LINDA LINGLE
GOVERNOR OF HAWAII

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

YVONNE Y. IZU
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

'04 MAY 26 P4:00

Ref.:PB:MM

MAY 25 2004

Files: CDUA ST-3176

MEMORANDUM

TO: Genevieve Salmonson, Director
~~Office of Environmental~~ Quality Control

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: Final Environmental Assessment (FEA)/Finding of No Significant Impact (FONSI) for CDUA ST-3176 for the Installation of a Submarine Fiber Optic Telecommunications Cable Project Statewide

The Department of Land and Natural Resources has reviewed the FEA. We have determined that this project will not have significant environmental effects, and have therefore issued a **FONSI**. Please publish this notice in the June 8, 2004 OEQC Environmental Notice.

Comments on the draft EA were sought from relevant agencies and the public, and were included in the final EA. The applicant has responded to these comments in a satisfactory manner. The applicant will deliver four (4) copies of the Final EA for the project. The applicant will also be submitting the OEQC Bulletin Publication Form.

It should be noted that acceptance of this EA does not constitute a project approval by the Board of Land and Natural Resources (BLNR). The BLNR has the discretion to approve or deny or modify the project.

Please contact me at 587-0381 if you have any questions on this matter.

Cc: Randal Urasaki

2004-06-08 ~~EBA~~ FONSI
SANDWICH ISLES COMMUNICATIONS
SUBMARINE FIBER-OPTIC CABLE
VOL 1 OF 2

Volume 1 of 2

Final Environmental Assessment/ Finding of No Significant Impact

Submarine Fiber-Optic Cable Project

Prepared Pursuant to
Chapter 343, Hawaii Revised Statutes and
Title 11, Chapter 200, Hawaii Administrative Rules

Proposed by:
Sandwich Isles Communications, Inc.

Prepared by:
Parsons Brinckerhoff Quade & Douglas, Inc.

April 2004

SUMMARY INFORMATION

PROJECT NAME: Submarine Fiber-Optic Cable Project

APPLICANT INFORMATION:
Sandwich Isles Communications, Inc. (SIC)
Pauahi Tower, 27th Floor
1001 Bishop Street
Honolulu, Hawaii 96813
Contact: Mr. Roy Choates

AUTHORIZED AGENT:
Parsons Brinckerhoff Quade & Douglas, Inc.
American Savings Bank Tower, Suite 3000
1001 Bishop Street
Honolulu, Hawai'i 96813
Contact: Mr. Randall Urasaki, P.E.

ACCEPTING AGENCY:
State of Hawai'i Department of Land and Natural Resources (Hawai'i *Revised Statutes, Chapter 343*)

PROJECT DESCRIPTION:

The State of Hawai'i Department of Hawaiian Home Lands (DHHL) has licensed SIC to provide exclusive telecommunications services to its landholdings statewide through modern, high speed, fiber-optic cable networks. SIC is currently developing terrestrial fiber-optic cable networks on the islands of Kaua'i, O'ahu, Moloka'i, Maui and Hawai'i.

The proposed project would link the five islands by deploying four submarine fiber-optic cable routes, totaling about 300 miles. The submarine cables would involve seven "landing sites", which would provide the connections between the submarine and terrestrial networks.

Four of the seven landing sites would provide direct connections with the terrestrial networks. For the other three landing sites, the proposed project also includes cable extensions between the landing sites and the terrestrial networks. These "connecting routes" would utilize the rights-of-way of existing roads, and would be constructed similar to how cables in the terrestrial networks were installed.

PROJECT LOCATION TAX MAP KEY; AND LAND OWNER (INCLUDING CONNECTING ROUTES):

Statewide ocean area among the islands of Kaua'i, O'ahu, Moloka'i, Maui and Hawaii

Coastal and nearshore areas at or near the following locations, which were selected as proposed landing sites:

1) 'Akialoa Road, Kekaha, Kaua'i; TMK: por. 4-1-2:032 and 4-1-3-001:999; owner: DHHL

2) Kili Drive, Mākaha, O'ahu: TMK: por. 1-8-4-002:047; owner: City & County of Honolulu

SUMMARY INFORMATION

3) Oneali'i Homesteads, Kaunakakai, Moloka'i; TMK: 2-5-4-006:019; owner: DHHL

4) Wahikuli, Lahaina, Maui: TMK: por. 2-4-5-021:007, 015; owner: County of Maui and State of Hawai'i

5) Po'olenalena Park, Mākena, Maui; TMK: por. 2-2-1-007:072, 084; owner: State of Hawaii

6) Kaewa Place, Kawaihai, Hawai'i; TMK: por. 3-6-1-004:020; owner: DHHL

Each landing site would use the following road rights-of-way, which are owned by the State Department of Transportation (SDOT) or one of the counties:

1) 'Akialoa Road Landing Site and Connecting Route: Kaumuali'i Highway (owner: SDOT), and 'Akialoa and Ulili Roads (owner: County of Kaua'i)

2) Kili Drive Landing Site and Connecting Route: Farrington Highway (owner: SDOT) and Kili Drive (City & County of Honolulu owner)

3) Sandy Beach Park Landing Site and Connecting Route: Kalaniana'ole Highway (owner: SDOT)

4) Oneali'i Homesteads Landing Site: Kamehameha V Highway (owner: SDOT)

5) Wahikuli Landing Site: Honoapi'ilani Highway (owner: SDOT)

6) Po'olenalena Park Landing Site: Mākena Alanui Road (owner: County of Maui)

7) Kaewa Place Landing Site: Akoni Pule Highway (owner: SDOT)

Executive Summary

Final Environmental Assessment/ Finding of No Significant Impact

Submarine Fiber-Optic Cable Project

EXECUTIVE SUMMARY

S.1 INTRODUCTION

This Final Environmental Assessment (EA) / Finding of No Significant Impact (FONSI) has been prepared to comply with the requirements of Chapter 343 of the Hawai'i Revised Statutes (HRS). This document discloses potential impacts that may result from the installation and operation of the Sandwich Isle Communications, Inc. (SIC) Submarine Fiber-Optic Cable Project.

SIC, a Native Hawaiian owned corporation, proposes to construct and operate an undersea fiber-optic cable system that would link the five major Hawaiian Islands (Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i). The undersea network will connect with SIC's terrestrial fiber-optic cable network on each island. While each terrestrial system serves the Hawaiian Home Lands on that island, the combination of the terrestrial and submarine systems would provide connectivity to most Hawaiian Home Lands statewide. The SIC network would be independent of existing communications networks owned and operated by other telecommunications providers.

Fiber-optic cable carries information or data through a glass fiber as light pulses. Fiber-optic cables represent advancement over copper cables because of larger capacity, less signal attenuation, resistance to electromagnetic "noise" from outside sources, and reduced maintenance cost.

S.1.1 Applicant

Sandwich Isle Communications, Inc., headquartered in Honolulu, Hawai'i, is licensed by the State Department of Hawaiian Home Lands (DHHL) to provide telecommunications services on the Department's property (Hawaiian Home Lands). The company was incorporated in 1995, and has been serving Hawaiian Home Lands since 1998. The Federal Communications Commission (FCC) certified SIC in 1998 as a rural local exchange carrier (RLEC). SIC is commissioned and regulated by the FCC, and is authorized by the State of Hawaii Public Utilities Commission (PUC) to provide telecommunications services on Hawaiian Home Lands.

S.1.2 Background and Purpose

The Hawaiian Homes Commission Act of 1920 created the mission to provide eligible native Hawaiians (those with at least a 50 percent blood quantum) with long term leased land to improve their quality of life. The lands made available for this purpose are called Hawaiian Home Lands. DHHL granted a license to SIC to provide modern telecommunications infrastructure and services for its properties and beneficiaries at no cost to DHHL. The individual subscribers would pay a fee equal to or less than the competitive rate.

Many Hawaiian Home Land properties are in rural areas with little access to basic infrastructure, such as telephone service. Broadband telecommunications service would help increase the standard of living and quality of life of native Hawaiian beneficiaries living in Hawaiian Home Land communities as well as increase the infrastructure services on DHHL commercial properties. To meet its obligation to DHHL, SIC is currently installing independent terrestrial fiber-optic cable networks on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i, generally using State and County road rights-of-way. Environmental reviews of the terrestrial networks have already been completed.

The submarine network is designed to work in conjunction with and enhance those benefits provided by the terrestrial systems. The SIC network would provide underserved DHHL homesteaders with affordable telephone and advanced telecommunications services, such as telemedicine, distance learning, video and data transmission, and internet access. The combination of the terrestrial and submarine networks would extend the reach of the SIC network to connect most DHHL properties on all islands, and would provide connectivity statewide among DHHL homesteads.

The specific benefits of the submarine network include the following:

- Ability to provide DHHL beneficiaries with affordable telecommunication services. Having an independent submarine system would mean that SIC would not have to rely on third party lines for inter-island connections.
- Ability to provide DHHL beneficiaries with modern telecommunication services and attract potential lessees for DHHL's commercial properties.
- Reliability of a new fiber-optic network. The SIC submarine network would be newer than the existing networks, and would provide sufficient capacity to serve the anticipated demand from DHHL properties.
- Providing employment opportunities for skilled and unskilled labor in the state.
- Ability to provide emergency telecommunication's service to historically remote rural communities

S.1.3 Accepting Agencies and Planning Process

Environmental review in accordance with HRS Chapter 343 is required for the proposed project because of use of: the State Conservation District, the Special Management Areas on each affected island, and State and county land, specifically DHHL properties and public road rights-of-way. These "triggers" involve several agencies including DHHL, the State of Hawai'i Department of Land and Natural Resources (DLNR), the State of Hawai'i Department of Transportation (SDOT), and the four county planning departments. Under HRS Chapter 343, only one of these agencies can be the "accepting agency" of the project's EA. Consistent with guidance provided in Section 11-200-4(b) of the Hawai'i Administrative Rules (HAR), DLNR was identified as the most appropriate accepting agency.

Based on Significance Criteria specified in HAR 11-200-12(b), the project is not anticipated to have a significant impact. Therefore, an EA process was selected for the environmental review of this project.[1]

Notice of the project's Draft EA published in the Office of Environmental Quality Control's (OEQC) The Environmental Notice on February 23, 2004 initiated a 30-day public review period that ended on March 23, 2004. The Draft EA was made available for public review in accordance with OEQC and DLNR requirements.

DLNR has decided to issue a Finding of No Significant Impact (FONSI) pursuant to HRS Chapter 343. This decision was made after careful consideration of the comments received on the Draft EA, and SIC's responses to those comments. DLNR's FONSI determination and the availability of this Final EA would also be announced in The Environmental Notice.

Federal loans administered by the U.S. Department of Agriculture, Rural Utilities Service (RUS), will help finance construction of the project. One of the missions of RUS is to facilitate the development of certain utility systems in rural areas in order to provide telephone services to a level comparable to urban areas. In addition, the Federal Communications Commission (FCC) would need to issue a Cable Landing License for the project.

Because of loan assistance from RUS, a federal agency, and the need for a Cable Landing License from the FCC, also a federal agency, this project must also comply with the federal National Environmental Policy Act (NEPA). This Final EA is not intended to address NEPA requirements. Rather, a stand alone NEPA EA, which will incorporate the information contained this Final EA, will serve as the environmental

[1] EAs were prepared for similar undersea fiber optic projects.

document satisfying RUS's requirements under NEPA. Like DLNR, RUS is expected to issue a FONSI determination.

S.2 PROPOSED ACTION

SIC proposes to construct and operate approximately 300 miles of submarine fiber-optic cables Statewide, divided into four segments (see Figure S-1):

- Kekaha, Kaua'i, to Mākaha, O'ahu;
- Hawai'i Kai, O'ahu, to Kaunakakai, Moloka'i;
- Kaunakakai, Moloka'i, to Lahaina, Maui; and
- Mākena, Maui, to Kawaihae, Hawai'i.

The alignments shown on Figure S-1 were carefully selected based on many factors including bathymetry, existing cable or pipe crossings, military restrictions, fishing grounds, other environmental factors, and the potential for undersea natural hazards.

The submarine system would be comprised of three types of cables. Lightweight protected cable would be used at depths from 2,000 to 15,000 feet in areas with little potential for cable damage. Single armor cable would be used at depths up to 2,000 feet in areas with moderate hazards, such as gently sloped areas where sediment flows may occur. Double armor cable would be used at depths up to 350 or in areas with high potential for cable damage. For example, double armor cable would be used at all near shore locations where the cable could be exposed to natural hazards.

The lengths of the SIC submarine cable runs would be short enough to avoid the need for underwater repeaters to maintain signal strength.

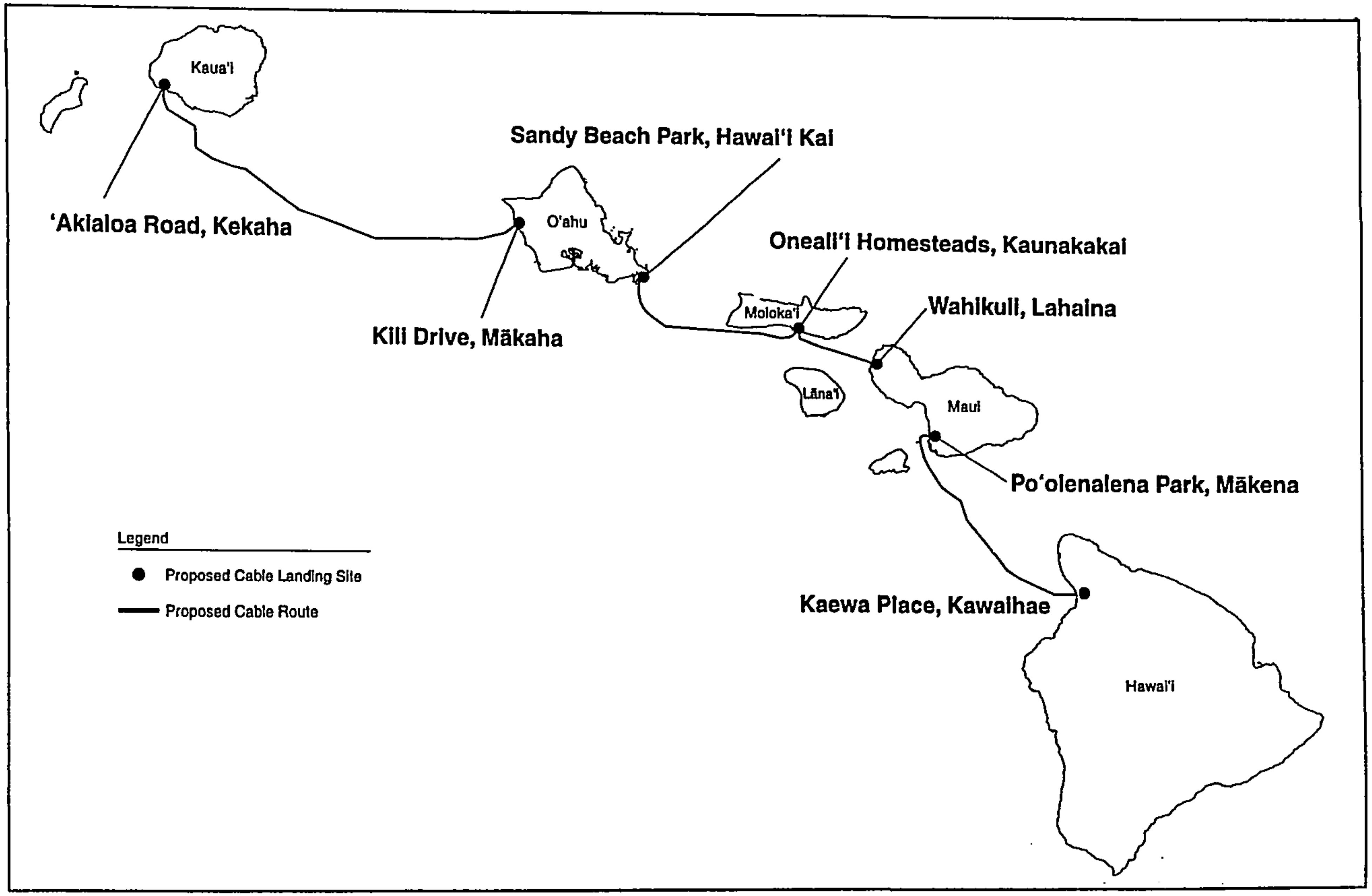
The submarine cables would achieve landfall at the following sites. These landing sites would be the nodes where the SIC submarine and terrestrial networks connect (see Figures S-2A through S-2E):

- 'Akialoa Road, Kekaha, Kaua'i (TMK: 4-1-2-002:032, 4-1-3-001:999)
- Kili Drive, Mākaha, O'ahu (TMK: 1-8-4-002:047)
- Sandy Beach Park, Hawai'i Kai, O'ahu (TMK: 1-3-9-015:001)
- Oneali'i Homesteads, Kaunakakai, Moloka'i (TMK: 2-5-4-006:019)
- Wahikuli, Lahaina, Maui (TMK: 2-4-5-021:007, 015)
- Po'olenalena Park, Mākena, Maui (TMK: 2-2-1-007:072, 084)
- Kaewa Place, Kawaihae, Hawai'i (TMK: 3-6-1-004:020)

The landing sites proposed on Moloka'i, Maui, and Hawai'i are adjacent to existing or future SIC terrestrial cables running within the rights-of-way of the nearest roadway. However, the three proposed landing site parcels on Kaua'i and O'ahu are not adjacent to existing or future terrestrial cables. Therefore, at these landing sites, sections of underground fiber-optic cable will be installed in road rights-of-ways to connect the landing site to the closest approach of the terrestrial network. These connections are called "connecting routes".

