night and may be attracted to construction lights at night. More details regarding these species and recommended avoidance measures are outlined below. Implementation of these measures is anticipated to avoid all potential adverse impacts to fauna.

Hawaiian hoary bat: Direct impacts to bats could occur if a juvenile bat that is too small to fly, but too large to be carried by a parent, was present in a tree that was cut down. Although the chances of adversely affecting the Hawaiian hoary bat as a result of the proposed Project is likely small, Tetra Tech recommends the following avoidance measures:

- Any fences that are erected as part of the Project should have barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire. No fences in the Survey Area were observed with barbed wire during the survey; however, if fences are present, the top strand of barbed wire should be removed or replaced with barbless wire.
- No trees taller than 15 feet (4.6 m) should be trimmed or removed as a result of this Project between June 1 and September 15, when juvenile bats that are not yet capable of flying may be roosting in the trees.

Hawaiian short-eared owl: The Hawaiian short-eared owl is most common in open habitats and could be impacted if present. These owls nest in the ground and can nest any time of the year. Owls could be displaced by the proposed Project if present, but are expected to find suitable habitat in the vicinity of the Survey Area. Although the chances of adversely affecting this species as a result of the proposed Project is likely small, Tetra Tech recommends the following avoidance measures:

- Pre-construction surveys for Hawaiian short-eared owl nesting should be conducted by a qualified biologist prior to vegetation clearing. If Hawaiian short-eared owl are found nesting during construction, vegetation clearing should be suspended within 300 feet (91 m) until young have fledged or nesting is no longer occurring.

Seabirds: The Survey Area does not provide suitable nesting or foraging habitat for Hawaiian petrel and Newell's shearwater. However, individuals may fly over the Survey Area at night and may be attracted to construction lights at night. Disorientation and fallout as a result of light attraction could occur to individuals attracted to nighttime construction lighting and unshielded nighttime facility lighting. Juvenile birds are particularly vulnerable to light attraction. Grounded birds are also more vulnerable to mammalian predators or vehicle strikes. Although the chances of adversely affecting listed seabirds as a result of the proposed Project are likely small, Tetra Tech recommends the following measures to avoid and minimize potential impacts to listed seabirds:

- Construction activity should be restricted to daylight hours as much as possible during the seabird peak fallout period (September 15–December 15) to avoid the use of nighttime lighting that could attract seabirds.
- Although not anticipated, should nighttime construction be required, construction lighting should be shielded, directed downward, and fitted with non-white lights if construction safety is not compromised, to minimize the attractiveness of construction lights to seabirds and other wildlife. Furthermore, if nighttime construction occurs during the seabird peak fallout period, a biological monitor should be present in the construction area between approximately 0.5 hour before sunset to 0.5 hour after sunrise to watch for the presence of seabirds. Should a seabird be observed, and appears affected by the lighting, the monitor should notify the construction manager to reduce or turn off construction lighting until the individual(s) move out of the area.
- Operational on-site lighting should consist of fixtures that will be shielded and/or directed downward to prevent upward radiation, triggered by a motion detector, and fitted with non-white light bulbs to the extent possible.

MBTA: Two additional MBTA-protected birds (cattle egret and house finch) were seen during the survey. Construction at the CLS may temporarily displace individuals of these species, but long-term and population-level impacts are not expected. These birds (likely limited to a few individuals) are expected to find suitable foraging habitat at nearby areas. Furthermore, the U.S. Fish and Wildlife Service has proposed a control rule to allow take of cattle egrets in Hawaiʻi without a permit in order to manage the depredation threat these introduced species pose to listed species in Hawaiʻi (USFWS 2013/ 78 FR 65955 – 65959).

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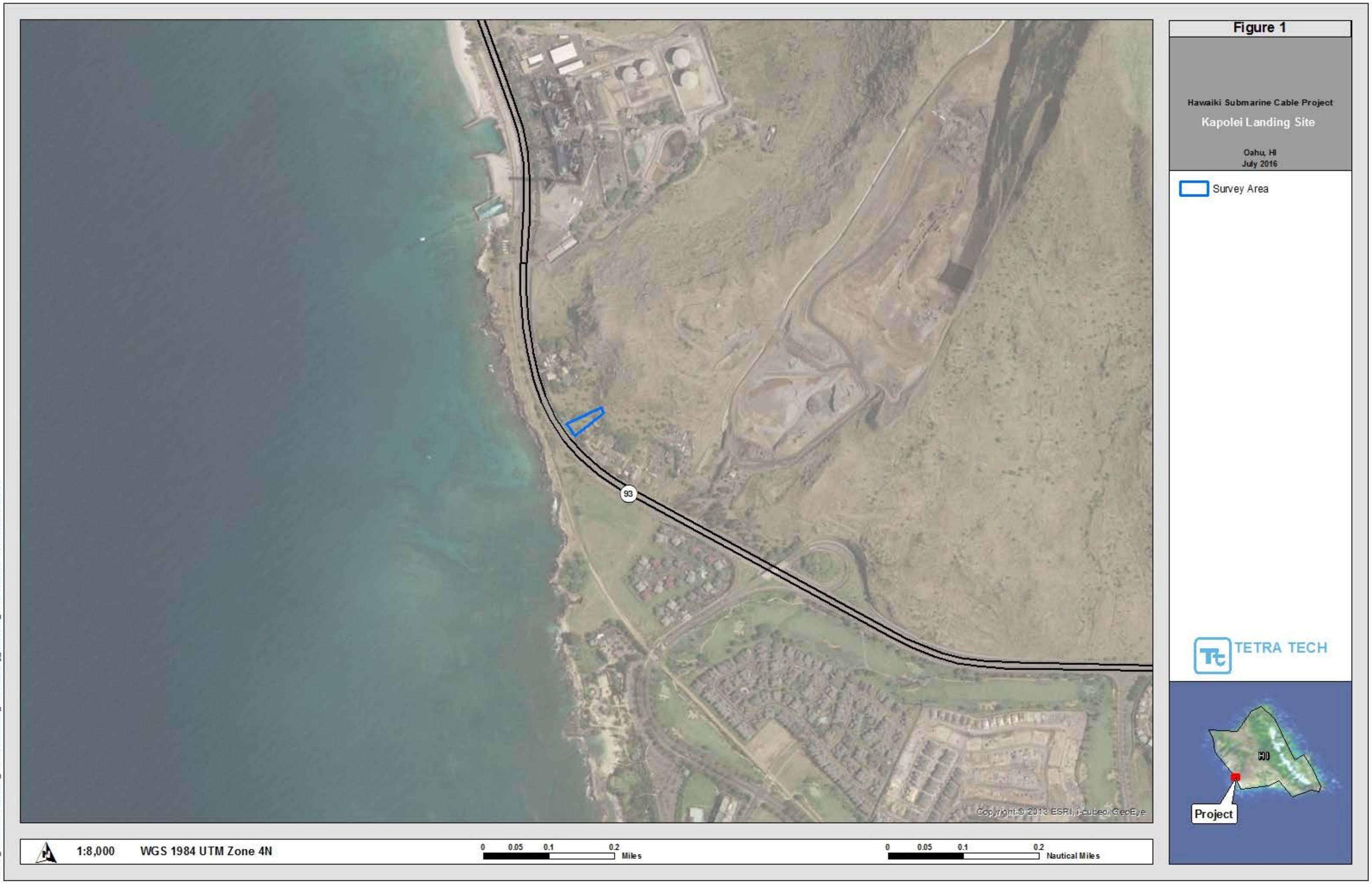

Figure 1. Location of Survey Area

Appendix A

Representative Photographs at the Hawaiki Submarine Cable Project Cable Landing Station

Photo 1: Vegetation in the Survey Area dominated by buffelgrass (*Cenchrus ciliaris*) with scattered kiawe (*Prosopis pallida*) trees.

Photo 2: View of the Survey Area looking seaward (makai) from the northeastern corner

Appendix B

Checklist of Plants Observed at the Hawaiki Submarine Cable Project Cable Landing Station on June 14, 2016

The following checklist is an inventory of plant species observed by Tetra Tech on June 14, 2016 during the survey of the Hawaiki Submarine Cable Project Cable Landing Station Survey Area. The plant names are arranged alphabetically by family and then by species into two groups: Monocots and Dicots.

Scientific Name	Common & Hawaiian Name(s)	Status[1]	Abundance[2]
MONOCOTS			
POACEAE			
Cenchrus ciliaris L.	buffelgrass	X	A
Chloris barbata Sw.	swollen fingergrass	X	R
Urochloa maxima (Jacq.) R. D. Webster	Guinea grass	X	C
DICOTS			
AIZOACEAE			
Trianthema portulacastrum L.	--	X	R
ASCLEPIADACEAE			
Stapelia gigantea N.E.Br.	zulu giant, giant toad plant, carrion flower	X	R
CHENOPODIACEAE			
Atriplex semibaccata R.Br.	Australian saltbush	X	R
CONVOLVULACEAE			
Merremia aegyptia (L.) Urb.	hairy merremia, koali kua hulu	X	U
EUPHORBIACEAE			
Euphorbia hirta L.	hairy spurge, garden spurge	X	R
FABACEAE			
Leucaena leucocephala (Lam.) de Wit	koa haole	X	A
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X	A
Vachellia farnesiana (L.) Wight & Arn.	klu	X	R
MALVACEAE			
Abutilon incanum (Link) Sweet	hoary abutilon, maʻo	I	U
Gossypium tomentosum Nutt. ex Seem.	maʻo, huluhulu, Hawaiian cotton	E	U
Sida fallax Walp.	ʻilima	I	U
NYCTAGINACEAE			
Boerhavia acutifolia (Choisy) J.W.Moore	alena	I	R
PORTULACACEAE			
Portulaca oleracea L.	pigweed, ʻākulikuli kula	X	R
STERCULIACEAE			
Waltheria indica L.	ʻuhaloa	I	R

[1] Status:

E = endemic (native only to the Hawaiian Islands).

I = indigenous (native to the Hawaiian Islands and elsewhere).

X = introduced/ alien (plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact [Cook's arrival in the islands in 1778]).

[2] Relative Site Abundance:

A = Abundant (forming a major part of the vegetation within the survey area).

C = Common (widely scattered throughout the area or locally abundant within a portion of it).

U = Uncommon (scattered sparsely throughout the area or occurring in a few small patches).

R = Rare (only a few isolated individuals within the survey area).

Appendix C

Checklist of Fauna Observed at the Hawaiki Submarine Cable Project Cable Landing Station on June 14, 2016

Scientific Name	Common/Hawaiian Name(s)	Status[1]	State/ Federal Protection[2]
Birds			
Acridotheres tristis	common myna	NN	None
Bubulcus ibis	cattle egret	NN	MBTA
Carpodacus mexicanus	house finch	NN	MBTA
Columba livia	rock pigeon	NN	None
Gallus gallus	red junglefowl	NN	None
Geopelia striata	zebra dove	NN	None
Padda oryzivora	Java sparrow	NN	None
Pycnonotus cafer	red-vented bulbul	NN	None
Zosterops japonicus	Japanese white-eye	NN	None
Insects			
Danaus plexippus	monarch butterfly	NN	None
Pantala flavescens	globe skimmer	I	None

[1] NN=Non-native, established species, I = indigenous.

[2] MBTA=Protected under the Migratory Bird Treaty Act

TETRA TECH

MEMO

To:	Hawaiki Submarine Cable LP
From:	Tiffany Agostini, Tetra Tech, Inc.
Date:	Tuesday, October 04, 2016
Subject:	Hawaiki Submarine Cable Kapolei Landing Project – Temporary Laydown Area Biological Survey Memorandum (TMK: 1-9-2-051-001)

1.0 INTRODUCTION

Hawaiki Submarine Cable LP (Hawaiki) is proposing the Hawaiki Submarine Cable Kapolei Landing Project (Project), a fiber optic telecommunications cable system that will link Australia, New Zealand, American Samoa, Hawaiʻi, U.S.A., and Oregon, U.S.A. The Project would pass through Hawaiʻi state waters and make landfall at 92-384 Farrington Highway (TMK: 1-9-2-051-011) in Kapolei on the Island of Oʻahu. The site where the cable lands is referred to as the cable landing station (CLS) site. Hawaiki may temporarily use a portion of the parcel to the north (TMK: 1-9-2-051-001) or south (TMK: 1-9-2-051-010) of the CLS for parking and equipment/materials staging during construction. This area is hereafter referred to as the Laydown Survey Area. The Laydown Survey Area encompasses approximately 0.02 hectare (0.49-acre) immediately to the north of the CLS site and approximately 0.60 hectare (0.24-acre) immediately south of the CLS site. It is unlikely that the entire Laydown Survey Area will be utilized for staging, but the survey area was developed for flexibility during project planning.

Hawaiki contracted Tetra Tech, Inc. (Tetra Tech) to conduct a biological survey of the Laydown Survey Area to support the environmental assessment (EA) for the Project pursuant to Hawaii Revised Statutes (HRS) Chapter 343 and the Hawaii Environmental Policy Act (HEPA). This technical memorandum (memo) summarizes the results of the biological survey conducted at the Laydown Survey Area on September 19, 2016. It supplements the biological survey memo prepared of the CLS site.

2.0 METHODS

Prior to the field survey, Tetra Tech conducted a review of available scientific and technical literature with respect to biological resources in and near the Laydown Survey Area. This review included scientific journals and reports, environmental assessments and environmental impact statements, National Wetlands Inventory data, and available unpublished data that were likely to contain information relevant to the natural history and ecology of the area. In addition, Tetra Tech reviewed available geospatial data, aerial photographs, and topographic maps of the area to identify any unique plant communities or features that could harbor federal or state listed species or other elements of interest.

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737 Bishop Street, Suite 2340, Mauka Tower, Honolulu, HI 96813
Tel 808.441.6655 Fax 808.836.1689 www.tetratech.com

Flora

A pedestrian survey was conducted in the northern parcel (TMK: 1-9-2-051-001) to record common plant species and dominant vegetation types, as well as rare or listed plant species in the Laydown Survey Area. Areas more likely to support native plants (e.g., rocky outcrops and shady areas) were more intensively examined. Because access to the southern parcel (TMK: 1-9-2-051-010) was not obtained prior to the survey, the area was scanned with binoculars from the boundary of the CLS site. This method was determined to be sufficient given the resources observed in the vicinity and the previous clearing activities at the southern parcel.

A comprehensive list of all plant species present in the Laydown Survey Area was not within the scope of this survey. Furthermore, plants recorded during this survey are indicative of the season and environmental conditions at the time of the survey. Plants are dynamic and influenced by seasonal and temporal changes; therefore, there may be additional species that occur on site, but which were not present during this survey.

The taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999, 2012), and Wagner and Herbst (2003). Common/Hawaiian names are provided first, followed by scientific names in parentheses. If no common or Hawaiian name is known, only the scientific name is provided.

Fauna

Fauna surveys consisted of observations of birds, mammals, reptiles, amphibians, and invertebrate species during a pedestrian survey. All species detected by sight and sound were recorded. Scientific nomenclature for fauna follows AOU (1998) for birds, Tomich (1986) for mammals, and Nishida (2002) for insects.

Similar to the flora survey, the fauna and their potential habitat within the southern parcel (TMK: 1-9-2-051-010) were observed with binoculars from the boundary of the CLS site.

Acoustic bat detectors for the endangered Hawaiian hoary bat or ʻōpeʻapeʻa (*Lasiurus cinereus semotus*) were not deployed as part of the survey; however, the presence/absence of suitable bat foraging and roosting habitat was noted. Similarly, presence of habitat for the state-endangered Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*; listed only for the Island of Oʻahu) was also recorded. Additional habitats or plants that could support other federal or stated listed threatened, endangered, proposed listed, or candidate species were also identified if present (e.g., water features as potential habitat for Hawaiian waterbirds).

3.0 RESULTS

No federal or state listed threatened, endangered, proposed listed, or candidate species for listing were found during the biological survey. The Laydown Survey Area does not encompass any designated or proposed critical habitat for threatened or endangered species. Although not observed, the endangered Hawaiian hoary bat may roost or forage in the Laydown Survey Area. Additionally, the Hawaiian short-eared owl, which is listed as endangered by the State of Hawaiʻi on the Island of Oʻahu, may be present or transverse the area. These species are discussed in further detail below. Representative photographs from the site visit are presented in Appendix A.

Flora

Fourteen plant species were observed during the survey. Of these, two are native to the Hawaiian Islands—hoary abutilon (*Abutilon incanum*) and ʻuhaloa (*Waltheria indica*). These species are indigenous, that is found in the Hawaiian Islands and elsewhere, and are not considered rare (Wagner et al. 1999). Appendix B provides a list of plant species observed by Tetra Tech in the Laydown Survey Area.

The vegetation within the northern parcel of the Laydown Survey Area is characterized by large non-native kiawe (*Prosopis pallida*) trees reaching up to 9 meters (30 feet) high, with a thick layer of non-native grass in the understory. Buffelgrass (*Cenchrus ciliaris*) is the most abundant grass species. In areas where the kiawe canopy is closed, the understory is predominately Guinea grass (*Urochloa maxima*). Short stature non-native koa haole (*Leucaena leucocephala*) trees are also common at the site.

The vegetation within the southern parcel of the Laydown Survey Area is dominated by non-native grasses and low growing herbaceous species due to recent clearing. Very few trees are present in the area.

Fauna

Fauna observed within the Laydown Survey Area are non-native to the Hawaiian Islands, with the exception of two indigenous dragonflies (see below). Fauna observed during the survey are presented in Appendix C.

In all, eight bird species were documented during the survey. All of these bird species are non-native to the Hawaiian Islands, and are species commonly found in urban or rural areas. Common myna (*Acridotheres tristis*) and house finch (*Carpodacus mexicanus*) were the most frequently seen bird species during the survey. Two bird species seen are protected by the Migratory Bird Treaty Act (MBTA)—the introduced cattle egret (*Bubulcus ibis*) and house finch (*Carpodacus mexicanus*). Although the native Hawaiian short-eared owl was not seen or heard, this species has the potential to forage or nest in the Laydown Survey Area due to the vegetation present.

Hawaiʻi's only native terrestrial mammal—the endangered Hawaiian hoary bat—could roost or forage in the Laydown Survey Area. This bat species forages over a wide range of habitat and vegetation types (U.S. Department of Agriculture 2009). Hawaiian hoary bats typically roost in woody vegetation over 4.6 meters (15 feet) tall (Bonaccorso et al. 2015) in a wide variety of native and introduced trees. Kiawe, which is present in the Laydown Survey Area, is a documented roost tree for the Hawaiian hoary bat.

No other mammals were observed during the survey; however, introduced mammals, such as dogs (*Canis familiaris*), cats (*Felis catus*), house mice (*Mus musculus*), small Indian mongoose (*Herpestes auropunctatus*), and rats (*Rattus* spp.) are likely to occur within the Laydown Survey Area due to the proximity to the landfill and residences.

Six insect species were recorded in the Laydown Survey Area. Two are considered native—the indigenous globe skimmer (*Pantala flavescens*) and the indigenous common green darner (*Anax junius*). The koa haole looper (*Macaria abydata*), carpenter bee (*Xylocopa sonorina*), a wasp (Order: Hymenoptera), and a grasshopper (order: Orthoptera) observed during the survey are all non-native to the Hawaiian Islands.

4.0 CONCLUSIONS AND RECOMMENDATIONS

Flora

No threatened or endangered plants were found, and no designated plant critical habitat occurs nearby. The vegetation types and species identified during the survey are not considered unique. Over 85 percent of the plant species seen in the Laydown Survey Area are not native to the Hawaiian Islands. Thus, the proposed Project is not expected to have a significant, adverse impact on botanical resources. This conclusion is further supported by previous biological surveys conducted for nearby proposed projects (Planning Solutions, Inc. 2014, R.M. Towill Corporation 2002).

If landscaping is required at the temporary laydown area as part of the Project, Tetra Tech recommends that native Hawaiian plants, or non-invasive plants, be employed for landscaping to the maximum extent possible. Potential native species that may be appropriate for landscaping at the Laydown Survey Area include maʻo (*Gossypium tomentosum*), ʻilima (*Sida fallax*), naupaka (*Scaevola taccada*), and pōhinahina (*Vitex rotundifolia*).

<u>Fauna</u>

The Laydown Survey Area does not contain any designated or proposed critical habitat for listed animal species. Although no federal or state listed species were observed during the survey, the endangered Hawaiian hoary bat and the state listed Hawaiian short-eared owl have the potential to use portions of the Laydown Survey Area. In addition, two seabirds —the endangered Hawaiian petrel (*Pterodroma sandwichensis*) and threatened Newell's shearwater (*Puffinus newelli*) —may fly over the area at night and may be attracted to construction lights at night. More details regarding these species and recommended avoidance measures are outlined below. Implementation of these measures is anticipated to avoid all potential adverse impacts to fauna.

Hawaiian hoary bat: Direct impacts to bats could occur if a juvenile bat that is too small to fly, but too large to be carried by a parent, was present in a tree that was cut down. Although the chances of adversely affecting the Hawaiian hoary bat as a result of the proposed Project is likely small, Tetra Tech recommends the following avoidance measures:

- Any fences that are erected as part of the Project should have barbless top-strand wire to prevent entanglements of the Hawaiian hoary bat on barbed wire. No fences were observed with barbed wire during the survey; however, if fences are present, the top strand of barbed wire should be removed or replaced with barbless wire.
- No trees taller than 4.6 meters (15 feet) should be trimmed or removed as a result of this Project between June 1 and September 15, when juvenile bats that are not yet capable of flying may be roosting in the trees.

Hawaiian short-eared owl: The Hawaiian short-eared owl is most common in open habitats and could be impacted if present. These owls nest in the ground and can nest any time of the year. Owls could be displaced by the proposed Project if present, but are expected to find suitable habitat in the vicinity of the Laydown Survey Area. Although the chances of adversely affecting this species as a result of the proposed Project is likely small, Tetra Tech recommends the following avoidance measures:

- Pre-construction surveys for Hawaiian short-eared owl nesting should be conducted by a qualified biologist prior to vegetation clearing. If Hawaiian short-eared owl are found nesting during construction, vegetation clearing should be suspended within 91 meters (300 feet) until young have fledged or nesting is no longer occurring.

Seabirds: The Laydown Survey Area does not provide suitable nesting or foraging habitat for Hawaiian petrel and Newell's shearwater. However, individuals may fly over the area at night and may be attracted to construction lights at night. Disorientation and fallout as a result of light attraction could occur to individuals attracted to nighttime construction lighting and unshielded nighttime facility lighting. Juvenile birds are particularly vulnerable to light attraction. Grounded birds are also more vulnerable to mammalian predators or vehicle strikes. Although the chances of adversely affecting listed seabirds as a result of the proposed Project are likely small, Tetra Tech recommends the following measures to avoid and minimize potential impacts to listed seabirds:

- Construction activity should be restricted to daylight hours as much as possible during the seabird peak fallout period (September 15–December 15) to avoid the use of nighttime lighting that could attract seabirds.
- Although not anticipated, should nighttime construction be required, construction lighting should be shielded, directed downward, and fitted with non-white lights if construction safety is not compromised, to minimize the attractiveness of construction lights to seabirds and other wildlife. Furthermore, if nighttime construction occurs during the seabird peak fallout period, a biological monitor should be present in the construction area between approximately 0.5 hour before sunset to 0.5 hour after sunrise to watch for the presence of seabirds
- Operational on-site lighting should consist of fixtures that will be shielded and/or directed downward to prevent upward radiation, triggered by a motion detector, and fitted with non-white light bulbs to the extent possible.

MBTA: Two additional MBTA-protected birds (cattle egret and house finch) were seen during the survey. Construction may temporarily displace individuals of these species, but long-term and population-level impacts are not expected. These birds (likely limited to a few individuals) are expected to find suitable foraging habitat at nearby areas. Furthermore, U.S. Fish and Wildlife Service has proposed a control rule to allow take of cattle egrets in Hawaiʻi without a permit in order to manage the depredation threat these introduced species pose to listed species in Hawaiʻi (USFWS 2013/ 78 FR 65955 – 65959).

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Figure 1. Location of Survey Area

Appendix A

Representative Photographs at the Hawaiki Submarine Cable Kapolei Landing Project Laydown Survey Area

Photo 1: Large kiawe (*Prosopis pallida*) trees with grass understory in the western (makai) portion of the Laydown Survey Area (northern parcel).

Photo 2: Buffelgrass (*Cenchrus ciliaris*) and large kiawe (*Prosopis pallida*) trees within the eastern (mauka) portion of the Laydown Survey Area (northern parcel).

Photo 3: The southern parcel of the Laydown Survey Area, showing the previous clearing and the wall along the boundary with the CLS site.

Photo 4: The southern parcel of the Laydown Survey Area looking northeast (mauka).

Appendix B

Checklist of Plants Observed at the Hawaiki Submarine Cable Kapolei Landing Project Laydown Survey Area

The following checklist is an inventory of plant species observed by Tetra Tech on September 19, 2016 during the survey of the Hawaiki Submarine Cable Kapolei Landing Project Laydown Survey Area. The plant names are arranged alphabetically by family and then by species into two groups: Monocots and Dicots.

Scientific Name	Common & Hawaiian Name(s)	Status[1]	Abundance[2]	
			Northern parcel	Southern parcel
MONOCOTS				
POACEAE				
Cenchrus ciliaris L.	buffelgrass	X	A	A
Chloris barbata Sw.	swollen fingergrass	X	R	C
Urochloa maxima (Jacq.) R. D. Webster	Guinea grass	X	A	A
DICOTS				
AIZOACEAE				
Trianthema portulacastrum L.	--	X	R	U
ASTERACEAE				
Tridax procumbens L.	coat buttons	X		R
CHENOPODIACEAE				
Atriplex semibaccata R.Br.	Australian saltbush	X	R	
CONVOLVULACEAE				
Merremia aegyptia (L.) Urb.	hairy merremia, koali kua hulu	X	R	
FABACEAE				
Leucaena leucocephala (Lam.) de Wit	koa haole	X	C	U
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X	A	U
Vachellia farnesiana (L.) Wight & Arn.	klu	X	R	
MALVACEAE				
Abutilon incanum (Link) Sweet	hoary abutilon, ma'o	I	U	R
Sida acuta subsp. *carpinifolia* (L.f.) Borss.Waalk.	--	X		R
PORTULACACEAE				
Portulaca oleracea L.	pigweed, ʻākulikuli kula	X	U	
STERCULIACEAE				
Waltheria indica L.	ʻuhaloa	I	R	U

[1] Status:

E = endemic (native only to the Hawaiian Islands).

I = indigenous (native to the Hawaiian Islands and elsewhere).

X = introduced/ alien (plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact [Cook's arrival in the islands in 1778]).

[2] Relative Site Abundance:

A = Abundant (forming a major part of the vegetation within the survey area).

C = Common (widely scattered throughout the area or locally abundant within a portion of it).

U = Uncommon (scattered sparsely throughout the area or occurring in a few small patches).

R = Rare (only a few isolated individuals within the survey area).

Appendix C

Checklist of Fauna Observed at the Hawaiki Submarine Cable Kapolei Landing Project Laydown Survey Area

The following checklist is an inventory of fauna observed by Tetra Tech on September 19, 2016 during the survey of the Hawaiki Submarine Cable Kapolei Landing Project Laydown Survey Area. The taxa are arranged into two groups: Birds and Insects.

Scientific Name	Common/Hawaiian Name(s)	Status[1]	State/ Federal Protection[2]
Birds			
Acridotheres tristis	common myna	NN	None
Bubulcus ibis	cattle egret	NN	MBTA
Carpodacus mexicanus	house finch	NN	MBTA
Gallus gallus	red junglefowl	NN	None
Geopelia striata	zebra dove	NN	None
Lonchura punctulata	nutmeg mannikin	NN	None
Zenaida macroura	mourning dove	NN	None
Zosterops japonicus	Japanese white-eye	NN	None
Insects			
Anax junius	common green darner	I	None
Hymenoptera sp.	wasp	NN	None
Macaria abydata	koa haole looper	NN	None
Orthoptera sp.	grasshopper	NN	None
Pantala flavescens	globe skimmer	I	None
Xylocopa sonorina	carpenter bee	NN	None

[1] NN = Non-native, established species, I = Indigenous.

[2] MBTA = Protected under the Migratory Bird Treaty Act

APPENDIX F

ARCHAEOLOGICAL INVENTORY SURVEY

Revised DRAFT2—Archaeological Inventory Survey Report

Hawaiki Submarine Cable Landing Project, 92-384 Farrington Highway, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu, Hawaiʻi

TMK (1) 9-2-049:001, 002, and 005; (1) 9-2-051:001 por., 010, and 011; and Farrington Highway

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Hawaiʻi SHPD Permit No. 16-27

GANDA Report No. 2365-1

GANDA

15 March 2017

MANAGEMENT SUMMARY

An archaeological inventory survey was carried out in support of the Hawaiki Submarine Cable Landing Project, a proposed fiber optic cable landing site at 92-384 Farrington Highway, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu. The "area of potential effect" (APE) for the undertaking includes a 1.83-acre area comprised of:

1. a 0.67-acre main parcel (TMK [1] 9-2-051:011) upon which facilities will be built,
2. two adjacent parcels (1.1 acres) that may be utilized temporarily as a construction staging area (TMK [1] 9-2-051:010 and 001 por.), and
3. a 909-meter-long by .25-m-wide (.06-acre) subterranean horizontal directional drill (HDD) borehole (TMK [1] 9-2-049:001, 002, and 005 and Farrington Highway).

The inventory survey was conducted in support of compliance with Section 106 of the National Historic Preservation Act of 1966, Hawaii Revised States §6E-42, and the Hawaii Environmental Protection Act. Fieldwork included both a pedestrian surface survey and subsurface testing. During the surface survey, modern refuse and evidence of prior grading or mechanical disturbance were observed throughout the terrestrial portion of the APE. No historic properties were identified on the surface of the terrestrial parcels. However, one National and Hawaiʻi Register of Historic Places-listed historic property was identified intersecting the route of the subterranean HDD bore: the OR&L Right-of-Way (SIHP 50-80-12-9714). Because the HDD bore will run 45 to 50 meters below surface, however, it will have no effect on the OR&L Right-of-Way. Furthermore, evaluation of visual effects associated with the undertaking indicates no negative impact to the characteristics that qualify the property for inclusion in the National or Hawaiʻi Register of Historic Places.

Subsurface testing included the excavation of 10 backhoe trenches within TMK (1) 9-2-051:011. These excavations revealed two stratigraphic layers: a disturbed alluvial sediment overlying undisturbed calcareous sand (present in the southwest portion of the parcel only). Test excavation produced no evidence of traditional Hawaiian or early historic subsurface cultural deposition.

Pursuant to HAR 13-276-7, the effect determination for this undertaking is "no historic properties affected." Pursuant 36 CFR 800.4(d)(1), the effect determination recommendation is also "no historic properties affected." The undertaking will have no effect on the NRHP-listed OR&L right-of-way (SIHP 50-80-12-9714), as defined in 36 CFR 800.16(i).

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ACRONYMS & ABBREVIATIONS

APE	area of potential effect
AIS	archaeological inventory survey
BMH	beach manhole
EA	Environmental Assessment
HAR	Hawaiʻi Administrative Rules
HDD	horizontal directional drilling
LCA	Land Commission Award
NEPA	National Environmental Policy Act
HEPA	Hawaiʻi Environmental Policy Act
m	meters
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
OR&L	Oahu Railway and Land Company
Project	Hawaiki Submarine Cable Landing Project
PVC	polyvinyl chloride
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
TMK	Tax Map Key

1.0 Introduction

At the request of Tetra Tech Inc., Garcia and Associates conducted an archaeological inventory survey (AIS) for the proposed Hawaiki Submarine Cable Landing Project (Project) located at 92-384 Farrington Highway, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu (Figure 1). The principal project parcel, TMK (1) 9-2-051:011, is owned by Hawaiki Submarine Cable USA. The adjacent parcels are owned by the Au Trust (TMK [1] 9-2-051:001 por.) and Joel and Yolanda Ballesteros (TMK [1] 9-2-051:010) and will only be accessed temporarily during construction. The horizontal directional drilling (HDD) associated with this project will occur under the Oahu Railway and Land Company (OR&L) right-of-way (TMK [1] 9-2-049:005) and land owned by the City and County of Honolulu (TMK [1] 9-2-049:001) and the State of Hawaiʻi (TMK [1] 9-2-049:002 and Farrington Highway).

The purpose of the AIS was to identify, document, assess significance, and evaluate National Register of Historic Places (NRHP) eligibility for all extant historic properties within the Area of Potential Effect (APE) and provide mitigation recommendations as needed.

Patrick O'Day, Ph.D., served as the Principal Investigator for the Project. Dr. O'Day meets the professional qualifications outlined in Hawaiʻi Administrative Rules (HAR) §13-281-3 and is permitted to conduct archaeological investigations under State Historic Preservation Division (SHPD) Permit No. 16-27. Dr. O'Day also meets the Secretary of the Interior's Professional Qualifications Standards for archaeology. The archaeological survey was conducted on 1 July and 19 September 2016 and consisted of pedestrian survey of the property and excavation of 10 test trenches with a mini-excavator.

1.1 Project Authority

This survey was conducted under the authority of Hawaii Revised States §6E-42 and is in accordance with the implementing regulations contained in HAR §13-276. Additionally, the Hawaiki Submarine Cable Landing Project is 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. This AIS is intended to support agency consultation required under Section 106 of the National Historic Preservation Act of 1966, as amended. All aspects of the AIS are in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation.

Evaluation of impacts to cultural and historic resources for the Project are also required under the National Environmental Policy Act (NEPA) (Title 42 of *United States Code* Sections 4321 to 4370 [f]), NEPA implementing regulations (40 CFR Parts 1500–1508), and the Hawaiʻi Environmental Policy Act (HEPA) as codified in Hawaiʻi Revised Statues Chapter 343, *Environmental Impact Statements*. Under HEPA regulations, an Environmental Impact Statement or an Environmental Assessment (EA) must consider the effects of the proposed action on the *human environment*, which 40 CFR 1508.14 defines as "the natural and physical environment and the relationship of people with that environment." The human environment, therefore, includes important scientific, archaeological, and other tangible and intangible cultural resources, including historic properties listed or eligible for the NRHP and sacred sites (Executive Order 13007).

Figure 1. Project location in Honouliuli Ahupuaʻa, ʻEwa District (1:24,000 scale). TMK (1) 9-2-051:011 is in center, 001 por. on left, 010 on right.

1.2 Undertaking and Area of Potential Effect

The undertaking consists of the construction of telecommunications infrastructure at parcel TMK (1) 9-2-051:011 in Kapolei, O‘ahu and the installation of a fiber optic cable using the HDD technique. Additionally, parcel TMK (1) 9-2-051:010 and/or a portion of parcel TMK (1) 9-2-051:001 may be used temporarily as staging areas to support construction. Ground disturbing activities at these adjacent parcels will be very minimal. At most, the areas will be graded for ease of use.