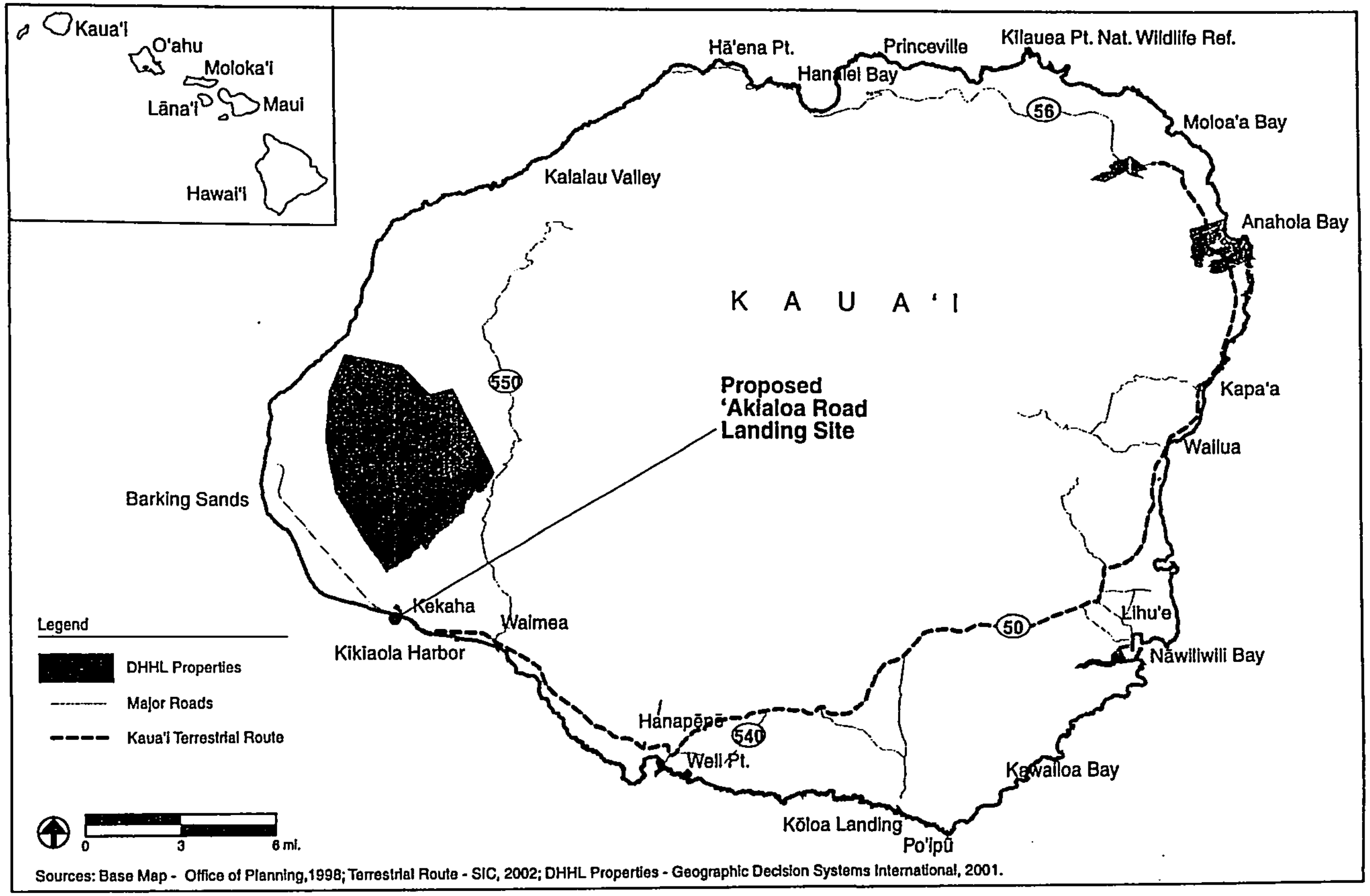
The following describes the elements of a typical landing site moving from the ocean side to the land (see Figures S-3 and S-4):

- Double armor protected fiber-optic cable (+60-foot depth);
- Fiber-optic cable within an under-seafloor steel drill casing or conduit between the submarine exit point (or "EP") and the drill site;
- Fiber-optic cable within a PVC pipe or conduit between the drill site and the beach manhole (three landing sites do not require this particular element because the drill site is on the mauka side of the manhole); and



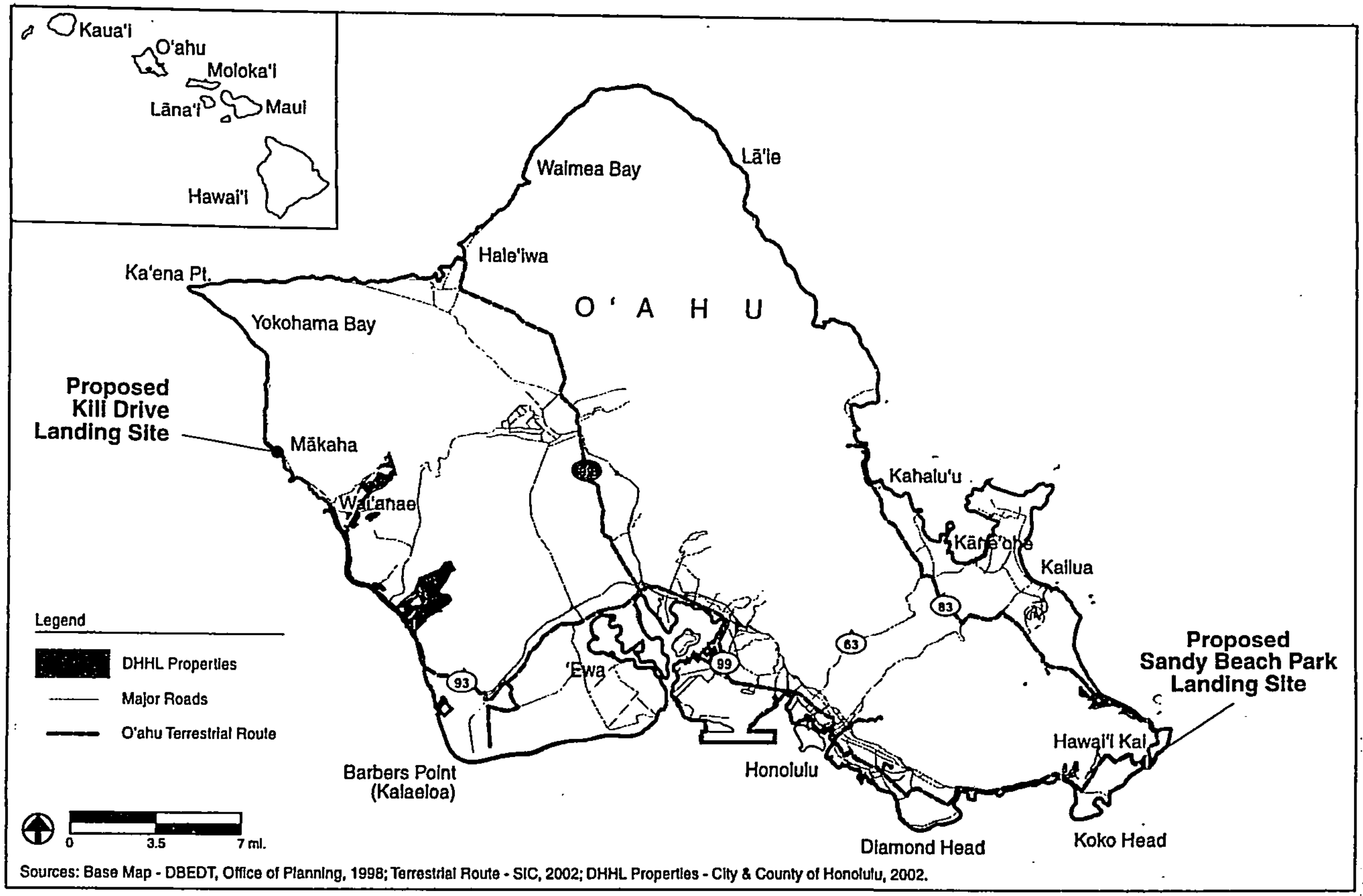
Sandwich Isles Communications, Inc.

Proposed SIC Submarine Fiber-Optic Network
Submarine Fiber-Optic Cable Project
Figure S-1



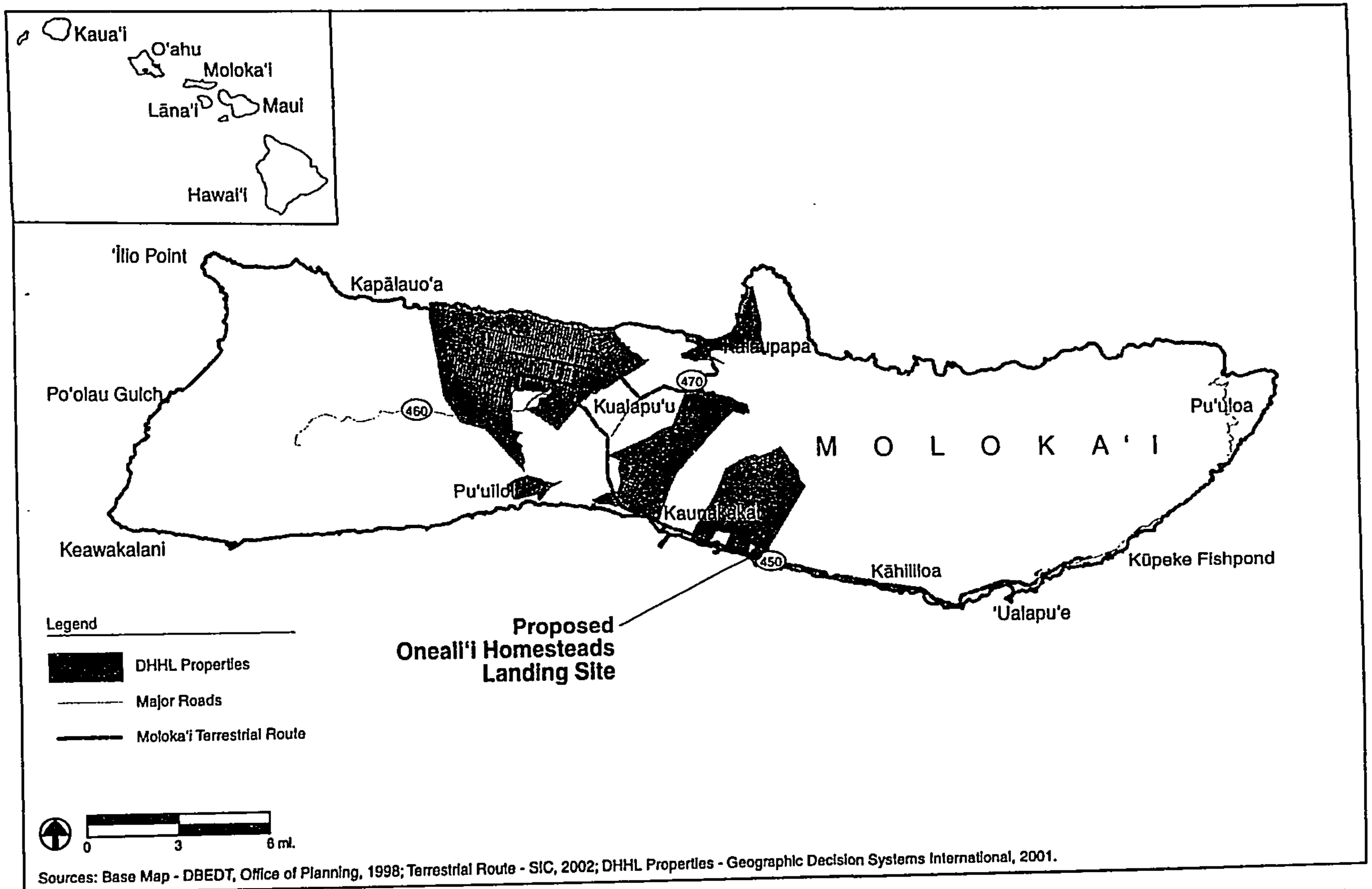
Sandwich Isles Communications, Inc.

Location of Proposed 'Akialoa Road Landing Site
Submarine Fiber-Optic Cable Project
Figure S-2A



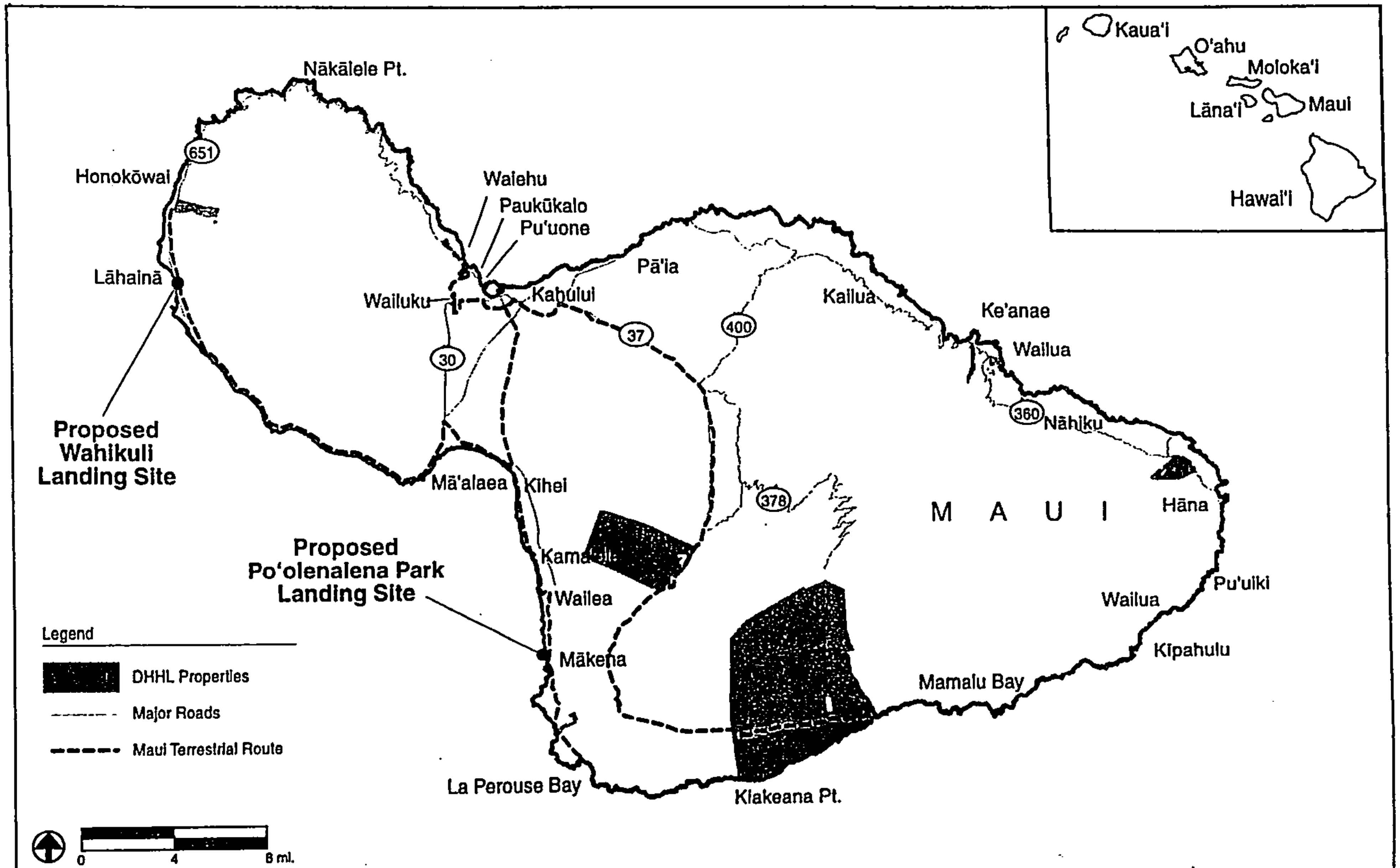
Sandwich Isles Communications, Inc.

Locations of Proposed Kili Drive and Sandy Beach Park Landing Sites
Submarine Fiber-Optic Cable Project
Figure S-2B



Sandwich Isles Communications, Inc.

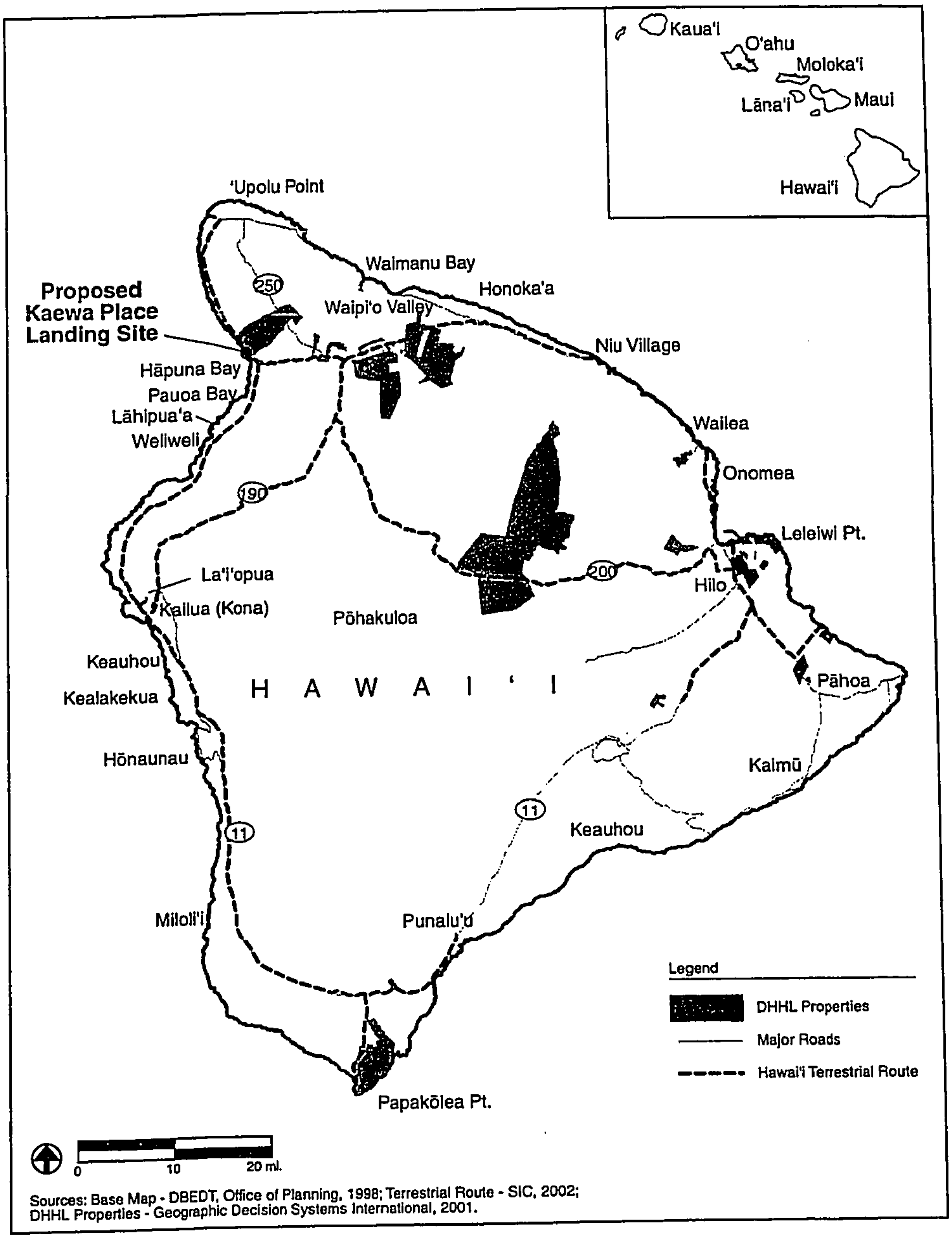
Location of Proposed Oneali'i Homesteads Landing Site
Submarine Fiber-Optic Cable Project
Figure S-2C



Sources: Base Map - DBEDT, Office of Planning, 1998; Terrestrial Route - SIC, 2002; DHHL Properties - Geographic Decision Systems International, 2001.

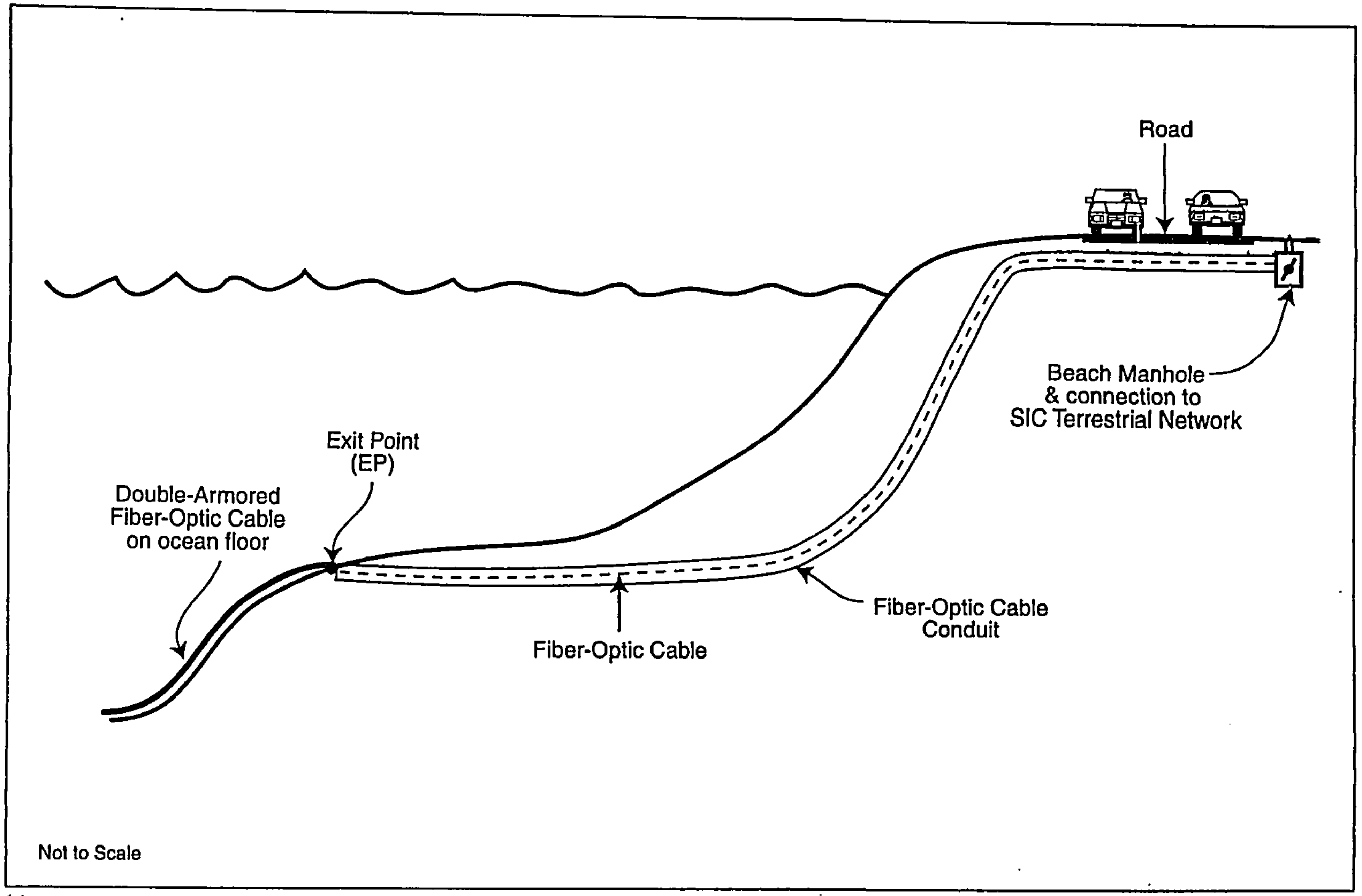
Sandwich Isles Communications, Inc.

Locations of Proposed Wahikuli and Po'olenalena Landing Sites
Submarine Fiber-Optic Cable Project
Figure S-2D



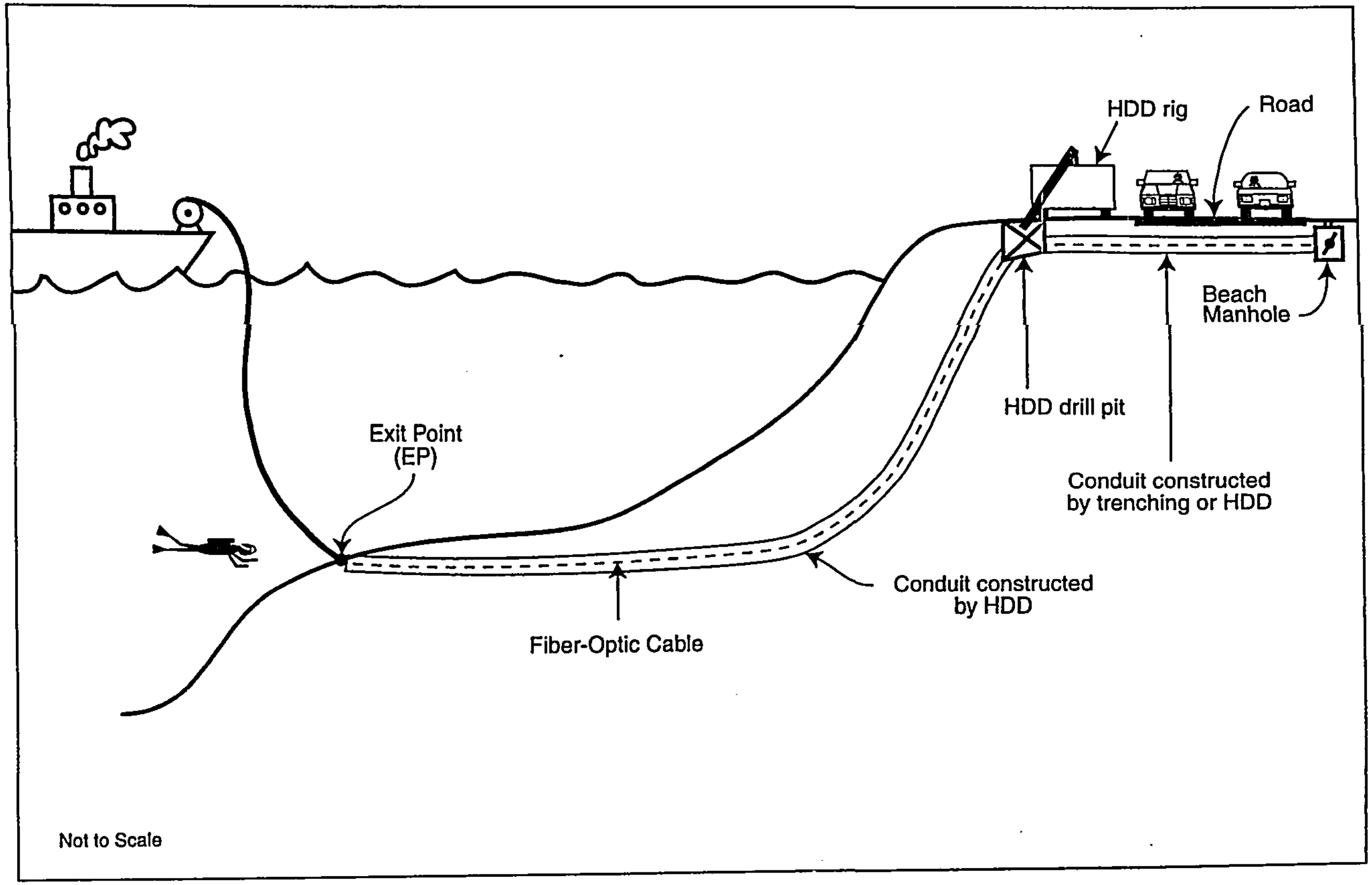
Sandwich Isles Communications, Inc.

Location of Proposed Kaewa Place Landing Site
Submarine Fiber-Optic Cable Project
Figure S-2E



Sandwich Isles Communications, Inc.

Typical Landing Site Infrastructure (As Completed)
Submarine Fiber-Optic Cable Project
Figure S-3



Sandwich Isles Communications, Inc.

Typical Construction Elements at Landing Sites
Submarine Fiber-Optic Cable Project
Figure S-4

- Beach manhole within the nearest road right-of-way, which is the point of connection of the submarine and terrestrial networks (or via connecting route for three of the landing sites: 'Akialoa Road, Kili Drive, and Sandy Beach Park).

S.3 PROPOSED CONSTRUCTION METHODS

A specialized cable-laying ship would precisely place the cable along a selected alignment between landing sites. While moving, the vessel would release the cable at a rate to accurately place the cable on the ocean floor.

Horizontal directional drilling (HDD) would be used to construct the cable landfalls. In the past, cable landfalls were constructed using open trenches. These trenches disturbed the surface of the land and cut through sensitive coastal and near shore resources, such as beaches and coral reefs. The use of HDD avoids adversely affecting such resources because a small diameter underground bore is created, avoiding surface disturbance along the length of the cable run. HDD can be conducted during rough weather and high waves because the operation would be shore-based, and excavation would occur below the ocean floor.

HDD involves the use of a special type of drilling rig supported by other equipment. A small pit is excavated for the drill entry point. From the entrance pit, the drill head commences boring towards the ocean, as shown in Figure S-4. The drill head can be changed depending on the type of soil or rock encountered. Drilling can be guided or steered both horizontally and vertically, but the angle of the drilling can be no more than 15 degrees. A probe located near the drill head allows the HDD operator to monitor and remotely control the precise vertical and horizontal location of the drill head. Sections of steel pipe, called drill casings, are used to push the drill head forward. These casings would remain in place and later be used as the fiber-optic cable conduit.

As the drill head bores its way underground, soil and rock is ground up, and this excavated material, called drill cuttings, is removed to create a hollow subterranean bore. Slurry, or drilling mud, is used to lubricate the drilling action, flush cuttings from the drill face and transport them back to the drill pit, and help seal the bore. The drilling mud consists of water and bentonite, a natural clay material, and is not toxic or harmful to the environment. A constant flow of slurry and cuttings is pumped back to the rig and into a centrifuge, called a desander or drilling fluid/mud handling tank. The cuttings are separated from the slurry in the centrifuge. The cleaned slurry is then recycled and re-injected into the bore hole. The cuttings are collected, dried, and disposed at a landfill.

The drill head progresses to the underwater EP, which will be located approximately 60 feet below mean sea level (msl) or deeper to protect the cable from damage from surface wave action. Just prior to reaching the EP, the slurry in the bore is replaced by water so that when the drill head breaks out into the ocean, there will be no discharge of slurry and/or cuttings into the ocean. A diver will remove the drill head and cap the bore to await later installation of the fiber-optic cable being delivered by the cable laying ship.

Upon arrival at the landing site, the cable ship would set a position near the EP using tugboats, side-thrusters, or other means. The vessel would release the appropriate amount of cable. Using small motorboats and/or other mechanical means and divers, the cable will be pulled to the EP and through the steel drill casing to the drill pit.

The beach manhole, with typical inside dimensions of 12 feet long by 7 feet wide and 7 feet deep, would be excavated within the nearest State or county road right-of-way.

A section of cable will need to be installed between the drill site and the beach manhole. A trench about one-foot wide and three-feet deep will be excavated for placement of the conduit. The fiber-optic cable is pulled through the conduit and spliced to the terrestrial fiber-optic cable at the beach manhole. Three of the landing sites do not require trenching between the drill site and beach manhole because the drill site would be mauka of the manhole. Similar trenching would also be conducted in roadway rights-of-way to install the connecting route fiber-optic cable.

Table S-1 summarizes the construction details by landing site.

TABLE S-1
SUMMARY OF CONSTRUCTION DETAILS BY LANDING SITE

Landing Site	Approx. HDD Distance	Trenching Between Drill Site and Manhole	Location of Beach Manhole	Connecting Route
'Akialoa Road (Kaua'i)	3,600 ft	No	Kaumuali'i Hwy	Yes (4,500 ft)
Kili Drive (O'ahu)	3,500 ft	No	Farrington Hwy	Yes (17,200 ft)
Sandy Beach Park (O'ahu)	2,100 ft	Yes	Kalaniana'ole Hwy	Yes (1,800 ft)
Oneali'i Homesteads (Moloka'i)	4,500 ft	Yes	Kamehameha V Hwy	No
Wahikuli (Maui)	2,860 ft	No	Honoapi'ilani Hwy	No
Po'olenalena Park (Maui)	1,900 ft	Yes	Mākena Road	No
Kaewa Place (Hawai'i)	3,200 ft	Yes	Akoni Pule Hwy	No

Source: Parsons Brinckerhoff, 2003.

S.4 ALTERNATIVES

Stretches of coastline, called "landing regions", were identified for each island. Identification of the landing regions was based on factors including providing connectivity to remote rural Hawaiian Home Lands, the ease of establishing a connection with the terrestrial networks; and design criteria of the submarine network.

The following landing regions were identified:

- Kekaha, Kaua'i;
- Mākaha, O'ahu;
- Hawai'i Kai-Waimānalo, O'ahu;
- Kaunakakai (and east along the south shore), Moloka'i;
- Honokowai-Lahaina, Maui;
- Mākena-Kahikinui, Maui; and
- North Kohala-Kawaihae, Hawai'i.

Multiple candidate (alternative) landing sites were identified within each of the landing regions. The initial and most important criterion for screening candidate landing sites was the technical feasibility of using HDD in order to minimize impact to the environment and natural resources. In general, near shore ocean conditions were not a major factor in assessing technical feasibility of the proposed landing sites because of the proposed use of HDD. The EP would be engineered to be in an area with sandy or benign (e.g., no live coral) bottom conditions. In terms of land ownership, Hawaiian Home Lands were generally the first choice as landing site parcels, if all other factors were equal. If not available, other government-owned properties were sought. Private land was the last choice, but none of the sites finally selected are on private property. Surrounding land uses were a major factor because construction activities could have an adverse affect on certain land uses, such as residences.

A desktop analysis using geographic information system (GIS) software was used to identify candidate landing sites, which are listed on Table S-2. GIS allows various mapped data layers including topography, land ownership, zoning, and bathymetry to be overlaid, which can expedite identification of acceptable sites. Candidate sites were field checked by environmental planners, civil and marine engineers, archaeologists, cultural consultants, community outreach specialists, and biologists.

TABLE S-2
CANDIDATE LANDING SITES BY LANDING REGION

Kekaha	Mākaha	Hawai'i Kai-Waimānalo	Kaunakakai	Honokowai-Lahaina	Mākena-Kahikinui	N. Kohala-Kawaihae
1. 'Alae Rd 2. 'Iwa Rd 3. Akepa Rd 4. Kikiaola Harbor 5. 'Akialoa Rd*	1. Keawa'ula 2. Mākua/Puna pōhaku 3. Kea'au-OLCC 4. Orange St-Mauna Lahilahi 5. Kili Drive*	1. Makai Pier 2. Kaiwi 3. Sandy Beach Park*	1. Kiowea Park 2. Kaunakakai Harbor 3. Kamiloloa 4. 'Ōnini Gulch 5. Oneali'i Homesteads* 6. Kapa'akae Loop 7. Kawela Gulch	1. Lipoa Point 2. Old Kā'anapali Airport 3. Nohea Dr 1 4. Nohea Dr 2 5. Honokōwai Beach Park 6. Pōhaku Kā'anapali 7. Kahoma Stream 8. Hawai'i Omori 9. Ala Moana St 10. Civic Center Rd 1 11. Civic Center Rd 2 12. Wahikuli*	1. Kama'ole Beach Pk III 2. Hale Kama'ole 3. Wailea Beach Hotel 4. Po'olenalena Park* 5. La Perouse Bay 6. Kanahena 7. Kamana-mana	1. 'Upolu Airport 2. 'Upolu Point Loran 3. Honoipu Landing 4. Kapa'a Beach Park 5. Honokoa 6. Kawaihae Harbor 7. Kawaihae 8. Spencer Beach 9. Honokoa St 10. Kaewa Place*

Source: Parsons Brinckerhoff Quade & Douglas, Inc., July 2003.
Note: *Selected landing site.

A comparative evaluation was performed to select the proposed landing site within each landing region The selected landing site is identified by an asterisk (*) on Table S-2. Besides the criteria listed above, the selections considered local community concerns and conditions.

S.5 IMPACTS AND MITIGATION

Table S-3 summarizes the potential environmental and social impacts of the proposed project, and a summary of proposed mitigation measures for each adverse impact.

Table S-3 is organized into two columns. The first column describes system-wide (i.e., Statewide) impacts and impacts that are common to all or most landing sites. Since the proposed action at each landing site is very similar, the potential impacts at these sites also tend to be similar. Therefore, the purpose of the first column is to reduce repetition in summarizing the impacts and proposed mitigation measures for each landing site. The environmental conditions of the landing sites do differ, therefore, potential impacts that would occur only at one or a few of the landing sites along with their proposed mitigation measures, if any, are provided in the second column. Table S-3 also clusters the environmental subjects, such as archaeology, noise, water resources, etc., covered in Chapters Three through Nine (the chapters that disclose the impacts and proposed mitigation measures of the proposed landing sites) in the order provided in these chapters. Within each cluster, short-term (i.e., construction period) impacts, long-term (i.e., operational) impacts, and proposed mitigation measures are disclosed.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION

Common to All Landing Sites or System-Wide	Landing Site Specific
Topographic and Geologic Conditions	
Construction or Short-Term Impacts. HDD operations are feasible at all proposed landing sites based on soil sampling information collected for this project. Although some excavation work will be required for the drill pit and trenching, excavated areas would be backfilled with the same material. Excess excavated material, such as from the beach manhole site, would be disposed of properly in accordance with State Department of Health (SDOH) regulations. Once the landing site has been completed, the affected parcel would be restored to its pre-construction condition. HDD operations and other excavation activities at any of the proposed landing sites are not anticipated to uncover or be affected by soils previously contaminated by hazardous materials.	'Akialoa Road, Kili Drive and Sandy Beach Park landing sites. The construction areas for these three proposed landing sites include connecting routes between their beach manholes and the SIC terrestrial system. Po'olenalena Park Landing Site. The geologic (underground) conditions of the site indicate that HDD may encounter voids, which could cause the loss of slurry. This would impact the effectiveness of the drilling operation. Kaewa Place Landing Site. The EP is within an area covered by dredged spoil associated with past dredging activities at the nearby Kawaihae Harbor.
Long-Term Impacts. Once construction is completed, all landing site infrastructure would be underground and under the seafloor, and would not change the topography of the landing site parcel or the nearshore area. A beach manhole cover would be the only visible evidence of the landing site.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. See landing specific site mitigation measures to the right.	Po'olenalena Park Landing Site. When going through a void, the SIC contractor shall monitor the returning slurry. If the slurry does not return or returns in insufficient quantities, the SIC contractor shall either alter the slurry mix consistency to make it thicker, or shall grout the void. Kaewa Place Landing Site. The cuttings from the dredged spoil shall be tested to determine if it contains hazardous materials. If hazardous materials were to be found, these cuttings shall be disposed of in accordance with applicable SDOH requirements.
Land Use	
Construction or Short-Term Impacts. All proposed landing site parcels contain adequate open space to conduct HDD and other fiber-optic cable installation operations. No existing land uses on or near the proposed landing site parcels would be affected, and the parcels would	Notable differences in impacts among landing sites are not anticipated.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Land Use (continued)	
Construction or Short-Term Impacts (cont.). be restored to their pre-construction conditions immediately after construction.	See above.
Long-Term Impacts. Ten-foot wide easements would be obtained for the proposed landing sites' fiber-optic cable conduits between the shoreline and roads that would contain the beach manholes. Development is generally not allowed on most of the affected properties (e.g., park property).	Oneali'i Homesteads and Kaewa Place Landing Sites. These DHHL-owned landing site parcels may be developed in the future. The Oneali'i Homesteads easement would be established along the west side of the property and should not affect development of a homestead on the property. The Kaewa Place landing site easement would be under an existing driveway, and therefore, would also not affect future DHHL homestead development on the property.
Mitigation Measures. Mitigation is not necessary.	Landing site specific mitigation measures are not required.
Archaeological and Historic Resources	
Construction or Short-Term Impacts. In general, the areas affected by HDD operations contain no historic properties. The exceptions are provided to the right. Trenching and excavation at certain landing site parcels may uncover "significant" archaeological or historic materials (see to the right).	Po'olenalena Park Landing Site. A subsurface inventory survey of the HDD alignment uncovered a coastal habitation site consisting of multiple cultural layers and showing evidence of pre-contact Hawaiians. The site is considered "significant". No human burial remains were found within the alignment. The cultural deposit may extend mauka of the drill site but within the sand formation parcel. Therefore, in addition to the HDD operation, some of the trenching for the fiber-optic cable conduit between the drill site and Mākena Alanui Road may affect the cultural deposit. Kaewa Place Landing Site. Historic structural remains from the 1930s were found in the area proposed for HDD operations. Pursuant to concurrence by SHPD, they do not need to be preserved, and have been properly documented by the archaeological study conducted for this project. 'Akialoa Road, Oneali'i Homesteads and Wahikuli Landing Sites. Excavation or trenching along the 'Akialoa Road connecting route, and within the Oneali'i Homesteads and Wahikuli parcels may uncover "significant" materials or resources.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Archaeological and Historic Resources (continued)	
Long-Term Impacts. No Long-Term impacts to historic properties are anticipated.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. See specific landing site mitigation measures to the right.	Po'olenalena Park Landing Site. A subsurface inventory survey of the HDD staging area and a portion of the trench alignment between the drill site and Mākena Alanui Road shall be conducted to better define and evaluate the coastal habitation site. A preservation plan for the historic site shall also be completed following completion of the inventory survey. Additional mitigation measures might be proposed following the second inventory survey. Kaewa Place Landing Site. Although the historic structures do not require preservation, the SIC contractor shall be instructed to avoid disturbing the sites if possible. 'Akialoa Road, Oneali'i Homesteads and Wahikuli Landing Sites. An archaeologist shall monitor excavation and trenching along the 'Akialoa Road connecting route and within Oneali'i Homesteads and Wahikuli parcels. If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the on-site archaeologist and other appropriate persons, such as SHPD staff, can determine the nature and significance of the resources.
Cultural, Social, and Economic Activities	
Construction or Short-Term Impacts. None of the proposed landing site parcels appears to be used for recreational activities, except two parcels (Sandy Beach Park and Po'olenalena Park landing sites), which are used as part of recreational shoreline parks. Four of the seven landing site parcels are located seaward of the coastal road (the road running nearest to the shoreline). Despite this location, it is not anticipated that HDD and other fiber-optic cable	Sandy Beach Park Landing Site. The construction site would be located in the eastern corner of the park's large grassy field that mostly is used for kite flying. Most of the field is also designated as a hang glider landing area (gliders take off from the nearby Koko Head crater), but the area proposed for HDD staging is not designated for hang glider landings. During construction, which might take up to three months, kite flying would be restricted from the part of the field used for HDD staging and other construction activities, such as trenching. Hang glider

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Cultural, Social, and Economic Activities (continued)	
Construction or Short-Term Impacts (cont.). Installation operations would restrict access to the shoreline within the affected parcel, except at one site (see to the right). If access were temporarily restricted within a parcel, it would be done solely for public safety purposes. Engineering and construction jobs will be created.	Sandy Beach Park Landing Site (cont.). landings would not be affected, however. This also means that the majority of the field would be available for kite flying during construction. Oneali'i Homesteads Landing Site. The landing site parcel provides access to Ali'i Fishpond, an important cultural resource. It is not anticipated at this time that access to the fishpond would be restricted during construction. Po'olenalena Park Landing Site. The public would continue to be allowed beach access through the parcel. However, HDD staging would temporarily displace some parking spaces, which would cause inconveniences to some beach users should there be a high demand to use the beach during landing site infrastructure installation. This impact is expected to last for the duration of construction, which might up to three months. Kaewa Place Landing Site. Since access to this L-shaped parcel is relatively narrow, the SIC contractor would probably temporarily restrict access onto the property and shoreline during HDD and cable installation operations for public safety purposes. Fishing was observed on the property, and other gathering activities are possible. The access restriction is expected to last for the duration of construction, which might be up to three months.
Long-Term Impacts. Once completed, all landing site infrastructure would be underground and therefore, would not affect cultural, social or economic activities that may be conducted from the landing site parcel or areas nearby. Maintenance and servicing of the telecommunications lines are expected to support several new permanent jobs including field and office positions.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. The contractor shall be required to have good safety protocols in place, especially if the landing site is at or near a	Oneali'i Homesteads Landing Site. If access to Ali'i Fishpond were restricted during construction for safety reasons, special arrangements

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Cultural, Social, and Economic Activities (continued)	
Mitigation Measures (cont.). park, such as those landing sites in Sandy Beach and Po'olenalena Parks.	Oneali'i Homesteads Landing Site (cont.). can be made to provide safe passage through the construction area if necessary.
Visual and Aesthetic Resources	
Construction or Short-Term Impacts. Vehicles and equipment, including the HDD rig, used to construct the landing site infrastructure would be visible from certain vantage points at or near the landing site parcels, which may temporally block scenic views.	Notable differences in impacts among landing sites are not anticipated.
Long-Term Impacts. Once completed, all landing site infrastructure would be underground and therefore, would not affect existing viewplanes or scenic resources.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. Construction activities are temporary. Therefore, mitigation is not necessary.	Landing site specific mitigation measures are not required.
Water Resources	
Construction or Short-Term Impacts. The quality of any nearby surface water body, such as the Pacific Ocean, would not be affected due to the following reasons: • HDD operations produce no discharges of pollutants, and the SIC contractor shall be required to implement best management practices (BMP) if applicable, as required by SDOH regulations. • The use of drilling slurry, a lubricant made from a mixture of bentonite and water that is non-toxic, is highly controlled and monitored throughout the drilling process, • The slurry is used to both lubricate the drill cutter head and help seal the bore, along with the drill rods. Slurry is not expected to leak from the bore. • The slurry would be replaced by water immediately prior to the drill head emerging from the exit point (EP). • Although excavation is needed for trenching and beach manhole, such activities would not be conducted next to the ocean and the SIC contractor will not conduct such activities during a storm or heavy rain.	Kili Drive Landing Site. Although a small wetland was identified within the landing site parcel, the construction site (e.g., drill rig, associated equipment and supplies, etc.) will not be within the wetland. In addition, the HDD alignment will not be within the wetland. Oneali'i Homesteads Landing Site. This landing site parcel is within the U.S. Environmental Protection Agency designated Moloka'i Sole Source Aquifer, which encompasses the entire island. Adverse impacts to the aquifer are not anticipated because recharge occurs at upland locations far beyond the project site, and the aquifer gradient flows seaward.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Water Resources (continued)	
Construction or Short-Term Impacts (cont.). Despite the above characteristics of HDD and its normal operating conditions, accidental or inadvertent discharges of slurry into the ocean are possible. For example, the drill head might encounter a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean, or the contractor could miscalculate the timing of the slurry to water exchange when the drill head emerges from the EP. Slurry in the ocean would temporarily affect water turbidity, but ocean currents or wave action would be expected dissipate the turbidity relatively quickly. Bentonite in the slurry is a naturally-occurring clay material, which is not toxic or harmful to the ocean environment. The SIC contractor would immediately be aware of losses of slurry, and would stop drilling if the discharges cannot be stopped.	See above.
Long-Term Impacts. Since all landing site infrastructure would be underground, water resources would not be affected. For example, the infrastructure would not cause changes to existing floodplains, some of which encroach on some landing site parcels.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. The ‘Akialoa Road, Kili Drive, and Sandy Beach Landing Sites include connecting routes between the beach manholes and the SIC terrestrial system. The connecting routes would increase the total construction area to over one acre, the threshold in which a National Pollutant Discharge Elimination System (NPDES) permit for Stormwater Discharges Associated with Construction Activity is needed. As required by this NPDES permit, site-specific BMP plans shall be developed appropriate to the construction activity, which mainly involves trenching, cable installation and backfilling. Although the other four landing sites may not require this NPDES permit, the same site-specific BMP measures shall be used because they involve basically the same excavation work. If the contractor were to find that slurry is leaking from the drill bore into the ocean environment, there are several measures to prevent further discharges, which include modifying the slurry properties (e.g., making	Kili Drive Landing Site: A botanist shall identify a buffer zone between the construction site and wetland.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Water Resources (Continued)	
Mitigation Measures (cont.). the slurry thicker) or modifying the pressure or volume of the slurry injection into the bore. If slurry is observed in the ocean and the problem cannot immediately be resolved, drilling will stop including the introduction of additional slurry. Drilling shall resume only when the contractor has taken measures to prevent further slurry discharges into the ocean. Divers stationed at the EP when the drill head emerges into the ocean shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch.	See above.
Marine and Nearshore Conditions	
Construction or Short-Term Impacts. SCUBA surveys were used to identify EP locations and submarine cable alignments immediately seaward of the EP. Six of the seven landing site EP locations and seaward alignments consist of sandy substrate. None of the landing sites would displace live coral communities. See Water Resources section regarding slurry discharges.	Kaewa Place Landing Site. An area of dredge spoil was identified as the EP location. The area is devoid of live coral cover and is at a safe distance from entrance channel of Kawaihae Harbor.
Long-Term Impacts. Coastal or nearshore areas are vulnerable to a number of natural hazards, such as storms, hurricanes, tsunamis and high waves. However, none of these coastal hazards are anticipated to damage landing site infrastructure because the fiber-optic cable would be beneath the ocean floor and underground on the landside. For a few hundred feet seaward of the EP, the submarine cable would have double armor protection.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. See Water Resources mitigation regarding slurry discharges.	Landing site specific mitigation measures are not required.
Terrestrial and Aquatic Biology	
Construction or Short-Term Impacts. Construction at all the landing site parcels would clear small amounts of vegetation at the drill spot and along the trench up to the road that would contain the beach manhole. The three landing sites with the connecting routes would also require	Kili Drive Landing Site. The connecting route on Farrington Highway may relocate existing trees within the right-of-way depending on the cable alignment as coordinated with the State Department of Transportation (SDOT).

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Terrestrial and Aquatic Biology (continued)	
Construction or Short-Term Impacts (cont.). clearance of some vegetation if the trench is located outside the road pavement, but within the right-of-way. Vehicles and equipment parked on-site could displace vegetation. At all the landing sites, types of vegetation that would be affected are common, and many are considered weedy. After construction is completed, the contractor would return the site as much as possible to its pre-construction condition. The use of identified EP locations would avoid potential adverse impacts to live coral communities, as well as the overall aquatic biology, at all landing sites. The drill head emerging from the EP would be a controlled event, observed by divers who would cap the bore when completed to await later hook-up with the submarine cable, which will also be a controlled event conducted by divers. The drill head emergence or cable hook-up would be suspended if a threatened or endangered species and/or a marine mammal, such as the Hawaiian monk seal or green turtle, were observed in the immediate vicinity. In the event of an accidental discharge of slurry in the ocean during drilling or at the EP (see above), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidity relatively quickly. As stated above, bentonite is not toxic or hazardous to marine life. Submarine cable laying activities would avoid interactions with protected species of dolphins and whales that frequent Hawaiian waters. If whales or other marine animals are spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, the operation would be halted until the animal(s) moves away from the vessel or cable deployment area of its own volition.	See above.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Terrestrial and Aquatic Biology (continued)	
Long-Term Impacts. Affected terrestrial areas would be returned to their pre-construction botanical condition. The depth of the submarine fiber-optic cable seaward of the EP provides more than enough pressure to hold the cable in place, even under stormy conditions. Therefore, movement of the cable is not expected.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. See Water Resources mitigation. To avoid adverse interactions with marine animals during EP and cable deployment activities, divers shall observe the environment. If a protected animal is observed, the activity shall be delayed until the animal moves away from the project area of its own volition.	Kili Drive Landing Site: If applicable, SIC will try to relocate trees near their original location. A qualified arborist shall be retained to supervise the relocation of any tree affected by the connecting route. Tree relocations shall be coordinated with the SDOT.
Air Quality	
Construction or Short-Term Impacts. Noticeable fugitive dust emissions may occur during trenching and excavation to install beach manholes if the excavated soil is dry and conditions windy. Operation of construction vehicles is expected to temporarily contribute air pollutants in the vicinity of the work area. The HDD rig and compressor are diesel-powered, which emit relatively high levels of nitrogen oxide (NO_X) in comparison to gasoline-powered equipment. The effects of NO_X are evaluated on a regional basis, and would therefore, would not be violated by emissions at single spot locations on each of the islands.	Notable differences in impacts among landing sites are not anticipated.
Long-Term Impacts. Ambient air quality conditions will not be affected because landing site infrastructure do not emit air pollutants.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. As required by SDOH regulations, the SIC contractor shall prevent fugitive dust emissions from migrating beyond the construction site by watering or covering exposed soils. The SIC contractor shall also be required to maintain his or her equipment in proper working order, including exhaust systems. Upon completion of work the project site shall be re-vegetated as appropriate to control erosion and release of dust by the wind.	Landing site specific mitigation measures are not required.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Noise	
Construction or Short-Term Impacts. HDD operations involve equipment that produces noise, such as air compressors, and the diesel-powered drill rig, which produces noise levels as high as 94 decibels 50 feet away. This noise level is comparable to the noise from a lawnmower. The estimated number of residences that may be affected by HDD noise emissions are provided on the right by landing site. However, HDD operations and other construction activities would be conducted within the hours allowed for construction, 7 a.m. to 6 p.m. Mondays through Friday and Saturdays 9 a.m. to 6 p.m. HDD operations would probably violate Community Noise Control Standards, therefore, the SIC contractor would require a noise permit from the SDOH.	'Akialoa Road Landing Site. One single-family residence is located about 100 feet from the drill site. Oneali'i Homesteads Landing Site. Two single-family residences are located on parcels immediately west and east of this landing site parcel Wahikuli Landing Site. Three or four single-family residences are located on the edge of a suburban neighborhood to the south of this landing site parcel. Po'olenalena Park Landing Site. A large residence adjacent to the site may be affected, but is separated from the parcel by a high wall, which would provide some noise attenuation. Noise emissions from the drill rig could disturb beach users next to the parking lot, but the beach is large enough for beach users to avoid this impact. Kaewa Place Landing Site. One single-family residence is located about 400 feet from the drill site.
Long-Term Impacts. No project-related noise emissions will occur once construction is completed other than occasional maintenance activities.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. SIC or its contractor shall inform residents near the proposed landing site parcels about the drilling noise and provide contact information. The SIC contractor shall be required to maintain his or her equipment in proper working order, especially all noise suppression systems.	Landing site specific mitigation measures are not required.
Public Facilities	
Construction or Short-Term Impacts. Installing beach manholes within State or County road rights-of-way would be coordinated with utility providers who are currently using the same rights-of-way for their infrastructure systems. Some of this coordination has been or is currently being conducted as part of SIC's terrestrial network project.	Wahikuli Landing Site. Installation of a beach manhole within the Honoapi'ilani Highway right-of-way, which is adjacent to the landing site parcel would require a lane closure, which would cause traffic delays because this section of highway is heavily used.

TABLE S-3
SUMMARY OF ENVIRONMENTAL IMPACTS AND PROPOSED MITIGATION
(CONTINUED)

Common to All Landing Sites or System-Wide	Landing Site Specific
Public Facilities (continued)	
Construction or Short-Term Impacts (cont.). Installation of fiber-optic cable along the connector routes may require new coordination with other utility providers. During installation of the beach manholes, up to one lane of traffic would be closed around the construction site. Depending on the level of usage of the affected road, traffic delays may result.	See above.
Long-Term Impacts. The landing site infrastructure or underground fiber-optic cables within the connecting routes would not affect maintenance of the affected roads, nor would it affect expansion or installation of infrastructure.	Notable differences in impacts among landing sites are not anticipated.
Mitigation Measures. SIC shall coordinate with the owners (i.e., agencies) of the affected roadways, such as the SDOT, for design plan reviews. Any lanes closures shall be coordinated with these agencies. All work within road rights-of-way shall include the posting of flagmen and/or police officers to safely direct traffic around construction sites. SIC shall also coordinate with the owners of utilities within the affected roadways to ensure that installation of the beach manholes and connecting routes (for three sites) do not cause damage or affect future utility plans.	Landing site specific mitigation measures are not required.

S.6 PERMITS AND APPROVALS

The following permits or approvals may be required prior to the construction of the project. Application for most of these permits cannot be made until compliance with the environmental review process (NEPA and HRS Chapter 343) is completed.

Federal

- U.S. Army Corps of Engineers – Department of Army permit pursuant to Section 10 of the Rivers and Harbors Act
- Federal Communications Commission (FCC) – Cable Landing License

State

- Department of Business, Economic Development and Tourism, Office of Planning - Hawaii Coastal Zone Management Program federal consistency determination
- DLNR, Land Division – Conservation District Use Permit
  - Submerged land up to 12 miles from the shoreline at all proposed landing sites
  - Sandy Beach Park Landing Site and Connecting Route
  - Wahikuli Landing Site: easement within Wahikuli Wayside Park
- DLNR, Land Division – Disposition of Easement for proposed landing sites
- Department of Health (SDOH), Clean Water Branch – National Pollutant Discharge Elimination System Permit for storm water discharges relating to construction activities
  - 'Akialoa Road Landing Site and Connecting Route
  - Kili Drive Landing Site and Connecting Route
  - Sandy Beach Park Landing Site and Connecting Route
- SDOH, Noise, Radiation and Indoor Air Quality Branch – Noise Permits for proposed landing sites
- SDOT – Construction right-of-entry and easement for use of state public right of way

Counties

- Department of Public Works (DPW) (Department of Planning and Permitting (DPP) for the City and County of Honolulu) – building and construction permits for proposed landing sites – construction of right of entry and easement for use of county public right-of-ways.
- DPW (DPP for the City and County of Honolulu) - building permits for proposed landing sites
- Planning Department (and DPP) – SMA use permits and Shoreline Setback Variances (SSV) for proposed landing sites (the County of Hawai'i Planning Department does not require a SSV)

S.7 COMMENTS AND COORDINATION

Over 800 agencies, organizations and individuals, including residents living near a proposed landing site, were contacted by letter and asked for their input into possible or potential environmental or social issues associated with the proposed project. A number of agencies, organizations and individuals responded to the request, and this input was used to help prepare the project's EA. Agency consultation for compliance with the following environmental regulations was also conducted:

- Section 106 of the National Historic Preservation Act
- Section 7 of the Endangered Species Act
- Marine Mammal Protection Act
- Sustainable Fisheries Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act
- Farmland Protection Policy Act
- Section 1424(e) of the Safe Drinking Water Act

- Section 10 of the Rivers and Harbors Act
- Conservation District Use Permitting
- Special Management Area Use Permitting

Ho'akea LLC, a private contractor hired by SIC conducted many meetings statewide with community groups, agencies and individuals on behalf of SIC. These meetings were used to inform community members about the status of the project and gather input on areas of concern related to the project in general, and in particular on potential landing site locations.