Onshore telecommunications infrastructure will include a 465 square meter cable landing station, two diesel generators to provide backup power to the cable landing station, a parking area, and a subterranean beach manhole (BMH) where the HDD conduit will make entry from land (Figure 2).

The APE for the undertaking includes:1) the entirety of TMK (1) 9-2-051:010 and 011, 2) a portion of TMK (1) 9-2-051:001, and 3) the underground HDD borehole which begins at the subject parcel and extends 909 m to an offshore location. The HDD borehole intersects TMKs (1) 9-2-049:001, 002, and 005 and Farrington Highway. Farrington Highway is a state-owned, divided highway with two eastbound and two westbound lanes separated by a narrow grassy median. The next parcel seaward is TMK (1) 9-2-049:002, another relatively narrow, linear parcel owned by the State of Hawai‘i. This parcel is level and exhibits remnant asphalt paving, likely from a former alignment of Farrington Highway. Various grasses, trees, and small shrubs are also present, including *kiawe*, *haole koa*, and guinea grass. Adjacent to this is the OR&L right-of-way (TMK [1] 9-2-049:005), a 40-foot-wide corridor containing an operational segment of historic rail line. This corridor contains one set of narrow-gauge track. Limestone is visible on the surface in many areas and soil development is generally very thin to nonexistent. Beyond this corridor, and extending the rest of the way to the shoreline, is a strip of City and County of Honolulu property (TMK [1] 9-2-049:001). This portion of the APE is entirely comprised of exposed limestone shelf with extremely shallow soil development. Grass is present where conditions permit. The parcel descends precipitously to the water in a cliff face standing some 20 meters high. The relative positions of the parcels transected by the HDD line are shown in cross-section in Figure 3 (note that the cliff face is not accurately represented).

TMK (1) 9-2-051:011, the main parcel for development, is wedge-shaped and ranges from 19 to 36 m wide, covering a 0.67-acre area. The parcel portion immediately to the north is also part of the APE and includes a 24.4 x 76.2 m (0.5 acre) area (Figure 4). Finally, the parcel immediately to the south covers a 0.6-acre area. The total terrestrial portion of the APE is therefore 1.77 acres.

1.2.1 Horizontal Directional Drilling (HDD) Methodology

An HDD boring rig will be staged onshore, within the cable landing site. The proposed BMH location will be excavated into a pit up to 3 m wide by 1 m deep to accommodate the installation and use of the HDD boring rig. Depending on geotechnical findings at the site, a 12- to 16-inch casing pipe may need to be installed in the pit extending to the rock interface. An approximately 10-inch-diameter (25-cm) borehole will be drilled in the pit wall and guided underground following a smooth curve to gradually reach a target depth of between 130 and 150 feet (45 to 50 m) below ground level, passing under Farrington Highway and the OR&L right-of-way. It will then progress

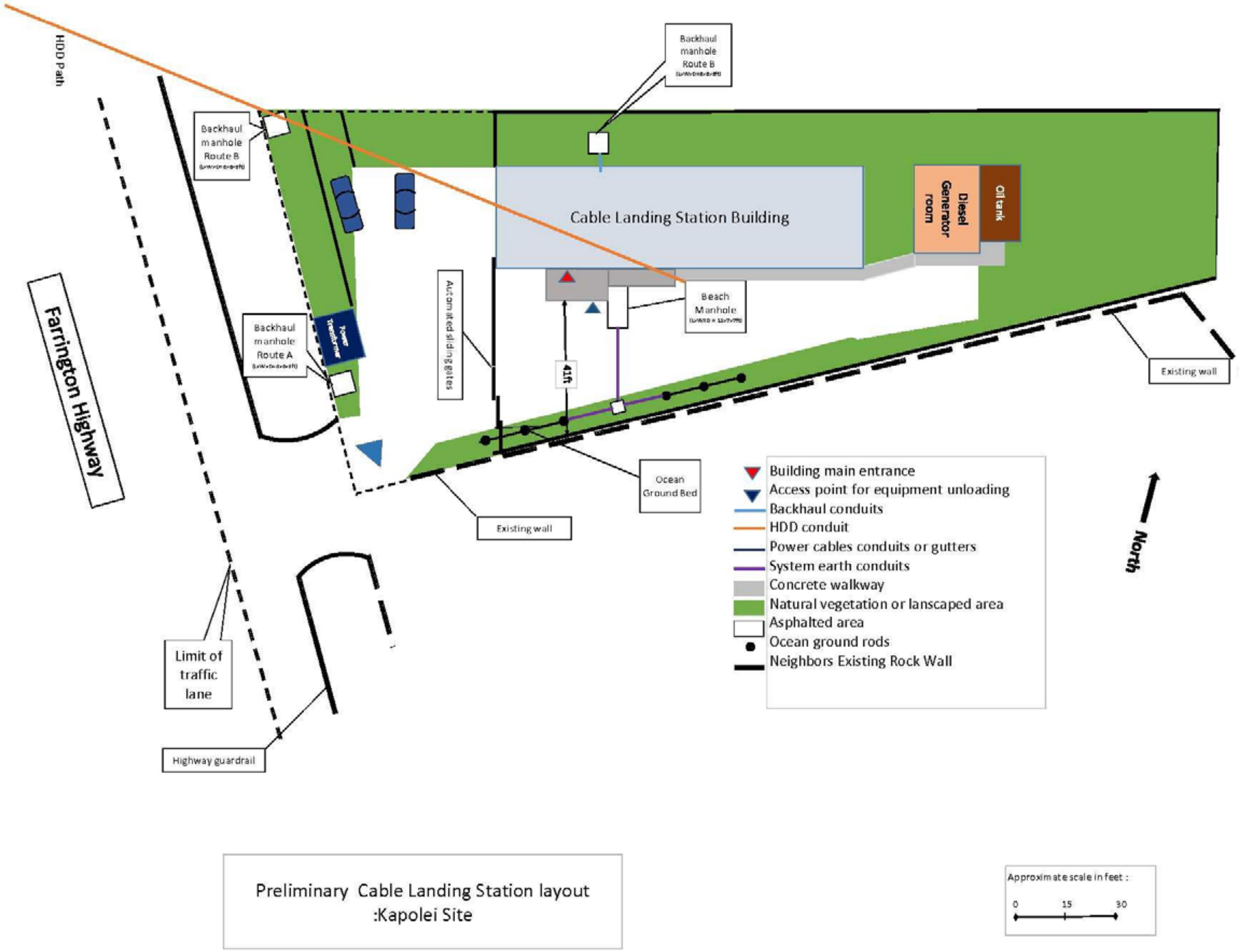

Figure 2. Telecommunications infrastructure plan (parcel TMK [1] 9-2-051:011 in green).

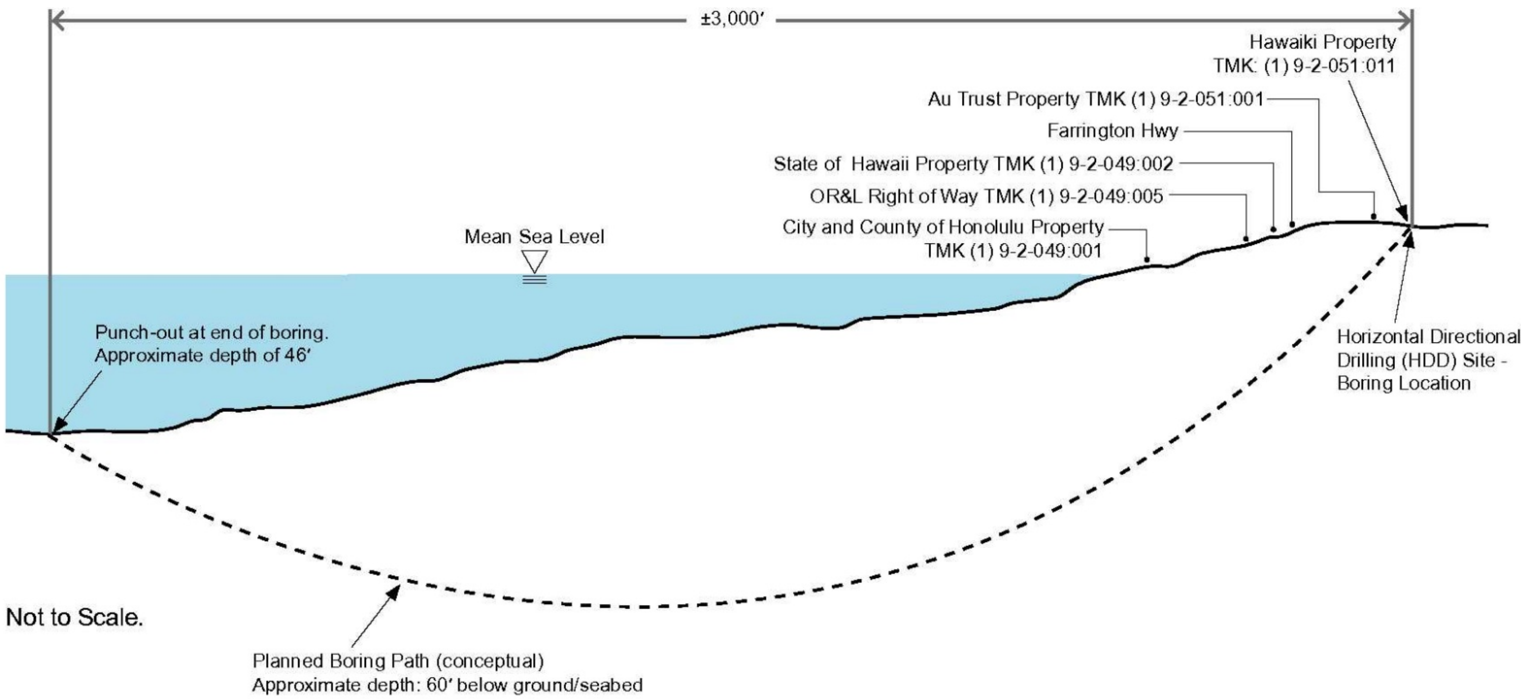

Figure 3. Schematic cross-section showing HDD boring path and intersected land parcels.

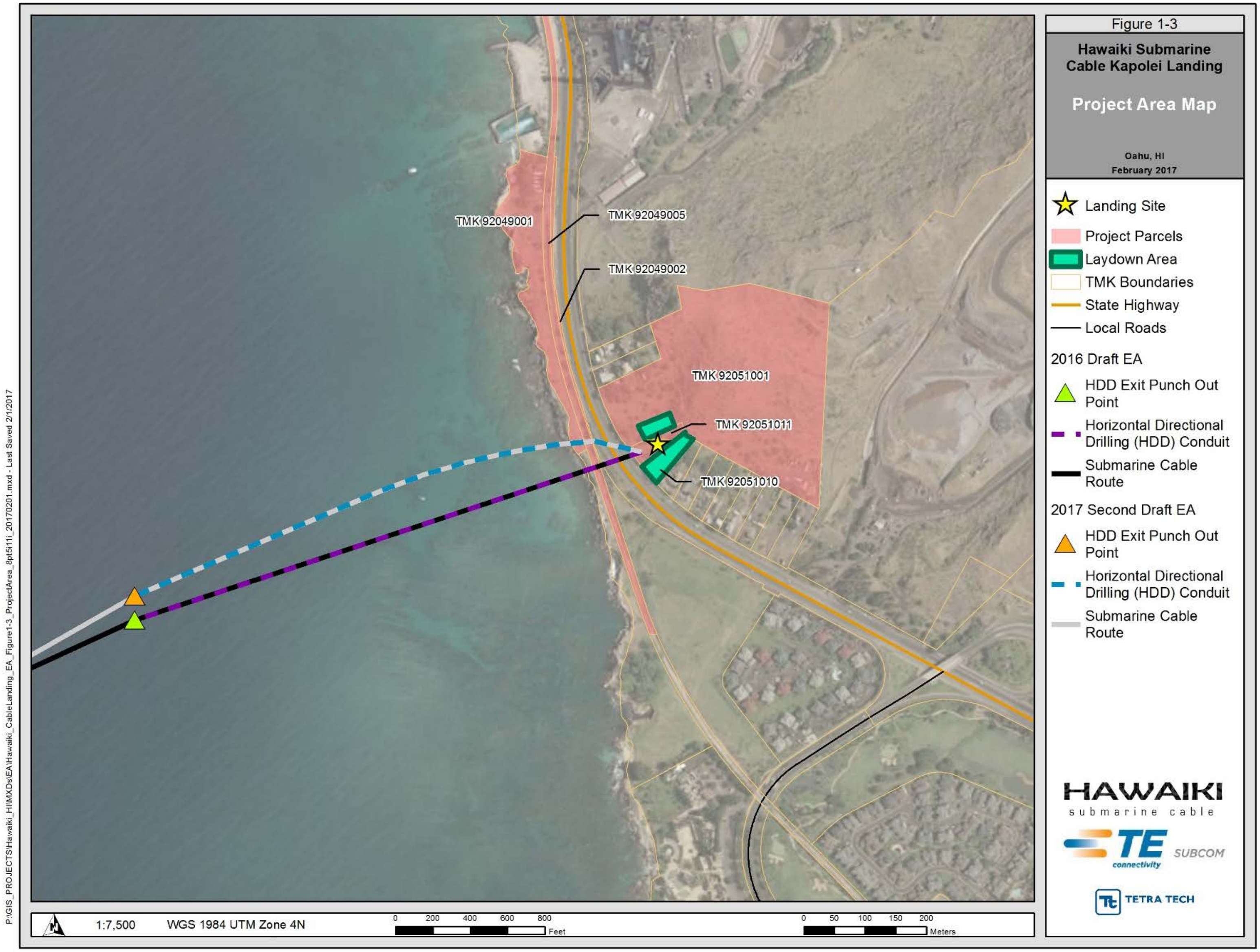

Figure 4. Project area showing TMK parcels (figure from Tetra Tech Hawaiki Second Draft Environmental Assessment).

offshore to a punch-out point at a water depth of approximately 45 feet (14 m), approximately 2,520 feet (768 m) from the shoreline. An approximately 5-inch (125-cm) diameter steel drill pipe will be installed following completion of the boring from the BMH location to the submerged punch-out point (approximately 2,982 linear feet [909 m] in total) as a conduit for the fiber optic cable.

Given that the HDD borehole is 10 inches in diameter (.25 m), and that its total linear distance is 909 m, the HDD line contributes an additional .06 acres to the APE. The total undertaking APE is therefore 1.83 acres.

2.0 ENVIRONMENTAL AND CULTURAL CONTEXT

The following section provides background information for the Project. This includes summary information on environmental conditions, historical information, and archaeological background information for the APE and provides context for interpreting the AIS results.

2.1 Environmental Setting

The terrestrial portion of the APE is situated in a dry lowland environment receiving a mean annual rainfall of 584.0 millimeters (Giambelluca et al. 2013). It is an undeveloped parcel and was covered with relatively dense vegetation at the time of the survey. Dominant species included buffelgrass (*Cenchrus ciliaris*) and large *kiawe* (*Prosopis pallida*) trees (Figure 5). Both of these introduced species are commonly found in dry areas throughout Hawai‘i.

Two soil types are present within the terrestrial APE (Figure 6) (Web Soil Survey 2016). Most of the terrestrial APE consists of Lualualei extremely cobbly clay. This soil type is derived from alluvial parent materials and found on 3 to 35 percent slopes. This soil is well drained and is not considered to be prime farm land. A very small portion of the terrestrial APE within the northwest corner of the parcel is Rock land. This soil series is derived from *pahoehoe* lava with basalt parent material and is situated on 5 to 70 percent slopes.

Although the terrestrial APE slopes gently to the northeast over most of its area, the far northeastern terminus includes a small rocky cliff. The far northeastern portion of the parcel is very rocky with variable topography.

The submarine portion of the APE, the HDD line, runs underneath O‘ahu’s near-shore marine environment along the Wai‘anae Coast (Figure 7). This portion ranges in depth from 0 to 46 feet below sea level and contains a series of coral reef patches within an otherwise sandy sea floor. Marine life in this area includes common Hawaiian reef fishes, marine invertebrates, and likely transient sea mammals and selachimorpha (sharks). The “punch-out” point for the HDD line is at 46 feet depth in a locale selected to minimize potential threat to marine life. It is not in a reef area. Other than the “punch-out” location, the HDD line is subterranean and therefore will not interact with the submarine environment.

2.2 Hawaiian Power and Politics in the Late Pre-Contact Period

This section presents a contextual overview of the development of Hawaiian political consolidation in the Late Pre-Contact Period as it applies to Honouliuli and the ‘Ewa region of

O‘ahu. Pre-Contact ethno-historical information for the study area is otherwise sparse to non-existent, in itself a statement on the remote and generally uninhabited nature of this arid landscape.

While the earliest oral histories are brief, they suggest that by the early 1300s larger district size communities were being formed on O‘ahu (Cordy 2002:22). Notably, the districts of ‘Ewa, Kona and, Ko‘olaupoko were dominant polities at this time, ruled by the sons of the Chief Māweke. The island of O‘ahu was subsequently unified under one kingdom during the early 1400s and ruled by La‘akona (Cordy 2002:26). La‘akona was the senior of the Māweke-Kumuhonua line, which held power between 1520 and 1540. It is suggested that at least one royal center for ‘Ewa was at Lihue in upland Honouliuli. Haka was the last chief of the Māweke-Kumuhonua line and portrayed as an ill-natured chief who was captured and slain by his men. After several shifts in political power between the 1500s and early 1700s, Kūali‘i seized control of all of O‘ahu by defeating the ‘Ewa and Kona chiefs (Fornander 1917:366, 400). Peleioholani, a son of Kūali‘i, became regent in 1740 and remained ruler of O‘ahu until his death in 1778.

Kahahana, from the ‘Ewa line of chiefs, had been raised in Kahekili’s Maui court and was chosen to be the new ruler of O‘ahu. After the death of Kahahana, the ‘Ewa and Kona chiefs conspired to kill Kahekili and the other Maui chiefs who were residing in Kailua. The Maui chiefs were warned and the plot against them failed. Kahekili and the Maui chiefs responded by retaliating against the ‘Ewa and Kona chiefs as Samuel Kamakau describes:

> …the districts of Kona and ‘Ewa were attacked, and men, women, and children were massacred, until the streams of Makaho and Niuhelewai in Kona and Kahoa‘ai‘ai in ‘Ewa were choked with the bodies of the dead, and their waters became bitter to taste, as eyewitnesses say, from the brains that turned the water bitter. All of the O‘ahu chiefs were killed. [Kamakau 1992:138]

Figure 5. Overview of terrestrial portion of APE showing vegetation, view to northwest.

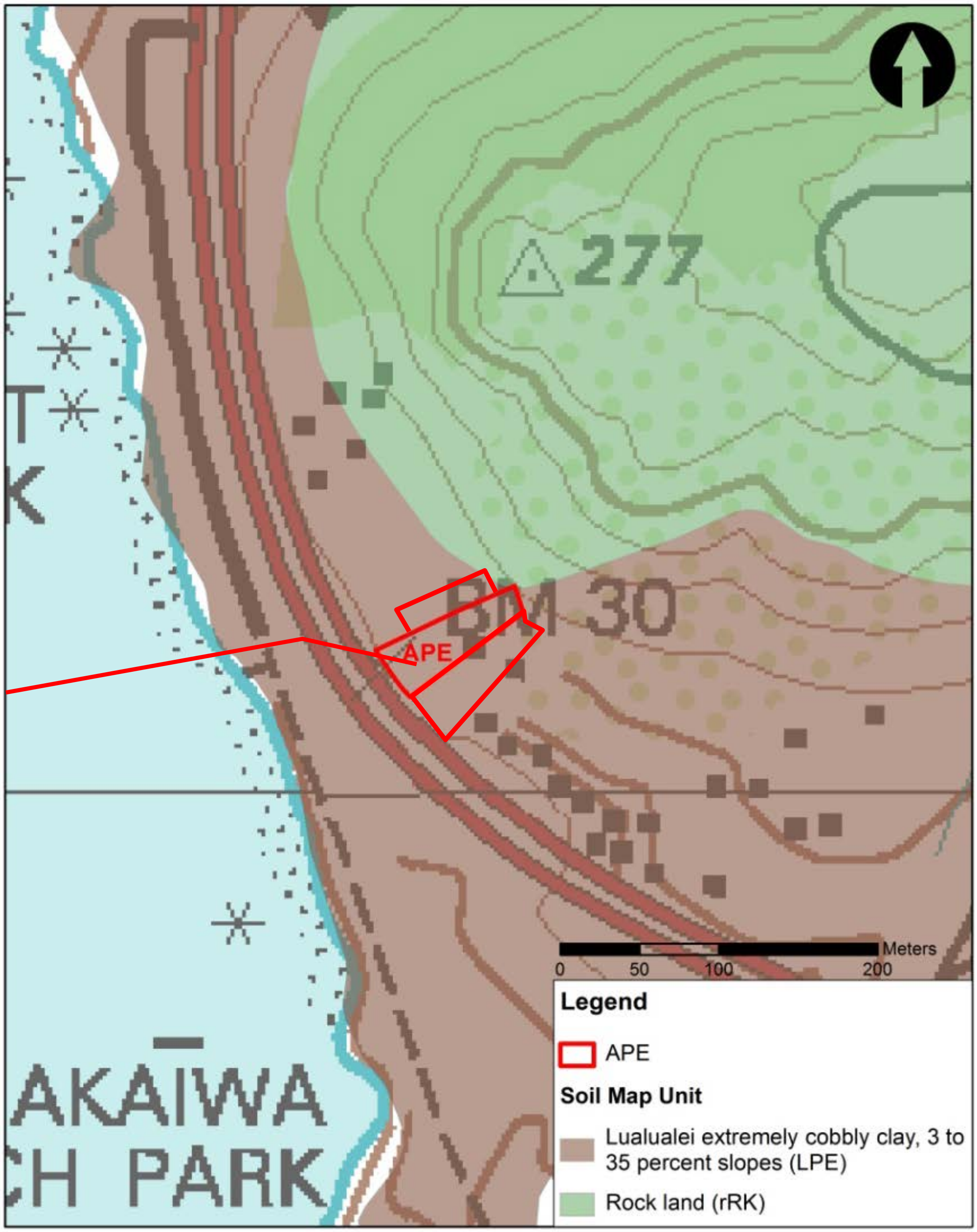

Figure 6. Soils within the terrestrial APE.

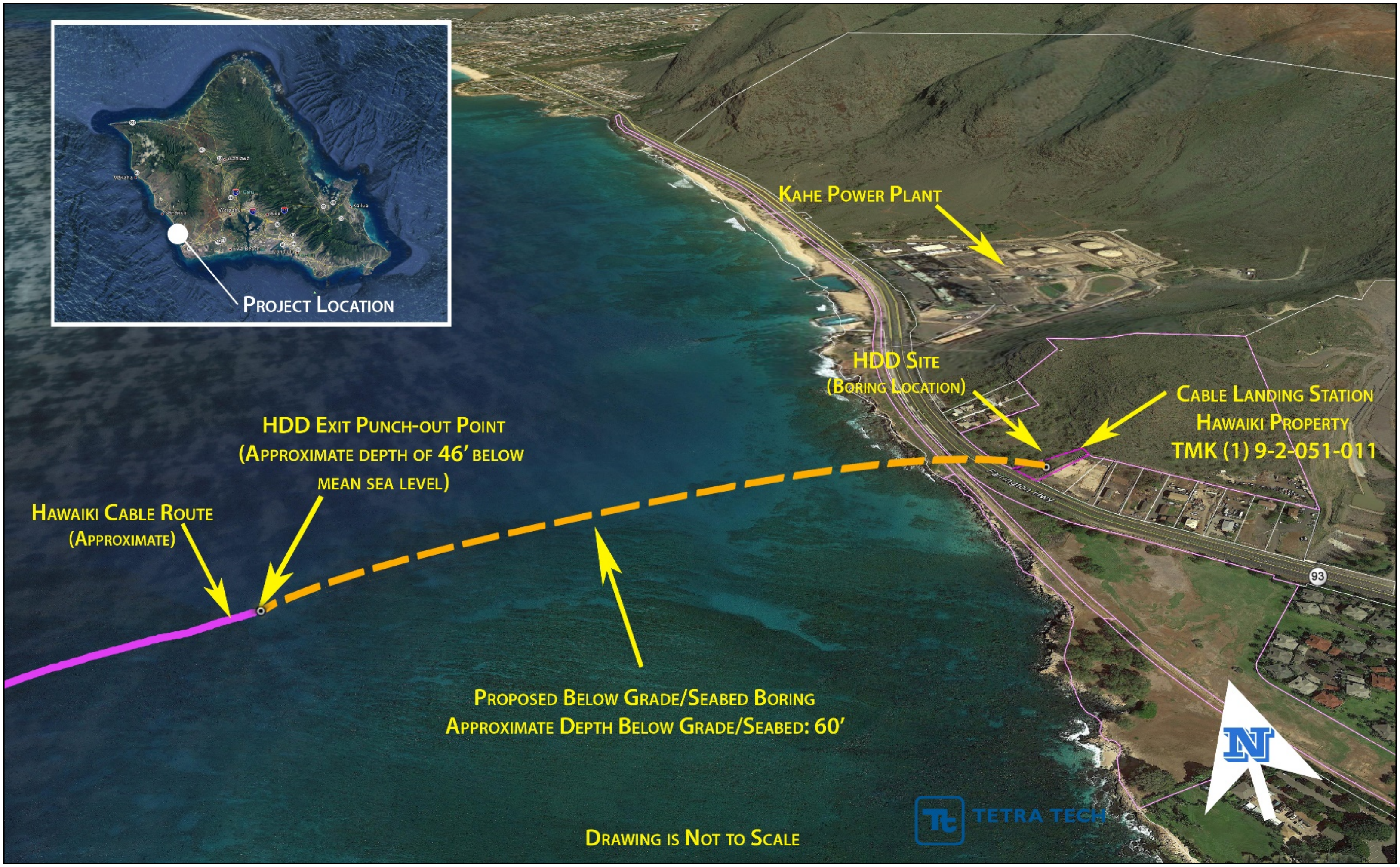

Figure 7. Submarine portion of APE, showing route under near-shore reef environment.

After Kamehameha I secured the island of Hawaiʻi under his power, in 1791, he started a campaign to unify the remaining islands. Kamehameha I's conquest of unification culminated with the victory at the Nuʻuanu Pali battle, which placed the island of Oʻahu under his control. The chiefs that supported Kamehameha I during his quest to unite the islands were rewarded and positioned as managers of districts and *ahupuaʻa* within the new kingdom. The *ahupuaʻa* of Honouliuli was given to Kamehameha I's supporter Kalanimōku as a part of the *panalāʻau*, or conquered lands; the gift included the right to pass the land on to his heirs (Kameʻeleihiwa 1992:58, 112). Kalanimōku later passed the *ahupuaʻa* to his sister, Wahinepiʻo.

2.3 Historic Land Tenure

In 1848, the Māhele instituted a change from the traditional Hawaiian system of land tenure to a system based on the western concept of fee-simple ownership. During the Māhele, the Hawaiian chiefs and *konohiki* were required to present their claims to the Land Commission and receive awards for the land quit-claimed to them by Kamehameha III. Until an award for these lands was issued, the title remained with the government. A land commission award (LCA) gave complete title to the lands with the exception of the government's right to commutation. Upon satisfaction of the commutation, which could be settled by a cash payment or through the exchange of land of equal value, a Royal Patent was issued by the minister of the interior. A Royal Patent quitclaimed the government's interest in the land and served as proof that the government's right to commutation no longer existed. The Act of August 10, 1854 provided for the dissolution of the Land Commission so that a LCA recipient was still protected if they had not obtained a Royal Patent (Chinen 1958:13–14). This act stated that "a Land Commission Award shall furnish as good and sufficient a ground upon which to maintain an action for trespass, ejectment, and other real action, against any person or persons, whatsoever, as if the claimant, his heirs or assigns, had received a Royal Patent for the same" (Chinen 1958:14).

Within Honouliuli Ahupuaʻa, there were 72 individual land claims that were registered and awarded to commoners by King Kamehameha III (Tuggle and Tomonari-Tuggle 1997:34). These *kuleana* claims were concentrated in the southern portion of Honouliuli near the rich taro lands by Pearl Harbor. No land awards were granted to commoners within or near the Project. Such dry coastal lands were apparently not of economic value to the average Hawaiian.

Kekauʻonohi, granddaughter of Kamehameha I and one of Kamehameha II's wives, acquired the title for all unclaimed lands within Honouliuli Ahupuaʻa (LCA 11216, Royal Patent 6971) (Jayatilaka et al. 1992:14) including the present Project area. This Royal Patent included 43,250 acres of land. After Kamehameha II's death, Kekauʻonohi remarried and became the wife of Chief Levi Haʻalelea. All of Kekauʻonohi's land holdings were passed to her husband and his heirs upon her death in 1851. In 1863, the owners of *kuleana* lands deeded their land to Haʻalelea to pay off debts owed to him. Amoe Ena, Levi Haʻalelea's second wife, inherited the land after his death in 1864. The land was leased to James Dowsett and John Meek in 1871 for cattle grazing. Amoe Ena sold Honouliuli to John Harvey Coney, her brother-in-law, in 1875; Coney subsequently sold it to James Campbell in 1877 (Frierson 1972:12).

2.3.1 Ranching and Sugarcane Cultivation

James Campbell developed the expansive Honouliuli Ranch. The ranch, used primarily for cattle grazing, encompassed much of Honouliuli Ahupuaʻa, extending from the coastal ʻEwa plain between Barber's Point and Pearl Harbor, upland to Wahiawa and the boundary of Waianae Uka. In 1880, the Honouliuli Ranch was described by George Bowser as:

> Acreage, 43, 250, all in pasture, but possessing fertile soils suitable for agriculture; affords grazing for such valuable stock. The length of the estate is no less than 18 miles. It extends to within less than a mile of the sea coast, to the westward of the pearl river inlet. [Bowser 1880:489]

1n 1879, Campbell drilled the first artesian well in Hawai'i, on the 'Ewa Plain, beginning the development of large-scale irrigation and agricultural production on regions marginal lands. In 1890, the OR&L expanded into Honouliuli, further facilitating large-scale sugarcane cultivation in the central plains of O'ahu. B.F. Dillingham leased the Honouliuli lands below 200 feet elevation to William Castle who subleased to land to the Ewa Plantation Company. The Honouliuli lands above 200 feet elevation were leased to the Oahu Sugar Company.

The Ewa Plantation Company was the first plantation entirely supplied by artesian wells (Kuykendall 1967:67). The plantation constructed ditches running from the lower slopes of the mountains to the lowland, encouraging soil deposition on the coral plain and increasing arable land. During the rainy season the slopes were plowed so the soil would be carried down the ditches and deposited on the lower plain. In 1892 the first crop of cane produce 2,849 tons of sugar. The Ewa Plantation Company was a widely successful venture and continued operations until the Oahu Sugar Company took control of the Ewa Plantation lands in 1970.

The Oahu 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 as pumping water proved too costly (Wilcox 1997:98). The Waiahole Irrigation Company was established and in 1912 began 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 to Honouliuli. Construction of the irrigation system started in February 1913 and was completed in December 1916. Additions to the system were made during the 1920s, 1930s, and 1960s (State of Hawai'i, Department of Agriculture 2002:2). Modern 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 2000:45, 50).

2.3.2 The Oahu Railway and Land Company

B.F. Dillingham financed the construction of a railway under the company name Oahu Railway and Land Company, addressing the logistics of the transportation of goods from the plantation to areas of market and distribution. By 1895, the railway extended from Honolulu to Wai'anae (Kuykendall 1967:100). After the Japanese attack on O'ahu, on December 7, 1941, the U.S. military heavily depended on OR&L lines to transport materials to build defense projects around the island and transport war material and personnel from Honolulu to military bases. The OR&L line operated 24 hours a day until the end of World War II in August 1945. Jim Chiddix and MacKinnon Simpson wrote:

> She had served her county well and proudly during the war, but operating round-the-clock on what little maintenance could be squeezed in, had taken a prodigious hit on the locomotives and track. Traffic stayed steady for a short time, but soon dropped precipitously as soldiers and sailors went home, military posts were shrunk or razed, and civilians could get tires, gasoline and new cars. [Chiddix and Simpson 2004:257]

Soon after the war the OR&L was forced to cease operations due to the competition from truck transportation. In 1946, Walter F. Dillingham wrote:

> The sudden termination of the war with Japan changed not only the character of our transportation, but cut the freight tonnage to a third and passenger business to a little above pre-war level. With the increased cost of labor and material and the shrinkage in freight tonnage and passenger travel, it was definite that the road could not be operated as a common carrier. With no prospect of increased tonnage, and the impossibility of increased rates against truck competition, your management has applied to the Interstate Commerce for authority to abandon its mainline. [Walther F. Dillingham, cited in Chiddix and Simpson 2004:257]

The majority of the main line was disassembled and sold. In 1947, the U.S. Navy took over and utilized portions of the OR&L line to transport ammunition and torpedoes from the Lualualei magazine to Pearl Harbor. The U.S. Navy used the railway until 1968.

2.3.2.1 SIHP Site No. 50-80-12-9714: OR&L Right-of-Way between Nānākuli and Honouliuli

The OR&L right-of-way was first documented by Soehren in 1964, working under the auspices of the Bishop Museum. Copies of this report could not be found during background research, but it is assumed that documentation was minimal at this early date, considering that the survey was focused more on traditional Hawaiian resources. According to its NRHP nomination form, the OR&L right-of-way was listed on the Hawaii Register of Historic Places in March of 1974. The federal government donated the tracks and the right-of-way to the State of Hawaiʻi that same year, and the two events were likely related.

The Hawaiian Railway Society—formed in 1970 to save and restore the remaining railways in Hawaiʻi—was able to place the segment of the OR&L right-of-way between the Pearl Harbor and Lualualei (Nānākuli to Honouliuli) on the NRHP in 1975 (National Register Information System ID 75000621). Because National Park Service guidance documents had not been authored yet, the National Register nomination form for the OR&L does not contain an explicit "Statement of Significance" that utilizes the National Register Criteria for Evaluation. The Statement of Significance does state that "The Nanakuli-Honouliuli right-of-way is the longest remaining continuous stretch of the historic Oahu Railway and Land Company narrow-gauge railroad in existence," and that "It is a well-preserved remnant of the earlier 175 miles of track laid by this railroad that had a tremendous effect on the economic development of Oahu and the State of Hawaii" (OR&L National Register Nomination Form, page 3). As for integrity, a statement on condition is made, to wit "It is in good condition, as is the roadbed. This is due to maintenance by the Navy."