The project's Draft EA was announced in the February 23, 2004 edition of the State of Hawai'i Office of Environmental Quality Control's The Environmental Notice, initiating a 30-day public comment period that ended on March 23, 2004. DLNR provided copies of the Draft EA to various divisions within DLNR, the State Department of Health, USACE, USFWS, NMFS, and all County planning and public works departments. In addition, the applicant provided Draft EA copies to over 30 other agencies, and community organizations, such as native Hawaiian groups who are familiar with historic and cultural issues of the project areas. The applicant also provided copies to 13 libraries statewide.

Seventeen federal, State and county agencies provided comments during the Draft EA comment period. Responses to these comments were sent by Parsons Brinckerhoff, the project consultant, on behalf of SIC. DLNR considered all comments received as they made their determination of whether or not the project will have a "significant impact" (see Sections S.1.3 and S.8).

S.8 FINDING OF NO SIGNIFICANT IMPACT

Based upon the criteria set forth in HRS Chapter 343 and HAR Sections 11-200-9 and 11-200-11.2, DLNR issued a Finding of No Significant Impact (FONSI) for the proposed project. This assessment is based on an evaluation of project impacts, which is summarized in Table S-4, in relation to the "Significance Criteria" specified in HAR 11-200-12(b). As shown in the summary of FONSI assessments in Table S-4, it has been determined that the project impacts (see Table S-3) will fall below the threshold of significance for all of the Significance Criteria specified in HAR 11-200-12(b). The FONSI determination is set to be announced in The Environmental Notice.

TABLE S-4
SUMMARY OF ASSESSMENT OF PROJECT IMPACTS IN COMPARISON TO SIGNIFICANCE CRITERIA

CRITERION	SIGNIFICANT
Involves an irrevocable commitment to loss or destruction of any natural or cultural resource	No
Curtails the beneficial uses of the environment	No
Conflicts with the State's long-term environmental policies or goals and guidelines expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders	No
Substantially affects the economic or social welfare of the community or State	No
Substantially affects public health	No
Involves substantial secondary impacts	No
Involves substantial degradation of environmental quality	No
Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions	No
Substantially affects a rare, threatened or endangered species, or its habitat	No
Detrimentally affects air or water quality or ambient noise levels	No
Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters	No
Substantially affects scenic vistas and view planes identified in county or state plans or studies	No
Requires substantial energy consumption	No

Source: Department of Land and Natural Resources, 2003.

Notes: "No" means project impact as it pertains to the criterion is considered to be not significant, and therefore, an EA is the appropriate HRS Chapter 343 review document.
"Yes" means project impact as it pertains to the criterion is considered to be significant, and therefore, an environmental impact statement (EIS) would be the appropriate HRS Chapter 343 review document.
Act 50 approved by the Governor of the State of Hawaii amended the definition of "Significant effect" in Chapter 343 to include ". . . or adversely affect the economic [or] welfare, social welfare [.], or cultural practices of the community and State."

Table of Contents

TABLE OF CONTENTS

TABLE OF FIGURES

EXECUTIVE SUMMARY

CHAPTER ONE: PROJECT DESCRIPTION

CHAPTER TWO: ALTERNATIVES TO THE PROPOSED PROJECT

CHAPTER THREE: KEKAHA, KAUA'I LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

CHAPTER FOUR: MĀKAHA, O'AHU LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

LIST OF TABLES

VOLUME 2

APPENDICES

Chapter 1
Project Description

Final Environmental Assessment/
Finding of No Significant Impact
Submarine Fiber-Optic Cable Project

CHAPTER ONE: PROJECT DESCRIPTION

1.1 INTRODUCTION AND PROJECT SUMMARY

This Final Environmental Assessment / Finding of No Significant Impact (Final EA/FONSI) has been prepared to comply with the requirements of Chapter 343, Hawai'i Revised Statutes (HRS). This document assesses the potential for environmental impacts from the installation and operation of the proposed Sandwich Isles Communications, Inc. (SIC) Submarine Fiber-Optic Cable Project, a network of four undersea fiber-optic cables that would connect seven landing sites on the five major Hawaiian Islands (Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i).

SIC's mission is to provide competitively priced, essential, broadband telecommunications services to the Native Hawaiian beneficiaries of the Department of Hawaiian Home Lands (DHHL). Reliable and affordable telecommunications plays an integral role in DHHL's ability to move more Native Hawaiians onto homestead lands. A modern fiber-optic system would also allow DHHL lessees to access state-of-the-art telecommunication services such as educational programming, Internet services, video teleconferencing, telemedicine, and other telecommunications-based programs.

Figure 1.1-1 shows the general alignment of the proposed submarine cable system. The total length of submarine cable would be about 300 miles. The proposed submarine cables would connect to independent terrestrial systems on each island to achieve complete system continuity throughout DHHL properties on the five islands.

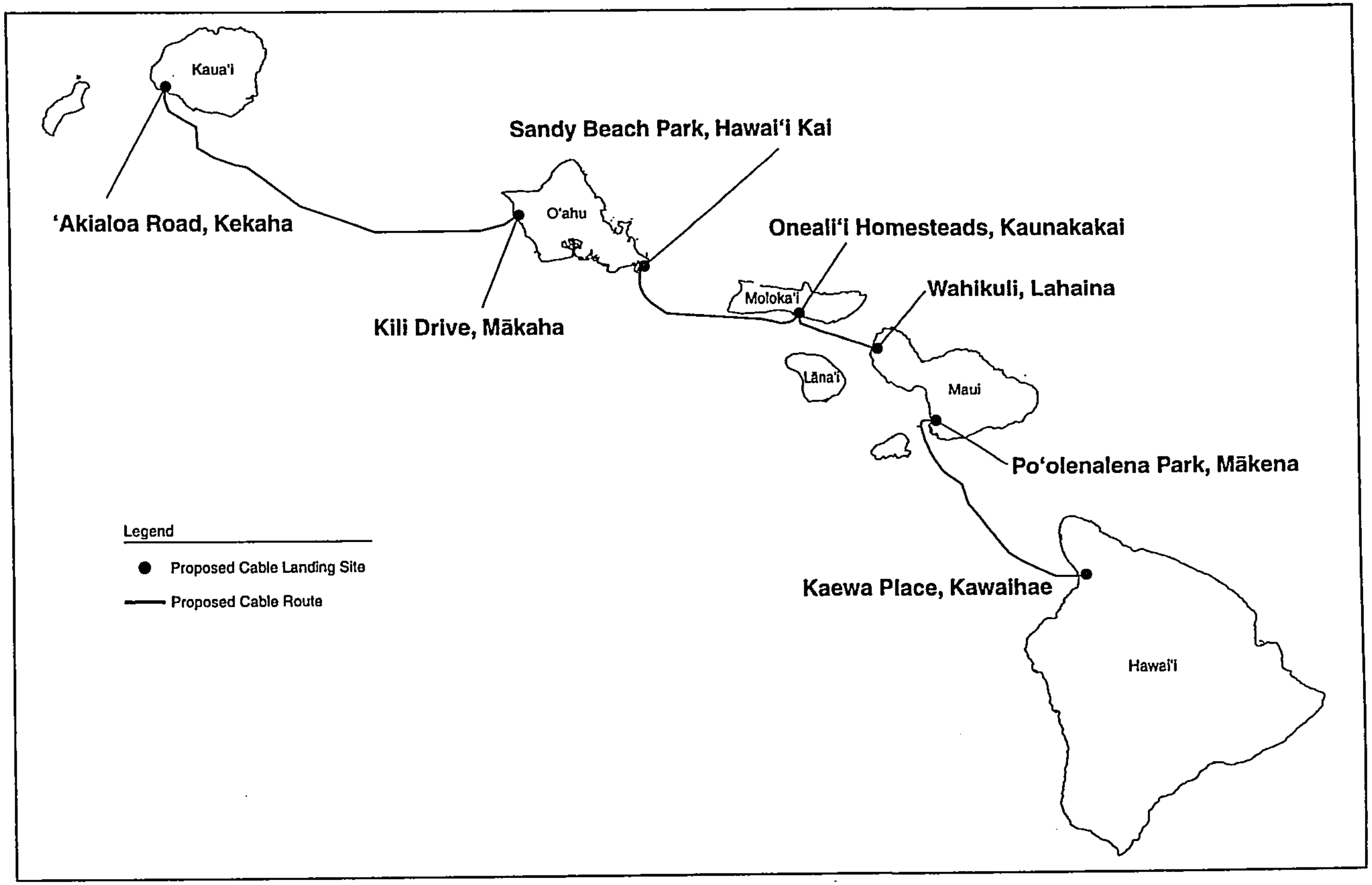
SIC is in varying stages of installing the onshore underground fiber-optic cables on each island. Each island's project is independent and is hereafter referred to as the "Terrestrial Project." Figures 1.1-2A through E show the proposed landing sites in relation to the alignments of the terrestrial fiber-optic systems. These terrestrial systems have already completed the environmental review process through the completion and acceptance the Hawai'i Department of Transportation (DOT) of a separate EA. DOT issued a FONSI for each terrestrial project. See Section 1.2 for a summary of the status of the terrestrial systems.

Construction funding for the submarine cable system would be provided through loans from the U.S. Department of Agriculture, Rural Utilities Service (RUS). The infusion of federal loan funds into the State economy would help promote economic development. DHHL would also be able to redirect millions of dollars they would have spent for telephone infrastructure to building more homes on their property. Because SIC is participating in a federal loan program, no DHHL or state funds would be needed to construct the development of telecommunications infrastructure on Hawaiian Home Lands in rural areas that are currently underserved.

This Final EA/FONSI covers the following actions:

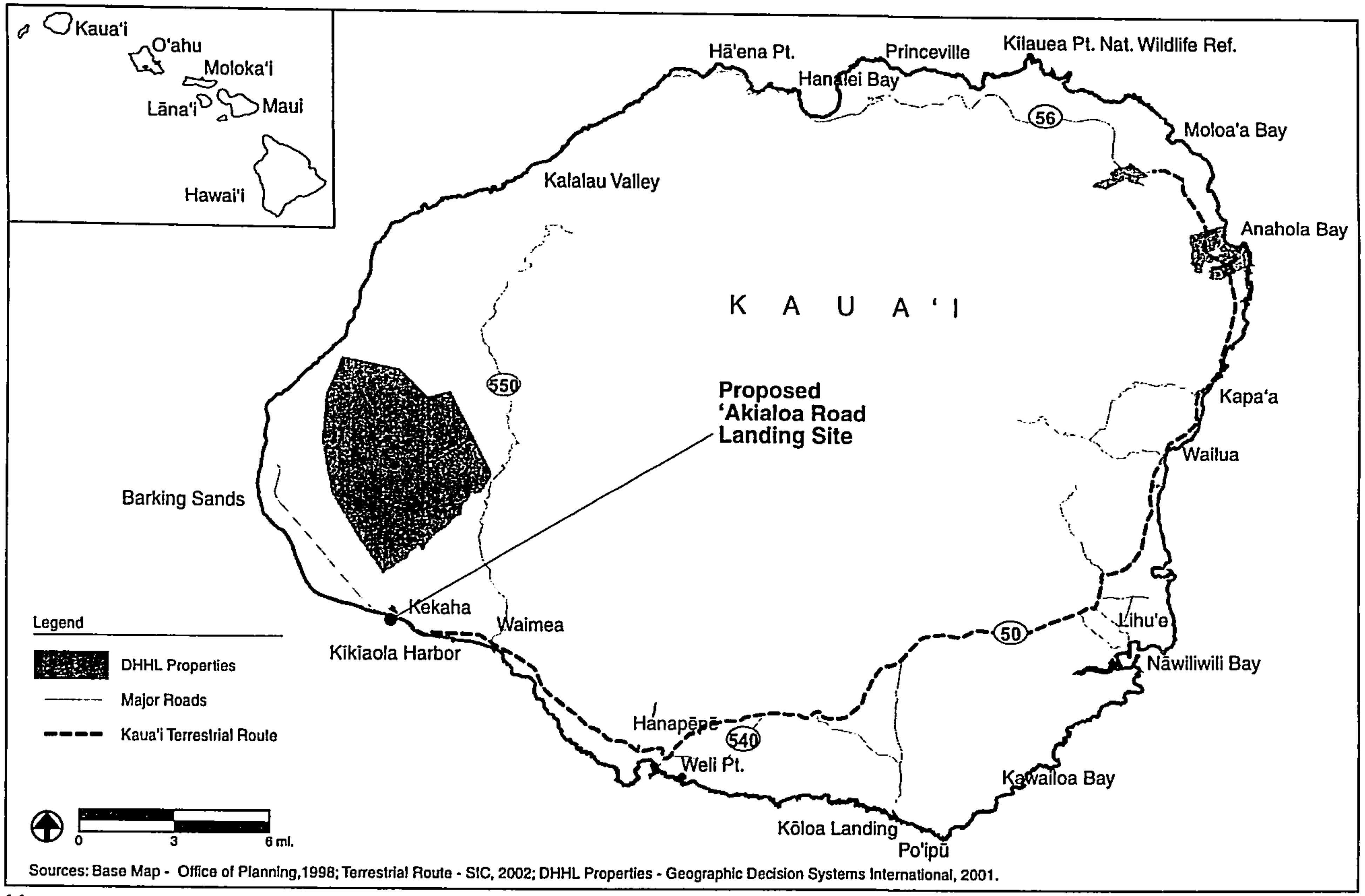
- Construction of landing sites for submarine cable landfalls, up to and including a beach manhole;
- Installation of submarine cables connecting the islands;
- Construction of additional onshore connecting segments to link the submarine cable landfalls with the termini of the previously installed SIC terrestrial system, where necessary; and
- Operation of the submarine cable system.

When completed, the SIC network would be independent of existing telecommunications networks. The combined length of the terrestrial and submarine SIC networks would be about 1,000 miles.



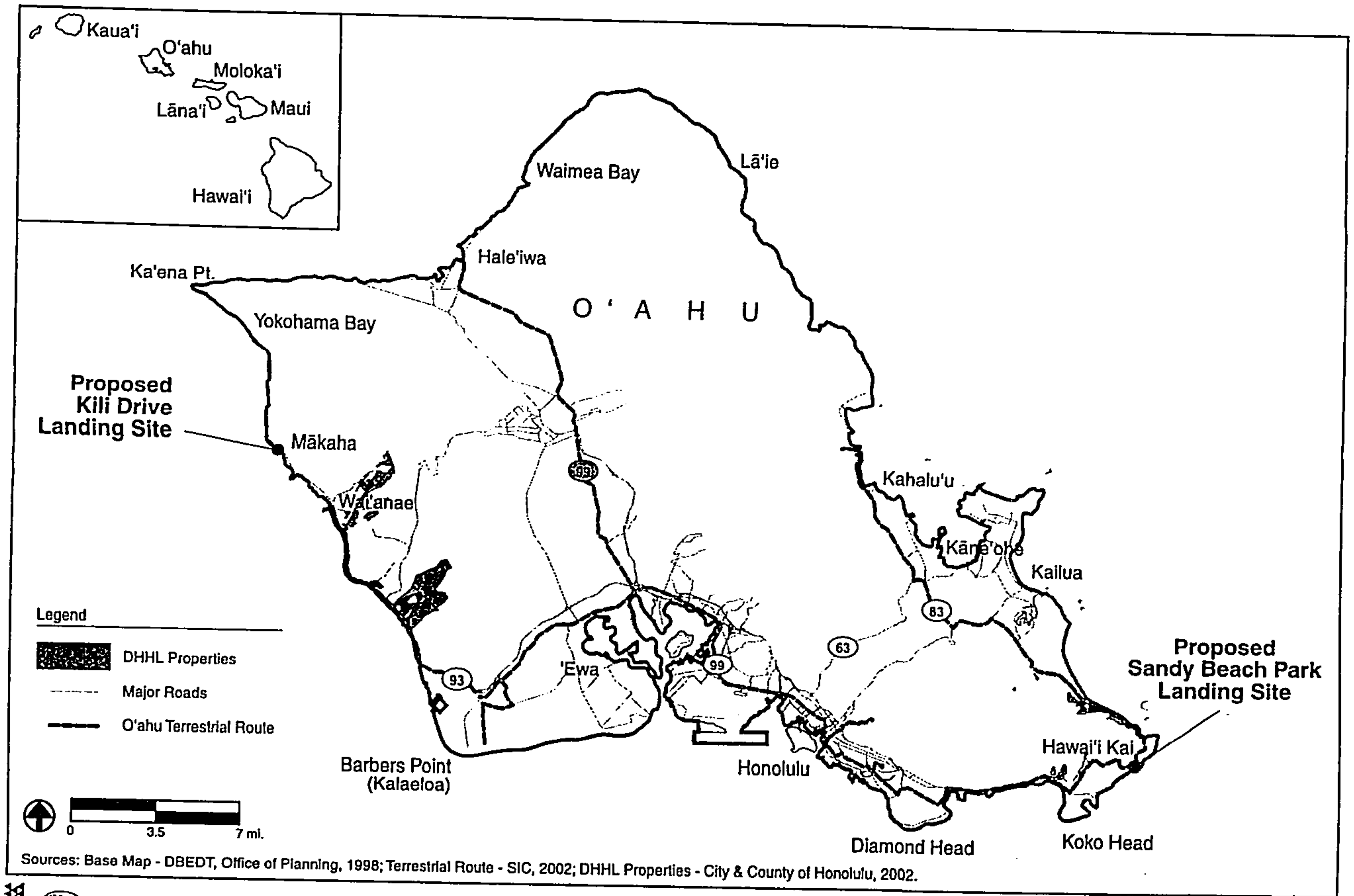
Sandwich Isles Communications, Inc.

Proposed SIC Submarine Fiber-Optic Network
Submarine Fiber-Optic Cable Project
Figure 1.1-1



Sandwich Isles Communications, Inc.

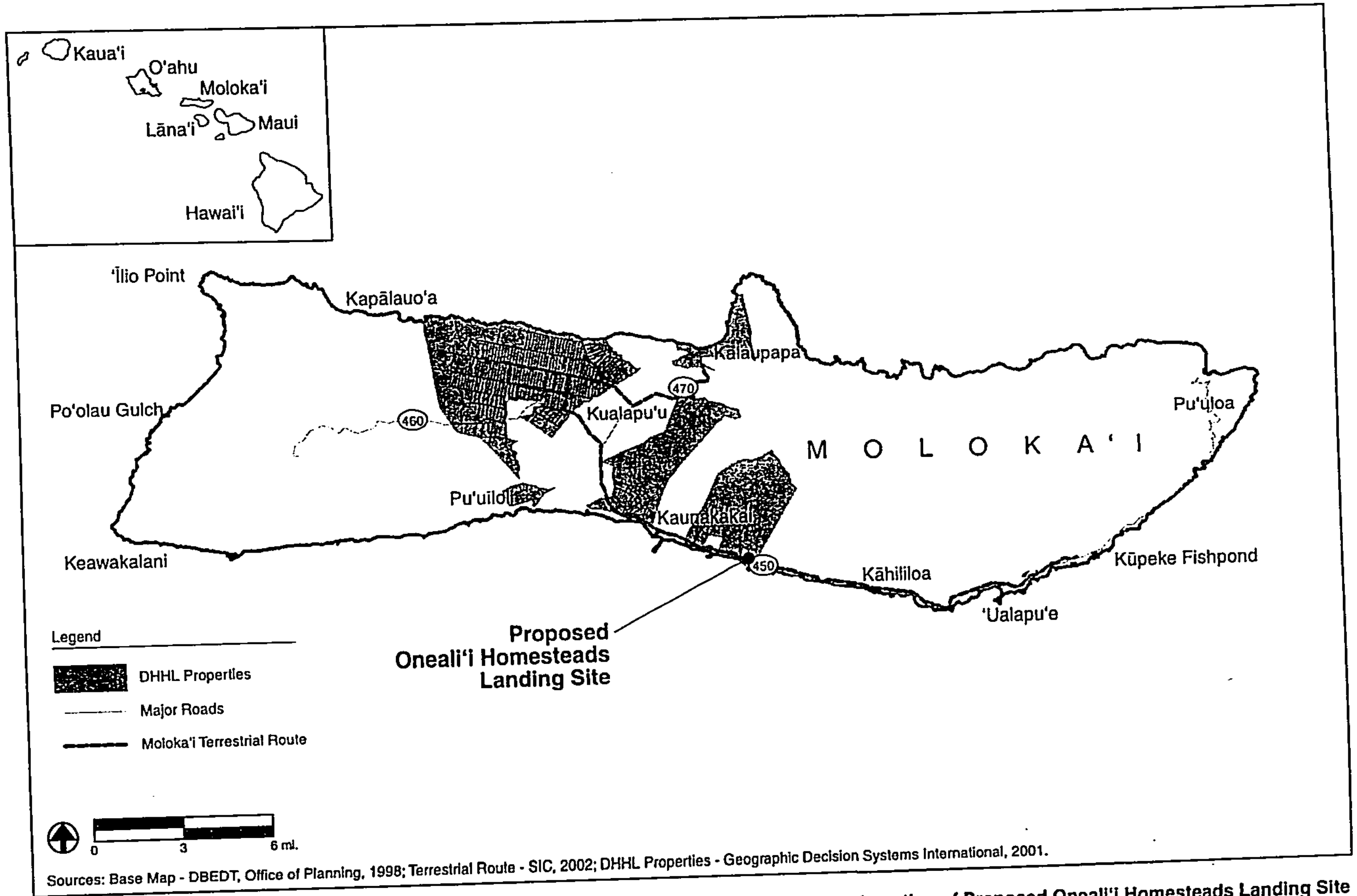
Location of Proposed 'Akialoa Road Landing Site
Submarine Fiber-Optic Cable Project
Figure 1.1-2A



Sandwich Isles Communications, Inc.

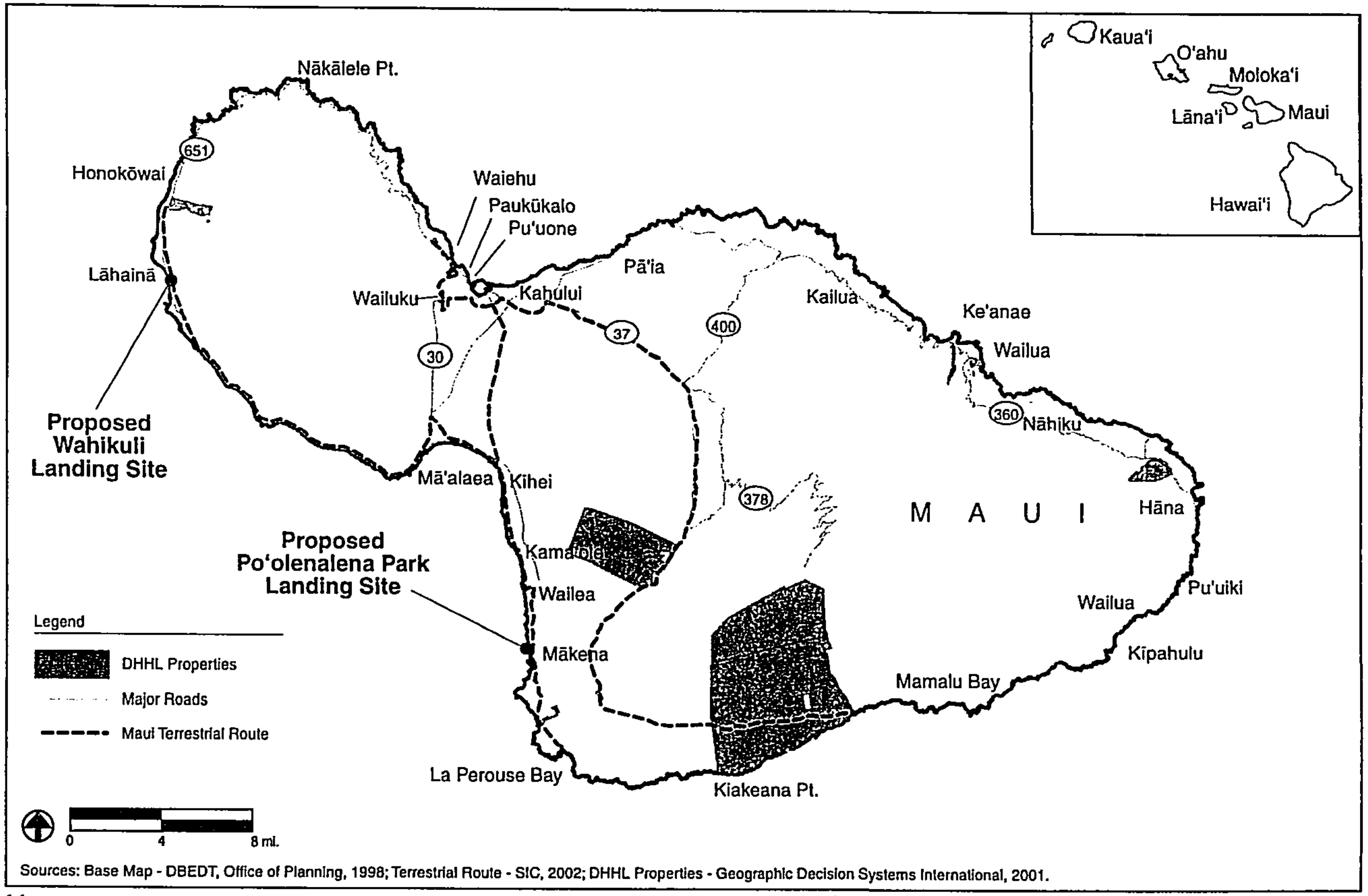
Location of Proposed Kili Drive and Sandy Beach Park Landing Sites
Submarine Fiber-Optic Cable Project

Figure 1.1-2B



Sandwich Isles Communications, Inc.

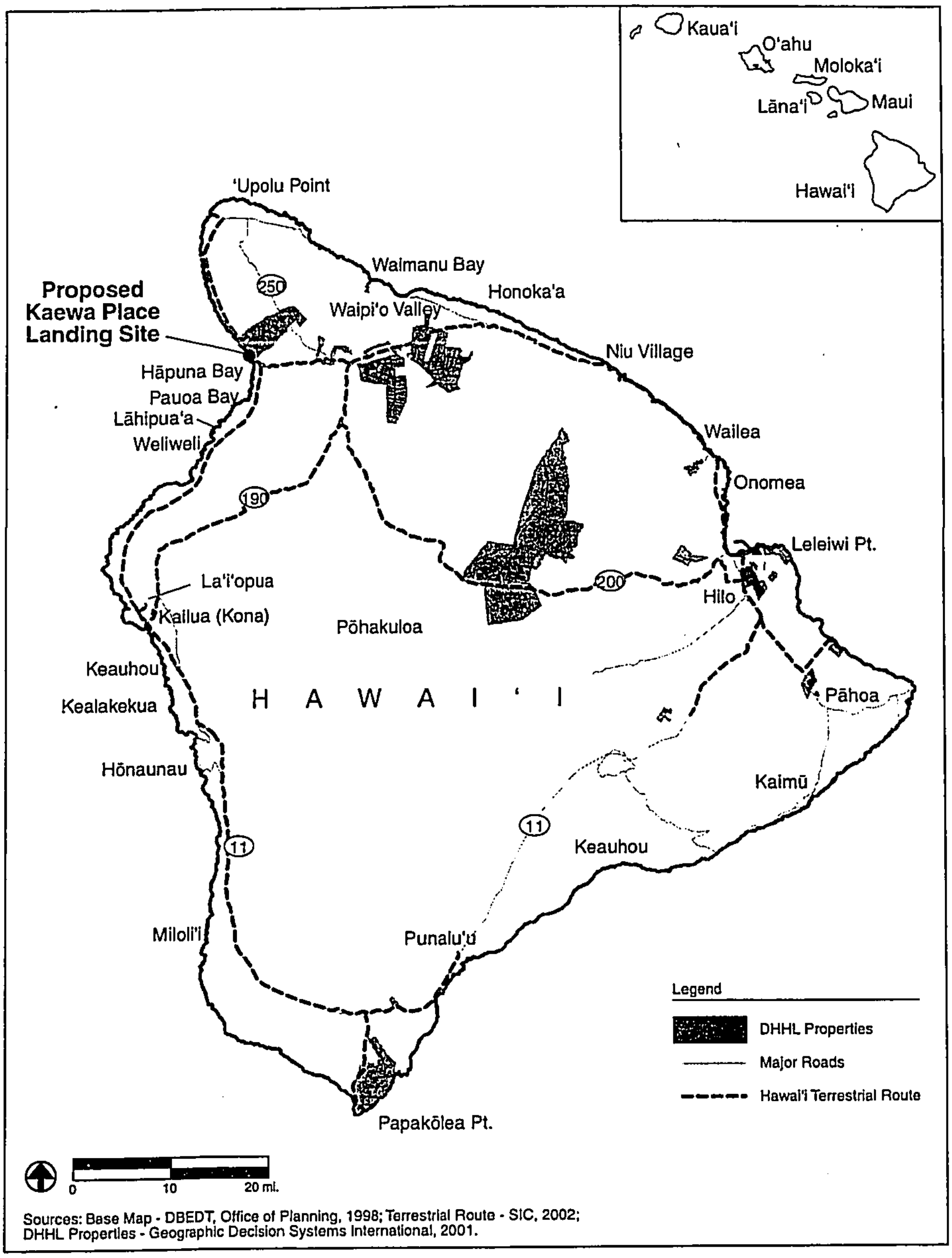
Location of Proposed Oneali'i Homesteads Landing Site
Submarine Fiber-Optic Cable Project
Figure 1.1-2C



Sandwich Isles Communications, Inc.

Locations of Proposed Wahikuli and Po'olenalena Landing Sites
Submarine Fiber-Optic Cable Project

Figure 1.1-2D



Sandwich Isles Communications, Inc.

Location of Proposed Kaewa Place Landing Site
Submarine Fiber-Optic Cable Project
Figure 1.1-2E

This project has been designed from the outset to avoid or minimize adverse environmental impact. For example, by placing all landing site infrastructure underground, scenic view planes will be preserved. Also, horizontal directional drilling (HDD) will be used to install the fiber-optic cable conduits, a construction method that would eliminate the need for trenching through sensitive shoreline and nearshore environments. The underground/under-seafloor cable conduits would provide the cables protection from waves and storm events.

All proposed landing sites have been carefully sited to eliminate or minimize potential impacts on burials, archeological resources, and cultural practices. SIC commits to implementing specific mitigation measures should there be inadvertent encounters with buried resources. These topics are discussed in more detail in Section 1.4.5 and in subsequent chapters.

This Final EA/FONSI uses Hawaiian terms used in common parlance to describe direction and location. In particular, the words "mauka" (meaning inland, or towards the uplands) and "makai" (meaning ocean, or towards the sea) are used throughout this text.

1.1.1 Organization of This Document

The organization of this document reflects the statewide extent of the proposed project. The discussion of environmental conditions and potential impacts has been divided into separate chapters addressing each landing site. The intent and coverage of each chapter is summarized below:

- Chapter 1: Provides an overview of the proposed project and the applicable planning and environmental review context, and summarizes the project goals and purposes.
- Chapter 2: Describes alternatives to the proposed project. It focuses on alternative landings sites that were considered earlier in project planning, but were rejected.
- Chapter 3: Describes the environmental conditions and potential impacts at the 'Akialoa Road, Kekaha, Kaua'i landing site.
- Chapter 4: Describes the environmental conditions and potential impacts at the Kili Drive, Mākaha, O'ahu landing site.
- Chapter 5: Describes the environmental conditions and potential impacts at the Sandy Beach Park, Hawai'i Kai, O'ahu landing site.
- Chapter 6: Describes the environmental conditions and potential impacts at the Oneali'i Homesteads, Kaunakakai, Moloka'i landing site.
- Chapter 7: Describes the environmental conditions and potential impacts at the Wahikuli, Lahaina, Maui landing site.
- Chapter 8: Describes the environmental conditions and potential impacts at the Po'olenalena Park, Mākena, Maui landing site.
- Chapter 9: Describes the environmental conditions and potential impacts at the Kaewa Place, Kawaihae, Hawai'i landing site.
- Chapter 10: Describes potential secondary and cumulative impacts resulting from the proposed project.
- Chapter 11: Provides detailed information on the regulatory processes with which this project must comply. These processes operate at Federal, State and county levels.
- Chapter 12: Describes public and agency coordination activities, including efforts to identify key issues.
- Chapter 13: Summarizes the analysis that supported the DLNR "FONSI determination.
- Chapter 14: Provides a list of references cited in the document.
- Appendices (Volume Two): Provides further detail on a range of topics. Reports prepared for this project by environmental specialists are included in Volume Two. The appendices provide copies of correspondences, including Draft EA comment letters and responses.

1.1.2 Applicant

Sandwich Isles Communications, Inc. (SIC) is a Native Hawaiian-owned corporation headquartered in Honolulu, Hawai'i. It was founded in 1995 to provide telephone service to rural areas. SIC is certified by the Federal Communications Commission (FCC) as a rural local exchange carrier (RLEC). The State Public Utility Commission has issued SIC a certificate of authority (COA) to provide telecommunications services on DHHL. As a rural telephone company, SIC is eligible for Universal Service Fund support to build and operate telecommunications networks and services in rural areas.

SIC was granted a license by DHHL to provide telecommunications service to Hawaiian Home Lands on Kaua'i, O'ahu, Moloka'i, Lāna'i, Maui, and Hawai'i. Under the DHHL license, SIC has agreed to construct all necessary telecommunications infrastructure at no cost to DHHL, which will allow DHHL to use its limited resources to be used for development of homestead properties. SIC began serving Native Hawaiians on DHHL properties in 1998 and since that time has invested over $100 million in the State in telecommunications facilities.

1.1.3 Project Location

Four submarine cable routes would connect the following seven landing sites (See Figure 1.1-1):

- 'Akialoa Road, Kekaha, Kaua'i (TMK: por. 4-1-2-002:032, 4-1-3-001:999);
- Kili Drive, Mākaha, O'ahu (TMK: por. 1-8-4-002:047);
- Sandy Beach Park, Hawai'i Kai, O'ahu (TMK: por. 1-3-9-015:001);
- Oneali'i Homesteads, Kaunakakai, Moloka'i (TMK: 2-5-4-006:019);
- Wahikuli, Lahaina, Maui (TMK: por. 2-4-5-021:007, 015);
- Po'olenalena Park, Mākena, Maui (TMK: por. 2-2-1-007:072, 084); and
- Kaewa Place, Kawaihae, Hawai'i (TMK: por. 3-6-1-004:020).

The four submarine cable routes are described in more detail in Section 1.4.1.3.

1.1.4 Planning Process

1.1.4.1 Accepting Agency and Environmental Review Triggers

The accepting agency pursuant to HRS Chapter 343 could be one of many State and county agencies because the project triggers multiple factors that require environmental review:

1) *This project requires a Conservation District Use Permit (CDUP).* The fiber-optic cables would be on submerged installed lands and/or within the State Conservation District up to 12 miles seaward of all shorelines. The CDUP would be issued by the State's Board of Land and Natural Resources (BLNR), the body governing the Department of Land and Natural Resources (DLNR). Public hearings will be held.

2) *This project requires a Special Management Area (SMA) Use Permits and Shoreline Setback Variances (SSV) from all the counties.* Each landing site would be within the SMA of the respective counties. Also, the underground conduit would be within the shoreline setback. In order to process SMA use permit and SSV applications, every county requires that the project comply with HRS Chapter 343.

3) *The project action involves use of State and County Lands.* Landing sites are located on Department of Hawaiian Home Lands (DHHL), other State of Hawai'i or County properties, and/or State and County road rights-of-way (ROW). Project approval for these uses must be obtained from the respective State or County agency.

Given these multiple jurisdictions and regulatory triggers, DLNR was determined to be the most appropriate Accepting Agency pursuant to HRS Chapter 343 since it:

1) Has the greatest responsibility for approving the action as a whole;

2) Can most adequately fulfill the requirements of Chapter 343;

3) Has special expertise and access to information; and

4) Would have the most participation in the action.

This determination is consistent with previously constructed cable landing projects.

1.1.4.2 Environmental Review

This Final EA/FONSI discloses environmental and social impacts that could result from project construction and operation. It proposes specific measures to prevent, minimize, or mitigate adverse impacts to the environment that SIC commits to implement.

Following review of agency and public comments on the project's Draft EA, which was published in the February 23, 2004 edition of The Environmental Notice, DLNR has determined that the project would not have a significant impact based on "significance criteria" specified in Title 11, Chapter 200 of the Hawai'i Administrative Rules (see Chapter 14). Under State law, a FONSI determination marks completion of the environmental review process if the project was determined not to have a significant impact as defined in HRS Chapter 343.

SIC is planning to obtain loan assistance from RUS (Rural Utility Services), a federal agency, and a cable landing license from the Federal Communications Commission (FCC), another federal agency. Federal involvement means that the project must comply with the National Environmental Policy Act (NEPA). In terms of NEPA compliance, RUS would be the lead agency. FCC normally considers cable landing licenses as categorically exempt (CatEx) from NEPA. This Final EA/FONSI is not intended to address NEPA requirements or compliance. Rather, this Final EA/FONSI, in addition to documentation of agency coordination pursuant to certain federal environmental regulations, will be used to coordinate with RUS for NEPA compliance. A separate environmental document will be prepared to satisfy RUS's requirements under NEPA.

1.2 PROJECT BACKGROUND

Created by the Hawaiian Homes Commission Act of 1920, the Hawaiian Homes Commission was tasked to develop and deliver properties ("Hawaiian Home Lands") to Native Hawaiian beneficiaries. The Commission's mission is to make available long term leases for native Hawaiians. The Act reserved 203,500 acres of public lands for this purpose. Today, DHHL is responsible for managing Hawaiian Home Lands.

Since many of the DHHL parcels (Department of Hawaiian Home Lands) are located in rural areas, they may not have one or more basic infrastructure systems, such as telephone service. Private utility providers have not provided service to many such rural areas because they have determined that the demand for such service is too small to justify the infrastructure investment.

In 1995, DHHL issued a license to provide statewide telecommunications service at no cost to DHHL, and at affordable prices to Hawaiian Home Lands beneficiaries. SIC then obtained loan support from the U.S. Department of Agriculture's Rural Utilities Service (RUS) to develop a modern telecommunications network serving rural Hawaiian Home Lands communities. The mission of RUS is to "[e]nhance the ability of rural communities to develop, to grow, and to improve their quality of life by targeting financial and technical resources in areas of greatest need through activities of greatest potential." (USDA RUS, 2003) Therefore, RUS assists in the development of utility infrastructure in rural America so rural and insular areas have affordable access to essential, modern, and emergency utility conveniences.