In reading the extensive historical background in the nomination, it is clear that the railway would likely be considered significant under today's Criterion A for its importance to the economic development of O‘ahu and Hawai‘i in the early twentieth century, as well as its importance to the war effort during World War II. It may also be eligible under Criterion B for its direct association with B.F. Dillingham, a significant historical figure in Hawai‘i. As mentioned, these significance attributions are not explicitly stated in the National Register nomination documents, nor in any subsequent documentation that could be found at the state or federal level.

The segment of OR&L line between Honouliuli and Nānākuli is currently listed on the Hawai‘i State Inventory of Historic Properties (SIHP) as Site No. 50-80-12-9714. It is located approximately 55 m from the southwest boundary of the terrestrial APE for the Hawaiki Submarine Cable undertaking. Currently, this portion of track supports tour rides operated by the Hawaiian Railway Society, running from Ewa to Kahe Point. Along this segment, gravel has been recently spread along the track and defunct railroad crossties appear to have been replaced (Figure 8 and Figure 9). It is in excellent overall condition and appears to retain its integrity through continual historically appropriate maintenance and upkeep by The Hawaiian Railway Society.

2.4 Previous Archaeological Research

A number of archaeological studies have been conducted within Honouliuli, especially in the areas east and west of the Farrington Highway stretch that leads into Nānākuli. The majority of these studies are remote from the Project area and the reader is referred to the comprehensive archaeological background in Hammatt et al. 2013 for further details.

Table 1 summarizes previous archaeological investigations conducted within the vicinity of the terrestrial APE. This includes projects that resulted in the identification of cultural properties, projects that produced no findings, and investigations that consisted of evaluations of previous work. Brief descriptions of previous projects that identified archaeological sites are also presented below along with a map illustrating the boundaries of these previous investigations in relation to the current Project's terrestrial APE (Figure 10).

In 1964, Lloyd Soehren (1964) conducted a field investigation of an area in Waimānalo after the Bishop Museum was notified of a "house site" located in the lower elevations of the gulch. The site was briefly documented and assigned SIHP 50-80-12-2317 (Soehren 1964).

Barrera (1979) conducted an archaeological investigation of the West Beach area resulting in the identification of pre-Contact and historic sites. He documented a traditional habitation site with a concentration of petroglyphs on a basalt outcrop, midden scatters, features associated with historic agriculture, tracks from the OR&L railroad, and a possible fishing shrine. The possible shrine, or *ko‘a* (SIHP 50-80-12-2317), is situated roughly 90 m south-southwest of the southern corner of the Project.

In 1983, Bordner and Silva (1983) conducted an archaeological reconnaissance survey within Waimānalo Gulch. The survey identified one possible World War II-era encampment.

Figure 8. Segment of the historic OR&L railway (Site 50-80-12-9714) within the APE. View to northwest.

Figure 9. Close-up view of repaired track at Site 50-80-12-9714, showing new ties and gravel.

Table 1. Previous Archaeological Research in the Vicinity of the APE

Reference	Nature of Study	Location	Results
Soehren 1964	Field Investigation	Waimānalo Gulch	Documented a house site (SIHP 50-80-12-2317)
Barrera 1979 and 1986	Archaeological Investigation	West Beach, Honouliuli	Identified a fishing shrine (SIHP 50-80-12-1433).
Komori and Dye 1979	Data Recovery	West Beach, Honouliuli	No findings.
Bordner and Silva 1983	Archaeological Reconnaissance Survey	Waimānalo Gulch,Honouliuli	Documented one World War II-era associated feature.
Hammatt 1984	Archaeological Reconnaissance Survey	Kahe Power Plant, Honouliuli	No findings.
Neller 1985	Archaeological Assessment	West Beach, Honouliuli	Evaluated previous research conducted in the West Beach Area.
Pietrusewsky 1988	Inadvertent Burial Investigation	Beach sand across from the Kahe Power Plant	Identified a pre-Contact burial (SIHP 50-80-12-4061).
Bath 1989	Field Investigation	Waimānalo Gulch, Honouliuli	Documented three petroglyph areas (SIHP 50-80-12-4110).
Hammatt and Shideler 1989	Archaeological Reconnaissance Survey	Honouliuli TMK (1) 9-2-003:027	Identified a small pre-Contact agricultural terrace (SIHP 50-80-12-4221).
Hammatt et al. 1991	Archaeological Inventory Survey	Makaīwa Hills, Honouliuli	Identified 34 historic properties.
Glidden et al. 1993	Data Recovery	Paradise Cove, Honouliuli	Noted a possible pre-Contact cultural deposit in one trench (no site number assigned).
Jourdane 1995	Inadvertent Burial Investigation	Paradise Cove, Honouliuli	Identified the human remains of at least five individuals (SIHP 50-80-12-4968).
Hammatt and Shideler 1999	Archaeological Inventory Survey	Waimānalo Gulch, Honouliuli	No findings.
Yucha and Hammatt 2011	Archaeological Inventory Survey	Kahe Valley, Honouliuli	Documented six newly identified historic properties (SIHP 50-80-12-7137–7142) and four previously recorded historic properties (SIHP 50-80-12-6647–6650).

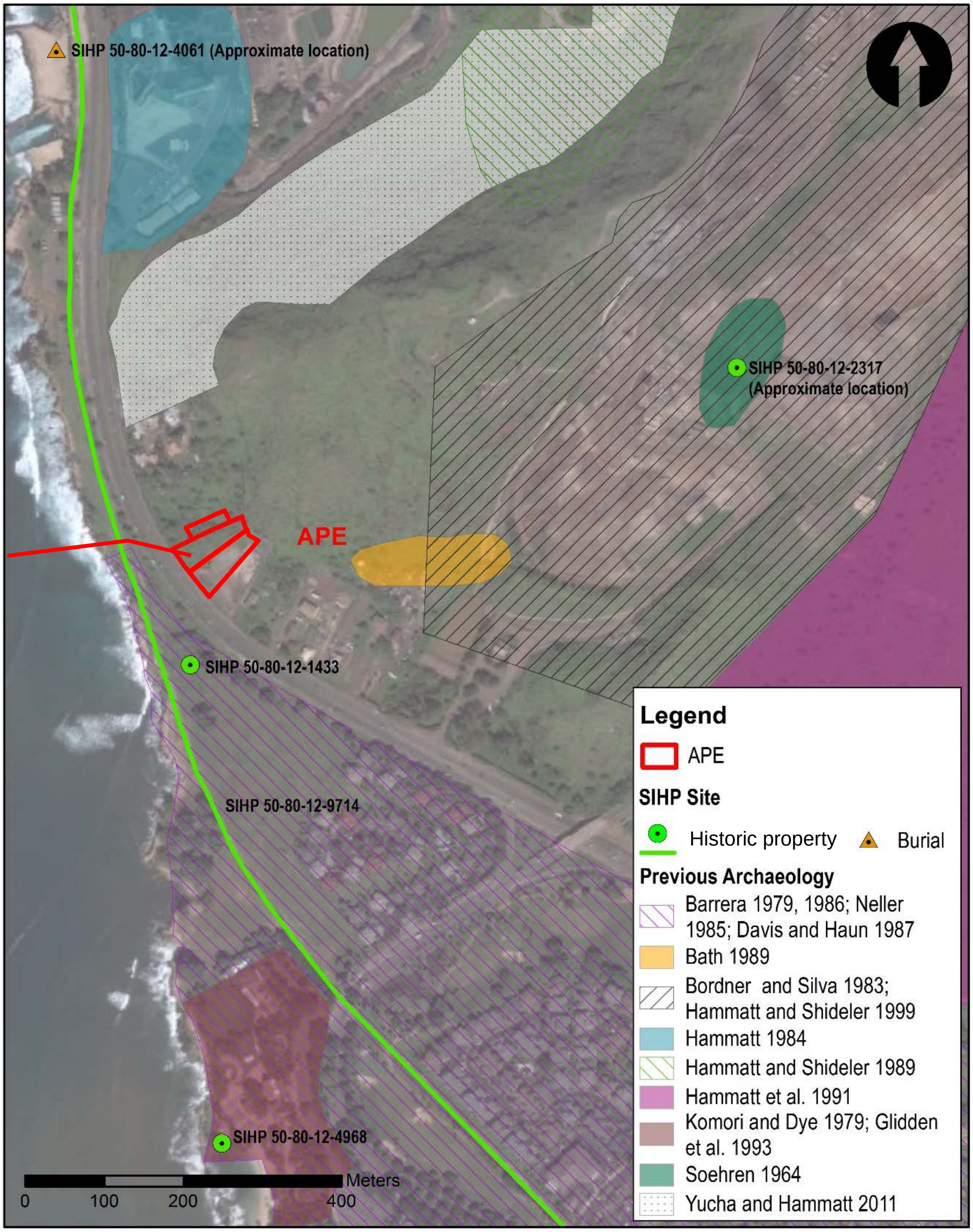

Figure 10. Map of previous archaeological investigations and historic properties in the vicinity of the APE.

In 1987, the State Historic Preservation Division received a report of a burial that was inadvertently discovered after being naturally exposed from the beach sands across the street from the Kahe Power Plant. Dr. Michael Pietrusewsky, of the University of Hawaiʻi, concluded that the skeletal remains represented one individual, most likely of Hawaiian descent (1988).

Hammatt and Shideler (1989) conducted an archaeological reconnaissance survey for a proposed Hawaiian Electric training facility. The southwestern boundary of the survey area is approximately 500 m northeast of the Project. One small rock terrace (SIHP 50-80-12-4221) was determined to be associated with Hawaiian agriculture.

In 1989, Joyce Bath conducted a field investigation of an area in lower Waimānalo Gulch after the SHPD was notified of the presence of petroglyphs (Bath 1989). Three petroglyphs areas were documented as SIHP Site 50-80-12-4110. These include two anthropomorphic images and one consisting of abstract symbols.

In 1991, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey of a 1,915-acre parcel for the Makaīwa Hills development project (Hammatt et al. 1991). The western boundary of the survey is approximately 500 m southeast of the Project. The survey resulted in the documentation of 34 historic properties including traditional Hawaiian permanent and temporary habitation structures, agricultural sites, petroglyphs, cairns, boundary markers and features related to the cultivation of sugarcane.

In 1993, Glidden conducted subsurface testing within the parking lot and beach area of Paradise Cove. Ten trenches were excavated, resulting in the identification of possible pre-Contact cultural layer within one of the trenches, which consisted of a grayish loam with charcoal flecking. The possible pre-Contact cultural deposit was not given a site number.

In 1995, exposed human remains within sand deposits near the coast at Paradise Cove were reported to the SHPD (Jourdane 1995). The skeletal elements represented at least five individuals. The area was designated SIHP 50-80-12-4968.

From 2010 to 2011, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey of portions of Kahe Valley. The southern boundary of the survey is approximately 160 m north of the current Project (Yucha and Hammatt 2011). The survey identified six historic properties and four previously documented historic properties. The six newly identified historic properties include a complex of military associated features (SIHP 50-80-12-7137), a complex of 56 mounds (SIHP 50-80-12-7138), a probable pre-Contact habitation and activity area (SIHP 50-80-12-7139), a machine gun shelter (SIHP 50-80-12-7140), a well or water tank foundation (SIHP 50-80-12-7141), and a wall constructed of basalt boulders and cobbles (SIHP 50-80-12-7142). Previously identified sites include a complex consisting of a stacked coral wall, a possible shrine, and a terrace (SIHP 50-80-12-6647), a complex consisting of structural ruins and a cement foundation (SIHP 50-80-12-6648), a wall of basalt blocks and mortar (SIHP 50-80-12-6649), and a pre-Contact complex consisting of eight features (SIHP 50-80-12-6650).

2.4.1 Nearshore Research and Resources

As part of background research conducted for HEPA compliance for the undertaking, Tetratech completed a desktop analysis of the nearshore (HDD) portion of the APE using publicly available information and consultation with local experts. The desktop analysis did not identify any potential resources within the nearshore portion of the APE; however, two underwater sites were identified by National Oceanic and Atmospheric Administration (NOAA) historian Hans Van Tilburg as being located nearby (within 0.25 to 0.50 mile [0.4 to 0.8 km]) of the APE (H. Van Tilburg, personal communication, September 8, 2016). These two sites include the shipwrecks of Vessel F6F-3 Hellcat and Vessel F2A-3 Buffalo.

Vessel F6F-3 Hellcat, squadron VF-100, was lost in 1945. The hypothesized wreck location is based on archival records and has not been verified empirically, although the wreck location is designated as having moderate to good accuracy. The site is located approximately 0.25 mile (0.4 km) northwest of the cable landing site. Vessel F2A-3 Buffalo, squadron VMF-212, was lost in 1942. The wreck location is approximately 0.5 mile (0.8 km) south of the cable landing site, although the NOAA record indicates the position estimate reliability as fair to poor (H. Van Tilburg, personal communication, September 8, 2016). The University of Hawai‘i Marine Option Program was also contacted regarding nearshore cultural resources within or adjacent to the APE. This source reported no knowledge of such resources (C. Hunter, personal communication, September 8, 2016).

2.4.2 Archaeological Expectations

The distribution of pre-Contact sites indicates that traditional Hawaiian settlement, resource procurement, and agriculture mainly took place in the southern part of Honouliuli Ahupua‘a near West Lock, the coast, and portions of the ‘Ewa Plain. This is evident from the presence of large permanent settlement sites associated with irrigated taro cultivation near West Loch, temporary fishing encampments scattered along the coastline, and small permanent settlements associated with dryland agriculture on the ‘Ewa Plain (Tuggle 1995:100). Settlement on the slopes of the Waianae Mountains bordering the ‘Ewa Plain was mainly temporary with a few recurrent residences related to the collection of upland forest goods (Handy and Handy 1991:469) and quarry materials (Hammatt et al. 1991).

Previous archaeological investigations conducted in the vicinity of the Project have documented a wide range of pre-Contact and historic features that include traditional Hawaiian habitation shelters, pre-Contact agricultural features, cairns, burials, and petroglyphs. Historic features documented include the OR&L railroad, agricultural features associated with the early sugar industry and structures related to the military defense of O‘ahu during World War II. The burials documented in the vicinity include SIHP 50-80-12-4061 located approximately 650 m north-northwest of the Project and SIHP 50-80-12-4968 located 550 m south. Sites documented in the immediate vicinity of the Project include a petroglyph site (SIHP 50-80-12-4110) located roughly 150 m to the east and a fishing shrine (SIHP 50-80-12-1433) situated 90 m to the southwest.

Considering the wide range of feature types recorded in the vicinity of the Project, there is a moderate probability of encountering features associated with pre-Contact and early historic period Hawaiian use and occupation within the terrestrial portion of the APE. Given the number of different types of historic period resources identified near the APE, it is probable that resources related to O‘ahu’s historic railway, sugarcane cultivation, and World War II are present.

3.0 FIELDWORK METHODS

The archaeological inventory survey consisted of two basic tasks: 1) systematic pedestrian survey of the entire terrestrial portion of the APE (TMK [1] 9-2-051:001 por., 010, and 011) and 2) extensive subsurface testing within TMK (1) 9-2-051:011. The pedestrian survey involved walking parallel transects spaced 5 m apart. Transects were oriented southwest-northeast with the long axis of the APE and extended from the southwestern project boundary at Farrington Highway to the northeastern parcel boundary. Pedestrian transect survey was conducted by a crew of two, including the SHPD-permitted Principal Investigator Dr. Patrick O'Day and one archaeological field technician, on 1 July and 19 September 2016.

Subsurface testing included excavation of 10 trenches with a miniature tracked excavator (Figure 11). Test trenching was conducted only within parcel TMK (1) 9-2-051:011 because this is the only area in which the undertaking will involve significant ground disturbing activity. Undertaking activities on the adjacent parcels (TMK [1] 9-2-051:001 por. and 010) will only involve minimal ground disturbance (surface improvements) and therefore only pedestrian survey was conducted there.

Test trenches were spaced as evenly as possible, though the locations and orientations of the trenches were often selected to avoid large trees and boulders. Most notably, the northeastern portion of the parcel was inaccessible to the backhoe, as it contained large boulders, rubble, a cliff face, and very little soil development. Although subsurface work could not be conducted in the northeast portion of the parcel, it was fully examined during pedestrian survey.

Prior to subsurface testing, the archaeologist met with the backhoe operator to explain the purpose of subsurface testing, review the types of archaeological resources that may be present, and clearly explain the protocols and procedures for dealing with archaeological resources.

Representative sections of excavation trench walls were stratigraphically profiled and photographed. Detailed stratigraphic descriptions were recorded in order to document the general stratigraphy of the area. Profiles include technical information in accordance with the U.S. Soil Conservation Service standards and an archaeological interpretation of the area's depositional history. Standards of documentation and recording were in accordance with Hawai'i Administrative Rules §13-276 and the Secretary of the Interior's Standards and Guidelines.

4.0 RESULTS

Fieldwork for the AIS did not locate any historic properties. The surface survey revealed that the middle and southwestern portion the parcel has been mechanically disturbed. Modern rubbish from illicit dumping and squatting is present throughout the parcel and the northeastern portion is covered by large boulders. A small cliff face is also present along the *mauka*,[1] or upland boundary of the APE.

[1] Inland, toward the mountains.

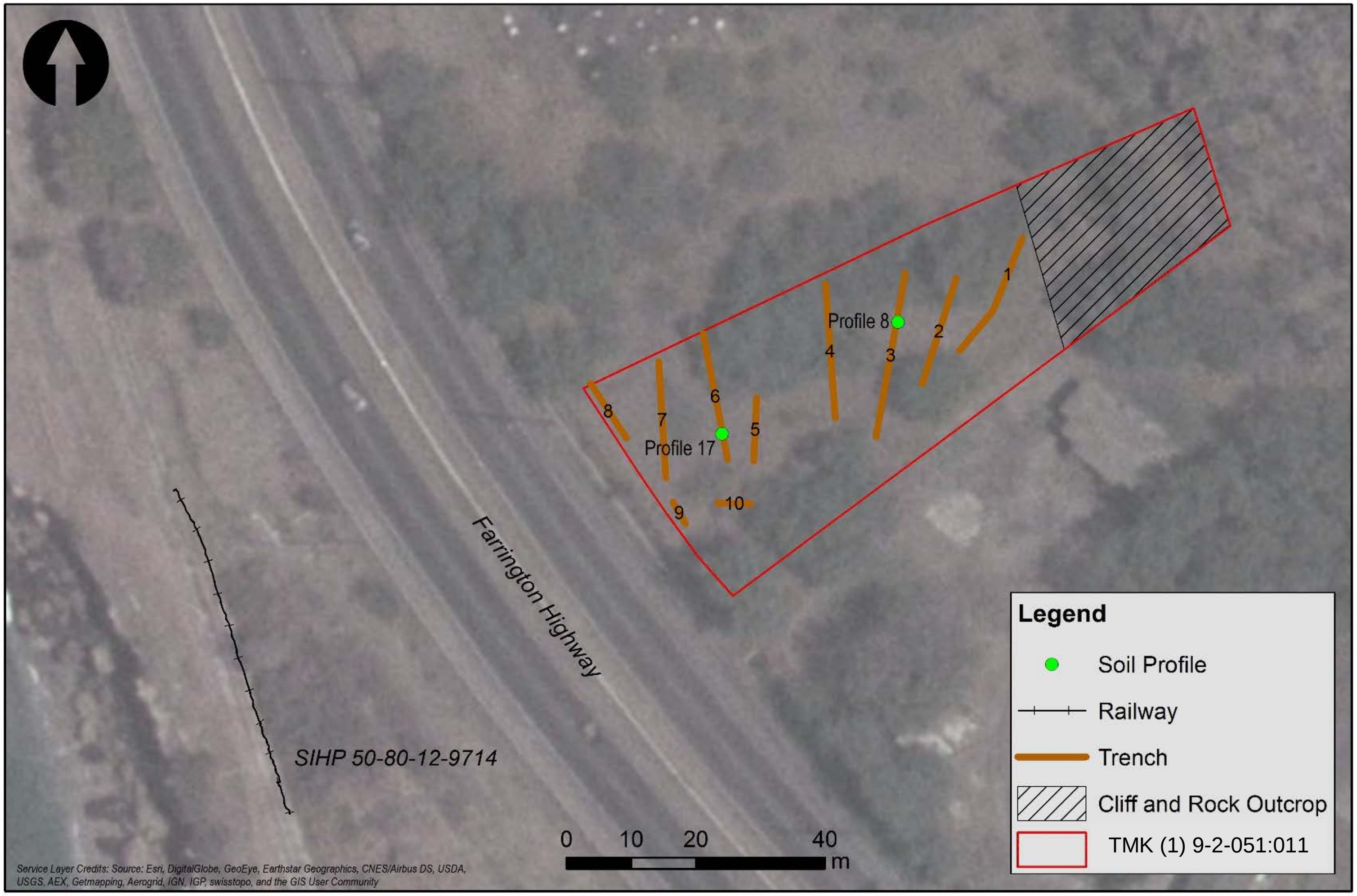

Figure 11. Locations of test trenches and representative soil profiles within TMK (1) 9-2-051:011.

Trenches were excavated throughout most of the subject parcel, except for the boulder-strewn northeastern portion. The locations and orientations of the trenches were constrained by the presence of large boulders and *kiawe* trees (Figure 11). Detailed findings of the surface survey and subsurface testing are presented in the following sections.

4.1 Surface Survey

The surface survey covered 100 percent of the Project area. Systematic survey transects ran from the southwestern boundary of the Project area at Farrington Highway to the small cliff band located along the northeastern boundary. At the time of the survey, the parcel was covered with buffelgrass and a few large *kiawe* trees. As mentioned, there is a concentration of large boulders along the northeastern boundary, which appears to have originated from the nearby cliff face.

The southeastern boundary of TMK (1) 9-2-051:011 has been heavily disturbed. There is a long linear pile of machine-scarred boulders running along the southeastern parcel boundary. These boulders appear to have been pushed here from the adjacent cleared lot (TMK [1] 9-2-051:010). Modern refuse was abundant and observed throughout the parcels and included broken power poles, 55 gallon drums, automobile parts, wooden pallets, and construction material (e.g., electrical wire, PVC pipes, and concrete blocks).

Lot TMK (1) 9-2-051:001 por. was observed to contain clusters of boulders and cobbles from previous landscape modifications. The ground surface did not appear to have been graded and retained a gently rolling topography. There was, however, no indication of intentionally constructed features.

Lot TMK (1) 9-2-051:010 was observed to be fully developed in anticipation of residential construction. The land had been fully graded and terraced. No trace of the original natural landscape was found.

Systematic pedestrian survey of the APE produced no traditional Hawaiian or early historic properties.

4.2 Subsurface Testing and Trench Stratigraphy

Ten test trenches were excavated at parcel TMK (1) 9-2-051:011, but produced no evidence of subsurface cultural deposition. Only two stratigraphic layers were sectioned during excavation. Technical descriptions of these layers are presented in Table 2 with representative profiles and photographs for two of the trenches shown in Figure 12 and Figure 13.

Layer I was present in all of the test trenches. The depth of Layer I ranged from 90 to 230 cm below surface and was deepest in trenches 1–4. These trenches were excavated in the middle portion of the parcel below the small cliff and upslope of the southwestern parcel boundary near Farrington Highway. Soils from Layer I were consistent throughout all the trenches and consisted of a homogeneous layer of moist dark reddish brown (5YR 3/2) silty clay with large rocks and boulders as shown on Profile 8 from Trench 3 (Figure 12). Very fine to medium sized roots were typically present in the upper portion of the layer. When encountered, the lower boundary of Layer I was smooth and abrupt.

Table 2. Stratigraphic Layers Observed in Test Excavations

Layer	Trench Number	Depth Range (cmbs)	Description	Interpretation
I	1–10	0–90/230	Dark reddish brown (5YR 3/2), moist silty clay, very fine to medium sized roots in upper portion of layer, smooth abrupt lower boundary, containing modern refuse and construction debris up to 100 cm below surface.	Disturbed native alluvium
II	5–10	90–200+	Very pale brown (10YR 7/2), very fine unconsolidated calcareous sand.	Undisturbed coastal deposit

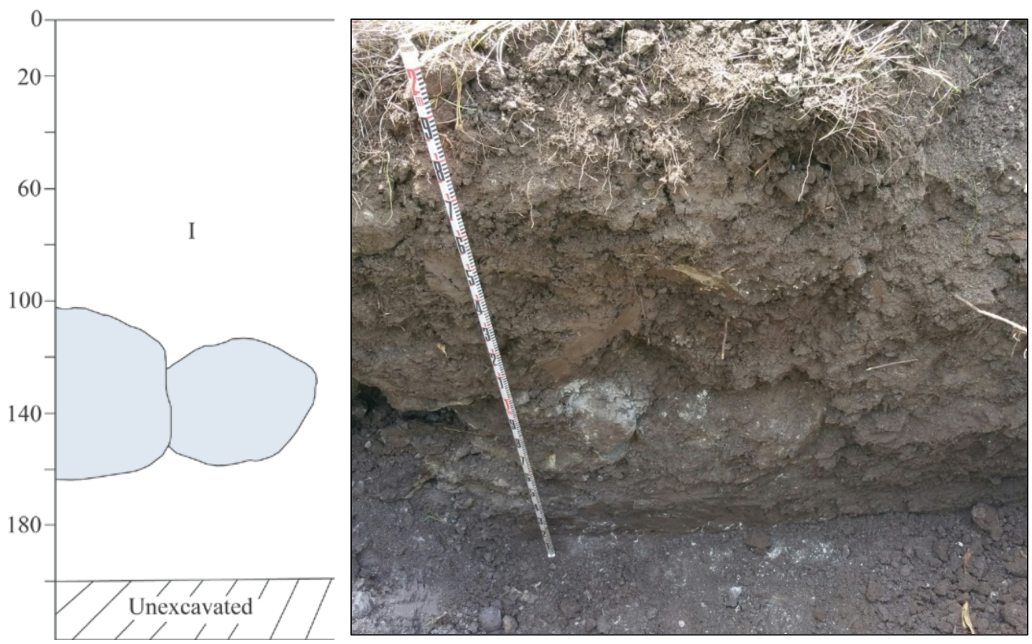

Figure 12. Soil Profile 8, view to east.

Figure 13. Soil Profile 17, view to east.

Modern refuse and construction debris was present in Layer I up to 100 cm below the ground surface. Layer I is interpreted to have formed from alluvial sedimentation. The deposits, however, have been heavily disturbed by modern activity.

Layer II was only observed in Trenches 5–10 in the southwestern portion of the APE. This area was lower in elevation than the middle portion of the parcel. Layer I was considerably thinner in this area, ranging from 90 to 180 cm thick. The boundary between Layers I and II was stark. The extreme differences in color and texture between Layers I and II are clearly visible in Profile 17, Trench 6 (Figure 13). While Layer I was a very fine silty clay with a dark reddish brown hue, Layer II consisted of a lightly-colored very pale brown (10YR 7/2) calcareous sand. Layer II ranged from 90 to 200 cm below the ground surface. The base of Layer II was not reached during trench excavation. No cultural materials were observed in Layer II, which appears to consist of undisturbed, naturally-deposited sand that was buried by the Layer I alluvial sediments.

5.0 Summary and Conclusions

An AIS was conducted for the proposed Hawaiki Submarine Cable Landing Project located at 92-384 Farrington Highway, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu (TMK [1] 9-2-049:001, 002, and 005; [1] 9-2-051: 001 por., 010, and 011; and Farrington Highway). The purpose of the AIS was to identify, document, assess significance, and evaluate NRHP eligibility for all extant historic properties within the APE and provide mitigation recommendations as needed. The AIS was conducted to support compliance with HRS §6E-42, Section 106 of the National Historic Preservation Act, and HEPA

The AIS included both systematic pedestrian surface survey and excavation of 10 test trenches at parcel TMK (1) 9-2-051:011. The surface survey revealed that modern rubbish from illicit dumping and squatting was present throughout the study area and that the middle and southwestern portions of the APE have been mechanically disturbed. Parcel TMK (1) 9-2-051:010 and 001 por. were subjected to pedestrian survey only and produced no evidence of traditional Hawaiian or historic properties.

Subsurface trenching at parcel TMK (1) 9-2-051:011 sectioned two stratigraphic layers, both devoid of prehistoric or early historic cultural deposits. These included an upper, disturbed layer of alluvial sediment followed by an intact basal layer of undisturbed calcareous sand (present in only half the excavations). Prior mechanical disturbance appears to extend well below the ground surface with modern refuse and debris observed up to one meter deep.

5.1 Visual Effects

Although no historic properties were identified within the undertaking APE, visual effects to nearby historic properties warrant consideration. Evaluation of visual effects to historic properties is largely perceptual, and therefore a subjective exercise. Visual effects are therefore most successfully evaluated in a consultation setting where various interested parties can exchange opinions, attitudes, and judgements on the level of perceived visual impact of an undertaking. However, assessment of visual effect for historic properties is, in fact, somewhat constrained by the nature of the significance of the property under consideration, and some empirical treatment is therefore possible.

The Delaware State Historic Preservation Office has produced a very useful set of guidelines for assessing visual effects to historic properties (n.d. Delaware Historic Preservation Office). These guidelines provide a concise definition of adverse visual effect:

> In regard to a historic property, adverse visual effects are those that diminish the property's integrity, which negatively affects its historic significance and hence its eligibility for listing in the National Register of Historic Places.

This is a special case of the more general definition of an adverse effect under Section 106, in which an undertaking alters, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the NRHP. In terms of the seven aspects of integrity, the historic property's setting, feeling, and association are relevant considerations for visual effect.

Adverse visual effects are incurred when an undertaking has negative aesthetic or obstructive visual effects. Aesthetic effects include impacts to perceived beauty of a place or structure. For historic properties, aesthetic effects are those that impair the historic character of the property or the qualities for which it is considered significant. Adverse obstructive effects occur when an undertaking obstructs any part of a property, or the scenic view from the perspective of the property, in manner that diminishes the property's historic character.

Although not necessarily adverse, a visual effect is incurred whenever a proposed project is visible from a historic property. For the Hawaiki Submarine Cable Landing Project, one historic property is visible: SIHP 50-80-12-9714, the OR&L right-of-way.

5.1.1 The OR&L Right-of-Way: SIHP 50-80-12-9714

The OR&L railway segment running past the property is part of the much larger OR&L right-of-way which is currently listed on the NRHP (No. 75000621) and the Hawaii Register of Historic Places. Based on field observations by the Principal Investigator, only one feature of the proposed Hawaiki Submarine Cable Landing Project would be visible from the railroad right-of-way—a one-story, 465 square meter building at the front of the project parcel. However, because of the significant elevation difference between the parcel and the railroad, only the top of the building will be visible. Other structures, such as a proposed small out-building and oil storage tank, are behind the building will likely not be visible at all. Normally, a viewshed analysis would provide clear data on visibility, but unfortunately the small distances involved make such analysis ineffective. Regardless, observations made at the site from the perspective of the historic railway indicate only limited visibility of the project parcel and proposed construction elements (Figure 14).

Although the undertaking will have a limited visual effect on the segment of the OR&L right-of-way that passes south of the parcel, this effect is not adverse for a number or reasons. First, the project's visual impact is almost negligible given the scale and extent of the overall OR&L right-of-way historic property. The section of the OR&L listed on the NRHP runs from Pearl Harbor to Lualualei, traversing some 15 miles. The section from which the proposed project would be visible is a fraction of this, perhaps a tenth of a mile at most. Secondly, the proposed new construction does not alter the character of the landscape significantly. Viewscapes seaward, north along the Wai'anae coastline, and *mauka* remain essentially unchanged.

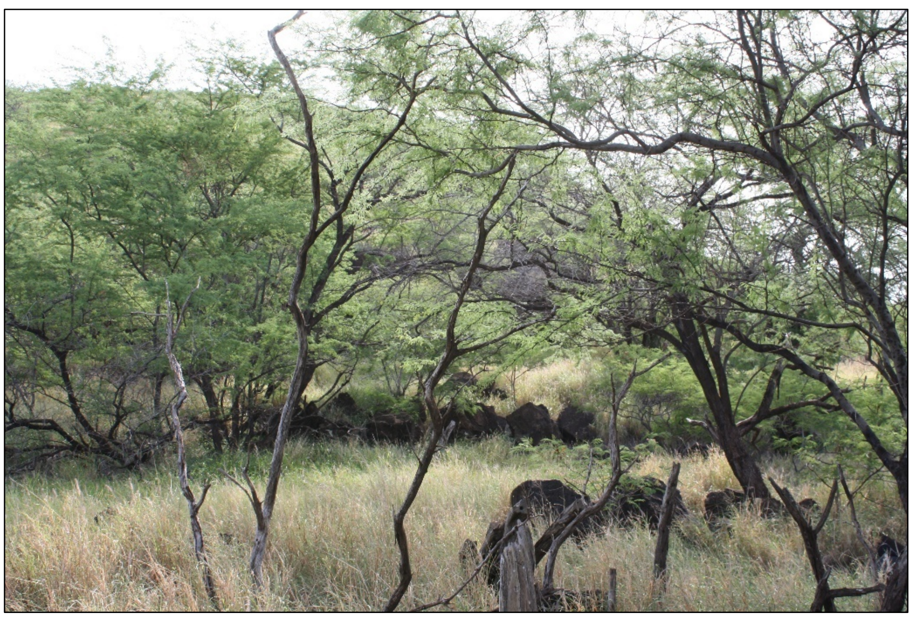

Figure 14. View to northeast from OR&L right-of-way, facing project area.

The proposed construction is also consistent with other recent development found along the railway, and is of a markedly smaller scale than other visible structures and complexes built over the last three decades (e.g., Koʻolina Resort). Overall, the proposed project does not appear to have any adverse aesthetic or obstructive effect on this segment of the historic OR&L right-of-way.

5.2 Conclusions

AIS investigations produced no evidence of surface or subsurface historic properties within the Hawaiki Submarine Cable Landing Project's terrestrial APE. One National Register of Historic Places-listed property, the OR&L right-of-way, is located 50 meters southwest of the project parcel and will be intersected by the proposed fiber optic cable. Cable installation, however, will be completed using the HDD method and will occur at a depth of 10–15 meters below surface. Cable installation will therefore not impact the OR&L right-of-way.

In conclusion, the undertaking is expected to have no direct effect on historic properties. Furthermore, the project will have no indirect adverse visual effect on historic properties. Although the OR&L right-of-way will have a limited view of project elements, visual effects are negligible and not adverse since the project does not impact the historic integrity of the property in term of its setting, feeling, and association.