In addition to basic telephone access, providing modern telecommunications services to underserved rural Hawaiian Home Lands communities would allow them to access and benefit from the "information highway," similar to urban communities. DHHL beneficiaries would have access to interactive services, such as telemedicine, educational programming, video and data transmissions, and the Internet.

For SIC to qualify for the RUS Loan Program, the RUS required SIC to have a defined geographic service area, a designation as an "eligible telecommunications carrier," a State of Hawai'i Public Utility Commission (PUC) certificate of authority (COA) to operate in the State, and a Federal Communications Commission (FCC) designation as a rural local exchange carrier (RLEC). After spending approximately two years to satisfy all RUS requirements, SIC received loan funds in 1997 to construct local loop facilities on O'ahu, including new DHHL developments on O'ahu. In 1999, SIC received additional loan funds to provide local loop service to DHHL developments on neighbor islands as they are planned and developed.

At present, SIC has 1,086 subscriber lines in service in 17 DHHL communities. DHHL has approximately 20,000 applicants on the waiting list, and SIC intends to service new lessees as they are awarded leases. The following DHHL communities are being serviced by SIC:

- On Kaua'i: Anahola and Hanapēpē
- On O'ahu: Waimānalo, Kalāwahine, and Kapolei
- On Moloka'i: Kalamaula, Ho'olehua East, and Ho'olehua Airport
- On Maui: Wai'ehu, Paukukalo, Kula, and Kahikinui
- On Hawai'i: La'i'ōpua, Waimea, Pu'ukapu, Hilo, and Keaukaha

Figures 1.1-2A through E show the alignments of SIC's terrestrial systems. The terrestrial systems consist of underground fiber-optic lines that are typically placed in State or County road rights-of-way (ROW). Each island's system was designed as a stand-alone system. In areas where SIC has no telecommunications system, they use leased lines from third party providers to connect DHHL homesteads.

Table 1.2-1 summarizes each terrestrial system and its status.

1.3 PURPOSE AND NEED FOR THE PROJECT

Broadband telecommunications service is an important element in improving the social and economic well-being of Hawaiian Home Land communities throughout Hawai'i. It would help increase the standard of living and quality of life of native Hawaiian beneficiaries and the community.

TABLE 1.2-1:
SUMMARY OF SIC'S TERRESTRIAL FIBER-OPTIC CABLE SYSTEMS
UNDER DEVELOPMENT

Island	Description of underground ducts	Status
Kaua'i	Approx. 51 miles Use existing State highways and DHHL road ROW	Under construction
O'ahu	Approx. 113 miles Use existing State highways and City & County road ROW	In design
Moloka'i	Approx. 37 miles Use existing State highways and County road ROW	Under construction
Maui	Approx. 97 miles Use existing State highways and County road ROW	In design
Hawai'i	Approx. 330 miles Use existing State highways, and County and private road ROW	Under construction

Source: Sandwich Isles Communications, Inc., 2003.

This section explains the relationship of SIC's submarine fiber-optic cable network (this proposed project) with the terrestrial networks currently under development, as well as the purpose and need for the *submarine fiber-optic cable network itself*. The submarine network is designed to work in conjunction with and enhance those benefits provided by independent terrestrial telecommunications systems currently under construction by SIC on each island.

While the terrestrial system on each island serves the DHHL properties on that island, the combination of the terrestrial and submarine networks would extend the reach of the SIC network to connect most DHHL properties on all islands, and would provide connectivity statewide among DHHL homesteads. While not an exhaustive list, some of the specific benefits of the submarine network include the following:

- Ability to provide DHHL beneficiaries with affordable telecommunication services. Having an independent submarine system would mean that SIC would not have to rely on third party lines for interisland connections. The cost of service would be regulated by the State Public Utilities Commission (PUC), and would be competitive with comparable telecommunication services provided elsewhere in the State. SIC beneficiaries are assured that their monthly cost for service will be at or less than the cost for comparable service in adjacent non-DHHL areas. Moreover, SIC is financing the entire cost of the project, at no cost to DHHL.

- Ability to provide DHHL beneficiaries with modern telecommunication services and attract potential lessees for DHHL's commercial properties. When completed, SIC's state-of-the-art infrastructure will permit DHHL communities to have affordable access to high-speed connections for distance-learning and telemedicine opportunities. SIC beneficiaries are assured that when the network is completed, they will have basic and advanced broadband services as good as or better than services found in adjacent non-DHHL areas.

- Reliability of a new fiber-optic network. The SIC submarine network would be newer than the existing networks, and would provide sufficient capacity to serve the anticipated demand from DHHL properties.

- Providing employment opportunities for skilled and unskilled labor in the state. SIC's projects have provided construction-related employment and other job opportunities for DHHL beneficiaries and other local residents. The submarine cable project would provide additional employment opportunities.

1.4 PROPOSED ACTION

The proposed project involves the installation of four submarine cable routes totaling about 300 miles that would connect seven landing sites on Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i. At each landing site, the submarine cable would then be connected to SIC's terrestrial system via a connection made at the beach manhole, to be constructed as a part of the landing site.

The proposed action comprises three major components:

- Submarine cables connecting the islands;
- Landing sites for submarine cables, up to and including the "beach manhole;" and
- Additional onshore connecting routes linking submarine cable landing sites with the SIC terrestrial system (in cases where the landing sites fall short of the terrestrial line).

1.4.1 Submarine Cables

Figure 1.1-1 shows the configuration of the proposed submarine cable routes. A detailed analysis was prepared to determine the best route of these four cable runs (see Section 1.4.1.1). The study considered various natural and man-made hazards/characteristics of the ocean bottom. Section 1.4.1.2 describes the types of submarine cable used. Section 1.4.1.3 describes each submarine route in detail. Chapter 3 describes criteria by which the landing regions were selected.

1.4.1.1 Cable Route Selection Criteria

Four ocean routes were selected to minimize length, interaction with other cables, and encroachment into environmentally sensitive offshore areas, and placement in stable areas. A deep-ocean study was performed to select preliminary submarine cable routes. The study also provided information on the appropriate level of armor and cable protection, and potential geological and environmental hazards to the cables. The cable route selection process is summarized below. (MOE, 2003)

The following factors were considered in determining the proposed ocean alignments:

- Bathymetry;
- Cable characteristics;
- Fishing regions;
- Cable and pipeline crossings;
- Dumping grounds;
- Alter course and maneuvering limitations;
- Sediments;
- Permitting and political boundaries;
- Burial requirements;
- Cable types and costs;
- Military restrictions;
- History of cable failures;
- Required cable slack; and
- Natural hazards.

Bathymetric data were used to route the cable around submarine hazards and steep slopes. When steep slopes were unavoidable, the cable path was laid perpendicular to the slope to minimize potential damage from slope failure and turbidity currents (flows of loose undersea sediments that travel downslope during some oceanographic and seismic events).

Locations of oceanic hazards such as military zones, buoys, fish aggregation devices (FADs), dumping grounds, and dredge spoil areas were considered. Locations of existing cables were also part of the analysis. SIC's proposed cable routes have been submitted to the Navy for review for potential interaction with military cables.

To account for naturally occurring submarine hazards, the MOE report addressed the likelihood of natural hazards at each landing site. This assessment took into account coastal slope, tsunami, stream flooding, waves, storm, erosion, sea level, and volcanic/seismic data. The overall hazard assessment ranged from 1 (low) to 7 (high). Subsequent chapters in this EA refer to this overall hazard assessment.

1.4.1.2 Types of Submarine Fiber-Optic Cables

Cable routes were designed based on three cable types appropriate to different environmental conditions. Table 1.4-1 describes the three types of cables and appropriate conditions for each. Figure 1.4-1 shows typical cross-sections of the cable types.

**TABLE 1.4-1:
THREE CABLE TYPES USED IN SIC SUBMARINE CABLE DESIGN**

Cable Type	Description of Use	Typical Depths for Cable Use
Double Armor (DA)	Used in high hazard areas having a strong potential for cable damage	60 to 350 feet
Single Armor (SA)	Used in areas of moderate hazards such as gently sloped areas with moderate threat from sediment flows and no cable obstructions	350 to 1,000 feet
Lightweight Protected (LWP)	Used in areas with little potential for cable damage	Greater than 1,000 feet

Source: Makai Ocean Engineering, 2003.

Submarine cables are most likely to be damaged by human activities such as commercial fishing and anchor dragging. The horizontal direction drilling (HDD) construction method to be used on this project (HDD is described in detail in Section 1.4.4.2) would place the cable at a minimum depth of about 60 feet, providing excellent protection for near-shore segments. HDD is described in detail in Section 1.4.4.2.

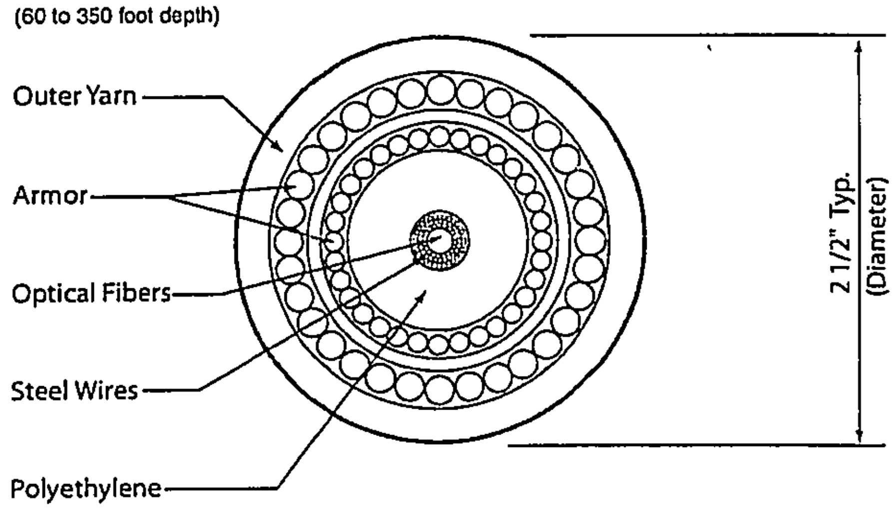
Use of double armor and single armor cables in shallower waters would also help protect the cables. Lightweight protected (LWP) cables would be used at greater depths.

The cable is made of non-toxic armoring materials and is not expected to have any adverse effects on water quality and/or marine biology. The SIC system has also been designed to avoid the use of submarine boosters or repeaters (equipment to maintain signal length segments). The light pulses generated within the cable are of low output. Also, in the event of cable failure, monitoring equipment would automatically initiate a shutdown of the cable.

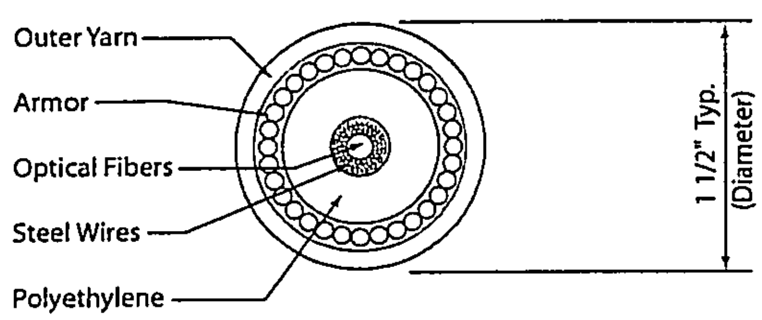
1.4.1.3 Selected Cable Routes

This section summarizes the four submarine routes. Additional details are provided in the Makai Ocean Engineering report (2003).

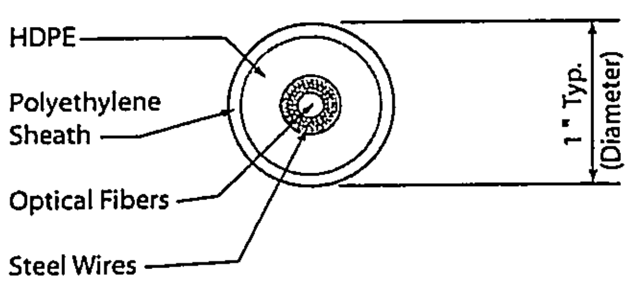
DOUBLE ARMORED FIBER OPTIC SUBMARINE CABLE *
(60 to 350 foot depth)



SINGLE ARMORED FIBER OPTIC SUBMARINE CABLE *
(maximum 350 to 1000 foot depth)



LIGHT WEIGHT PROTECTED (LWP) FIBER OPTIC SUBMARINE CABLE *
(greater than 1000 foot depth)



* Size, material & depth may vary depending on manufacturer.

Source: Makai Engineering Report, 2003.

Sandwich Isles Communications, Inc.

Cross-Sections of Three Fiber-Optic Submarine Cable Types
Submarine Fiber-Optic Cable Project
Figure 1.4-1

1.4.1.3.1 Kaua'i to O'ahu (Kekaha to Mākaha)

The proposed route from Kekaha to Mākaha is approximately 130 miles. This route would cross existing systems at five points.

Beginning at Kekaha, a double armored (DA) cable would start its descent south, from an exit point (EP) depth of 72 feet. At 330 feet, the cable would transition to single armored (SA) cable. A transition to lightweight protected (LWP) cable would occur at 1,180 feet, continuing until the ascension of the Wai'anae slump. As the cable descends the South Kaua'i submarine landslide, it would cross a submerged submarine operation area, and maneuver between two fish aggregation devices (FADs) at a minimum distance of 3,500 feet. It would then descend to a depth of 15,000 feet in the Kaua'i Channel where it would cross the existing TPC-5 system cable, and then the TPC-3 system cable 18 miles later on the Wai'anae slump. As the cable would pass south of an explosives dumping area, it would cross the HICS system cable and then the Japan-US cable. At a depth of 1,180 feet, the cable would transition back to SA, shortly after which another crossing with the TPC-3 system would occur. Approximately 600 feet shoreward of the TPC-3 cable crossing, the cable would transition to DA. Shortly thereafter, the last cable crossing would occur with the HAW-4 system. The final EP on the Mākaha end would be at a depth of 77 feet.

1.4.1.3.2 O'ahu to Moloka'i (Hawai'i Kai to Kaunakakai)

The proposed route distance from Hawai'i Kai, O'ahu, to Kaunakakai, Moloka'i, is approximately 43 miles. This route would cross existing cables at three points.

There were two concerns with this route. The first involved planning the cable path over Penguin Bank, a shallow (200 feet) region extending from the southwest corner of Moloka'i. A decision was made to cross Penguin Bank using single armored cable for extra protection, despite concerns about surface activity (fishing, dragging anchors) potentially damaging the cable, because two existing cables crossing this region have no history of failure. Going around Penguin Bank would have doubled the length of the cable path and considerably increased the cost of deployment. The second concern was associated with three submerged buoys off the southwest coast of Moloka'i. The proposed cable path has been planned carefully around the submerged buoys, as well as away from an existing HICS cable.

Beginning from Hawai'i Kai, a DA cable would descend south from the EP at 69 feet. At a depth of 332 feet, the cable would transition to SA cable; at 661 feet, it would transition to LWP. Through the Kaiwi Channel until the ascension up Penguin Bank, the cable would remain LWP. It then would switch to SA from Penguin Bank, until transitioning back into DA just short of the Kaunakakai breakout.

Two existing cables lie just east of the proposed Hawai'i Kai exit point (HIFN and HICS systems), but no crossings occur until Penguin Bank. At Penguin Bank the SIC cable would cross the HICS system cable at a depth of 197 feet. From this crossing, the proposed route parallels the HICS cable for approximately 30 miles at a minimum separation distance of 1,850 feet. The SIC cable would also intersect the HIFN system cable at a depth of 197 feet at Penguin Bank. A second crossing with a different HIFN cable would occur at a depth of 419 feet before the proposed cable route turns toward Moloka'i. The Kaunakakai exit point would occur in 80 feet of water.

1.4.1.3.3 Moloka'i to Maui (Kaunakakai to Lahaina)

The proposed route distance from Kaunakakai, Moloka'i, to Lahaina, Maui, totals approximately 24 miles. LWP cable is not used in this route, and no cable crossings would be necessary.

Beginning from Kaunakakai, the DA cable would descend south from the EP at 80 feet, between two coral ridges. The cable would then immediately enter a Submerged Submarine Operating Area and the Hawaiian Islands Humpback Whale National Marine Sanctuary, where it would remain for the rest of the proposed path to Maui. At a depth of 230 feet the cable would transition to SA and the path would turn southeast toward the Maui landing site. Several course alterations would be made to avoid steep slopes in the Kalohi Channel. Approximately 5.5 miles west of the Maui landing site, the cable would begin its ascent up the Kalohi Channel slope and follow a ridge between deep depressions. At a depth of 230 feet, the cable would transition back to DA. The Lahaina (Wahikuili) exit point would be located at a water depth of 58 feet.

1.4.1.3.4 Maui to Hawai'i (Mākena to Kawaihae)

The proposed route distance from Mākena to Kawaihae is approximately 67 miles. Five cable crossings would be required in this segment.

From the proposed Mākena EP in 58 feet of water, a DA cable would travel west where it would cross two existing cables (HIFN and HICS systems) at a depth of roughly 200 feet. At a depth of 380 feet the cable would transition to SA. The cable would then turn south, traveling east of Molokini Island, and encounter another HICS cable crossing in 853 feet of water. The proposed cable route would then pass to the east of the Kaho'olawe Island Reserve through Alalākeiki Channel, where the cable would transition to LWP at a water depth of 1,490 feet. Approximately 14 miles after the transition, another cable crossing would occur in 6,250 feet of water, just prior to descending in the Alenuihāhā Channel. After crossing the channel, the cable would transition back to SA in 2,038 feet of water. Upon reaching Kawaihae bay, a final cable transition to DA is proposed at a depth of 427 feet. Within the last 7,280 feet of the Kawaihae exit point, the SIC cable would cross three near shore cables, in approximately 400 feet of water. The first would be the HICS system, the second would be the HIFN system, and the third crossing would be the Southern Cross system. The Kawaihae exit point would occur at a depth of 81 feet.