6.0 Effect Determination Recommendation

Based on the information presented above, and pursuant to HAR 13-276-7, the effect determination for this undertaking is "no historic properties affected." Pursuant 36 CFR 800.4(d)(1), our effect determination recommendation is also "no historic properties affected." The undertaking will have no effect on the NRHP-listed OR&L right-of-way (SIHP 50-80-12-9714), as defined in 36 CFR 800.16(i). The undertaking will not alter any of the characteristics that qualify the OR&L right-of-way for inclusion in the NRHP.

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APPENDIX G

CULTURAL IMPACT ASSESSMENT

FINAL—Cultural Impact Assessment

Hawaiki Submarine Cable Landing Project
92-384 Farrington Highway, Honouliuli Ahupua‘a, ‘Ewa District, Island of O‘ahu, Hawai‘i

TMK (1) 9-2-049:001, 002, and 005; (1) 9-2-051:001 por., 010, and 011; and Farrington Highway

Prepared for:

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GANDA Report No. 2365-2

30 March 2017

MANAGEMENT SUMMARY

At the request of Tetra Tech Inc., Garcia and Associates conducted a Cultural Impact Assessment (CIA) in support of Hawai‘i Environmental Policy Act and Hawai‘i Revised Statutes Chapter 343 compliance for the proposed Hawaiki Submarine Cable Landing Project located at 92-384 Farrington Highway, Honouliuli Ahupua‘a, ‘Ewa District, Island of O‘ahu (“Project Area”). The proposed action includes a 1.83-acre area comprised of:

1. a 0.67-acre main parcel (TMK [1] 9-2-051:011) upon which facilities will be built,
2. two adjacent parcels (1.1 acres) that may be utilized temporarily as a construction staging area (TMK [1] 9-2-051:010 and 001 por.), and
3. a 909-meter-long by .25-m-wide (.06-acre) subterranean horizontal directional drill (HDD) borehole (TMK [1] 9-2-049:001, 002, and 005 and Farrington Highway).

The purpose of the CIA is to determine the presence or absence of cultural practices or traditionally significant cultural places within the Project Area and vicinity, and to evaluate any impacts the project may have on such resources. Background research and ethnographic interviews with locally knowledgeable native Hawaiian consultants produced one culturally significant site, a traditional Hawaiian fishing shrine (State Inventory of Historic Places Site No. 50-80-12-1433), located approximately 90 meters south of the Project Area. Consultant interviews indicate that although the site is important to Hawaiians, no cultural practices are known to be currently practiced at the site. Furthermore, the Hawaiki Submarine Cable Landing Project will not physically affect the site in any way, as the Project is located a significant distance away. In addition to this culturally significant site, other important activities for the maintenance of Hawaiian culture and subsistence such as fishing and the gathering of marine resources were identified as the dominant traditional Hawaiian cultural practices in the area. Ethnographic interviews indicate that exploitation of marine resources will not be impacted by the project, since it is exclusively contained within the project parcel inland of Farrington Highway. Horizontal directional drilling will occur 10 to 15 meters underground and will not affect the coastline, access, or marine subsistence resources.

This CIA concludes that no traditional Hawaiian cultural sites or practices will be affected by the Hawaiki Submarine Cable Landing Project.

CONTENTS

FIGURES

TABLE

ACRONYMS & ABBREVIATIONS

APE	area of potential effect
CIA	Cultural Impact Assessment
HDD	horizontal directional drilling
LCA	Land Commission Award
m	meters
OR&L	Oahu Railway and Land Company
Project	Hawaiki Submarine Cable Landing Project
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
TMK	Tax Map Key

1.0 INTRODUCTION

At the request of Tetra Tech Inc., Garcia and Associates conducted a Cultural Impact Assessment (CIA) for the proposed Hawaiki Submarine Cable Landing Project at 92-384 Farrington Highway, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu (Figure 1) ("Project Area"). The principal parcel (TMK [1] 9-2-051:011) is owned by Hawaiki Submarine Cable USA. The primary objective of the CIA is to identify and document the presence or absence of cultural practices or traditionally significant cultural places within the Project Area and vicinity and evaluate any impacts the undertaking may have on such resources.

The contents of this report include a description of the historical context of the Project Area, a synthesis of previous cultural resource studies in the area, methods employed during the present CIA, and the results and conclusions of the CIA.

1.1 Project Authority

This CIA was conducted in accordance the Hawaiʻi Environmental Policy Act and Hawaiʻi Revised Statutes Chapter 343 which require the assessment of cultural resources in determining the overall significance of the impact of a proposed undertaking. Furthermore, this study complies with Act 50, which amends Hawaiʻi Revised Statutes 343-2 to consider the effects of a proposed action on "cultural practices." 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.

1.2 Project Location and Design

The proposed action consists of the construction of telecommunications infrastructure at parcel TMK (1) 9-2-051:011 and the installation of a fiber optic cable using the horizontal directional drilling (HDD) technique. Additionally, parcels TMK (1) 9-2-051:010 and/or :001 por. may be used temporarily as construction staging areas. All Project parcels are in Kapolei, Honouliuli Ahupuaʻa, Oʻahu. Onshore telecommunications infrastructure will include a 465-square-meter cable landing station, two diesel generators to provide backup power to the cable landing station, a parking area, and a subterranean beach manhole to accept the HDD conduit (Figure 2).

The HDD boring rig will be placed within the cable landing site (TMK [1] 9-2-051:011) and an approximately 10-inch-diameter (25 cm) borehole will be drilled and guided underground following a smooth curve until it reaches a depth of between 130 and 150 feet (45 to 50 m) below the ground surface. This will pass under Farrington Highway and the Oahu Railway and Land Company right-of way and progress offshore to a punch-out point at approximately 45 feet (14 m) in depth. This point will be situated approximately 2,550 feet (777 m) from the shoreline. Following completion of the HDD, a 5-inch (125 cm) diameter steel drill pipe will be inserted into the bore hole from the cable landing site and run to the submerged punch-out point. This steel pipe will be used as a conduit for the fiber optic cable.

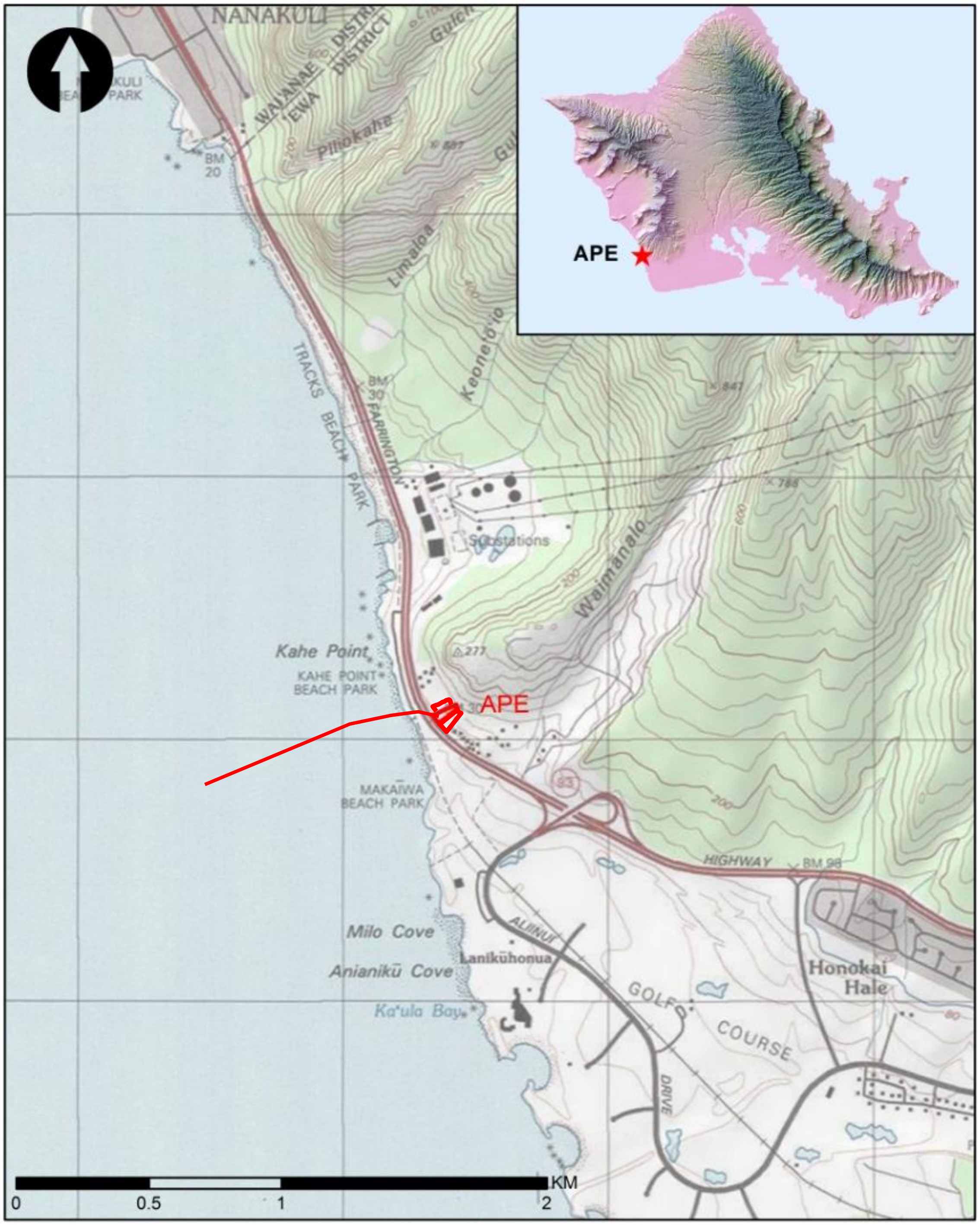

Figure 1. Project location, Honouliuli Ahupuaʻa, ʻEwa District (1:24,000 scale). TMK (1) 9-2-051:011 in center, :001 por. on left, :010 on right.

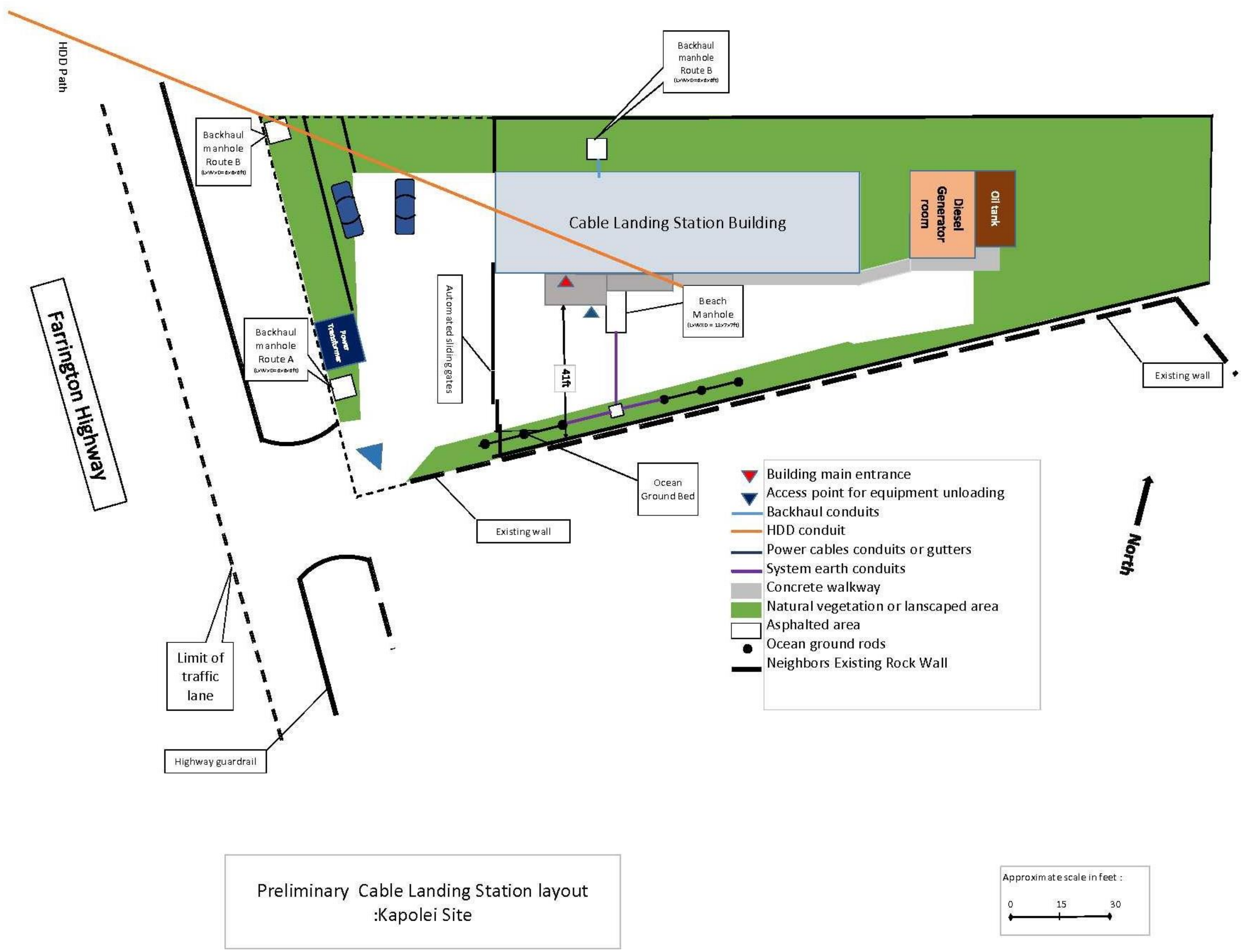

Figure 2. Telecommunications infrastructure plan (parcel TMK [1] 9-2-051:011 in green).

2.0 ENVIRONMENTAL, HISTORICAL, AND CULTURAL CONTEXT

The background information presented in this section includes summaries of environmental conditions and the cultural history of the Project Area and its immediate surroundings. This information provides context for interpreting the CIA results.

The Project Area is situated along O‘ahu’s western coast within Honouliuli Ahupua‘a, ‘Ewa District. 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 Wai‘anae and ‘Ewa, 2.5 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.

2.1 Environmental Setting

The Project Area is in a dry lowland environment receiving a mean annual rainfall of 584.0 millimeters (Giambelluca et al. 2013). During the current study, this undeveloped parcel was covered with relatively dense vegetation consisting of buffelgrass (*Pennisetum ciliare*) and large kiawe (*Prosopis pallida*) trees (Figure 3). Both of these introduced species are commonly found in dry areas throughout Hawai‘i.

The Project Area is comprised of sloping terrain covered with alluvial soils and boulders. Lualualei extremely cobbly clay dominates the Project Area and is derived from alluvial parent materials usually found on 3 to 35 percent slopes. The northwest corner of the parcel is classified as “Rock land” derived from *pahoehoe* lava derived from basalt parent material on 5 to 70 percent slopes (Web Soil Survey 2016).

2.2 Pre-Contact Occupation

Pre-Contact and ethno-historical information specifically related to the Project Area are sparse to non-existent. This speaks to the remote and generally uninhabited nature of this arid landscape. Because of this, reports written for previous investigations conducted near the project area 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 Hawaiian political consolidation associated with the ‘Ewa plain and Pearl Harbor regions, which are quite distant from the project area.

Early period archaeology sites located along the west coast and near Honoulili Steam indicate that fishing villages and bird hunting camps were established by A.D. 200–600 (Tuggle and Tomonari-Tuggle 1997). At the start of the post-Contact period, however, the largest populations were noted in the eastern portion of the *ahupua‘a* where fishpond aquaculture and taro agriculture had been established and where Pearl Harbor offered a rich larder of marine resources (Tuggle and Tomonari-Tuggle 1997). While the eastern portion of the *ahupua‘a* supported large populations, the western portion of Honouliuli, in which the current Project Area is situated, supported only small scattered fishing hamlets. It appears the extremely dry climate in western Honouliuli was not conducive to pre-Contact agriculture and therefore could not support permanent habitation.

Figure 3. Overview of project area, facing northwest.

Notably, chief Kākuhihewa utilized the small coastal village of Kōʻolina, just south of the project area, as a vacationing place (McDermott et al. 2006; Sterling and Summers 1978; Tuggle and Tomonari-Tuggle 1997). As Park and Collins (2010:7) point out, the sunny and dry climate of the western portion of Honouliuli Ahupuaʻa remains attractive to modern-day vacationers.

2.2.1 *Moʻolelo*[1]

Moʻolelo specific to the Project Area and its immediate surroundings could not be found. Within Honouliuli, most Hawaiian myths or references to famous places are associated with the eastern portion of the *ahupuaʻa*. At the location of the Project Area, only a trail appears on this otherwise blank portion of Alexander's 1873 historical map (Figure 4). This route is described simply as a trail that followed the beach from Puʻuloa on the west side of Pearl Harbor to Waimanalo and beyond, following the coastline around the entire island (Sterling and Summers 1978:2).

The nearest place mentioned in ancient legend is Pili-o Kahe and is approximately 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 Kapukaki (now known as Red Hill) they played a game of *ʻulu maika*. During this game, they cast their stones to determine the boundaries of ʻEwa District. In an effort to include as much of the level ʻEwa Plain as possible, the gods hurled a stone as far as the Waiʻanae Range where it landed in Waimānalo near the Project Area. It followed a crooked path, however, and was subsequently lost.

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

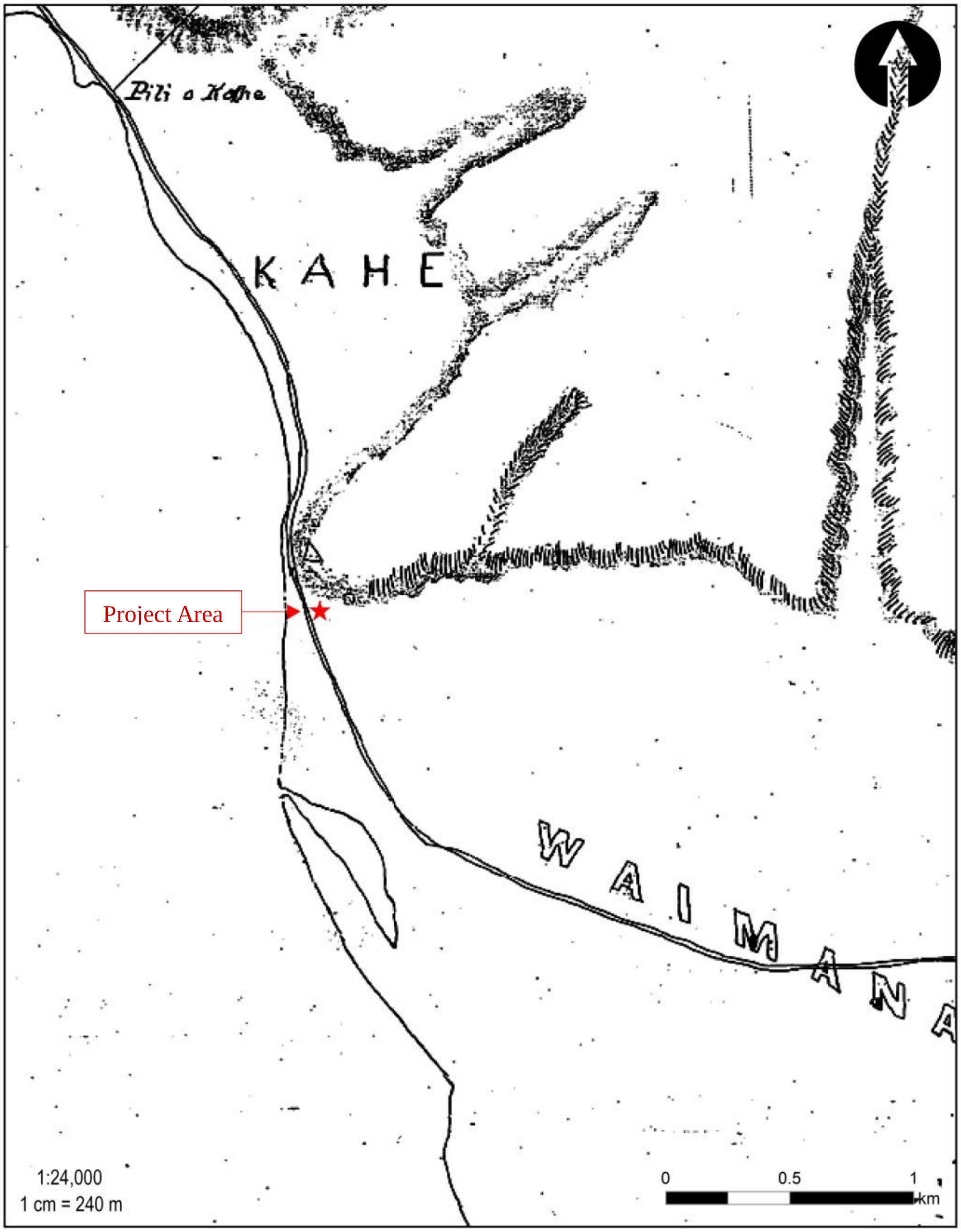

Figure 4. 1873 Alexander "Map of Honouliuli, O'ahu" map, Registered Map No. 618 (on file at Hawai'i State Survey Office, Honolulu). Project area indicated by red arrow and star.

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).

As recounted by Simeon Nawaa to E. Sterling on 22 March 1954 (Sterling and Summers 1978:1), the stray stone was eventually found at a place called Pili-o-Kahe. At this place, the hills extend down from the Wai‘anae Range along the boundary between Honouliuli and Nanakuli (or ‘Ewa and Wai‘anae Districts). According to ancient Hawaiians, the hill on the ‘Ewa side was identified as male and the hill on the Wai‘anae side was identified as female. The stone was found on the hill in Wai‘anae at Pili-o-Kahe. Pili-o-Kahe therefore refers to the female, or Wai‘anae side, and lies at the boundary between the two districts. Pili may mean that the stone was found clinging to the place called Kahe which could refer to a flowing stream (Sterling and Summers (1978:1).

2.3 Post-Contact Period

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 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 an early historical maps suggests that the area had 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 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 Oahu Railway.

2.3.1 The Great Māhele and Historic Land Tenure

In 1848, the Māhele transformed the traditional Hawaiian system of land tenure into a westernized system based on fee-simple ownership. During the Māhele, Hawaiian chiefs and *konohiki* 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. After satisfaction of the commutation through a cash payment or exchange of land, a Royal Patent was issued. This quitclaimed the government’s interest in the land and was proof that the government no longer had rights to commutation. The Act of August 10, 1854 dissolved the Land Commission and protected LCA recipients that had not obtained a Royal Patent (Chinen 1958:13–14).

Within Honouliuli Ahupua‘a, 72 individual land claims were registered and awarded to commoners by King Kamehameha III (Tuggle and Tomonari-Tuggle 1997:34). 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 *ahupua‘a* near the project parcel could not support permanent or more intensive modes of traditional Hawaiian occupation or agriculture. Therefore, no awards were granted to commoners within or near the Project Area.

All unclaimed lands in Honouliuli Ahupua‘a were acquired by Kekau‘onohi (LCA 11216, Royal Patent 6971), the granddaughter of Kamehameha I and one of Kamehameha II’s wives (Jayatilaka et al. 1992:14). This consisted of 43,250 acres of land including the present project 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* 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 1972:12).

2.3.2 Ranching and Sugarcane Cultivation

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 of pasture land and was 18 miles long at its widest point (Bowser 1880:489).

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 Oʻahu Railroad and Land Company (OR&L) expanded into Honouliuli in 1890, further expanding large-scale sugarcane cultivation in the central plains of Oʻahu. Honouliuli lands below 200 feet elevation were leased to William Castle by B.F. Dillingham who then subleased the land to the Ewa Plantation Company. Lands within Honouliuli Ahupuaʻa above 200 feet were leased to the Oahu Sugar Company.

The Ewa Plantation Company was the first to irrigate its crops using water from an artesian well (Kuykendall 1967:67). 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. In 1892, the first crop yielded 2,849 tons of sugar. The Ewa Plantation Company continued to operate until 1970, when the Oahu Sugar Company took control of the Ewa Plantation lands.

The Oahu 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 Koʻolau Mountains to Honouliuli because pumping water proved too costly (Wilcox 1997:98). 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 Oʻahu, through the Koʻolau mountains, and onto the central plain at Honouliuli. Construction of the irrigation system started in February 1913 and was completed in December 1916. Additions to the system were made during the 1920s, 1930s, and 1960s (State of Hawaiʻi, Department of Agriculture 2002:5). Commercial agriculture in Honouliuli is still largely dependent on water supplied by the Waiahole irrigation system. The Oahu 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 2000:45, 50).

A map dating to 1906 (Figure 5) shows the distribution of ranch grazing land and sugarcane fields in relation to the Project Area. This map indicates that the Project Area is located on historic grazing lands. Aside from a small strip of sugarcane lands that extended to a point southeast of the Project Area, most of the land within the western portion of Honouliuli Ahupuaʻa was used for grazing.

2.3.3 The Oahu Railway and Land Company

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 Waiʻanae (Kuykendall 1967:100). After the Japanese attack on Oʻahu 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 2004:257).

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 Hawaiian Railway Society was formed in 1970 in an effort to save and restore the remaining railways in Hawaiʻi. In 1974, the federal government donated the tracks and the right-of-way to the State of Hawaiʻi. The Hawaiian Railway Society was able to place the segment of the OR&L line running between the U.S. Navy's Pearl Harbor and Lualualei on the National Register of Historic Places in 1975. The segment of OR&L line between Honouliuli and Nānākuli was also listed on the Hawaiʻi State Register of Historic Places as Site 50-80-12-9714. A segment of this OR&L track is located approximately 55 meters from the Project Area and is currently used for tour rides that run from ʻEwa to Kahe Point.

2.3.4 Historic Maps and Aerial Photographs

The location of the Project Area was plotted on various historic maps to illustrate changes in the landscape surrounding the subject parcel through time. These maps are arranged in chronological order below and include maps dating from 1873 to 1953. Aerial photographs dating from 1952/1953 to 2000 are also presented. From these maps and photos, it can be easily discerned that development and subsequent changes to the landscape surrounding the project area involved a slow and punctuated process.

Maps of the Project Area vicinity that post-date the construction of the OR&L in 1895 (see Figure 5) indicate that little to no significant change occurred on the landscape over the next sixty years. USGS quadrangle maps from 1929 (Figure 6), 1936 (Figure 7), 1943 (Figure 8), and 1953 (Figure 9), depict the same information.

The figures above illustrate the same railway and road alignments. None indicate the addition of any structures or features near the Project Area.

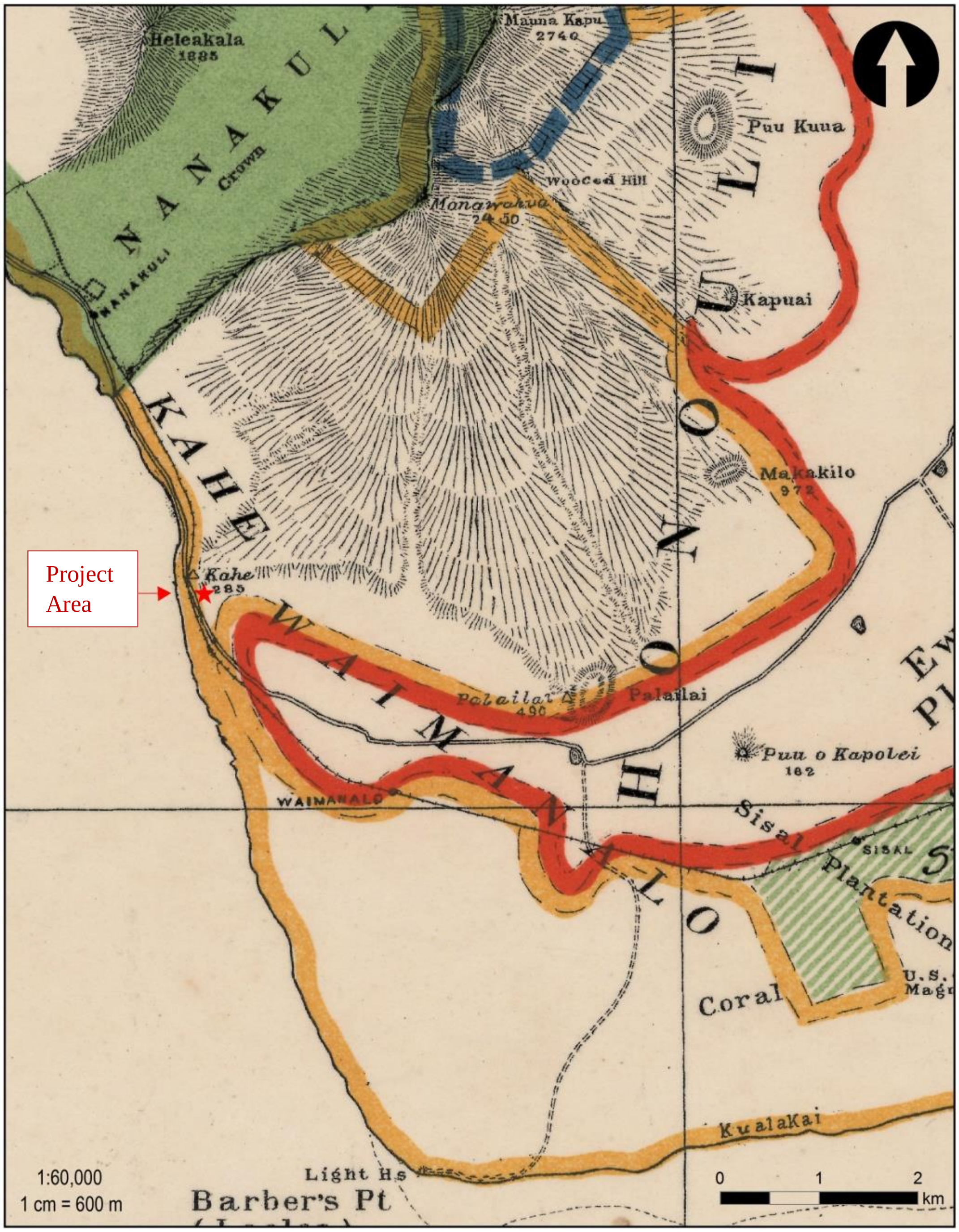

Figure 5. 1902 Wall "Map of Oahu" showing location of project area (digital map on file at University of Hawai'i at Manoa Library, Georeferenced Data, Hawaii Historical Maps website). Areas outlined in yellow are grazing lands and areas outlined in red are sugarcane lands.

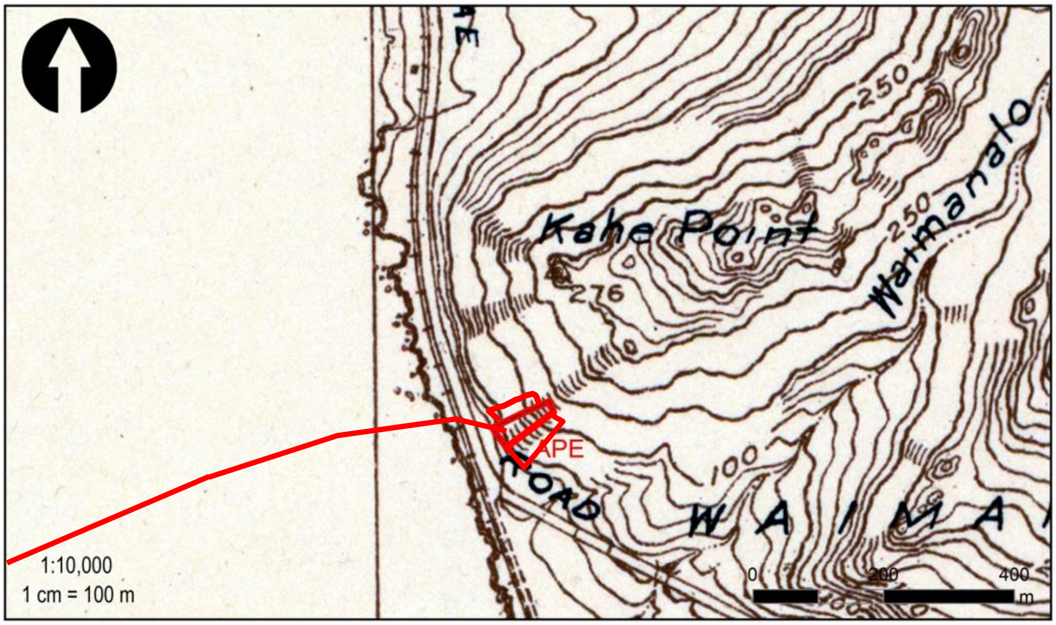

Figure 6. 1928 “Waianae, Hawai‘i” USGS topo quad map (scale 1:24000) showing location of project area.

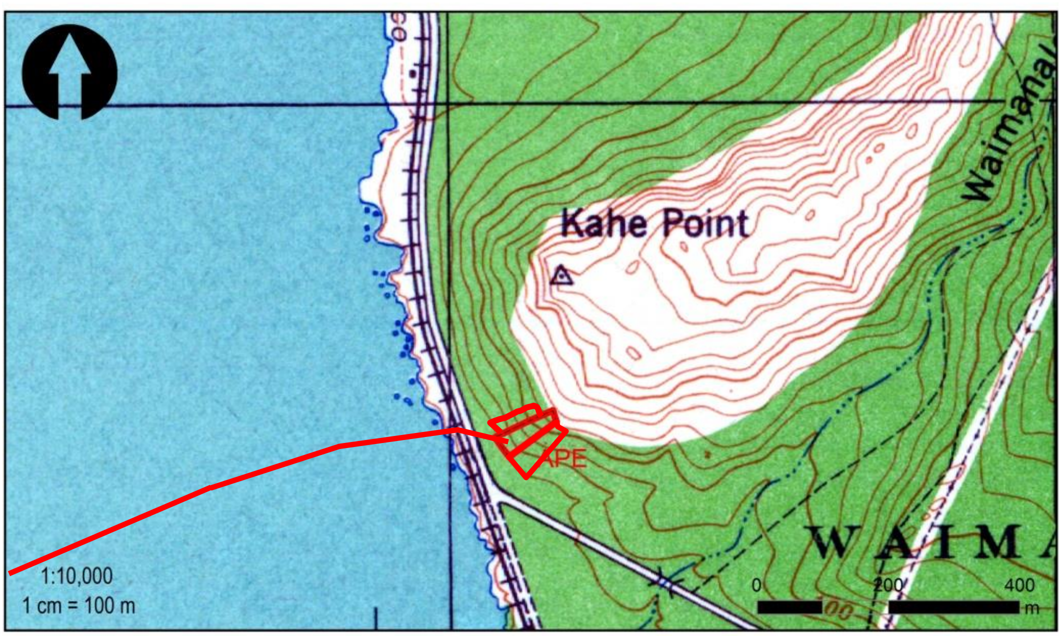

Figure 7. 1936 “Waianae, Hawai‘i” USGS topo quad map (scale 1:24000) showing location of project area.

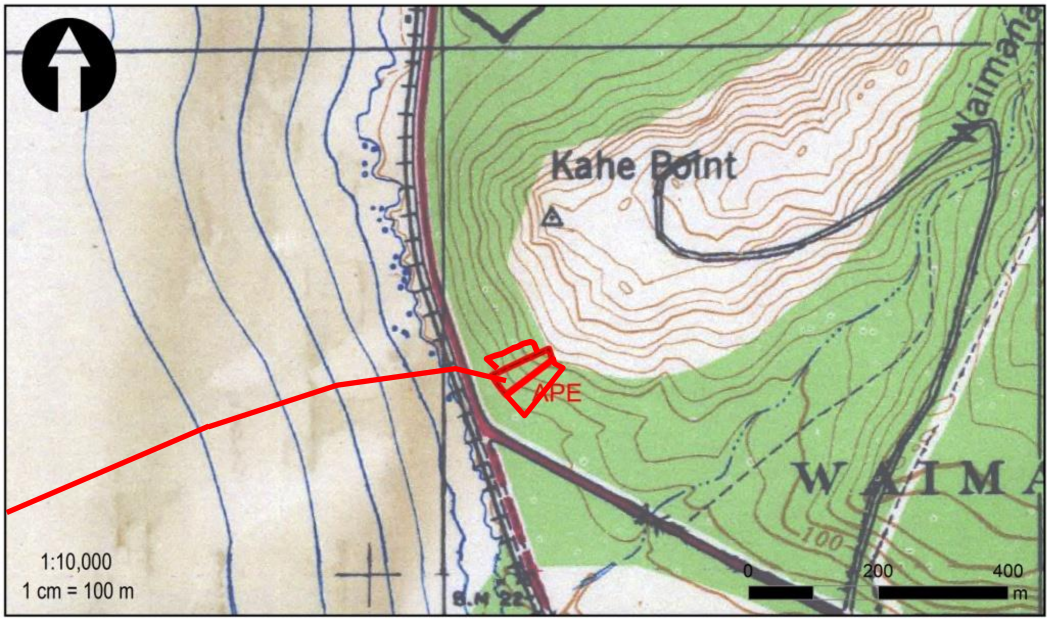

Figure 8. 1943 "Nanakuli, Hawai'i" USGS topo quad map (scale 1:24000) showing location of project area.

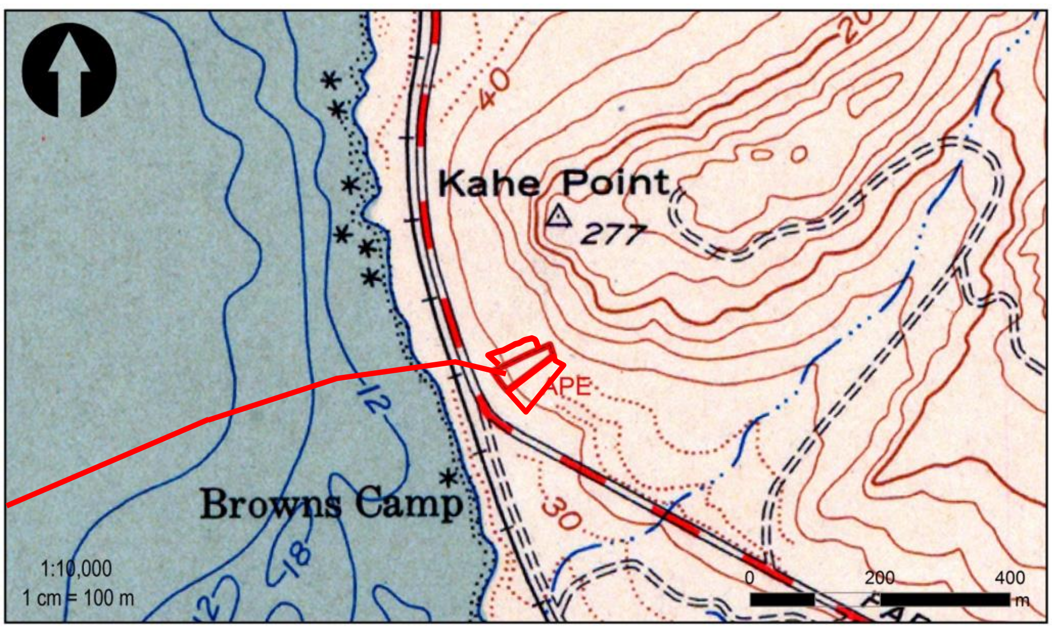

Figure 9. 1953 "Ewa, Hawai'i" USGS topo quad map (scale 1:24000) showing location of project area.

Aerial photographs show that the most substantive change in the landscape surrounding the Project Area occurred after 1953. A 1951 USGS aerial photograph (Figure 10) indicates that the area remained largely untouched. A 1965 USGS aerial photograph (Figure 9) shows that neighboring land parcels to the south had been cleared and developed. Linear patterns on a 1968 USGS aerial photograph (Figure 11) indicate that the project area may have been modified or cleared and that neighboring parcels to the northwest had been developed. This photo also shows that Farrington Highway had been significantly widened at some point after 1965. According to the 1977 USGS aerial photograph (Figure 13), little development appears to have occurred after 1968. However, the 2000 USGS aerial photograph shows that during the twenty-three years following 1977, the Waimanalo Gulch had been completely filled-in leaving Kahe Point between the project parcel and the Kahe Power plant, to the north, undeveloped.

2.4 Previous Archaeology

No previous archaeology has been performed within the boundaries of the Project Area. However, an extensive number of archaeological studies have been conducted along the stretch of Farrington Highway that leads into Nānākuli. Most of these studies were conducted far from the present Project Area and are discussed in detail by Hammatt et al. (2013).

Table 1 summarizes previous archaeological investigations that resulted in the identification of cultural properties, projects that produced no findings, and investigations that consisted of evaluations of previous work conducted within the vicinity of the Project Area. Brief descriptions of projects that identified archaeological sites are also presented below along with a map illustrating the boundaries of these previous investigations in relation to the current Project Area (Figure 15).

Figure 10. 1951 USGS Ewa aerial photo (Flight Line 22, Image No. 2332) (digital photo on file at University of Hawai‘i at Manoa Library, MAGIS:Aerial Photos & Imagery website). Red arrow indicates location of project area.

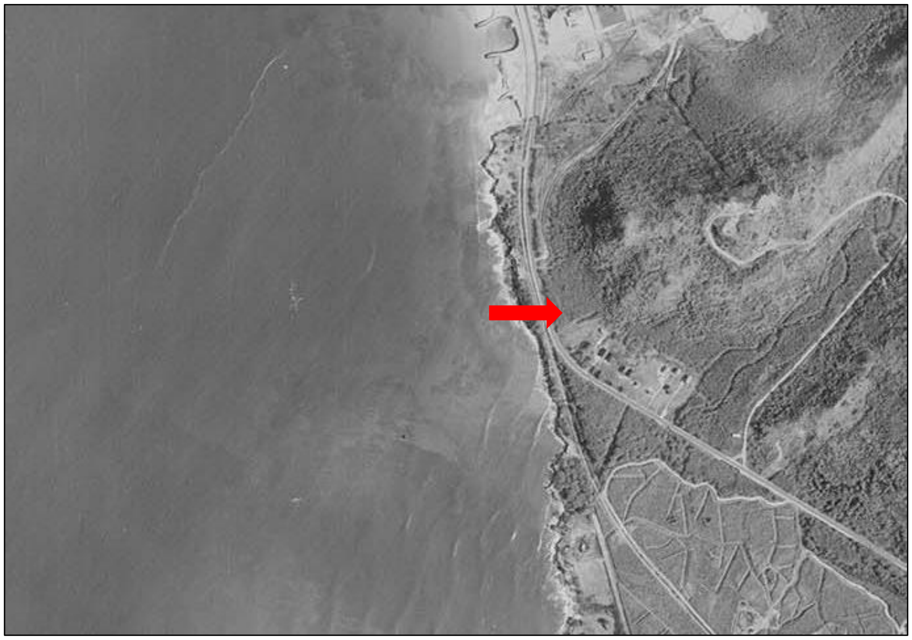

Figure 11. 1965 USDA Ewa aerial photo (Flight Line 47, Image No. 4390) (digital photo on file at MAGIS:Aerial Photos & Imagery website). Red arrow indicates location of project area.

Figure 12. 1968 USGS Ewa aerial photo (Flight Line 21, Image No. 2295) (digital photo on file at MAGIS:Aerial Photos & Imagery website). Red arrow indicates location of project area.

Figure 13. 1977 USGS Ewa aerial photo (Flight Line 20, Image No. 2133) (digital photo on file at MAGIS:Aerial Photos & Imagery website). Red arrow indicates location of project area.

Figure 14. 2000 NOAA Ewa aerial photograph (Flight Line 18, Image No. 901) (digital photo on file at MAGIS:Aerial Photos & Imagery website). Red arrow indicates location of project area.

Table 1. Previous Archaeological Research in the Vicinity of the Project Area

Reference	Nature of Study	Location	Results
Soehren 1964	Field Investigation	Waimānalo Gulch	Documented a house site (SIHP 50-80-12-2317).
Barrera 1979, 1986	Archaeological Investigation	West Beach, Honouliuli	Identified a fishing shrine (SIHP 50-80-12-1433).
Komori and Dye 1979	Data Recovery	West Beach, Honouliuli	No findings.
Bordner and Silva 1983	Archaeological Reconnaissance Survey	Waimānalo Gulch,Honouliuli	Documented one World War II-era associated feature.
Hammatt 1984	Archaeological Reconnaissance Survey	Kahe Power Plant, Honouliuli	No findings.
Neller 1985	Archaeological Assessment	West Beach, Honouliuli	Evaluated previous research conducted in the West Beach Area.
Pietrusewsky 1988	Inadvertent Burial Investigation	Beach sand across from the Kahe Power Plant	Identified a pre-Contact burial (SIHP 50-80-12-4061).
Bath 1989	Field Investigation	Waimānalo Gulch, Honouliuli	Documented three petroglyph areas (SIHP 50-80-12-4110).
Hammatt and Shideler 1989	Archaeological Reconnaissance Survey	Honouliuli TMK: 9-2-003:027	Identified a small pre-Contact agricultural terrace (SIHP 50-80-12-4221).
Hammatt et al. 1991	Archaeological Inventory Survey	Makaīwa Hills, Honouliuli	Identified 34 historic properties.
Glidden et al. 1993	Data Recovery	Paradise Cove, Honouliuli	Noted a possible pre-Contact cultural deposit in one trench (no site number assigned).
Jourdane 1995	Inadvertent Burial Investigation	Paradise Cove, Honouliuli	Identified the human remains of at least five individuals (SIHP 50-80-12-4968).
Hammatt and Shideler 1999	Archaeological Inventory Survey	Waimānalo Gulch, Honouliuli	No findings
Yucha and Hammatt 2011	Archaeological Inventory Survey	Kahe Valley, Honouliuli	Six newly identified historic properties (SIHP 50-80-12-7137–7142) and four previously recorded historic properties (SIHP 50-80-12-6647–6650).

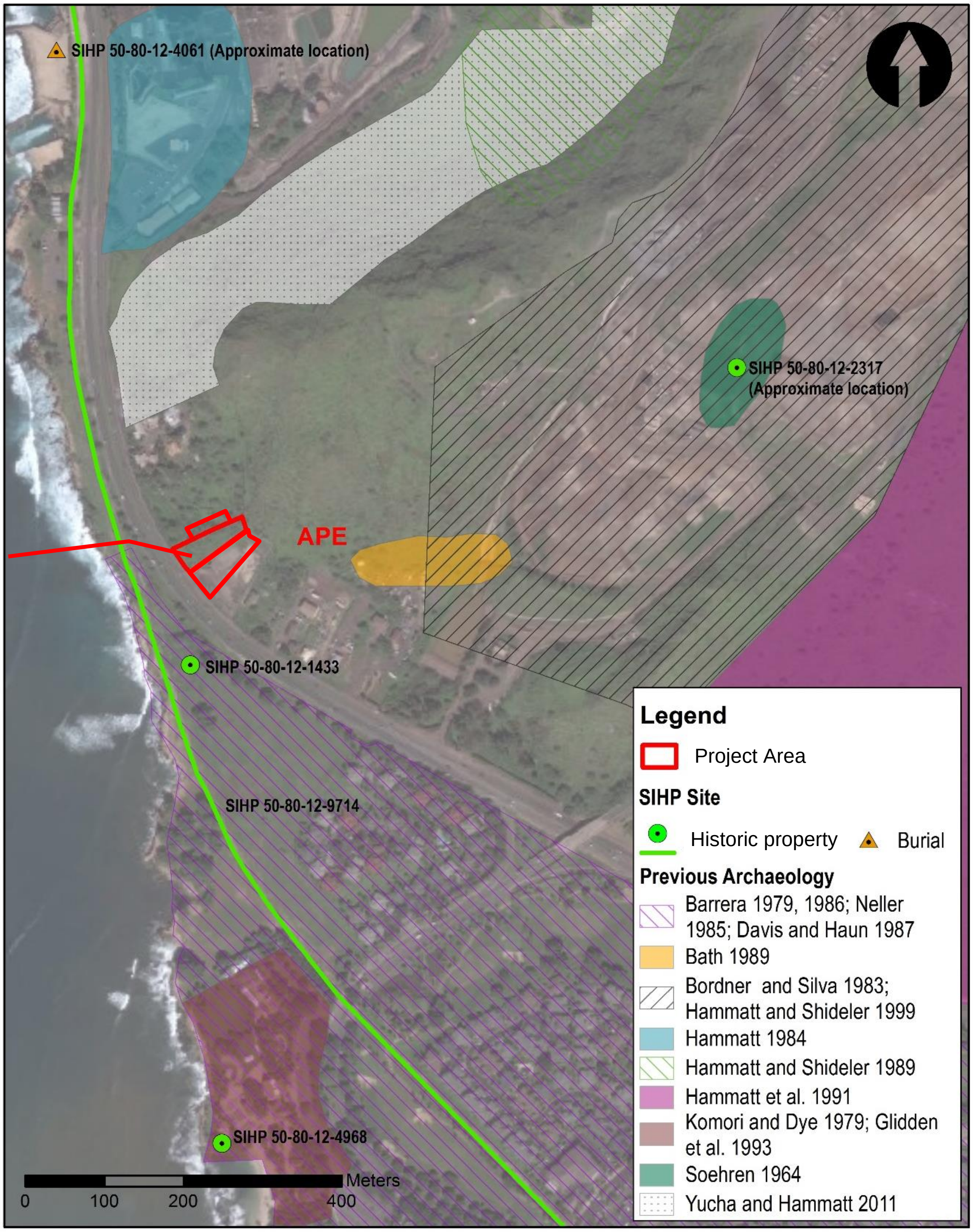

Figure 15. Map of previous archaeological investigations and historic properties in the vicinity of the project area.

In 1964, Lloyd Soehren (1964) conducted a field investigation of an area in Waimānalo after the Bishop Museum was notified of a "house site" located in the lower portions of the gulch. The site was documented and assigned SIHP Site No. 50-80-12-2317 (Soehren 1964).

Barrera (1979) conducted an archaeological investigation of the West Beach area resulting in the identification of pre-Contact and historic period sites. This included a traditional habitation site with petroglyphs on a basalt outcrop, midden scatters, historic agricultural features, tracks from the OR&L railroad, and a possible fishing shrine. The possible shrine, or *koʻa*, was assigned SIHP Site No. 50-80-12-1433. It is situated roughly 90 meters south-southwest of the Project Area (see Figure 15).

In 1983, Bordner and Silva (1983) conducted an archaeological reconnaissance survey within Waimānalo Gulch. The survey identified one possible World War II-era encampment.

In 1987, the State Historic Preservation Division (SHPD) received a report of a burial that was exposed in beach sands across Farrington Highway from the Kahe Power Plant. The human remains were examined by Dr. Pietrusewsky (1988), of the University of Hawaiʻi, who concluded that the exposed skeletal elements were from one individual and most likely represented a Hawaiian burial.

Hammatt and Shideler (1989) conducted an archaeological reconnaissance survey for a proposed Hawaiʻi Electric Company training facility located approximately 500 m northeast of the current project area. A small rock terrace (SIHP Site No. 50-80-12-4221) was identified. This feature was determined to be associated with Hawaiian agriculture.

In 1989, Joyce Bath conducted a field investigation of a portion of the lower Waimānalo Gulch after SHPD was notified of the presence of petroglyphs (Bath 1989). Three petroglyphs areas, or panels, were documented as SIHP Site No. 50-80-12-4110. These comprise two anthropomorphic images and one panel of abstract symbols.

In 1991, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey for the Makaīwa Hills development project. This survey covered a 1,915 acre parcel (Hammatt et al. 1991). The western boundary of this parcel is approximately 500 m southeast of the project area. Thirty-four historic properties were documented. These include both long-term and short-term Hawaiian habitation structures, native agricultural sites, petroglyphs, cairns, boundary markers, and features related to sugarcane agriculture.

In 1993, Glidden conducted testing within the parking lot and the beach area of Paradise Cove. A total of ten test trenches were excavated resulting in the identification of a possible pre-Contact cultural layer. This consisted of a grayish loam with charcoal flecking. This pre-Contact cultural deposit was not given a site number.

In 1995, exposed human remains within sand deposits near the coast at Paradise Cove were reported to the SHPD (Jourdane 1995). The skeletal elements of at least five individuals were identified. The area was designated SIHP Site No. 50-80-12-4968.

In 2010 and 2011, Cultural Surveys Hawaiʻi conducted an archaeological inventory survey of portions of Kahe Valley. The southern boundary of this survey area is approximately 160 m north of the project area (Yucha and Hammatt 2011). Six historic properties and four previously documented historic properties were documented during the survey. The six newly identified historic properties include a complex of military features (SIHP Site No. 50-80-12-7137), a cluster of 56 mounds (SIHP Site No. 50-80-12-7138), a pre-Contact habitation and activity area (SIHP Site No. 50-80-12-7139), a machine gun shelter (SIHP 50-80-12-7140), a well or water tank foundation (SIHP Site No. 50-80-12-7141), and a wall constructed of basalt boulders and cobbles (SIHP Site No. 50-80-12-7142). Previously identified sites include a complex of features consisting of a stacked coral wall, a possible shrine, and a terrace (SIHP Site No. 50-80-12-6647), ruins of a structure with a concrete foundation (SIHP Site No. 50-80-12-6648), a basalt block and mortar wall (SIHP Site No. 50-80-12-6649), and a pre-Contact complex consisting of eight features (SIHP Site No. 50-80-12-6650).

3.0 ASSESSMENT METHODOLOGY

Investigations for this CIA were scaled according to the size and complexity of the project. The proposed submarine cable landing project is relatively small in scale covering a minimal footprint. Because of this, interviews with three knowledgeable community members were considered to be an appropriately-sized sample. Relevant community members were selected based on their past experience providing cultural resource consultation on federal and private projects in the area of concern. Some individuals were also referred by the primary consultant, Mr. Shad Kane. In an effort to acquire three consultations, the five individuals were contacted repeatedly to participate. Unfortunately, only one consultant has responded (see below).

Interviews for this CIA were informal consisting of a “talk story” format. This follows Spradley’s (1979) conception of the ethnographic interview as a qualitative “speech event,” stressing the importance of developing a rapport with interviewees. Interviews were not recorded. Consultations started with a brief explanation of the goals and objectives of the CIA and a description of the Project. General questions regarding cultural practices and resources of the area followed the project introduction. Research domains that were specifically discussed included cultural and spiritual sites and practices and marine resource gathering and fishing. Based upon responses, these domains were further explored through direct questioning. Consultation interviews included a home visit, telephone conversations, and email correspondence.

The following individuals were contacted for interviews:

- Shad Kane
- Thurston “Ali‘i” Kamealoha
- Ginger Burch
- Eric Burch
- Ho‘ohuli, Josiah “Black”

Mr. Shad Kane and Mrs. Ginger Burch were the only consultants to respond to repeated requests for an interview and their input are incorporated into the results section below. Mr. Kane is the founder of the Kalaeloa Heritage & Legacy Foundation and caretaker of Kalaeloa Heritage

Park. He chairs the Ewa moku on the Committee on the Preservation of Historic Sites and Cultural Properties in the O'ahu Council of Hawaiian Civic Clubs.

4.0 RESULTS

Results of the CIA are presented according to the two principal topical domains. These were identified during the planning and interview processes and are regionally-appropriate research topics. They are specific to the project area, which is characterized by a distinctly dry and remote coastal environment. Although consultants were also asked very broadly about cultural places and practices, responses typically returned to the themes below.

4.1 Religio-Spiritual Activities

Consultant Shad Kane was unaware of any religious or spiritual sites, such as burials or *heiau* in the vicinity of the project area. He was also unaware of any religio-spiritual practices being currently conducted in the area or of any legends specifically related to the project area. This is consistent with the findings of the archival background research, which indicated a general absence of such traditional cultural places in the area.

4.1.1 Impact Assessment

Background research and the consultant interview indicate that no religio-spiritual sites are present within or near the project area. Mr. Kane was also unaware of any religio-spiritual practices associated with this area and indicated that it was unlikely that the undertaking would adversely impact any such sites or practices.

4.2 Marine Resources: Gathering and Fishing

The beaches and reefs west of the project area are important loci for local residents, including members of the Hawaiian community, to participate in diving, fishing, and surfing activities. Although poorly endowed with terrestrial resources, the rich marine resources found in the waters near the project area were undoubtedly vital to Hawaiians throughout the pre-Contact period. Consultant Shad Kane did not express concerns regarding potential negative effects to these resources or activities due to the proposed project.

During the interview, Mr. Kane did discuss a fishing shrine possibly dating to the pre-Contact period and located near the project area (SIHP Site No. 50-80-12-1433). Keenly interested in Hawaiian cultural sites, Mr. Kane indicated that in the past he regularly visited this site to clear vegetation and monitor its condition. However, after doing this he noticed that cleaning the site made it more visible and led to increased pedestrian traffic. Concerned that the increased traffic to the site might cause damage, he stopped the clearing activities and has not returned to the site in a number of years. Due to its distance from project area, Mr. Kane did not feel that the site or its potential future use by Hawaiians would be affected by project.

4.2.1 Impact Assessment

It is currently unknown to what extent traditional Hawaiian subsistence gathering and fishing is still practiced along this section of coastline. However, it is clear that the beaches and reefs across the road from the project area are popular loci for fishing, diving, and surfing by local inhabitants.

Since proposed project activities are restricted to the project parcel and a deep underground boring, they will not affect these activities either during construction or thereafter. The HDD boring, in particular, will extend well below and beyond these popular activity areas with the punch-out point located 2,565 feet offshore. The one cultural site in proximity to the project area, the fishing shrine, is situated on the other side of Farrington Highway from the project area. Cultural consultant Shad Kane indicated that he thought the proposed undertaking would not impact this or any other cultural resource.

5.0 SUMMARY AND CONCLUSIONS

The purpose of the CIA was to determine the presence or absence of cultural practices or traditionally significant cultural places within the project area and its vicinity and to evaluate any impacts the project might have on such resources. Background research and an interview with a locally knowledgeable individual indicated that specific Hawaiian cultural information about the area surrounding the project is extremely limited. This is because the project area occupies a relatively remote and resource-poor portion of Honouliuli Ahupuaʻa. It is far from the rich aquatic resources and productive agricultural fields of the eastern portion of the *ahupuaʻa*, which was once a center of chiefly power on Oʻahu. Lack of water in this region inhibited the development of Hawaiian agriculture and the establishment of permanent pre-Contact settlements.

The various reefs and beaches in close proximity to the project area, the presence of a probable pre-Contact fishing shrine, and use of the small coastal village of Kōʻolina by a prominent chief as a vacation spot, however, all indicate that fishing and the gathering of marine resources were the dominant traditional Hawaiian activities in the area during ancient times. Ethnographic interviews indicate that modern Hawaiian activities in the area remain focused on marine resources. While this was a prominent topic during the consultant interview, it was made explicitly clear that the proposed action would have no negative effect on any extant cultural practices or sites. Overall, the project was viewed as beneficial.

5.1 Conclusions

Background research and ethnographic interviews with locally knowledgeable native Hawaiian consultants produced one culturally significant site, a traditional Hawaiian fishing shrine (SIHP Site No. 50-80-12-1433), located approximately 90 meters south-southwest of the project area. The consultant interview indicates that although the site is important to Hawaiians, no cultural practices are known to be currently performed at the site. The Hawaiki Submarine Cable Landing Project will not affect the site in any way, being a significant distance away.

In addition to this cultural site, fishing and the gathering of marine resources were identified as the dominant traditional Hawaiian activities in the area historically. These practices continue to the present day along this coastline and are an important element of Hawaiian culture and subsistence. Ethnographic interviews indicate that exploitation of marine resources will not be impacted by the project, since it is exclusively contained within the subject parcel on the inland side of Farrington Highway. HDD will be deep underground and not affect the coastline, access, or marine subsistence resources. This CIA, therefore, concludes that no traditional Hawaiian cultural sites or practices will be affected by the Hawaiki Submarine Cable Landing Project.

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APPENDIX H

DRAFT EA AND SECOND DRAFT EA COMMENTS AND RESPONSES

APPENDIX H

DRAFT EA AND SECOND DRAFT EA COMMENTS AND RESPONSES

OFFICE OF PLANNING
STATE OF HAWAII

DAVID Y. IGE
GOVERNOR

LEO R. ASUNCION
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Ref. No. P-15447

January 23, 2017

ST-1

To: Suzanne Case, Chairperson
Department of Land and Natural Resources

From: Leo R. Asuncion, Director

Attention: Alex J. Roy, M.Sc.
Office of Conservation and Coastal Lands

Subject: Draft Environmental Assessment – Hawaiki Submarine Cable Landing Project, Kapolei, Island of Oahu;

Cable landing site: TMK (1) 9-2-051:011
Horizontal directional drilling areas: TMKs (1) 9-2-049:005, (1) 9-1-056:001, and (1) 9-1-057:026
Temporary parking/equipment staging areas: TMKs (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Thank you for the opportunity to provide comments on the Draft Environmental Assessment (Draft EA) for the proposed Hawaiki Submarine Cable Kapolei Landing project. The Draft EA review material was transmitted to our office by letter dated December 21, 2016.

It is our understanding that Hawaiki Submarine Cable, USA and its supplier, Tyco Electronics Subsea Communications, propose to construct a telecommunications fiber optic cable system. The proposed telecommunication cable system would consist of a 9,000 mile-long submarine fiber optic telecommunications cable connecting Pacific City, Oregon, to Coogee, Australia, with connecting branches on Oahu, American Samoa, and New Zealand. The Hawaii portion of the system, the Hawaiki Submarine Cable Kapolei Landing project, includes installation of subsea cable and associated telecommunications infrastructure located on the Waianae Coast of Oahu.

The cable would be landed via construction of a subterranean horizontal directionally drilled (HDD) conduit extending from a beach manhole on land to a subsea punch-out exit point, located approximately 2,550 feet seaward from the shoreline, into which the fiber optic cable would be installed. The upland features of the project, at the cable landing station building, include two diesel generators and a parking area. This area would be located on approximately 0.6 acres at 92-384 Farrington Highway, Waianae, Hawaii, TMK (1) 9-2-051: 011.

The Office of Planning (OP) has reviewed the transmitted material and has the following comments to offer:

1. The Draft EA addresses several of our comments made in a previous pre-consultation letter dated July 8, 2016 (Reference Number P-15225). The Draft EA:
   a. examines the goals and objectives of the Hawaii Coastal Zone Management (CZM) program as listed in Hawaii Revised Statutes (HRS) § 205A-2;

   b. recognizes the need for a Special Management Area (SMA) permit and a shoreline setback variance from the City and County of Honolulu;

   c. acknowledges the potential need for a Federal Consistency Review that would be
1 conducted by our office due to required federal permit from the U.S Army Corps of Engineers;

   d. states that best management practices (BMPs) and water quality mitigation plans will be developed, with regard to surface water and marine resources, for the Clean Water Act Section 401, 402, and 403 U.S. Army Corps of Engineers permit;

   e. affirms that BMPs and mitigation measures will be followed to safeguard marine resources during the HDD and cable landing station installation; and,

   f. examines stormwater runoff and its potential impacts resulting from the cable landing station (once complete) and concludes that there will be a minimal increase of impervious surfaces from the onshore cable landing station and offshore HDD corridor.

2. Section 5.2.2, pages 5-5 to 5-7 of the Draft EA assesses the project's compatibility with the three land use districts in which this project will take place (Urban, Agriculture, and Conservation).

2
   - The construction and operation of a fiber optic cable is permitted within the State Land Use Urban District.

   - The proposed actions are also consistent with permitted activity within the State Land Use Agriculture District, pursuant to Hawaii Administrative Rules 15-15-25(b), HRS 205-2(d), HRS 205-4.5, and HRS 205-4.5(a)(7).

   - The applicant will be required to obtain a Conservation District Use Permit (CDUP) from the Board of Land and Natural Resources (BLNR) for the use of submerged lands.

3 3. Section 5.2.4.7, page 5-14 of the Draft EA, in its discussion of the objectives and policies of the Hawaii CZM program, Managing Development, provides justification that the proposed action is an appropriate coastal development. The analysis states the cable landing project will undergo a number of statutory and voluntary processes to ensure that it is developed appropriately from both an environmental and developmental perspective.

4 4. Section 5.2.5, pages 5-17 to 5-22 of the Draft EA examines the project's consistency with the objectives and policies of the Hawaii State Planning Act, as listed in HRS Chapter 226. The Draft EA states the objectives and policies of HRS Chapter 226 applicable to this project are:

- HRS 226-10: Objective and policies for the economy – potential growth and innovative activities;
- HRS 226-10.5: Objectives and policies for the economy – information industry;
- HRS 226-11: Objectives and policies for the physical environment – land-based, shoreline, and marine resources;
- HRS 226-14: Objective and policies for facility systems – in general; and,
- HRS 226-18.5: Objectives and policies for facility systems – telecommunications.

The analysis on the Hawaii State Planning Act should be expanded in the Final Environmental Assessment to include an examination of the project's ability to meet the goals, objectives, policies, and priority guidelines of the Hawaii State Planning Act in its entirety or clarify where it conflicts with them. If any of these statutes are not applicable to the project, the analysis should affirmatively state such determination. The most efficient method is summarizing these guidelines in tabular form followed by discussion paragraphs.

We have no further comments at this time. If you have any questions regarding this comment letter, please contact Joshua Hekekia of our office at (808) 587-2845.

c: ✓Ms. Megan Higgins, Project Manager, Tetra Tech, Inc.

TETRA TECH

April 11, 2017

Leo R. Asuncion
Director
State of Hawaii, Office of Planning
235 South Beretania Street, 6th Floor
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Asuncion:

Thank you for your letter dated January 23, 2017 on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. Thank you for confirming that the Draft Environmental Assessment addresses comments from the State of Hawaii Office of Planning provided during the pre-consultation period.
2. Thank you for confirming that the construction and operation of the cable is a permitted use within the State Land Use Urban District and Agricultural District, and that the applicants will require a Conservation District Use Permit from the Board of Land and Natural Resources for the use of submerged lands, as described in Section 2.5 of the Environmental Assessment.
3. As requested in your letter, the analysis of Project consistency with the Hawaii State Planning Act in Section 5.2.5 of the Final Environmental Assessment was expanded to include an assessment of how the Project will meet the goals, objectives, policies, and priority guidelines of the Hawaii State Planning Act. Statutes that are not applicable to the Project are also noted.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DAVID Y. IGE
GOVERNOR OF HAWAII

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

2017 JAN -9 A 11: 15

ST-2

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
EMD/CWB

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

01004PCTM.17

January 4, 2017

Mr. Alex J. Roy
Planner
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
1151 Punchbowl Street, Room 131
Honolulu, Hawaii 96813

Dear Mr. Roy:

**SUBJECT: Comments on the Draft Environmental Assessment (DEA) for the Hawaiki Submarine Cable – Kapolei Landing
Ewa, Island of Oahu, Hawaii
TMK: (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001; (1) 9-2-051:010**

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated December 20, 2016, requesting comments on the subject project. The DOH-CWB has reviewed the document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that they also read our standard comments on our website at: http://health.hawaii.gov/epo/files/2013/05/Clean-Water-Branch-Std-Comments.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

1

   a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2

2. You may be required to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55).

For NPDES general permit coverage, a Notice of Intent (NOI) form must be submitted at least 30 calendar days before the commencement of the discharge. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the applicable form ("CWB Individual NPDES Form" or "CWB NOI Form") through the e-Permitting Portal and the hard copy certification statement with the respective filing fee ($1,000 for an individual NPDES permit or $500 for a Notice of General Permit Coverage). Please open the e-Permitting Portal website located at: https://eha-cloud.doh.hawaii.gov/epermit/. You will be asked to do a one-time registration to obtain your login and password. After they register, they can click on the Application Finder tool and locate the appropriate form. They can then follow the instructions to complete and submit the form.

3

3. If your project involves work in, over, or under waters of the United States, it is highly recommended that they contact the Army Corp of Engineers, Regulatory Branch (Tel: 835-4303) regarding their permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40 of the Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

4

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

5

5. It is the State's position that all projects must reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. Project planning should:

   a. Treat storm water as a resource to be protected by integrating it into project planning and permitting. Storm water has long been recognized as a source of irrigation that will not deplete potable water resources. What is often overlooked is that storm water recharges ground water supplies and feeds streams and estuaries; to ensure that these water cycles are not disrupted, storm water cannot be relegated as a waste product of impervious surfaces. Any project planning must recognize storm water as an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters, like community beautification, beach going, swimming, and fishing. The approaches necessary to do so, including low impact development methods or ecological bio-engineering of drainage ways must be identified in the planning stages to allow designers opportunity to include those approaches up front, prior to seeking zoning, construction, or building permits.

b. Clearly articulate the State's position on water quality and the beneficial uses of State waters. The plan should include statements regarding the implementation of methods to conserve natural resources (e.g., minimizing potable water for irrigation, gray water re-use options, energy conservation through smart design) and improve water quality.

c. Consider storm water Best Management Practice (BMP) approaches that minimize the use of potable water for irrigation through storm water storage and reuse, percolate storm water to recharge groundwater to revitalize natural hydrology, and treat storm water which is to be discharged.

d. Consider the use of green building practices, such as pervious pavement and landscaping with native vegetation, to improve water quality by reducing excessive runoff and the need for excessive fertilization, respectively.

e. Identify opportunities for retrofitting or bio-engineering existing storm water infrastructure to restore ecological function while maintaining, or even enhancing, hydraulic capacity. Particular consideration should be given to areas prone to flooding, or where the infrastructure is aged and will need to be rehabilitated.

If you have any questions, please visit our website at: http://health.hawaii.gov/cwb, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E., CHIEF
Clean Water Branch

CTM:bk

c: DOH-EPO 16-429 [via e-mail Noella.Narimatsu@doh.hawaii.gov only]
Ms. Megan Higgins, Tetra Tech, Inc. [via e-mail megan.higgins@tetratech.com only]
Mr. Richard Howarth, Hawaiki Submarine Cable USA
[via e-mail richard.howarth@hawaikicable.co.nz only]
Ms. Catherine Brady, TE SubCom [via e-mail cbrady@subcom.com only]

TETRA TECH

April 11, 2017

Alec Wong, P.E., Chief
State of Hawaii, Department of Health, Clean Water Branch
P.O. Box 3378
Honolulu, HI 96801

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Wong:

Thank you for your letter dated January 4, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. The Project will comply with the provisions on potential impacts to State waters, specifically Hawai‘i Administrative Rules (HAR) §11-54-1.1, §11-54-3, and §11-54-4 to §11-54-8.
2. A National Pollutant Discharge Elimination System permit will be obtained as applicable.
3. We are consulting with the Army Corps of Engineers, Regulatory Branch to verify permit requirements.
4. We acknowledge that all discharges related to the Project construction and operation will need to comply with the State’s Water Quality Standards, and understand noncompliance may be subject to penalties of $25,000 per day per violation.
5. The Project will implement practices to reduce, reuse, and recycle to protect, restore, and sustain water quality and beneficial uses of State waters. These measures are outlined in Section 2.4 - Onshore Water Resources and Hydrology and 2.5 – Marine Water Quality of the Environmental Assessment.

As suggested in your letter, we read your standard comments on your website to determine if any are applicable to the Project. The applicable comments were included as part of your comment letter.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 16-429

January 9, 2017

ST-3

Ms. Megan Higgins
Tetra Tech, Inc.
737 Bishop Street, Suite 2340
Mauka Tower
Honolulu, Hawaii 96813
Email: Megan.higgins@tetratech.com

Dear Ms. Higgins:

SUBJECT: Draft Environmental Assessment (DEA) for Hawaiki Submarine Cable Kapolei Landing
TMK: (1) 9-2-049:005, (1) 9-1-057:026, (1) 9-1-056:001, (1) 9-2-051:011, and (1) 9-2-051:001; (1) 9-2- 051:010 1

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:
http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Oahu/2010s/2016-12-23-OA-5E-DEA-Hawaiki-Submarine-Cable-Kapolei-Landing.pdf

We understand from the OEQC publication form project summary that *"The Hawaiki cable system is an approximately 9,078-mile-long submarine fiber optic (F/0) telecommunications cable consisting of a trunk route extending from Pacific City, Oregon, to Coogee, Australia, with connections to Kapolei, O'ahu, Hawai'i; Tafuna, American Samoa; and Mangawhai Heads, New Zealand. The Hawai'i portion of this system, the Hawaiki Submarine Cable Kapolei Landing project (Project), includes installation of subsea F/0 cable and associated telecommunications infrastructure at Kapolei. The F/0 cable would be landed via construction of one subterranean horizontal directionally drilled (HDD) conduit extending from a beach manhole (BMH) on land to a subsea punch-out exit point, located approximately 2,550 feet seaward from the shoreline, into which the F/0 cable would be installed. The subsea punch-out location would be at approximately 45 feet sea depth. Onshore infrastructure includes the BMH, a cable landing station building (CLS), two diesel generators, and a parking area, would be located mauka (inland) of Farrington Highway. The purpose of the Project is to provide direct and affordable telecommunications connectivity between Hawai'i, the mainland U.S., Australia, New Zealand and other Pacific islands. It would respond to needs identified in the Hawai'i Broadband Initiative, and would benefit the State through improved telecommunications speed, and reliability.*

1 In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: http://health.hawaii.gov/epo/egis.

2 EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

3 We suggest you review the requirements of the Clean Water Branch (HAR, Section 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch, Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

You may also wish to review the draft Office of Environmental Quality Control (OEQC) viewer at: http://eha-web.doh.hawaii.gov/oeqc-viewer. This viewer geographically shows where some previous Hawaii Environmental Policy Act (HEPA) {Hawaii Revised Statutes, Chapter 343} documents have been prepared.

4 In order to better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

We request that you utilize all of this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

Mahalo nui loa,

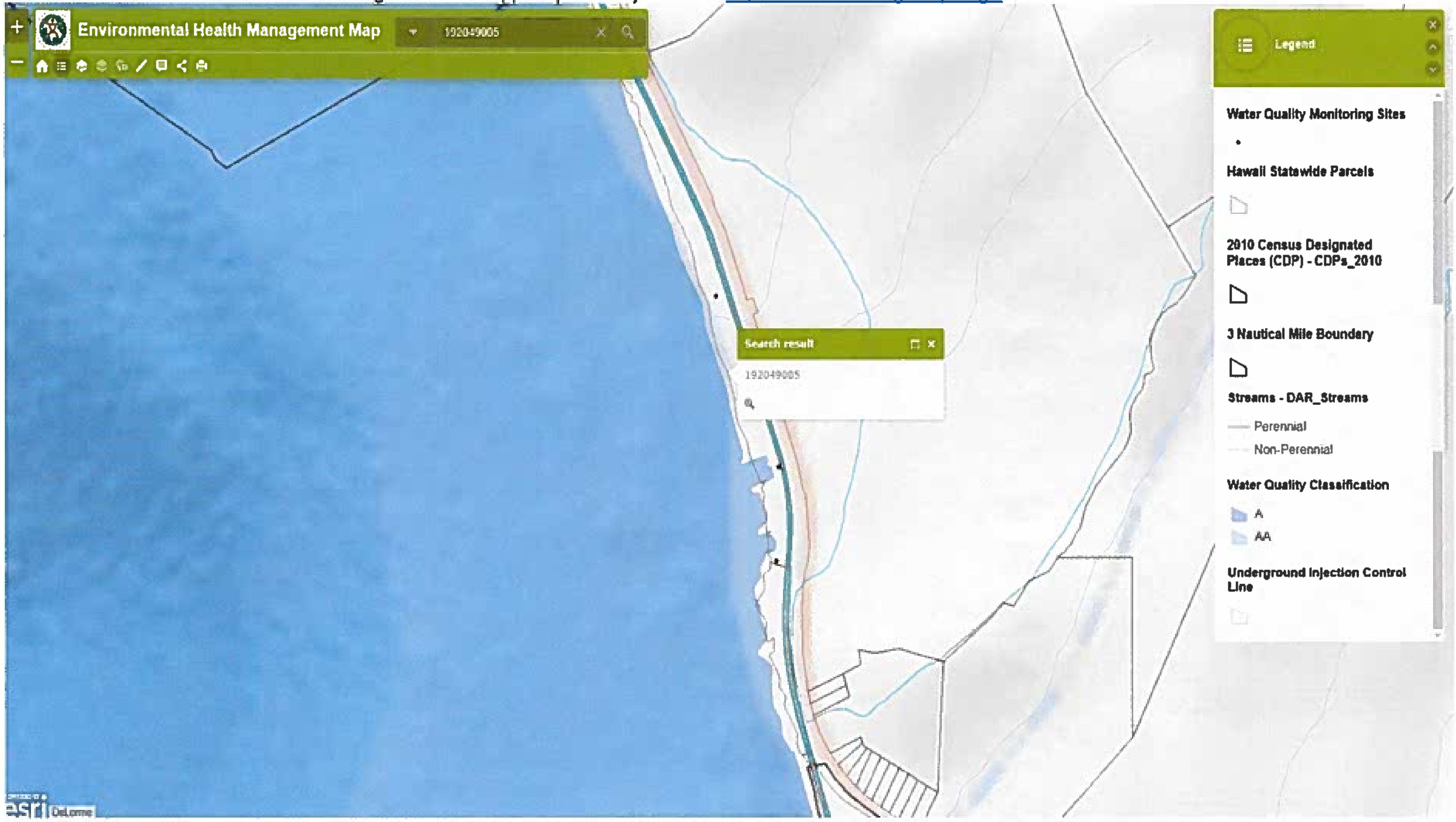
Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

LM:nn

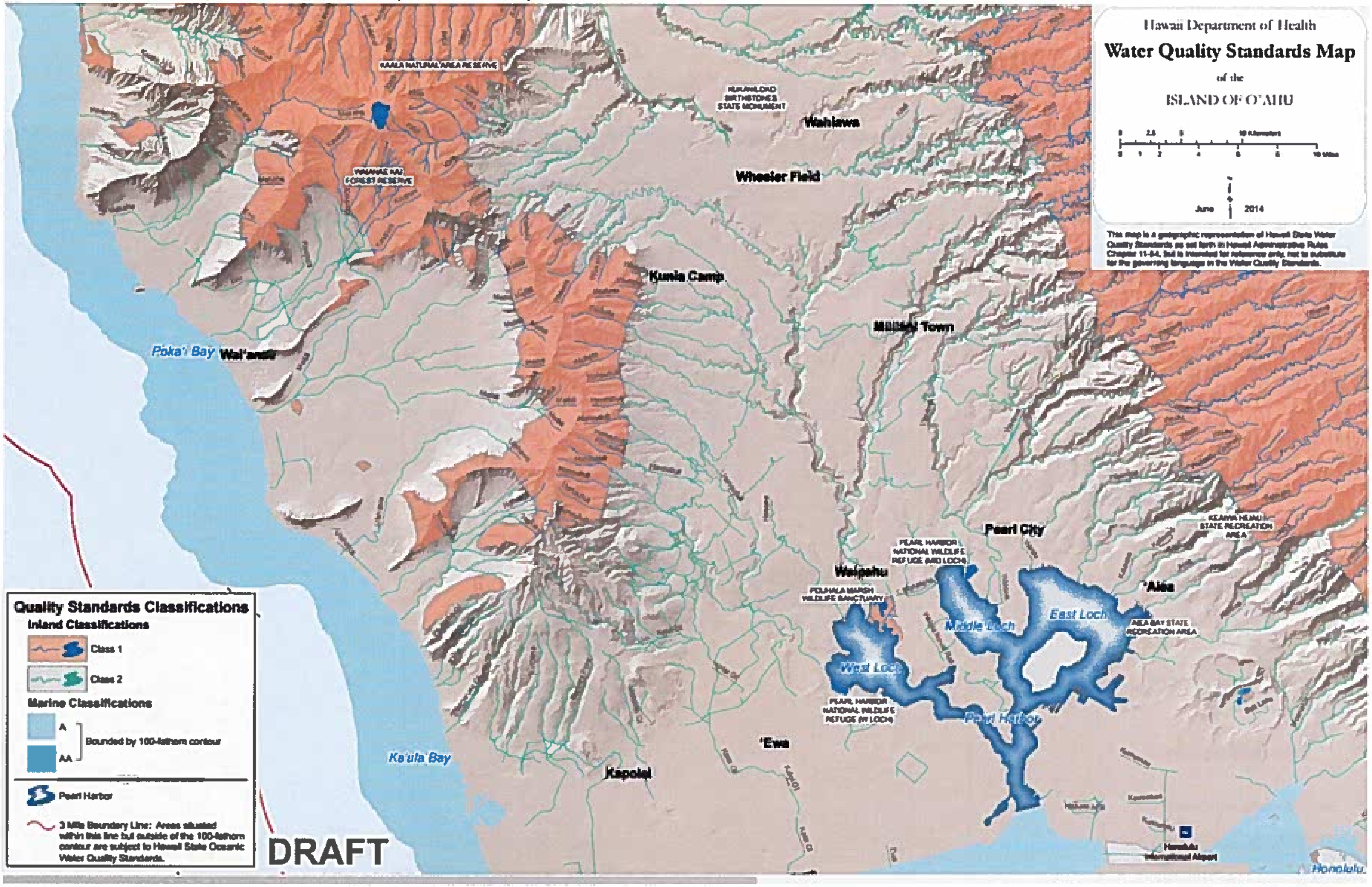
Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis
Attachment 2: Clean Water Branch: Water Quality Standards Map
Attachment 3: Wastewater Branch: Recycled Water Use Map of Project Area
Attachment 4: OEQC Viewer (of past EA's, EIS's in area)
Attachment 5: U.S. EPA EJSCREEN Report for Project Area

c: Richard Howarth, Hawaiki Submarine Cable USA and TE Subcom (via email: richard.howarth@hawaikicable.co.nz)
Alex Roy, Planner, DLNR, OCCL (via email: alex.j.roy@hawaii.gov)
DOH: DDEH, CWB {via email only}

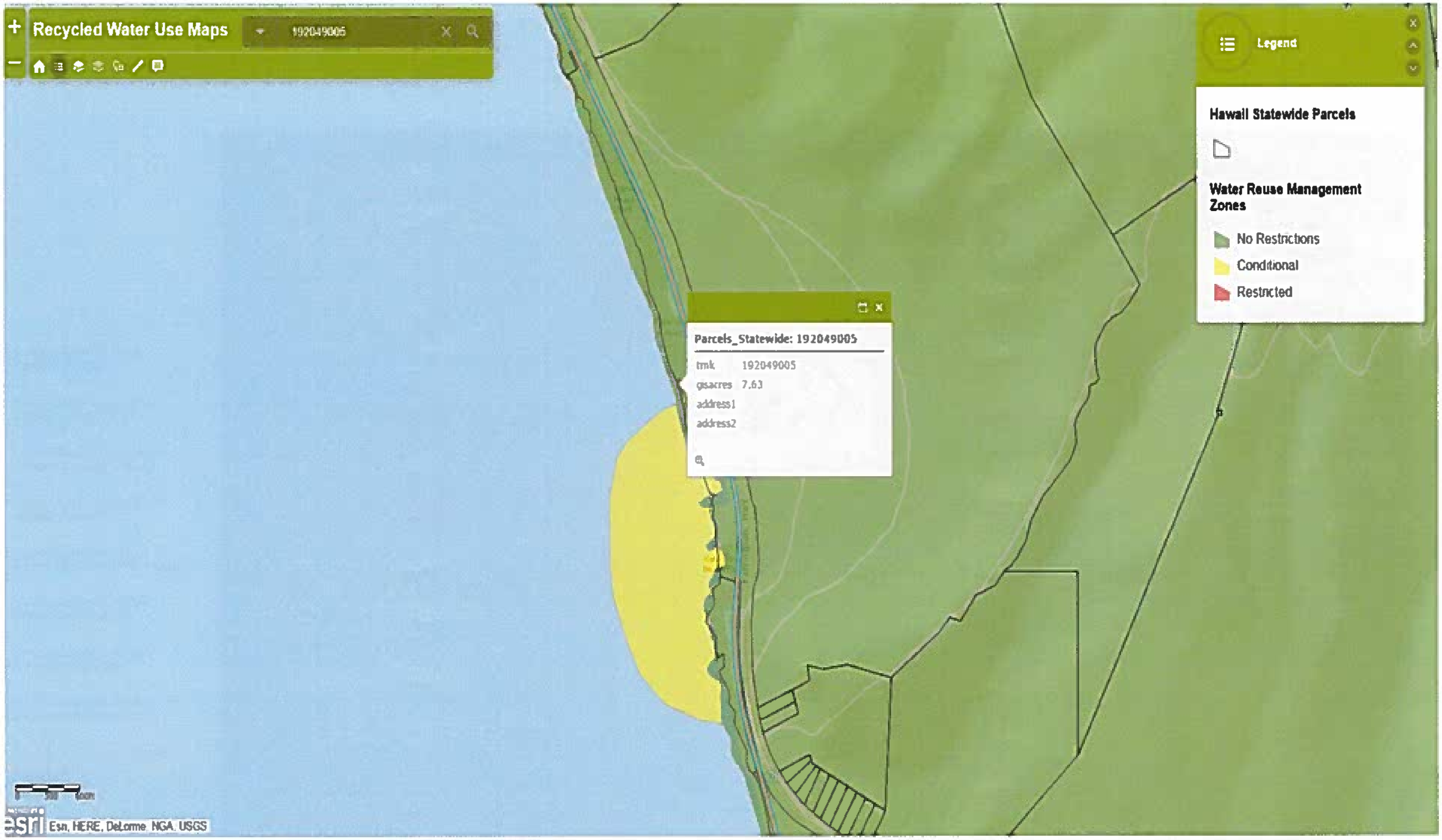
Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis



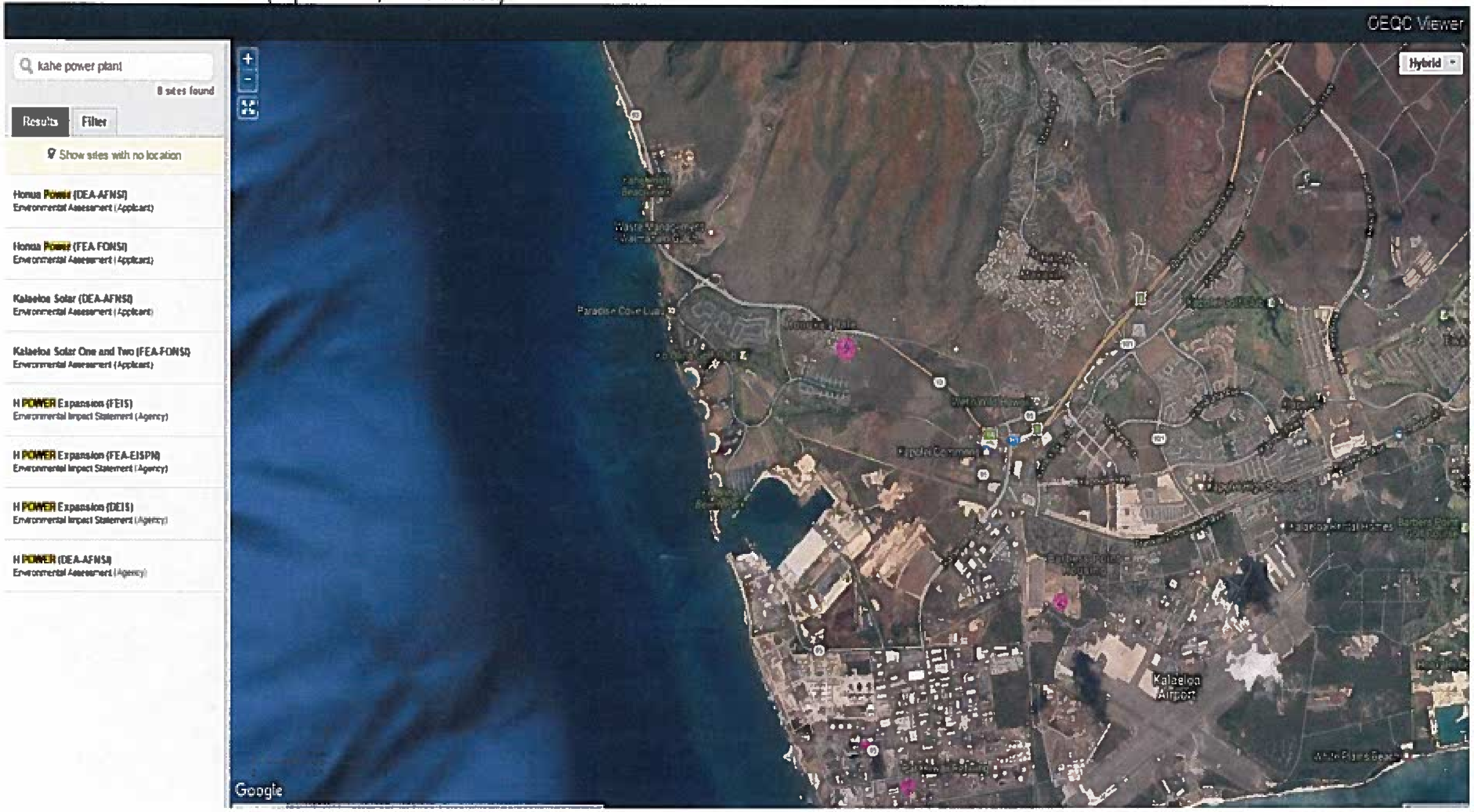
Attachment 2: Clean Water Branch: Water Quality Standards Map



Attachment 3: Wastewater Branch: Recycled Water Use Map of Project Area



Attachment 4: OEQC Viewer (of past EA's, EIS's in area)



Attachment 5: U.S. EPA EJSCREEN Report for Project Area

EPA United States Environmental Protection Agency

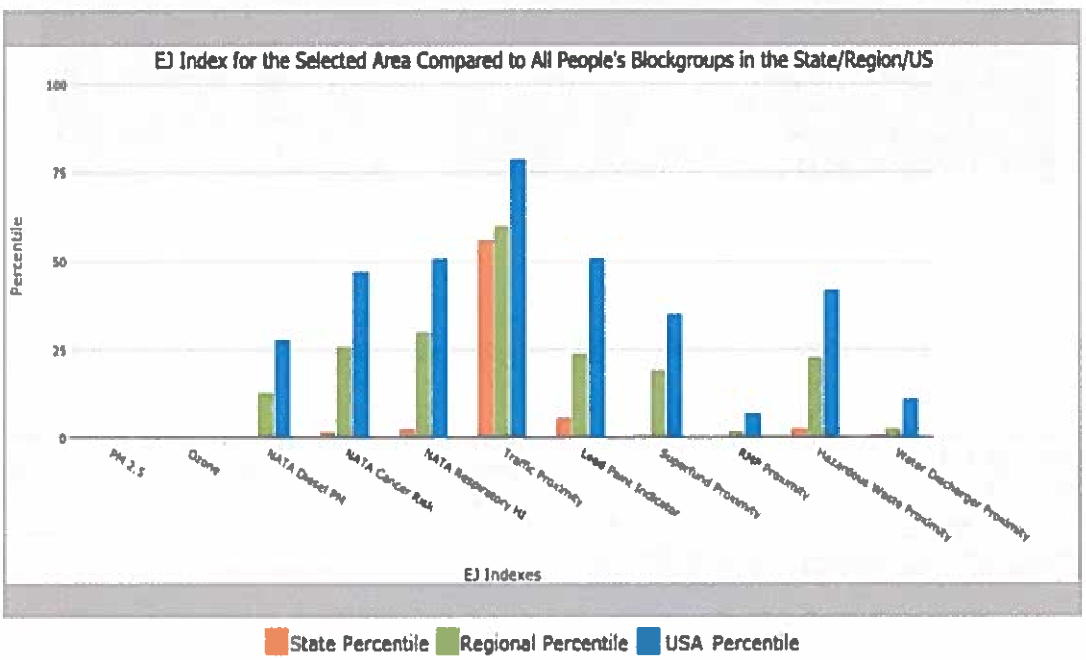
EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.349532,-158.127287, HAWAII, EPA Region 9

Approximate Population: 530

Input Area (sq. miles): 3.14

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	0	13	28
EJ Index for NATA* Air Toxics Cancer Risk	2	26	47
EJ Index for NATA* Respiratory Hazard Index	3	30	51
EJ Index for Traffic Proximity and Volume	56	60	79
EJ Index for Lead Paint Indicator	6	24	51
EJ Index for Superfund Proximity	1	19	35
EJ Index for RMP Proximity	0	2	7
EJ Index for Hazardous Waste Proximity*	3	23	42
EJ Index for Water Discharger Proximity	1	3	11



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.349532,-158.127287, HAWAII, EPA Region 9

Approximate Population: 530

Input Area (sq. miles): 3.14

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0
National Pollutant Discharge Elimination System (NPDES)	1

United States Environmental Protection Agency

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.349532,-158.127287, HAWAII, EPA Region 9

Approximate Population: 530

Input Area (sq. miles): 3.14

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu g/m^3$)	N/A	N/A	N/A	9.37	N/A	9.32	N/A
Ozone (ppb)	N/A	N/A	N/A	51	N/A	47.4	N/A
NATA* Diesel PM ($\mu g/m^3$)	0.695	0.149	97	0.978	<50th	0.937	<50th
NATA* Cancer Risk (lifetime risk per million)	31	34	50	43	<50th	40	<50th
NATA* Respiratory Hazard Index	0.84	1	45	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	790	990	74	1100	67	590	84
Lead Paint Indicator (% Pre-1960 Housing)	0.0092	0.16	17	0.24	19	0.3	12
Superfund Proximity (site count/km distance)	0.071	0.098	61	0.15	51	0.13	55
RMP Proximity (facility count/km distance)	1.4	0.19	99	0.57	89	0.43	93
Hazardous Waste Proximity* (facility count/km distance)	0.061	0.14	29	0.14	39	0.11	44
Water Discharger Proximity (facility count/km distance)	0.77	0.34	89	0.2	96	0.31	90
Demographic Indicators							
Demographic Index	24%	52%	1	47%	18	36%	40
Minority Population	36%	77%	3	58%	27	37%	58
Low Income Population	13%	26%	24	36%	16	35%	16
Linguistically Isolated Population	2%	6%	34	9%	25	5%	52
Population With Less Than High School Education	2%	9%	15	17%	12	14%	12
Population Under 5 years of age	8%	6%	71	7%	65	6%	69
Population over 64 years of age	10%	15%	25	13%	45	14%	35

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

* The hazardous waste environmental indicator and the corresponding EJ index will appear as N/A if there are no hazardous waste facilities within 50 km of a selected location.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

TETRA TECH

April 11, 2017

Laura Leialoha Phillips McIntyre, AICP
Program Manager
State of Hawaii, Department of Health
Environmental Planning Office
P.O. Box 3378
Honolulu, HI 96801

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Ms. McIntyre:

Thank you for your letter dated January 9, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. The Project will adhere to all applicable standards and will regularly review State and Federal environmental health land use guidance as well as visit the EPO's environmental GIS website page.
2. The Project will utilize the Hawaii Environmental Health Portal.
3. The Project will comply with all requirements of the Clean Water Branch (HAR, Section 11-54-1.1, -3, 4-8) and the National Pollutant Discharge Elimination System permit (HAR, Chapter 11-55). We are currently consulting with the Army Corps of Engineers, Regulatory Branch to verify permit requirements.
4. The EPA's environmental justice mapping and screening tool EJSCREEN will be utilized in project planning.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DAVID Y. IGE
GOVERNOR OF
HAWAII

ST-4

RECEIVED
DEC 21 2016
Division of Aquatic Resources

DAR# 5454

2017 JAN 25 A 9:46

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

COR: OA-17-92

DEC 20 2016

MEMORANDUM:

TO:

___ ODLO	___ DOH - CWB	___ NOAA
___ DAR	___ OHA	___ OEQC
___ SHPD	___ CCH – DPP	___ DOT – Highways
___ DOBOR	___ CCH – ENV	
___ DLNR – ENG	___ USFWS	
___ CWRM	___ USACOE – Honolulu Branch	

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

JK ✓
PM

SUBJECT: REQUEST FOR COMMENTS – Draft Environmental Assessment (DEA)
Hawaiki Submarine Cable – Kapolei Landing

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

Please find the Draft Environmental Assessment (DEA) for the proposed *Hawaiki Submarine Cable Landing Project - Kapolei* located in the Wai'anae District, Island of Oahu. We would appreciate a review of the DEA and any comments your agency or office has on the document which can be downloaded from our website:

https://dlnr.hawaii.gov/occl/files/2015/07/Hawaiki-Draft-EA-CD.pdf

Please contact Alex J. Roy, M.Sc. of the Office of Conservation and Coastal Lands at 808-587-0316, should you have any questions on this DEA. If no response is received by the suspense date of **January 23, 2017**, we will assume there are no comments.

(X) Comments Attached PM
( ) No Comments

Signature
Bruce S. Anderson, DAR Administrator

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 1/18/17
DAR # 5454

MEMORANDUM

TO: Bruce S. Anderson, DAR Administrator *BA*
DATE: *1/23/17*

FROM: Paul Murakawa, Aquatic Biologist *PM*
SUBJECT: REQUEST FOR COMMENTS-Draft Environmental Assessment (DEA) *Hawaiki Submarine Cable- Kapolei Landing*

Comment	Date Request	Receipt	Referral	Due Date
	12/20/16	12/21/16	12/21/16	1/23/17

Requested by: Sam Lemmo, Administrator
Office of Conservation and Coastal Lands

Summary of Proposed Project

Title: Draft Environmental Assessment (DEA) *Hawaiki Submarine Cable- Kapolei Landing*

Project by: TE SubCom and Hawaiki Submarine Cable USA. DEA prepared by Tetra Tech, Inc.

Location: Submerged Lands seaward of (1) 9-1-057:026

Brief Description:

The Hawaiki Cable System is an approximately 9,320 mile long submarine fiber optic cable consisting of a route extending from Oregon to Australia with a connection in Kapolei, Hawaii. The proposed cable landing site is located in Kapolei near the Waimanalo Gulch Landfill and HECO's Kahe Power Plant. The cable will be laid on the seafloor along a predetermined route and landed via construction of up to two sub-oceanic horizontal directionally drilled (HDD) bore pipes. The HDD portion of the route will extend from a punch out point in approximately 50-65 feet and underneath Farrington Highway to a beach manhole.

Comments:

1 DAR has reviewed the DEA and has the following comments. In the DEA, biological (fish, invertebrates and corals) surveys were conducted at the proposed punch out location and along the route of the fiber optic cable out to a depth of 98 feet. The results of the biological surveys determined that no long-term monitoring will be required.

2 Also, the DEA recommends the Best Management Practices (BMPs) for the HDD to prevent petroleum based products and any lubricants used during the drilling from entering the ocean environment and BMPs for prevention of runoff and/or sediment, from the construction of the proposed upland features (beach manhole, cable landing station, and parking area) of project, from entering the ocean environment.

3 DAR's requests from the pre-consultation with Tetra Tech (June 2016) have been addressed.

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plans; DAR requests the opportunity to review and comment on those changes.

TETRA TECH

April 11, 2017

Bruce Anderson, DAR Administrator
State of Hawaii, Department of Land and Natural Resources
Division of Aquatic Resources
1151 Punchbowl Street, Room 330
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Anderson:

Thank you for your letter dated January 18, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. Thank you for confirming that, based on the results of the biological surveys conducted for the Project, no long term monitoring will be required.
2. Best Management Practices will be followed during Horizontal Directional Drilling procedures. These are outlined in the Project's Inadvertent Drilling Fluid Release (IDFR) Contingency Plan, included in Appendix C to the Environmental Assessment.
3. Thank you for confirming that your requests from pre-consultation with Tetra Tech in June of 2016 have all been addressed.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DAVID Y. IGE
GOVERNOR OF
HAWAII

ST-5

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
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CONSERVATION AND RESOURCES ENFORCEMENT
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HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

COR: OA-17-92

DEC 20 2016

MEMORANDUM:

TO:

___ ODLO	___ DOH - CWB	___ NOAA
___ DAR	___ OHA	___ OEQC
✓ SHPD	___ CCH – DPP	___ DOT – Highways
✓ DOBOR	___ CCH – ENV	
___ DLNR – ENG	___ USFWS	
___ CWRM	___ USACOE – Honolulu Branch	

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS – Draft Environmental Assessment (DEA)
Hawaiki Submarine Cable – Kapolei Landing

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

Please find the Draft Environmental Assessment (DEA) for the proposed *Hawaiki Submarine Cable Landing Project - Kapolei* located in the Wai'anae District, Island of Oahu. We would appreciate a review of the DEA and any comments your agency or office has on the document which can be downloaded from our website:

https://dlnr.hawaii.gov/occl/files/2015/07/Hawaiki-Draft-EA-CD.pdf

Please contact Alex J. Roy, M.Sc. of the Office of Conservation and Coastal Lands at 808-587-0316, should you have any questions on this DEA. If no response is received by the suspense date of **January 23, 2017**, we will assume there are no comments.

( ) Comments Attached
(✓) No Comments

Signature

DEC21'16PM 2:26EOR ADM

TETRA TECH

April 11, 2017

Edward Underwood
Administrator
State of Hawaii
Department of Land and Natural Resources
Division of Boating and Ocean Recreation
4 Sand Island Access Road
Honolulu, HI 96819

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Underwood:

Thank you for your letter dated December 20, 2016, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, we acknowledge that you have reviewed the document and have no comment at this time.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

ST-6

DAVID Y. IGE
GOVERNOR OF
HAWAII

RECEIVED
LAND DIVISION
2016 DEC 21 AM 11: 03
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR COR: OA-17-92

DEC 20 2016

RECEIVED
OFFICE OF CONSERVATION AND COASTAL LANDS
2016 DEC 2? A 11:12
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

MEMORANDUM:

TO: TR

✓ ODLO	___ DOH - CWB	___ NOAA
___ DAR	___ OHA	___ OEQC
___ SHPD	___ CCH – DPP	___ DOT – Highways
___ DOBOR	___ CCH – ENV	
___ DLNR – ENG	___ USFWS	
___ CWRM	___ USACOE – Honolulu Branch	

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

To

SUBJECT: REQUEST FOR COMMENTS – Draft Environmental Assessment (DEA)
Hawaiki Submarine Cable – Kapolei Landing

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

Please find the Draft Environmental Assessment (DEA) for the proposed *Hawaiki Submarine Cable Landing Project - Kapolei* located in the Wai'anae District, Island of Oahu. We would appreciate a review of the DEA and any comments your agency or office has on the document which can be downloaded from our website:

https://dlnr.hawaii.gov/occl/files/2015/07/Hawaiki-Draft-EA-CD.pdf

Please contact Alex J. Roy, M.Sc. of the Office of Conservation and Coastal Lands at 808-587-0316, should you have any questions on this DEA. If no response is received by the suspense date of **January 23, 2017**, we will assume there are no comments.

(✓) Comments Attached
( ) No Comments

Signature

1

- A perpetual, non-exclusive easement will be required for the subsurface fiber-optic cable across State submerged lands.

TETRA TECH

April 11, 2017

Barry Cheung
District Land Agent
State of Hawaii
Department of Land and Natural Resources
Land Division
1151 Punchbowl Street, Room 220
Honolulu HI, 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

To Mr. Cheung:

Thank you for your letter dated December 20, 2016, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

Thank you for confirming that the Project will require a perpetual, non-exclusive easement for the subsurface fiber optic cable that will be installed across State submerged lands. As noted in Chapter 1 of the Environmental Assessment, and consistent with your comment, the Department of Land and Natural Resources Land Division will be the agency to grant a submerged lands easement for the portion of the cable located in State of Hawai‘i waters, upon completion of the Chapter 343 environmental review process.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DAVID Y. IGE
GOVERNOR
STATE OF HAWAII

SHAN S. TSUTSUI
LT. GOVERNOR
STATE OF HAWAII

JOBIE M. K. MASAGATANI
CHAIRMAN
HAWAIIAN HOMES COMMISSION

WILLIAM J. AILA, JR.
DEPUTY TO THE CHAIRMAN

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

P. O. BOX 1879
HONOLULU, HAWAII 96805

2017 JAN 17 A 9:30

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

ST-7

January 12, 2017

Attention: Alex J. Roy, M.Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawai`i 96809

Dear Mr. Roy:

Subject: Draft Environmental Assessment for Hawaiki Submarine Cable Kapolei Landing Project

1 The Department of Hawaiian Home Lands acknowledges receiving the request for comments on the above-cited project. After reviewing the materials submitted, due to its lack of proximity to Hawaiian Home Lands, we do not anticipate any impacts to our lands or beneficiaries from the project.

However, we highly encourage all agencies to consult with Hawaiian Homestead community associations and other (N)native Hawaiian organizations when preparing environmental assessments in order to better assess potential impacts to cultural and natural resources, access and other rights of Native Hawaiians.

Mahalo for the opportunity to provide comments. If you have any questions, please call Lehua Kinilau-Cano, at 620-9486 or contact via email at nicole.l.kinilau-cano@hawaii.gov.

Sincerely,

M. Kaleo Manuel
Acting Planning Program Manager

cc: Kapolei Homestead Associations

TETRA TECH

April 11, 2017

M. Kaleo Manuel
Acting Planning Program Manager
State of Hawaii
Department of Hawaiian Homelands
P.O. Box 1879
Honolulu, HI 96805

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Manuel:

Thank you for your letter dated January 12, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, thank you for confirming that you do not anticipate any impacts to your land or beneficiaries from the Project due to its lack of proximity to Hawaiian Home Lands.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DAVID Y. IGE
GOVERNOR OF
HAWAII

ST-8

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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NATURAL RESOURCES
STATE

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

COR: OA-17-92

DEC 20 2016

MEMORANDUM:

~~**TO:**~~

FR:

___ ODLO	___ DOH - CWB	___ NOAA
___ DAR	___ OHA	___ OEQC
___ SHPD	___ CCH – DPP	___ DOT – Highways
___ DOBOR	___ CCH – ENV	
___ DLNR – ENG	___ USFWS	
✓ CWRM	___ USACOE – Honolulu Branch	

2016 DEC 21 PM 12:08
RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT

TO:

~~**FROM:**~~ Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS – Draft Environmental Assessment (DEA)
Hawaiki Submarine Cable – Kapolei Landing

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

Please find the Draft Environmental Assessment (DEA) for the proposed *Hawaiki Submarine Cable Landing Project - Kapolei* located in the Wai'anae District, Island of Oahu. We would appreciate a review of the DEA and any comments your agency or office has on the document which can be downloaded from our website:

Please contact Alex J. Roy, M.Sc. of the Office of Conservation and Coastal Lands at 808-587-0316, should you have any questions on this DEA. If no response is received by the suspense date of **January 23, 2017**, we will assume there are no comments.

(x) Comments Attached
( ) No Comments

/s/ Jeffrey T. Pearson, P.E.

Signature

RFD. 4437.3
14398v

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

January 25, 2017

REF: RFD.4437.3

TO:	Mr. Sam Lemmo, Administrator Office of Conservation & Coastal Lands, DLNR-OCCL
FROM:	Jeffrey T. Pearson, P.E., Deputy Director Commission on Water Resource Management
SUBJECT:	Request for Comments - Draft Environmental Assessment (DEA) Hawaiki Submarine Cable - Kapolei Landing
FILE NO.:	RFD.4437.3
TMK NO.:	(1) 9-1-056:001, (1) 9-1-057:026, (1) 9-2-049:001, (1) 9-2-049:002, (1) 9-2-049:005, (1) 9-2-051:011

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

- [ ] 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.
- [ ] 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- [ ] 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- [ ] 11. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.
- [ ] 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- [ ] 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- [ ] 14. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- [ ] 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.
- [ ] 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.
- [ ] 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- [ ] 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

1

- [x] OTHER: The document mentions the construction of several monitor wells to determine the hydrology of the area. CWRM would like to know the nature of these monitor wells as no well construction permits were applied for through our office to ensure compliance with the Hawaii Well Construction and Pump Installation Standards, and if these wells are temporary or permanent.

If you have any questions, please contact W. Roy Hardy of the Commission staff at 587-0225.

April 11, 2017

Jeffery T. Pearson, P.E.
Deputy Director
State of Hawaii, Department of Land and Natural Resources
Commission on Water Resources Management
P.O. Box 621
Honolulu, HI 96809

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Pearson:

Thank you for your letter dated January 25, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following response to your comment.

The monitoring wells that were referenced in the Draft Environmental Assessment were not constructed for the Project. Data reported from the monitoring wells was summarized in a hydrological report prepared for the Waimanalo Gulch Sanitary Landfill (Waste Management, Inc./Geosyntec Consultants, Inc. 2006). The intent of referencing these wells in relation to the Project is to provide information on depth to groundwater in the vicinity of the Project. Additional text has been added to the Final Environmental Assessment to clarify the wells were drilled for a previous project.

Additional information can be found in the report:
Waste Management, Inc./Geosyntec Consultants, Inc. 2006. Hydrological Setting and Groundwater Monitoring, Waimanalo Gulch Sanitary Landfill, Kahe Valley, Island of Oahu, Hawaii.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

'16 DEC 21 AM 10:37 ENGINEERING

DAVID Y. IGE
GOVERNOR OF
HAWAII

ST-9

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
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JEFFREY T. PEARSON, P.E.
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CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
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FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

REF: OCCL: AJR

COR: OA-17-92

DEC 20 2016

MEMORANDUM:

From: ~~TO~~:

___ ODLO	___ DOH - CWB	___ NOAA
___ DAR	___ OHA	___ OEQC
___ SHPD	___ CCH – DPP	___ DOT – Highways
___ DOBOR	___ CCH – ENV	
✓ DLNR – ENG	___ USFWS	
___ CWRM	___ USACOE – Honolulu Branch	

To: ~~**FROM**~~: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS – Draft Environmental Assessment (DEA)
Hawaiki Submarine Cable – Kapolei Landing

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

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https://dlnr.hawaii.gov/occl/files/2015/07/Hawaiki-Draft-EA-CD.pdf

Please contact Alex J. Roy, M.Sc. of the Office of Conservation and Coastal Lands at 808-587-0316, should you have any questions on this DEA. If no response is received by the suspense date of **January 23, 2017**, we will assume there are no comments.

(x) Comments Attached
( ) No Comments

Signature Carty S. Chang, Chief Engineer

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

OCCL/Samuel Lemmo
Ref: Request for Comments - Draft Environmental Assessment (DEA)
Hawaiki Submarine Cable – Kapolei Landing

COMMENTS

1

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a designated Flood Hazard.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zone designations can be found using the Flood Insurance Rate Map (FIRM), which can be accessed through the Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may take precedence over the NFIP standards as local designations prove to be more restrictive. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

Signed: ____________________
CARTY S. CHANG, CHIEF ENGINEER

Date: 1/3/17

TETRA TECH

April 11, 2017

Carty S. Chang
Chief Engineer
State of Hawaii, Department of Land and Natural Resources
Engineering Division
1151 Punchbowl Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Chang:

Thank you for your letter dated January 3, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following response to your comment.

A map of potential flood zones is included in Figure 2.3-1 of the Draft Environmental Assessment. The onshore cable landing site is located in Zone D. The Horizontal Directional Drilling (HDD) conduit is located within Zone D and Zone VE. The National Flood Insurance Program (NFIP) does not have any regulations regarding development within Zone D; however, consistent with NFIP regulations for development in Zone VE which is at higher risk of flooding, installation of the HDD conduit below ground will minimize risks to construction activities due to flooding. The owner of the property will abide by the rules and regulations of the NFIP.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

-----Original Message-----
From: Iwasa, Russell [mailto:russell.iwasa@hawaii.gov] ST-10
Sent: Tuesday, February 07, 2017 7:16 PM
To: Higgins, Megan <Megan.Higgins@tetratech.com>; Roy, Alex J <alex.j.roy@hawaii.gov>
Cc: Tatsuguchi, Ken <ken.tatsuguchi@hawaii.gov>; Kato, Norren M <Norren.M.Kato@hawaii.gov>; Teshima, Elton <Elton.Teshima@hawaii.gov>; Iwamasa, Wayne Y <wayne.y.iwamasa@hawaii.gov>
Subject: Hawaiki Submarine Cable, DEA

Ms. Higgins, Mr. Roy,

The Hawaii Department of Transportation (HDOT) has missed the comment deadline for the DEA of January 30, 2017 and wishes to make known the following comments though we fully understand that there is no requirement that they be addressed in the HRS 343 process. The DEA had been routed to the wrong office.

1 1. The DEA should have contained a discussion about traffic impacts, confirmed or verified by a traffic engineer, even if the trips related to the submarine cable would be minimal. The cable facility has access to Farrington Highway, State route 93, so a short discussion that there would be no impact would satisfy that traffic issues were considered.

2 2. The DEA did not make clear whether the cable facility or installation of the cable or conduit will, in any way, require access to the Farrington Highway right-of-way. If it does then permits review by the Highways Construction Branch of plans will be needed.

3 3. Any crossing of the OR&L right of way requires an easement which requires preparation of NEPA documents. TetraTech should pre-coordinate with HDOT, primarily the Highway rights of way branch, HWY-R and other Branches as may be needed.

We will be forwarding HDOT official comments via hardcopy from our Statewide Transportation Planning office.

If you have any questions, contact Ken Tastsuguchi, Engineering Program Manager, Highways Planning Branch at (808) 587-1830 or Russell Iwasa, Civil Engineer at (808) 587-1833.

Russell Iwasa
HWY-PS

TETRA TECH

April 11, 2017

Russell Iwasa, Civil Engineer
State of Hawaii, Department of Transportation
Highways Planning Branch
869 Punchbowl Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Iwasa:

Thank you for your email dated February 7, 2017 on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. A traffic impacts analysis has been prepared for the Project by a Professional Traffic Engineer. The results from this analysis will be included in the Final Environmental Assessment.
2. The Horizontal Directional Drill (HDD) conduit for the fiber optic cable will not require access to Farrington Highway right-of-way. The HDD conduit will be drilled from the cable landing station parcel and it will pass beneath the Hawaii Department of Transportation (HDOT) right-of-way but will not require surface level access for construction.
3. Thank you for confirming that crossing under the OR&L right-of-way will require a Use and Occupancy Agreement from HDOT and requires Section 106 consultation with Federal Highways and State Historic Preservation District. Section 106 consultation was concluded March 17, 2017. HDOT is coordinating with Federal Highways Administration (FHWA) to specifically request a no effect determination under Section 7 of the Endangered Species Act and a Categorical Exclusion under 23 CFR 771.117(c)(2) from FHWA.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DAVID Y. IGE
GOVERNOR OF HAWAII

VIRGINIA PRESSLER, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

EPO 17-047

March 14, 2017

ST-11

Ms. Megan Higgins
Tetra Tech, Inc.
737 Bishop Street, Suite 2340
Mauka Tower
Honolulu, Hawaii 96813
Email: Megan.higgins@tetratech.com

Dear Ms. Higgins:

SUBJECT: Resubmission of Draft Environmental Assessment (DEA) for Proposed Hawaiki Submarine Cable Kapolei Landing Project, Ewa, Oahu
TMK: (1) 9-2-049:005, (1) 9-2-049:002, (1) 9-2-049:001, (1) 9-2-051:011, and (1) 9-2-051:001; (1) 9-2-051:010

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your DEA to our office via the OEQC link:
http://oeqc.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Oahu/2010s/2017-02-23-OA-5E-RDEA-Hawaiki-Submarine-Cable-Kapolei-Landing.pdf

We understand from the OEQC publication form project summary that *"Hawaiki Submarine Cable USA and TE SubCom have prepared a Second Draft Environmental Assessment (EA) for the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). The Project includes installation of subsea fiber optic (F/0) cable and associated telecommunications infrastructure at Kapolei, O'ahu. The F/0 cable would be landed via construction of one subterranean horizontal directionally drilled (HOD) conduit extending from a beach manhole (BMH) on land to a subsea punch-out exit point, located approximately 2,520 feet seaward from the shoreline, into which the F/0 cable would be installed. Onshore infrastructure include the BM H, a cable landing station building, two diesel generators, and a parking area. The purpose of the Project is to provide direct and affordable telecommunications connectivity between Hawai'i, the mainland U.S., Australia, New Zealand and other Pacific islands. The original Draft EA was published on December 23, 2016. Subsequent refinements in the Project design shifted the punch-out exit point and HOD conduit to the north, adding two new Tax Map Key parcels to the Project."*

In the development and implementation of all projects, EPO strongly recommends regular review of State and Federal environmental health land use guidance. State standard comments and available strategies to support sustainable and healthy design are provided at: http://health.hawaii.gov/epo/landuse. Projects are required to adhere to all applicable standard comments.

1

EPO has recently updated the environmental Geographic Information System (GIS) website page. It now compiles various maps and viewers from our environmental health programs. The eGIS website page is continually updated so please visit it regularly at: http://health.hawaii.gov/epo/egis.

EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

2 EPO also encourages you to examine and utilize the Hawaii Environmental Health Portal at: https://eha-cloud.doh.hawaii.gov. This site provides links to our e-Permitting Portal, Environmental Health Warehouse, Groundwater Contamination Viewer, Hawaii Emergency Response Exchange, Hawaii State and Local Emission Inventory System, Water Pollution Control Viewer, Water Quality Data, Warnings, Advisories and Postings.

3 We suggest you review the requirements of the Clean Water Branch (Hawaii Administrative Rules {HAR}, Chapter 11-54-1.1, -3, 4-8) and/or the National Pollutant Discharge Elimination System (NPDES) permit (HAR, Chapter 11-55) at: http://health.hawaii.gov/cwb. If you have any questions, please contact the Clean Water Branch (CWB), Engineering Section at (808) 586-4309 or cleanwaterbranch@doh.hawaii.gov. If your project involves waters of the U.S., it is highly recommended that you contact the Army Corps of Engineers, Regulatory Branch at: (808) 835-4303.

4 In order to better protect public health and the environment, the U.S. Environmental Protection Agency (EPA) has developed a new environmental justice (EJ) mapping and screening tool called EJSCREEN. It is based on nationally consistent data and combines environmental and demographic indicators in maps and reports. EPO encourages you to explore, launch and utilize this powerful tool in planning your project. The EPA EJSCREEN tool is available at: http://www.epa.gov/ejscreen.

5 Hawaii's climate is changing. Sea level rise and the associated coastal impacts have the potential to harm an array of natural and built environments in Hawaii. For additional information on projected sea level rise in Hawaii, EPO recommends that you visit the following informative links:

- State of Hawaii Climate Adaptation Portal: http://climateadaptation.hawaii.gov
- University of Hawaii, Manoa, School of Ocean and Earth Sciences and Technology, Coastal Geology Group: http://www.soest.hawaii.edu/coasts/index.html
- US Environmental Protection Agency – Climate Impacts on Coastal Areas: https://www.epa.gov/climate-impacts/climate-impacts-coastal-areas

We request that you utilize all this information on your proposed project to increase sustainable, innovative, inspirational, transparent and healthy design. Thank you for the opportunity to comment.

Mahalo nui loa,

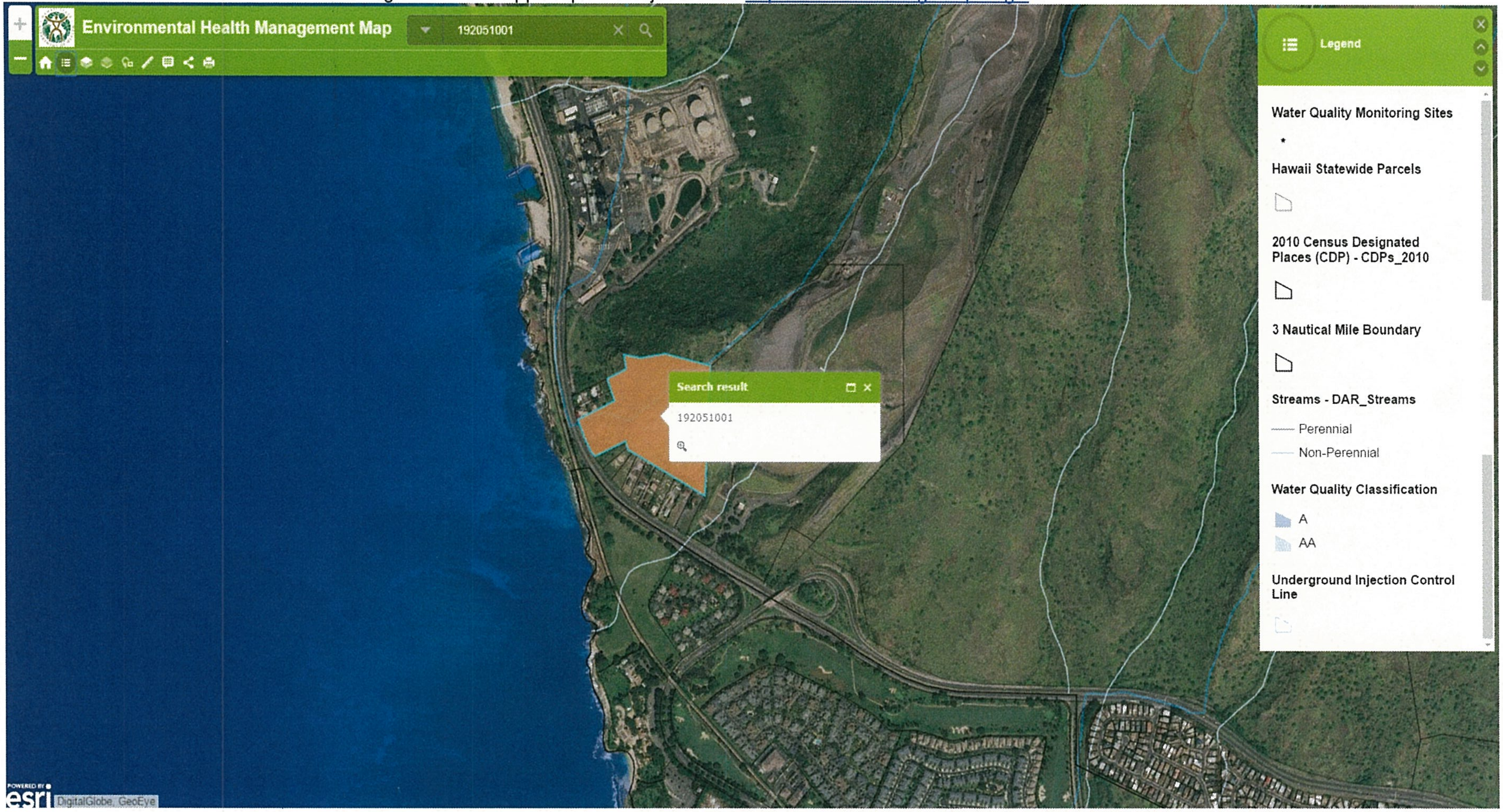
Laura Leialoha Phillips McIntyre, AICP
Program Manager, Environmental Planning Office

LM:nn

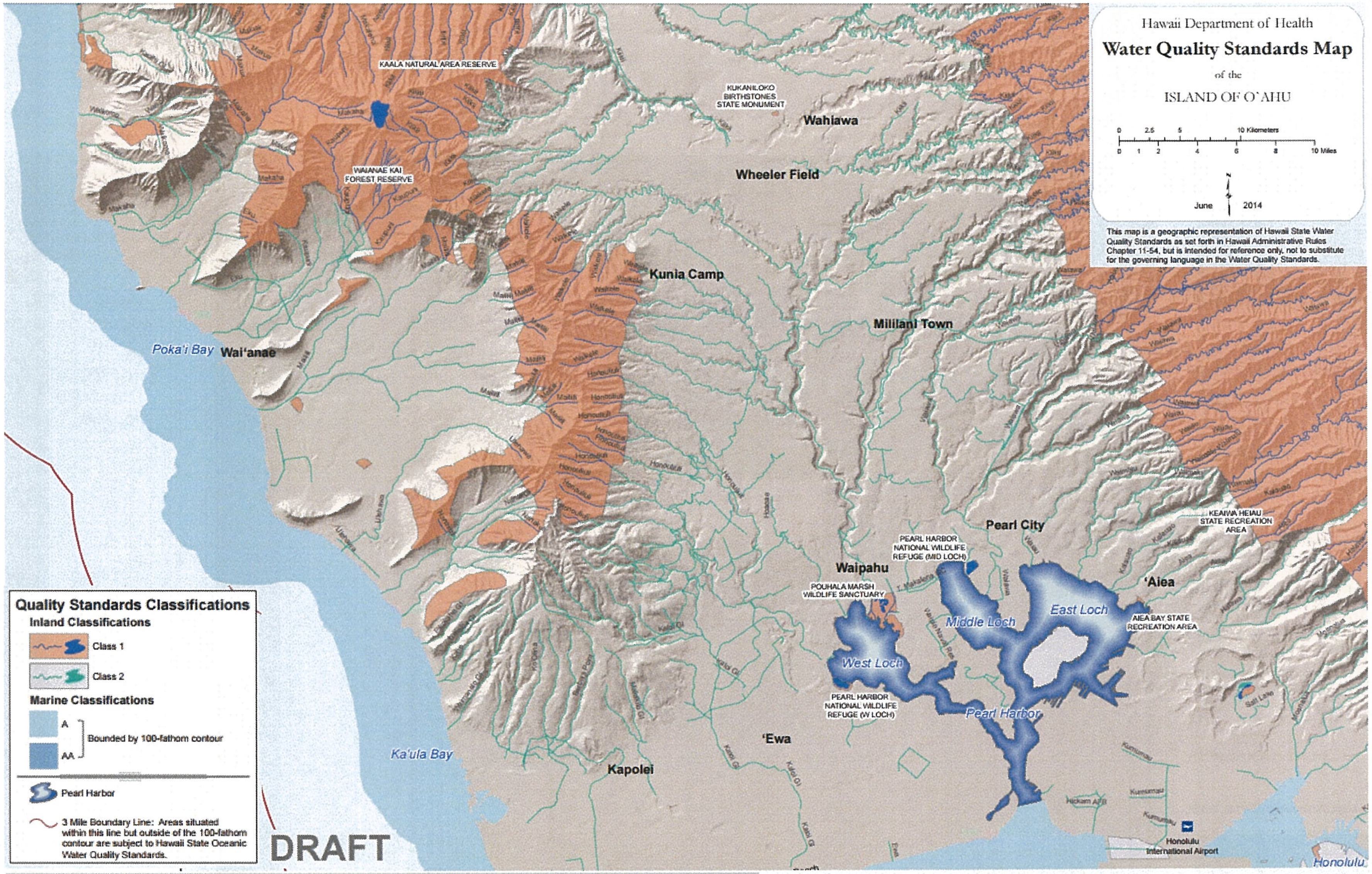
Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis
Attachment 2: Clean Water Branch: Water Quality Standards Map
Attachment 3: Wastewater Branch: Recycled Water Use Map of Project Area
Attachment 4: U.S. EPA EJSCREEN Report for Project Area

c: Richard Howarth, Hawaiki Submarine Cable USA (via email: richard.howarth@hawaikicable.co.nz)
Catherine Brady, TE SubCom (via email: cbrady@subcom.com)
Alex Roy, OCCL (via email: alex.j.roy@hawaii.gov)
DOH: CWB {via email only}

Attachment 1: Environmental Health Management Web App Snipit of Project Area: http://health.hawaii.gov/epo/egis



Attachment 2: Clean Water Branch: Water Quality Standards Map



Attachment 3: Wastewater Branch: Recycled Water Use Map of Project Area

Attachment 4: U.S. EPA EJSCREEN Report for Project Area

United States Environmental Protection Agency

EJSCREEN Report (Version 2016)

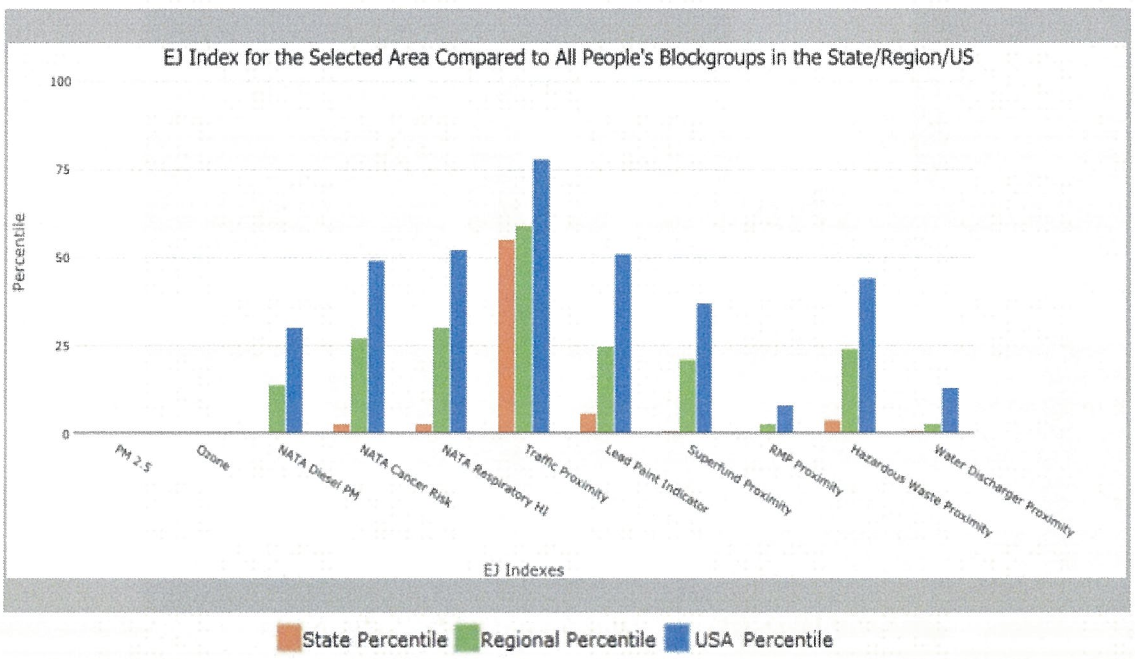
1 mile Ring Centered at 21.350591,-158.127106, HAWAII, EPA Region 9

Approximate Population: 587

Input Area (sq. miles): 3.14

Hawaiki Submarine Cable

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	N/A	N/A	N/A
EJ Index for Ozone	N/A	N/A	N/A
EJ Index for NATA* Diesel PM	0	14	30
EJ Index for NATA* Air Toxics Cancer Risk	3	27	49
EJ Index for NATA* Respiratory Hazard Index	3	30	52
EJ Index for Traffic Proximity and Volume	55	59	78
EJ Index for Lead Paint Indicator	6	25	51
EJ Index for Superfund Proximity	1	21	37
EJ Index for RMP Proximity	0	3	8
EJ Index for Hazardous Waste Proximity*	4	24	44
EJ Index for Water Discharger Proximity	1	3	13



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.350591,-158.127106, HAWAII, EPA Region 9

Approximate Population: 587

Input Area (sq. miles): 3.14

Hawaiki Submarine Cable

March 8, 2017

+ Digitized Point

1:4,514

0 0.0375 0.075 0.15 mi

0 0.05 0.1 0.2 km

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0
National Pollutant Discharge Elimination System (NPDES)	1

EJSCREEN Report (Version 2016)

1 mile Ring Centered at 21.350591,-158.127106, HAWAII, EPA Region 9

Approximate Population: 587

Input Area (sq. miles): 3.14

Hawaiki Submarine Cable

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	N/A	N/A	N/A	9.37	N/A	9.32	N/A
Ozone (ppb)	N/A	N/A	N/A	51	N/A	47.4	N/A
NATA* Diesel PM (µg/m^3)	0.634	0.149	97	0.978	<50th	0.937	<50th
NATA* Cancer Risk (lifetime risk per million)	31	34	48	43	<50th	40	<50th
NATA* Respiratory Hazard Index	0.83	1	44	2	<50th	1.8	<50th
Traffic Proximity and Volume (daily traffic count/distance to road)	720	990	72	1100	66	590	83
Lead Paint Indicator (% Pre-1960 Housing)	0.011	0.16	18	0.24	20	0.3	13
Superfund Proximity (site count/km distance)	0.072	0.098	62	0.15	51	0.13	56
RMP Proximity (facility count/km distance)	1.3	0.19	98	0.57	88	0.43	92
Hazardous Waste Proximity+ (facility count/km distance)	0.061	0.14	30	0.14	39	0.11	45
Water Discharger Proximity (facility count/km distance)	0.74	0.34	88	0.2	95	0.31	90
Demographic Indicators							
Demographic Index	28%	52%	2	47%	23	36%	46
Minority Population	40%	77%	5	58%	31	37%	61
Low Income Population	15%	26%	31	36%	20	35%	21
Linguistically Isolated Population	1%	6%	32	9%	24	5%	51
Population With Less Than High School Education	2%	9%	14	17%	10	14%	11
Population Under 5 years of age	9%	6%	79	7%	74	6%	77
Population over 64 years of age	9%	15%	24	13%	44	14%	33

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

+ The hazardous waste environmental indicator and the corresponding EJ index will appear as N/A if there are no hazardous waste facilities within 50 km of a selected location.

For additional information, see: www.epa.gov/environmentaljustice

TETRA TECH

April 11, 2017

Laura Leialoha Phillips McIntyre
Program Manager, Environmental Planning Office
State of Hawaii, Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Ms. McIntyre:

Thank you for your letter dated March 14, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. The Project will adhere to all applicable standards and will regularly review State and Federal environmental health land use guidance as well as visit the EPO’s environmental GIS website page.
2. The project will utilize the Hawaii Environmental Health Portal.
3. The Project will comply with all requirements of the Clean Water Branch (HAR, Section 11-54-1.1, -3, 4-8) and the National Pollutant Discharge Elimination System permit (HAR, Chapter 11-55). We are currently consulting with the Army Corps of Engineers, Regulatory Branch to verify permit requirements.
4. The EPA’s environmental justice mapping and screening tool EJSCREEN will be utilized in project planning.
5. Thank you for the additional climate change resources. Climate change is addressed in Section 2.1 of the Environmental Assessment.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DAVID Y. IGE
GOVERNOR OF
HAWAII

RECEIVED
LAND DIVISION
2017 MAR 16 AM 10:46

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
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

RECEIVED
OFFICE OF CONSERVATION AND COASTAL LANDS
2017 MAR 22 A 11:19

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

REF: OCCL: AJR   ST-12   COR: OA-17-92

MAR 15 2017

MEMORANDUM:

From: ~~**TO**~~:

✓ ODLO	___ DOH - CWB	___ NOAA
___ DAR	___ OEQC	___ DLNR – ENG
___ SHPD	___ CCH – DPP	___ DOT – Highways
___ DOBOR	___ CCH – ENV	___ USFWS
		___ OHA

To: ~~**FROM**~~: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS – Resubmission of Draft Environmental Assessment (DEA); *Hawaiki Submarine Cable – Kapolei Landing*

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

Please find the Resubmitted Draft Environmental Assessment (DEA) for the proposed *Hawaiki Submarine Cable Landing Project - Kapolei* located in the Wai'anae District, Island of Oahu. We would appreciate a review of the Resubmitted DEA and any comments your agency or office has on the document which can be downloaded from our website:

https://dlnr.hawaii.gov/occl/files/2015/07/Hawaiki-2DEA-combined-v2.pdf

Staff notes that the resubmission of this DEA for the subject project is being pursued due to changes in the nearshore project design. The location of the proposed drilling corridor has moved to an alternate TMK, and as such the previously designed drill corridor and "daylight" locations have been modified. Due to these changes the DEA is being resubmitted for review and processing.

Please contact Alex J. Roy of the OCCL at 808-587-0316, should you have any questions. If no response is received by the suspense date **March 28, 2017**, we will assume there are no comments.

(x) Comments Attached
( ) No Comments

Darlene Bryant-Takamatsu
Signature

Any improvement on State Land needs a land disposition from the Board.   1

TETRA TECH

April 11, 2017

Barry Cheung
District Land Agent
State of Hawaii
Department of Land and Natural Resources
Land Division
1151 Punchbowl Street, Room 220
Honolulu HI, 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

To Mr. Cheung:

Thank you for your letter dated March 15, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

Thank you for confirming that any improvement on State Land as a result of the Project will require a land disposition from the Board of Land and Natural Resources. As noted in Chapter 1 of the Environmental Assessment, the Project will require approval from the Board of Land and Natural Resources to obtain a submerged lands easement for the portion of the cable located in State of Hawai'i waters.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

ST-13

DAVID Y. IGE
GOVERNOR OF
HAWAII

RECEIVED
LAND DIVISION
2017 MAR 20 AM 11: 27
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
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

OFFICE OF CONSERVATION AND COASTAL LANDS
2017 MAR 21 A 11: 50
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

COR: OA-17-92

MAR 15 2017

MEMORANDUM:

TO:

___ ODLO	___ DOH - CWB	___ NOAA	OHA
___ DAR	___ OEQC	___ DLNR – ENG	
___ SHPD	___ CCH – DPP	___ DOT – Highways	
✓ DOBOR	___ CCH – ENV	___ USFWS	

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS – Resubmission of Draft Environmental Assessment (DEA); *Hawaiki Submarine Cable – Kapolei Landing*

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

Please find the Resubmitted Draft Environmental Assessment (DEA) for the proposed *Hawaiki Submarine Cable Landing Project - Kapolei* located in the Wai'anae District, Island of Oahu. We would appreciate a review of the Resubmitted DEA and any comments your agency or office has on the document which can be downloaded from our website:

https://dlnr.hawaii.gov/occl/files/2015/07/Hawaiki-2DEA-combined-v2.pdf

Staff notes that the resubmission of this DEA for the subject project is being pursued due to changes in the nearshore project design. The location of the proposed drilling corridor has moved to an alternate TMK, and as such the previously designed drill corridor and "daylight" locations have been modified. Due to these changes the DEA is being resubmitted for review and processing.

Please contact Alex J. Roy of the OCCL at 808-587-0316, should you have any questions. If no response is received by the suspense date **March 28, 2017**, we will assume there are no comments.

( ) Comments Attached
(X) No Comments

Signature

MAR15'17PM 2:24BOR ADM

TETRA TECH

April 11, 2017

Edward Underwood
Administrator
State of Hawaii
Department of Land and Natural Resources
Division of Boating and Ocean Recreation
4 Sand Island Access Road
Honolulu, HI 96819

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Underwood:

Thank you for your letter dated March 15, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, we acknowledge that you have reviewed the document and have no comment at this time.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DAVID Y. IGE
GOVERNOR OF
HAWAII

RECEIVED
LAND DIVISION

2017 MAR 20 AM 11:27

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

'12 MAR 15 PM 3:00 ENGINEERING

RECEIVED
OFFICE OF CONSERVATION AND COASTAL LANDS

2017 MAR 21 A 11:50

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEKOA KALUHIWA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

ST-14

COR: OA-17-92

MAR 15 2017

MEMORANDUM:

3/20 ~~TO~~ From:

___ ODLO
___ DAR
___ SHPD
___ DOBOR
___ DOH - CWB
___ OEQC
___ CCH – DPP
___ CCH – ENV
___ NOAA
✓ DLNR – ENG
___ DOT – Highways
___ USFWS
___ OHA

~~FROM~~: To: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS – Resubmission of Draft Environmental Assessment (DEA); *Hawaiki Submarine Cable – Kapolei Landing*

LOCATION: Wai'anae District, Island of Oahu

TMK: *Submerged Lands seaward of (1) 9-1-057:026*

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https://dlnr.hawaii.gov/occl/files/2015/07/Hawaiki-2DEA-combined-v2.pdf

Staff notes that the resubmission of this DEA for the subject project is being pursued due to changes in the nearshore project design. The location of the proposed drilling corridor has moved to an alternate TMK, and as such the previously designed drill corridor and "daylight" locations have been modified. Due to these changes the DEA is being resubmitted for review and processing.

Please contact Alex J. Roy of the OCCL at 808-587-0316, should you have any questions. If no response is received by the suspense date **March 28, 2017**, we will assume there are no comments.

(X) Comments Attached
( ) No Comments

Signature Carty S. Chang, Chief Engineer

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

OCCL/Samuel Lemmo
Ref: Request for Comments - Resubmission of Draft Environmental Assessment (DEA); Hawaiki Submarine Cable - Kapolei Landing

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a designated Flood Hazard.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zone designations can be found using the Flood Insurance Rate Map (FIRM), which can be accessed through the Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

1

Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may take precedence over the NFIP standards as local designations prove to be more restrictive. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

Signed: [signature]
CARTY S. CHANG, CHIEF ENGINEER

Date: 3/14/17

TETRA TECH

April 11, 2017

Carty S. Chang
Chief Engineer
State of Hawaii, Department of Land and Natural Resources
Engineering Division
1151 Punchbowl Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Chang:

Thank you for your letter dated March 21, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following response to your comment.

A map of potential flood zones is included in Figure 2.3-1 of the Second Draft Environmental Assessment. The onshore cable landing site is located in Zone D. The Horizontal Directional Drilling (HDD) conduit is located within Zone D and Zone VE. The National Flood Insurance Program (NFIP) does not have any regulations regarding development within Zone D; however, consistent with NFIP regulations for development in Zone VE which is at higher risk of flooding, installation of the HDD conduit below ground will minimize risks to construction activities due to flooding. The owner of the property will abide by the rules and regulations of the NFIP.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

ST-15

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD, STE 555
KAPOLEI, HAWAII 96707

March 23, 2017

IN REPLY REFER TO:
Log No. 2017.00503
Doc No. 1703GC14
Archaeology

Mr. Samuel J. Lemmo, Land Administrator
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, HI 96809

Dear Mr. Lemmo:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Draft Environmental Assessment (DEA) – 2nd Draft
Hawaiki Submarine Cable Kapolei Landing
Hono'uli'uli Ahupua'a, 'Ewa District, Island of O'ahu
TMK: (1) 9-2-049:001, 002 and 005; 9-2-051:001, 010 and 011; Farrington Highway ROW

Thank you for the opportunity to review and comment on this revised draft report titled, *Draft Environmental Assessment, Hawaiki Submarine Cable Kapolei Landing (Tetra Tech, Inc. February 2017)*, which SHPD received on March 15, 2017. The applicant, Hawaiki submarine Cable USA, and its supplier, Tyco Electronics Subsea Communications LLC, proposes to construct the Hawaiki cable system, an approximately 9,313-mile long submarine fiber optic (FO) telecommunications cable extending from Pacific City, Oregon, to Coogee, Australia, with connections to Kapolei, O'ahu, Hawai'i, Tafuna, Samoa, and Mangawhai Heads, New Zealand. The DEA addresses the Hawai'i portion of this system. The project would provide direct and affordable telecommunications connectivity between Hawai'i, the continental US, Australia, New Zealand, and other Pacific islands. It also would respond to needs identified in the Hawai'i Broadband Initiative, and would benefit Hawai'i through improved telecommunications speed and reliability.

The DEA provides a comprehensive overview of the proposed project and presents a determination of *Anticipated Finding of No Significant Impact* (AFONSI). The FO cable would be laid on the seafloor along a predetermined route from the limits of the State of Hawai'i waters (out to 3 nautical miles) to Kapolei, crossing State of Hawai'i submerged lands. The FO cable would be landed via construction of a horizontal directional drilling (HDD) bore extending a beach manhole (BMH) to a subsea punch-out exit point located approximately 2,520 feet seaward from the shoreline and approximately 46-feet (14 meters) deep, into which the FO cable would be installed. The DEA further indicates that the HDD conduit portion would be installed beneath Farrington Highway, the Oahu Railway & Land Company (OR&L) right-of-way (ROW), TMK: (1) 9-2-049:002 and 005, and Kahe Beach Park, TMK: (1) 9-2-49:001.

Additionally, the DEA indicates that the land features of the proposed project include construction of the BMH, a cable landing station (CLS), two diesel generators, and a parking area. The station would be located on an approximately 0.6-acre parcel owned by Hawaiki, at 92-384 Farrington Highway, identified as TMK: (1) 9-2-051:011. The applicant is seeking agreements for a temporary lease of adjacent parcels identified as TMK: (1) 9-2-051:001, a portion of the 21-acre parcel owned by Au Trust and TMK: (1) 9-2-051:010, a 0.604-acre parcel owned by Joel and Yolanda Ballesteros. These parcels are intended for parking and equipment materials staging during construction, in addition to seeking an HDD passage easement through TMK: (1) 9-2-051:001.

SHPD records review indicates that two historic properties are identified proximate to the proposed project permit area, the OR&L ROW (Site 50-80-12-9714) and a traditional Hawaiian fishing shrine (Site 50-80-12-1433). In a letter dated March 15, 2017 (Log No. 2017.00483, Doc No. 1703SL07), SHPD reviewed and accepted an archaeological inventory survey report (Byerly and O'Day, March 2017). The report indicated that the proposed project is a federal undertaking as defined in 36 CFR 800.16(y) and is subject to the National Historic Preservation Act (NHPA) Section 106 consultation process. The project also involves a highway right-of-way (ROW) owned by the State of Hawaii and land beyond the ROW, and is subject to historic preservation review under Hawaii Revised Statutes (HRS) Chapter 6E-8.

The fieldwork involved 100% pedestrian survey of the surface portion of the proposed project, TMK: (1) 9-2-051:001 por., 010 and 011, and the excavation of 10 backhoe trenches in TMK: (1) 9-2-051:11. No subsurface cultural deposits or features were identified. The field work identified no historic properties within the cable land station area or the proposed staging areas.

A single historic property occurs above the subterranean HDD conduit portion of the proposed project area, the OR&L ROW (Site 9714). The OR&L ROW was first documented in 1964 by Bishop Museum. In 1974 it was listed on the Hawaii Register of Historic Places (HRHP) and on the National Register of Historic Places (NRHP) in 1975. The OR&L ROW will be impacted by the proposed project.

No historic properties occur within the underwater portion of the proposed project area. Nearby identified historic properties include a traditional Hawaiian fishing shrine (Site 1433), located approximately 90 m south/southwest of the APE. The shipwrecks of Vessel F6F-3 Hellcat and Vessel F2A3 Buffalo are reported as being from 0.4 to 0.8 km away from the project site.

The AIS report states that pursuant to Hawaii Administrative Rules (HAR) §13-276-7, the effect determination is no historic properties affected, and that pursuant to 36 CFR 800.4(d)(1), the effect determination recommendation is no historic properties affected. The undertaking will not alter any of the characteristics that qualify the OR&L ROW (Site 50-80-12-9714) for inclusion in the NRHP.

1 The State Historic Preservation Officer (SHPO) accepted the AIS report and concurred with the HAR §13-276-7 effect determination and the 36 CFR 800.4(d)(1) effect recommendation of *no historic properties affected* (March 15, 2017; Log No. 2017.00483, Doc. No. 1703SL07). The SHPO also responded to requests from the U.S. Army Corps of Engineers (Log No. 2017.00391) and the Federal Highway Administration (Log No. 2017.00479) for the SHPO's concurrence. In a letter dated March 16, 2017 (Log No. 2017.00391, Doc. No. 1703SL09), the SHPO approved the use of the OR&L ROW, concurred with the FHWA's request to allow processing the project before the PA is executed, and concurred with both the Corps' and the FHWA's 36 CFR 800.4(d)(1) effect determinations of *no historic properties affected*.

Please contact me at Susan.A.Lebo@hawaii.gov or at (808) 692-8019 for any questions regarding this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Archaeology Branch Chief

cc: Alex J. Roy, DLNR-OCCL (Alex.J.Roy@hawaii.gov)

TETRA TECH

April 11, 2017

Susan Lebo
Archaeology Branch Chief
State Historic Preservation Division
Department of Land and Natural Resources
Kakuhihewa Building
601 Kamokila Blvd, Suite 555
Kapolei, HI 96707

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Ms. Lebo:

Thank you for your letter dated March 23, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

Thank you for confirming that the State Historic Preservation Officer (SHPO) accepted the Archaeological Inventory Survey (AIS) report, and concurrent with the HAR §13-276-7 effect determination and the 36 CFR 800.4(d)(1) effect recommendation. Hawaiki Submarine Cable USA and TE SubCom appreciate the expedited review of the requests from the U.S. Army Corps of Engineers and the Federal Highway Administration, and concurrence with their effect determinations.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DAVID Y. IGE
GOVERNOR

FORD N. FUCHIGAMI
DIRECTOR

Deputy Directors
JADE T. BUTAY
ROSS M. HIGASHI
EDWIN H. SNIFFEN
DARRELL T. YOUNG

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

ST-16

IN REPLY REFER TO:
STP 8.2104

April 3, 2017

TO: THE HONORABLE SUZANNE CASE, CHAIRPERSON
DEPARTMENT OF LAND AND NATURAL RESOURCES (DLNR)

ATTN: ALEX J. ROY M.SC.
OFFICE OF CONSERVATION AND COASTAL LANDS

FROM: FORD N. FUCHIGAMI
DIRECTOR OF TRANSPORTATION

SUBJECT: HAWAIKI SUBMARINE CABLE KAPOLEI LANDING PROJECT
SECOND DRAFT ENVIRONMENTAL ASSESSMENT
KAPOLEI, OAHU, HAWAII
TMK: (1) 9-2-049:001, (1) 9-2-049:002, (1) 9-2-049:005, (1) 9-2-051:001;
(1) 9-2-051:010 AND (1) 9-2-051:011

The project requires compliance with Hawaii Revised Statutes (HRS) 343, due to the easement across submerged lands (State Conservation District), and State highway easements for crossing Farrington Highway and the Oahu Railway and Land Company Right-Of-Way (OR&L ROW).

Our Department of Transportation's (DOT) comments on the subject project are as follows:

1

1. The draft environmental assessment (DEA) should disclose the traffic impacts to Farrington Highway due to the construction and operation of the landing station facility and be written by a Professional Traffic Engineer, including his PE stamp.

2

2. The DEA should discuss if access to Farrington Highway has sufficient sight distance.

   a. The DEA should delineate the Hawaii State Department of Transportation (HDOT) State highway ROW property line.

   b. The DEA should disclose and discuss the installation of the horizontal directional drilling (HDD) facilities and auxiliary construction in or near the State highway ROW indicated.

3 3. The DEA should provide figures of the planned HDD horizontal alignment and vertical profile at the crossings of Farrington Highway and the OR&L ROW.

4 4. Any easement through the OR&L ROW requires Federal environmental compliance. Tetra Tech, Inc. shall coordinate with the HDOT.

If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

c: Megan E. Higgins, Tetra Tech, Inc.

April 11, 2017

Ford Fuchigami, Director of Transportation
State of Hawaii, Department of Transportation
Statewide Transportation Planning Office
869 Punchbowl Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Fuchigami:

Thank you for your letter dated April 3, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. A traffic impacts analysis has been prepared for the Project by a Professional Traffic Engineer. The results from this analysis will be included in the Final Environmental Assessment.
2. The traffic impacts analysis evaluated the sight distance for vehicles accessing the Project's driveway from Farrington Highway and the results of this analysis will be included in the Final Environmental Assessment.
    a. The Hawaii State Department of Transportation (HDOT) highway right-of-way (ROW) property line will be delineated on drawings prepared for the Use and Occupancy Permit application that Hawaiki Submarine Cable USA will be seeking from HDOT for the crossing of Farrington Highway and the Oahu Railroad and Land Company (OR&L) ROW.
    b. The Horizontal Directional Drill (HDD) conduit for the fiber optic cable will not require access to Farrington Highway ROW. The HDD conduit will be drilled from the cable landing station parcel and it will pass beneath the HDOT ROW but will not require surface level access for construction. Access to the cable landing station facilities from Farrington Highway is discussed in Section 1.1 of the Final Environmental Assessment.
3. Figures of the planned HDD horizontal alignment and vertical profile at the crossings of Farrington Highway and the OR&L ROW will be included in the Use and Occupancy Permit application submitted to HDOT.
4. Thank you for confirming that issuance of a Use and Occupancy Agreement from HDOT requires federal environmental compliance. National Historic Preservation Act Section 106 consultation was concluded March 17, 2017. HDOT is coordinating with the Federal Highways Administration (FHWA) to specifically request a no effect determination under Section 7 of the Endangered Species Act and a National Environmental Policy Act Categorical Exclusion under 23 CFR 771.117(c)(2) from FHWA.

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Norren Kato, Statewide Transportation Planning Office
Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

KIRK CALDWELL
MAYOR

MARK K. KIKUCHI, P.E.
ACTING DIRECTOR

JON Y. NOUCHI
DEPUTY DIRECTOR

TP12/16-676008R

January 18, 2017

CO-1

Mr. Alex J. Roy, M.Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

SUBJECT: Draft Environmental Assessment (DEA) for Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Oahu, Hawaii

This is in response to a letter that we received from Ms. Megan Higgins, from Tetra Tech, Inc., dated December 21, 2016, requesting our review and comments on the DEA for the Hawaiki Submarine Cable Kapolei Landing Project.

We have reviewed the document and have no comments at this time.

Should you have any questions, please contact Renee Yamasaki of my staff at 768-8383.

Very truly yours,

Mark K. Kikuchi, P.E.
Acting Director

cc: Ms. Megan Higgins, Tetra Tech, Inc.

TETRA TECH

April 11, 2017

Mark K. Kikuchi, P.E.
Acting Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Kikuchi:

Thank you for your letter dated January 18, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom we acknowledge that you have reviewed the document and have no comment at this time.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

LOUIS M. KEALOHA
CHIEF

CARY OKIMOTO
JERRY INOUYE
DEPUTY CHIEFS

OUR REFERENCE MT-DK

CO-2

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AND COASTAL LANDS

2017 JAN -9 A 8: 51

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

January 4, 2017

Mr. Alex J. Roy, M.Sc.
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

This is in response to a letter (dated December 21, 2016) from Ms. Megan Higgins of Tetra Tech, Inc., requesting comments on the Draft Environmental Assessment for the Hawaiki Submarine Cable Landing Kapolei Project in Waianae.

1 Based on the information provided, this project should have no significant impact on the services or operations of the Honolulu Police Department at this time.

If there are any questions, please call Major Sean Naito of District 8 (Kapolei) at 723-8403.

Thank you for the opportunity to review this project.

Sincerely,

CARY OKIMOTO
Acting Chief of Police

By
for MARK TSUYEMURA
Management Analyst VI
Office of the Chief

Serving and Protecting With Aloha

TETRA TECH

April 11, 2017

Cary Okimoto
Acting Chief of Police
Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Okimoto:

Thank you for your letter dated January 4, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom we acknowledge that the project should have no significant impact on the services or operation of the Honolulu Police Department.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 Ulu'ohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

CO-3

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER DESIGNATE

EDUARDO P. MANGLALLAN
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 17-06

January 10, 2017

Mr. Alex J. Roy, M.Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

SUBJECT: Draft Environmental Assessment for Hawaiki Submarine Cable Kapolei Landing Project

This is in response to Tetra Tech, Inc.'s Memo requesting for comments on the above subject.

1 We have no comments at this time as we do not have any facilities or easements on the subject property.

If you have any questions, please call Mr. Kyle Oyasato of the Division of Road Maintenance at 768-3697.

Sincerely,

Ross Sasamura, P.E.
Director and Chief Engineer Designate

cc: Ms. Megan Higgins, Project Manager
Tetra Tech, Inc.

April 11, 2017

Ross Sasamura, P.E.
Director and Chief Engineer Designate
Department of Facility Maintenance
City and County of Honolulu
1000 Ulu'ohia Street, Suite 215
Kapolei, HI 96707

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Sasamura:

Thank you for your letter dated January 10, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom we acknowledge your confirmation that you do not have any facilities or easements on the subject property and have no comments at this time.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DEPARTMENT OF BUDGET AND FISCAL SERVICES
CITY AND COUNTY OF HONOLULU
530 SOUTH KING STREET, ROOM 208 • HONOLULU, HAWAII 96813
PHONE: (808) 768-3900 • FAX: (808) 768-3179 • INTERNET: www.honolulu.gov

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2017 JAN 13 A 11: 09

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

KIRK CALDWELL
MAYOR

NELSON H. KOYANAGI, JR.
DIRECTOR DESIGNATE

GARY T. KUROKAWA
DEPUTY DIRECTOR

CO-4

January 10, 2017

Mr. Alex J. Roy, M Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

Subject: Proposed Hawaiki Submarine Cable Kapolei Landing Project

In a letter dated October 5, 2016, the City was informed by Tetra Tech that the above-mentioned project will not affect any City property. Therefore we have no comment on the proposed project.

Please contact Tammy Namihira at 768-3942 should you have any questions or need further assistance.

Sincerely,

Michael F. Hin

For Wendy K. Imamura
Purchasing Administrator

WKI/tn

TETRA TECH

April 11, 2017

Wendy K. Imamura
Purchasing Administrator
Department of Budget and Fiscal Services
City and County of Honolulu
530 South King Street, Room 208
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Ms. Imamura:

Thank you for your letter dated January 10, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom we acknowledge your confirmation that the project will not affect any city property and that you have no comments at this time.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
ACTING DEPUTY DIRECTOR

2016/ELOG-3389(ST)

CO-5

January 24, 2017

Ms. Suzanne Case, Chairperson
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Attention: Alex J. Roy, M.Sc.

Dear Ms. Case:

SUBJECT: Draft Environmental Assessment
Hawaiki Submarine Cable Kapolei Landing
92-384 Farrington Highway - Kapolei
Tax Map Keys 9-2-51: portions 1 and 10, 11;
9-1-56: portion 1; 9-1-57: portion 26; 9-2-49: portion 5

Our comments on the Draft Environmental Assessment (EA) for the above Project are as follows:

1 1. Executive Summary: The land area in the executive summary should clarify that the 0.6 acres represents only the area of the new cable station on Parcel 11; the subsurface area where the submarine cable will be installed via horizontal directional drilling (HDD) is not reflected in this figure.

2 2. Section 2.5.2 Environmental Impacts: The final EA should include estimates of the total amount of earthwork necessary to complete the construction of the onshore Cable Landing Station (CLS) (i.e., cubic yards of grading and embankment). Similarly, estimates of the anticipated volume of displaced fluids and spoils from the HDD process deposited at the CLS site should be included. This section should explain where and how these HDD spoils will be dispersed.

3 3. Section 2.18 Scenic and Aesthetic Resources: The final EA should include elevations, drawings, and/or renderings to illustrate the completed CLS, including all exterior structures and security fencing. Site simulations should be provided to illustrate the visual impact of the proposed CLS site from various vantage points, especially Farrington Highway.

4 4. <u>Section 5.3.5 Shoreline Setback Variance (SSV) Permit</u>: This section should be expanded to include a discussion of the criteria for granting an SSV, pursuant to Section 23-1.8(b), Revised Ordinances of Honolulu, and how the proposed cable crossing meets this criteria.

Should you have any questions, please contact Steve Tagawa of our staff at 768-8024.

Very truly yours,

FOR Kathy K. Sokugawa,
Acting Director

cc: Megan Higgins, Tetra Tech Inc.
OEQC

TETRA TECH

April 11, 2017

Kathy K. Sokugawa
Acting Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Ms. Sokugawa:

Thank you for your letter dated January 24, 2017 on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. The executive summary has been updated to clarify that the reported land area of 0.6 acres represents only the area of the new cable landing station site, and does not include the subsurface area where the fiber optic cable would be installed.
2. Information on the volume of earthwork resulting from construction of the onshore cable landing site and spoils and fluids resulting from the Horizontal Directional Drilling (HDD) process has been added to Section 2.5 of the Final Environmental Assessment. Spoils and fluids generated from the HDD process would be handled onsite using a recycling unit. If local permitting allows, some of the clean, filtered spoil may be re-used onsite. Otherwise, spoils will be removed from the cable landing station site and disposed of at an authorized location. All drilling fluid will be removed from the cable landing station site at the completion of HDD activities and disposed of at an authorized location.
3. A new figure depicting rendering and elevation drawings of the CLS, and additional information on potential visual impacts on line of site from the highway to the ocean associated with the CLS, has been added to the Final EA (please see Figure 1-7 in Section 1.3.3 and Section 2.18).
4. Section 5.3.5 has be expanded to include discussion of the criteria for granting a Shoreline Setback Variance Permit and how the proposed cable crossing meets these criteria.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

January 23, 2017

CO-6

Mr. Alex J. Roy, M.Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

Subject: The Letter Dated December 21, 2016 Requesting Comments on the Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Landing Project in Kapolei – Tax Map Keys: 9-1-057: 026; 9-1-056: 001; 9-2-049: 001, 002, 005; 9-2-051: 011

Thank you for the opportunity to comment on the proposed cable landing project.

1 The existing water system is adequate to accommodate the proposed submarine cable landing project. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

2 When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

3 The construction drawings should be submitted for our review, and the construction schedule should be coordinated to minimized impact to the water system.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

TETRA TECH

April 11, 2017

Ernest Y. W Lau, P.E.
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96843

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Lau:

Thank you for your letter dated January 23, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. Thank you for confirming that the existing water system is adequate to accommodate the proposed Project. We acknowledge that Board of water Supply reserves the right to change position on the Project until the final approval of the building permit application, and that the final decision on water availability will be confirmed when the building permit application is submitted for approval.
2. We acknowledge that Hawaiki Submarine Cable USA will pay water system facility charges for resource development, transmission, and daily storage.
3. Construction drawing will be submitted to the Board of Water Supply for review and the construction schedule will be coordinated to minimize impact on the water system.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

CO-7

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

RECEIVED
OFFICE OF CONSERVATION AND COASTAL LANDS
2017 JAN 27 P 1:10
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

January 19, 2017

Mr. Alex Roy, M.Sc.
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

Subject: Draft Environmental Assessment
Proposed Hawaiki Submarine Cable Kapolei Landing Project
Kapolei, Hawaii
Tax Map Keys: 9-1-056: 001
9-1-057: 026
9-2-049: 001, 002, 005
9-2-051: 011

1 In response to your memorandum received on December 27, 2016, regarding the above-mentioned subject, the Honolulu Fire Department determined that there will be no significant impact to fire department services.

Should you have questions, please contact Acting Battalion Chief Jarin Wong of our Fire Prevention Bureau at 723-7151 or jwong1@honolulu.gov.

Sincerely,

Socrates D. Bratakos

SOCRATES D. BRATAKOS
Assistant Chief

SDB/SY:bh

TETRA TECH

April 11, 2017

Socrates D. Bratakos
Assistant Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Bratakos:

Thank you for your letter dated January 19, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, thank you for confirming that the Project will have no significant impact on the fire departments services.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

CO-8

March 13, 2017

Mr. Alex J. Roy, M.Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
Post Office Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

SUBJECT: Second Draft Environmental Assessment for Hawaiki Submarine Cable Kapolei Landing Project

The Department of Parks and Recreation is in receipt of a copy of the Second Draft Environmental Assessment for the Hawaiki Submarine Cable Kapolei Landing from Tetra Tech, Inc. requesting our review and comment.

1 The Department of Parks and Recreation has no comment.

Should you have any questions, please contact John Reid, Planner at 768-3017.

Sincerely,

Michele K. Nekota
Director

MKN:jr
(675510)

cc: Glenn Kajiwara, Department of Parks and Recreation
Megan Higgins, Project Manager Tetra Tech

TETRA TECH

April 11, 2017

Laura Leialoha Phillips McIntyre
Program Manager, Environmental Planning Office
State of Hawaii, Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Ms. McIntyre:

Thank you for your letter dated March 14, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. The Project will adhere to all applicable standards and will regularly review State and Federal environmental health land use guidance as well as visit the EPO's environmental GIS website page.
2. The project will utilize the Hawaii Environmental Health Portal.
3. The Project will comply with all requirements of the Clean Water Branch (HAR, Section 11-54-1.1, -3, 4-8) and the National Pollutant Discharge Elimination System permit (HAR, Chapter 11-55). We are currently consulting with the Army Corps of Engineers, Regulatory Branch to verify permit requirements.
4. The EPA's environmental justice mapping and screening tool EJSCREEN will be utilized in project planning.
5. Thank you for the additional climate change resources. Climate change is addressed in Section 2.1 of the Environmental Assessment.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

CO-9

March 14, 2017

Mr. Alex Roy, M.Sc.
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Roy:

Subject: Second Draft Environmental Assessment
Hawaiki Submarine Cable Landing Project
Kapolei, Hawaii

1 In response to a memorandum from Ms. Megan Higgins of Tetra Tech, Inc. dated February 21, 2017, regarding the above-mentioned subject, the Honolulu Fire Department determined that there will be no significant impact to fire department services.

Should you have questions, please contact Acting Battalion Chief Jarin Wong of our Fire Prevention Bureau at 723-7152 or jwong1@honolulu.gov.

Sincerely,

SOCRATES D. BRATAKOS
Assistant Chief

SDB/SY:bh

cc: Ms. Megan Higgins, Tetra Tech, Inc.

April 11, 2017

Socrates D. Bratakos
Assistant Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Bratakos:

Thank you for your letter dated March 14, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, thank you for confirming that the Project will have no significant impact to fire department services.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

~~LOUIS M. KEALOHA~~
CHIEF

CARY OKIMOTO
JERRY INOUYE
DEPUTY CHIEFS

OUR REFERENCE MT-DK

CO-10

March 8, 2017

2017 MAR 14 A 10: 13

DEPT OF LAND & NATURAL RESOURCES STATE OF HAWAII

OFFICE OF CONSERVATION AND COASTAL LANDS

Mr. Alex J. Roy, M.Sc.
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

This is in response to a letter (dated February 21, 2017) from Ms. Megan Higgins of Tetra Tech, Inc., requesting comments on the Second Draft Environmental Assessment for the Hawaiki Submarine Cable Landing Kapolei Project in Waianae.

1 Based on the information provided, this project should have no significant impact on the services or operations of the Honolulu Police Department at this time.

If there are any questions, please call Major Sean Naito of District 8 (Kapolei) at 723-8403.

Thank you for the opportunity to review this project.

Sincerely,

CARY OKIMOTO
Acting Chief of Police

By [signature]
MARK TSUYEMURA
Management Analyst VI
Office of the Chief

TETRA TECH

April 11, 2017

Cary Okimoto
Acting Chief of Police
Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, HI 96813

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Okimoto:

Thank you for your letter dated March 8, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, thank you for confirming that the Project will have no significant impact to the services or operations of the Honolulu Police Department.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

ROBERT J. KRONING, P.E.
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

CO-11

March 14, 2017

Department of Land and Natural Resources
Office of Conservation and Coastal Lands
Attn: Alex J. Roy, M.Sc.
P.O. Box 621
Honolulu, HI 96809

2017 MAR 16 A 10:49

Dear Mr. Roy,

Subject: Second Draft Environmental Assessment for Hawaiki Submarine Cable Kapolei Landing Project

1 Thank you for the opportunity to review and comment. The Department of Design and Construction, Facilities Division did comment that the project passes under the City beach park. There are no concerns as long as no structures are needed on the City property.

If you have any other questions regarding this comment please call Clifford Lau, Chief of our Facilities Division at 768-8483.

Sincerely,

Robert J. Kroning, P.E.
Director

RJK:ms(681358)

TETRA TECH

April 11, 2017

Robert Kroning
Director
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, HI 96843

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Kroning:

Thank you for your letter dated March 14, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. Thank you for confirming that the Project will pass under the City beach park. The Project does not require structures on the City property. As stated in the Environmental Assessment, the horizontal directional drilled (HDD) conduit would be installed beneath the property. Thank you for confirming that the Department has no concerns as long as no structures are needed on the City property.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

CO-12

March 13, 2017

Mr. Alex J. Roy, M.Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Roy:

Subject: Your Letter Dated February 21, 2017 Requesting Comments on the Second Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Landing Project in Kapolei - Tax Map Key: 9-1-049: 001, 002, 005, 9-2-051: 011

Thank you for the opportunity to comment on the proposed cable landing project.

1 The existing water system is adequate to accommodate the proposed submarine cable landing project. However, please be advised that this information is based upon current data, and therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of the building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

2 When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

3 The construction drawings should be submitted for our review, and the construction schedule should be coordinated to minimize impact to the water system.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

for ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

TETRA TECH

April 11, 2017

Ernest Y. W Lau, P.E.
Manager and Chief Engineer
Board of Water Supply, City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96843

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Lau:

Thank you for your letter dated March 13, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. Thank you for confirming that the existing water system is adequate to accommodate the proposed Project. We acknowledge that Board of water Supply reserves the right to change position on the Project until the final approval of the building permit application, and that the final decision on water availability will be confirmed when the building permit application is submitted for approval.
2. We acknowledge that Hawaiki Submarine Cable USA will pay water system facility charges for resource development, transmission, and daily storage.
3. Construction drawing will be submitted to the Board of Water Supply for review and the construction schedule will be coordinated to minimize impact on the water system.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
Tel 808.441.6652 Fax 808.836.1689 www.tetratech.com

KHLF

KALAELOA HERITAGE AND LEGACY FOUNDATION

P.O. Box 75447 Kapolei, HI 96707

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2017 JAN 24 P 1:28

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

January 19, 2017

Alex J. Roy, M. Sc.
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

ORG-1

Aloha Alex,

The mission statement of the Kalaeloa Heritage and Legacy Foundation, a 501c3 non-profit is "Through partnership, planning, advocacy and stewardship, the Kupa'aina of Honouliuli accepts the kuleana to preserve and protect our kupuna, historical sites and mo'olelo of Kalaeloa. We are also committed to assuring that cultural traditions and practices of na 'oiwi o Kalaeloa are perpetuated".

1 Our comments with respect to your request is in keeping with our mission statement. We have received request for comments from others to include archaeologist and Waianae residents and our comments have been the same. The only known historic cultural structure that we are aware of is outside the area of potential effects and distance away.

We have not had the opportunity to review your Draft Environmental Assessment. However our comment is consistent with our mission statement. Appreciate the opportunity to comment.

Mahalo,

Shad Kane, Board Member
Kalaeloa Heritage and Legacy Foundation

TETRA TECH

April 11, 2017

Shad Kane
Director
Kalaeloa Heritage and Legacy Foundation
P.O. Box 75447
Kapolei, HI 96707

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai'i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Kane:

Thank you for your letter dated January 19, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

An archeological inventory survey (AIS) has been completed for the Project and was approved by the Hawaii State Historic Preservation Division (SHPD) on March 16, 2017. The Final AIS is included in Appendix F of the Environmental Assessment. Thank you for confirming that known historic cultural sites are outside of the Project area. Community outreach for the Project began in October 2016. The Applicants have hosted community meetings to share information about the proposed Project, and have provided presentations to the Wai'anae Coast, Nanakuli/Maili, and Makakilo/Kapolei/Honokai Hale Neighborhood Boards. A complete list of consultations can be found in section 9.0 of the EA.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

BA/G

March 16, 2017

ORG-2

Mr. Alex J. Roy
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
PO Box 621
Honolulu, Hawaii 96809

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2017 MAR 20 A 11:25
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Dear Mr. Roy:

Subject: Proposed Hawaiki Submarine Cable Landing Project

1 Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Should HECO have existing easements and facilities on the subject property, we will need continued access for maintenance of our facilities.

2 We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Hawaiki Submarine Cable Landing Project comes to fruition, please continue to keep us informed. We have recognized the project is in the vicinity of some of our existing fiber cables to our Kahe Power Plant. Further along in the design, we will be better able to evaluate potential impacts to our fiber cables and the effects on our system facilities.

If you have any questions, please call me at 543-7245

Sincerely,

FOR RLIU

Rouen Q.W. Liu
Permits Engineer

RL:kmk

Cc: Alan Oshima

TETRA TECH

April 11, 2017

Rouen Q.W. Liu
Hawaiian Electric
P.O. Box 2750
Honolulu, HI 96840-0001

Subject: Draft Environmental Assessment for the Proposed Hawaiki Submarine Cable Kapolei Landing Project, Kapolei, Hawai‘i, TMKs (1) 9-2-051:011, (1) 9-2-051:001, (1) 9-2-049:002, (1) 9-2-049:005, and (1) 9-2-049:001, (1) 9-2-051:001 (por.) and (1) 9-2-051:010 (por.)

Dear Mr. Liu:

Thank you for your letter dated March 16, 2017, on the proposed Hawaiki Submarine Cable Kapolei Landing Project (Project). On behalf of the Hawaiki Submarine Cable USA and TE SubCom, please see the following responses to your comments.

1. We acknowledge your comment that you have no objection to the Project.
2. There are no HECO easements or facilities in the Project Area; however, there are existing HECO overhead utility lines located on the mauka side of Farrington Highway adjacent to the Project Area, and as noted in your letter, the Kahe Electric Power Plant is nearby.
3. The Applicants will continue to coordinate with HECO throughout the design of the Project.

Again, thank you for your letter, which will be included in the Final Environmental Assessment. If you have any questions, please contact Megan Higgins at 808.441.6600 or by email at Megan.Higgins@tetratech.com.

Sincerely,
TETRA TECH, INCORPORATED

Megan E. Higgins

Megan Higgins
Senior Project Manager

cc: Alex Roy, Office of Conservation and Coastal Lands
Dan Walsh, TE SubCom
Richard Howarth, Hawaiki Submarine Cable USA

Tetra Tech, Inc.
737 Bishop Street, Suite 2340, Honolulu, Hawaii 96813
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