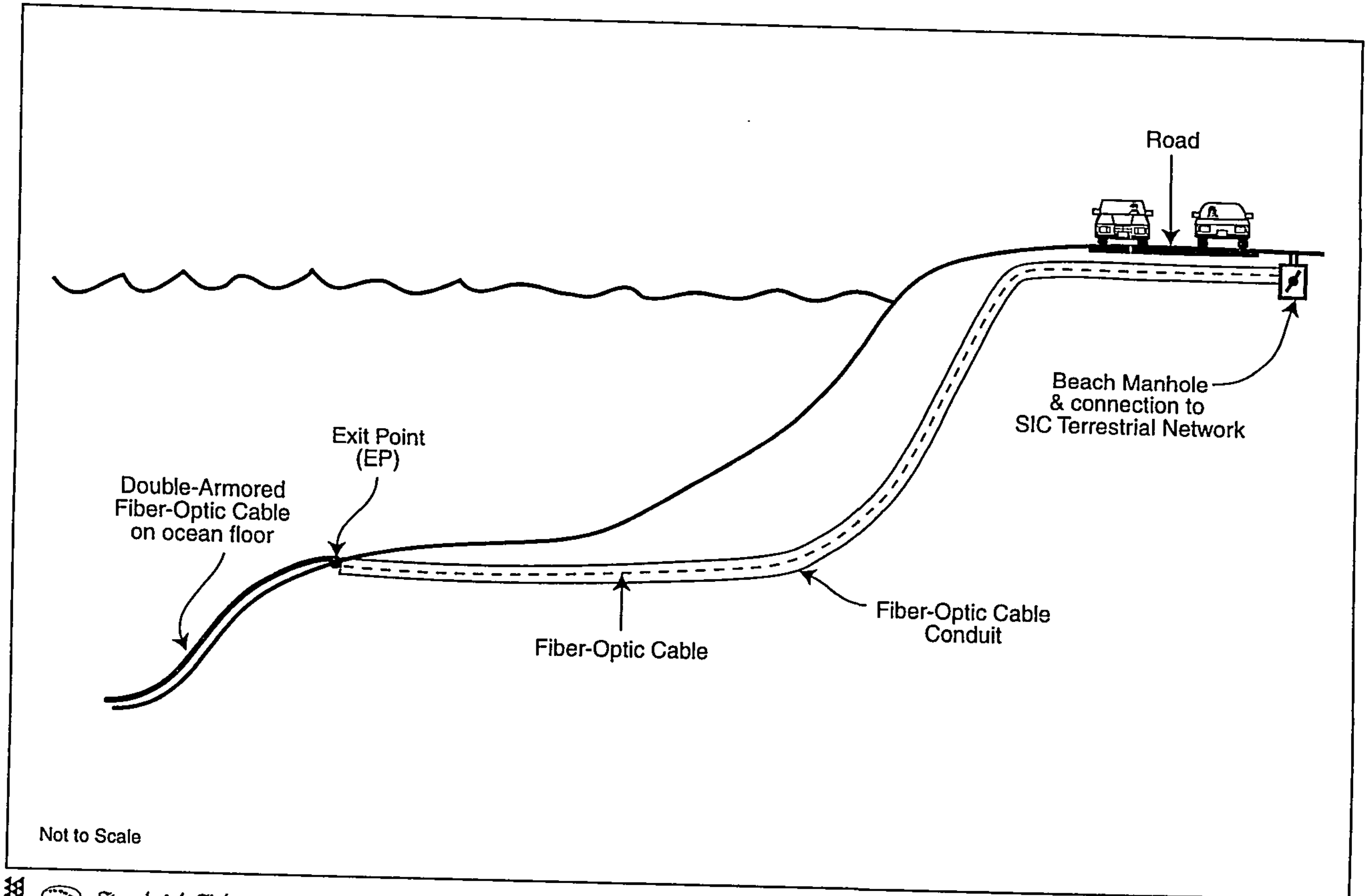
1.4.2 Landing Sites

A specific landing site at each of the seven landing regions was selected through the alternatives analysis process described in Chapter 2. The proposed landing sites are the following:

- 'Akialoa Road, Kekaha, Kaua'i (TMK: por. 4-1-2-002:032, 4-1-3-001:999);
- Kili Drive, Mākaha, O'ahu (TMK: por. 1-8-4-002-047);
- Sandy Beach Park, Hawai'i Kai, O'ahu (TMK: por. 1-3-9-015:001);
- Oneali'i Homesteads, Kaunakakai, Moloka'i (TMK: 2-5-4-006:019);
- Wahikuli, Lahaina, Maui (TMK: por. 2-4-5-021:007, 015);
- Po'olenalena Park, Mākena, Maui (TMK: por. 2-2-1-007:072, 084); and
- Kaewa Place, Kawaihae, Hawai'i (TMK: por. 3-6-1-004:020).

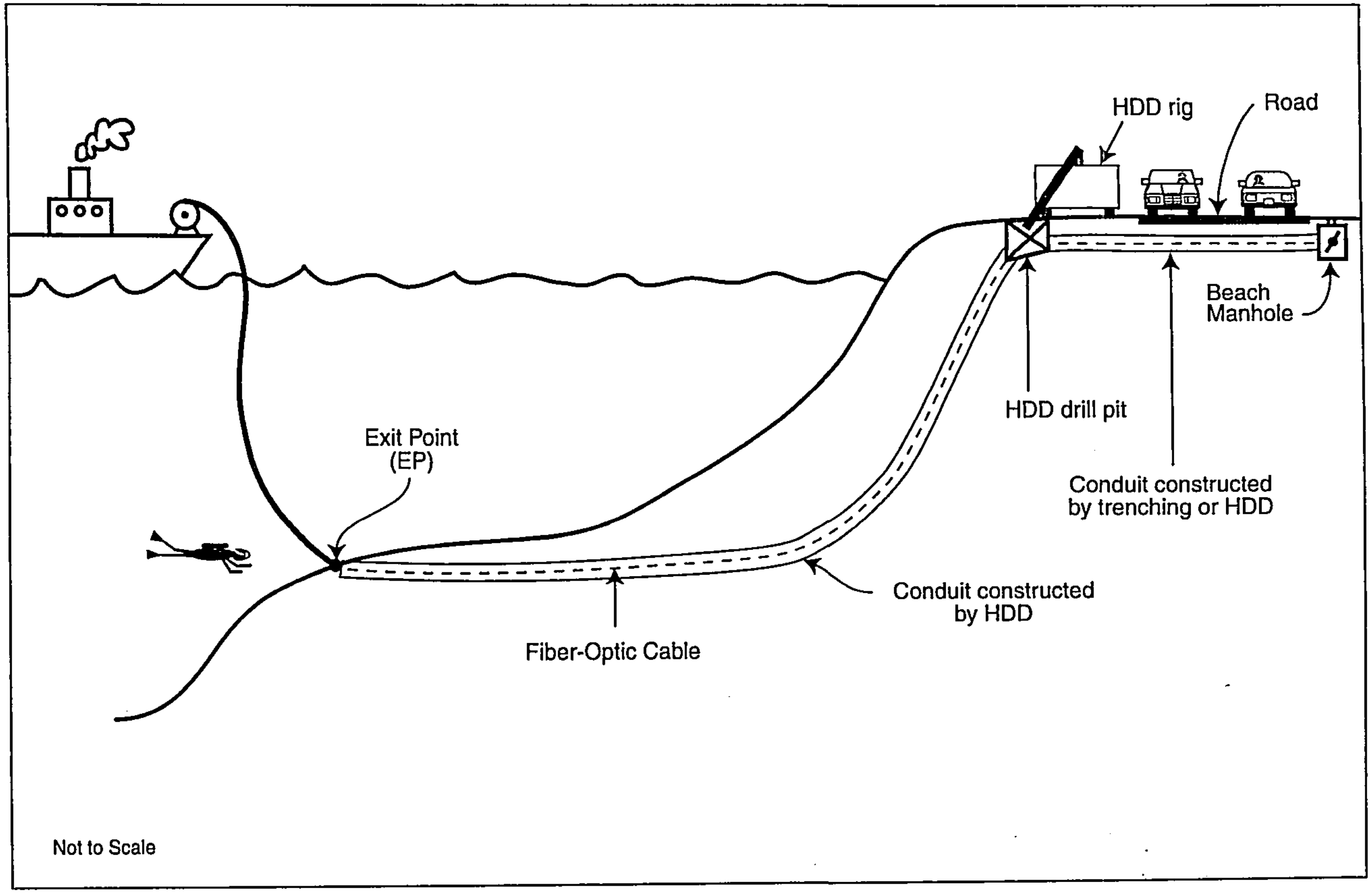
The key elements of a typical "landing site" are the following (see Figures 1.4-2 and 1.4-3):

- Double armored fiber-optic cable (60-foot depth or greater);
- Undersea exit point (EP) for the fiber-optic cable conduit;
- Fiber-optic cable placed within an underground steel drill casing or conduit between the EP and the drill site;
- Fiber-optic cable within a PVC pipe or conduit between the drill site and the beach manhole (three landing sites do not require this particular element because the drill site is on the mauka side of the manhole); and
- "Beach manhole" (the first manhole on land from a submarine cable) placed within a road right-of-way, which is used to connect the submarine network with the terrestrial network (or to link with a connecting route, in the case of three landing sites).



Sandwich Isles Communications, Inc.

Typical Landing Site Infrastructure (As Completed)
Submarine Fiber-Optic Cable Project
Figure 1.4-2



Sandwich Isles
Communications, Inc.

Typical Construction Elements at Landing Sites
Submarine Fiber-Optic Cable Project
Figure 1.4-3

Table 1.4-2 summarizes selected characteristics of the proposed landing sites, including any necessary connecting route to the terrestrial system. Figures 1.4-4A through G show the key elements at each landing site.

1.4.3 Connecting Route to Terrestrial System

Three of the seven landing sites would require an extra segment to connect the submarine network (from the beach manhole) to the terrestrial fiber-optic cable network. At these locations, the beach manhole location would fall short of the terrestrial network's cable alignment. The landing sites requiring such connecting routes are the following:

- 'Akialoa Road, Kekaha, Kaua'i;
- Kili Drive, Mākaha, O'ahu; and
- Sandy Beach Park, Hawai'i Kai, O'ahu.

Lengths of these terrestrial extensions are shown in Table 1.4-2. The cable for this connecting route may be placed in a trench or in an HDD conduit within road rights-of-way. The connection between the beach manhole and the terrestrial system would be a bundle of three ducts.

1.4.4 Construction Method

The construction process is described below in three major phases:

- Construction of landing sites,
- Construction of connecting routes, and
- Installation of submarine cables connecting the islands.

Once construction is completed at each site, all equipment would be demobilized and construction areas would be restored to pre-construction conditions.

1.4.4.1 Construction of Landing Sites

Construction elements of a typical landing site are shown in Figure 1.4-3 and listed below:

- Horizontal directional drilling (HDD) drill site, to drill the cable conduit between the drill site and undersea exit point (EP);
- Construction of beach manhole; and
- Trench from drill site to beach manhole.

Duration of construction would be roughly three months at most landing sites. Construction duration would be approximately five months at the Oneali'i Homesteads landing site, where two HDD bores must be drilled adjacent to each other – one bore would be used by the submarine cable to O'ahu and the other bore by the cable to Maui. Work at each landing site would be limited by State regulations, which allow construction that exceed the Community Noise Standards only between the hours of 7 a.m. to 6 p.m. on weekdays and from 9 a.m. to 6 p.m. on Saturdays.

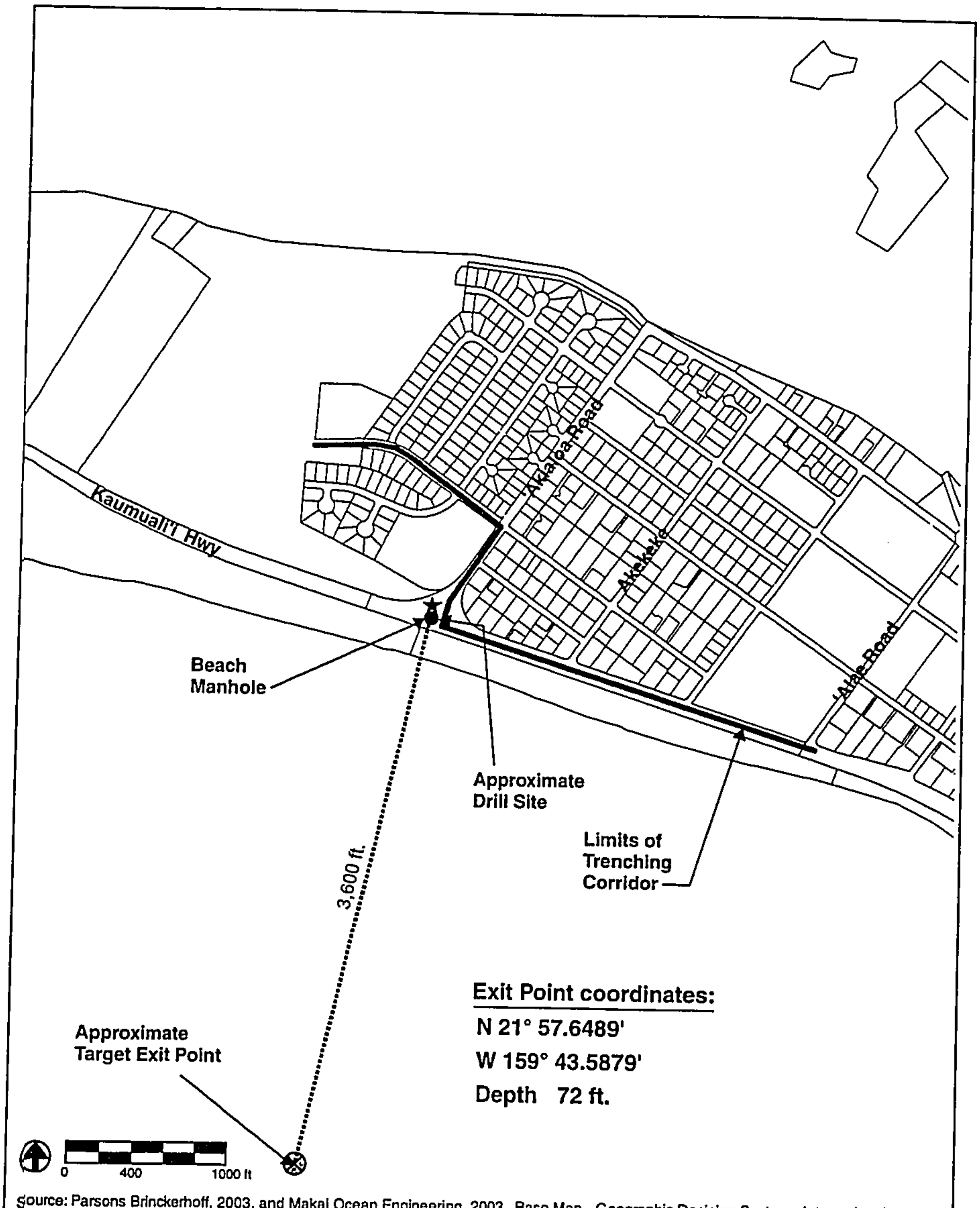
1.4.4.1.1 Horizontal Directional Drilling (HDD)

Cable landfalls have typically been constructed using open trenches. Trenches disturb the surface of the land and could cut through sensitive coastal and nearshore resources such as beaches and coral reefs.

TABLE 1.4-2:
SUMMARY OF LANDING SITE ELEMENTS

Landing Site	Location	Exit Point (EP) Coordinates	EP Depth	Drill Site - EP Distance	Landing Site Conduit	Location of Beach Manhole	Connecting Route (length)
'Akialoa Road	Kekaha, Kaua'i	N21° 57.6489'; W159° 43.5879'	72 ft	3,600 ft	No	Kaumuali'i Hwy	Yes (4,500 ft)
Kili Drive	Mākaha, O'ahu	N21° 28.3095'; W158° 13.6861'	77 ft	3,500 ft	No	Farrington Hwy	Yes (17,200 ft)
Sandy Beach Park	Hawai'i Kai, O'ahu	N21° 16.9731'; W157° 39.9497'	69 ft	2,100 ft	Yes	Kalaniana'ole Hwy	Yes (1,600 ft)
Oneali'i Homesteads	Kaunakakai, Moloka'i	N21° 3.8180; W156° 59.3700'	80 ft	4,500 ft	Yes	Kamehameha V Hwy	No
Wahikuli	Lahaina, Maui	N20° 54.0019; W156° 41.5676'	58 ft	2,860 ft	No	Honoapi'ilani Hwy	No
Po'olenalena Park	Mākena, Maui	N20° 39.8191'; W156° 26.8201'	58 ft	1,900 ft	Yes	Mākena Road	No
Kaewa Place	Kawaihae, Hawai'i	N20° 2.1480'; W155° 50.3140'	81 ft	3,200 ft	Yes	Akoni Pule Hwy	No

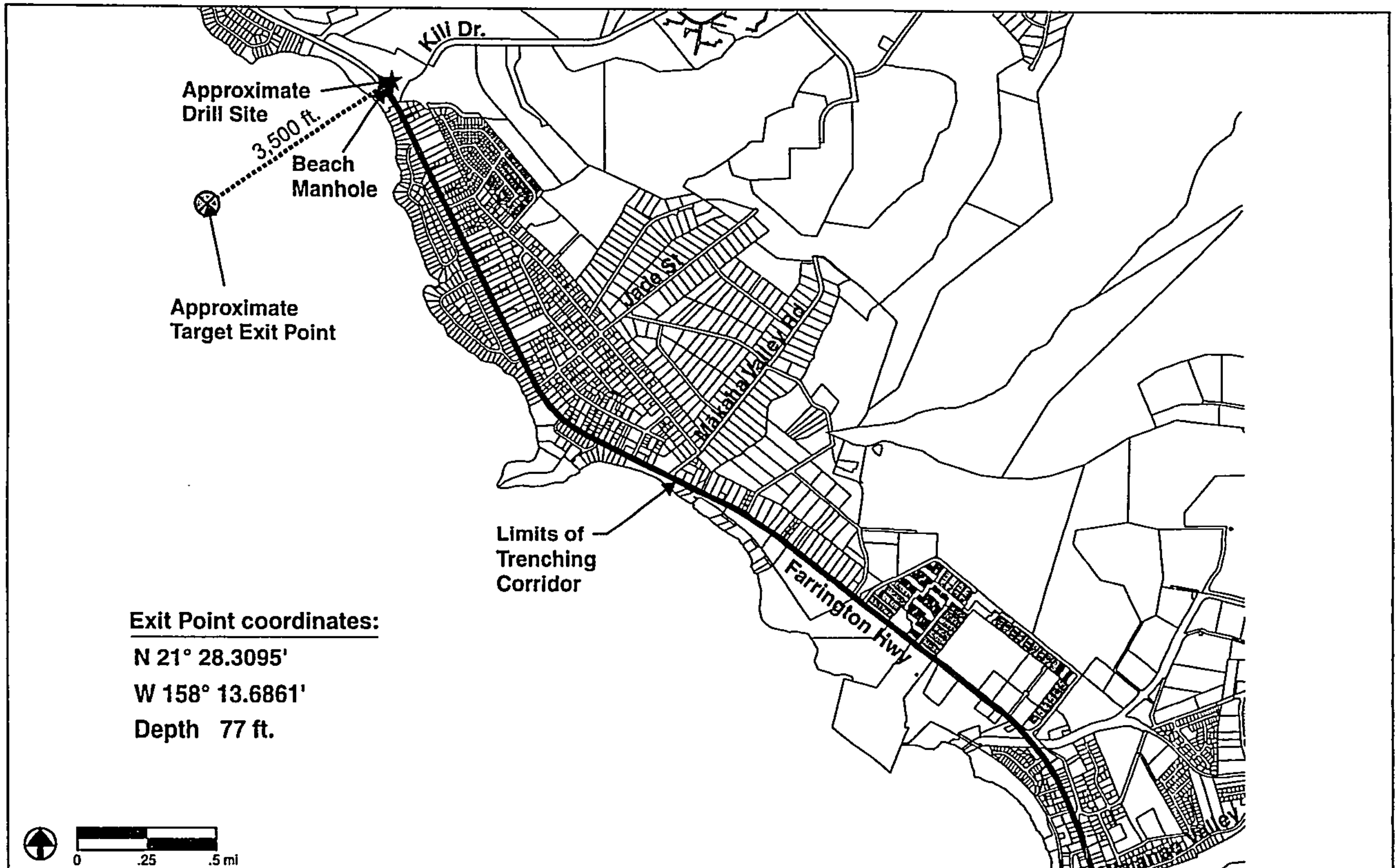
Source: Parsons Brinckerhoff, 2003.



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

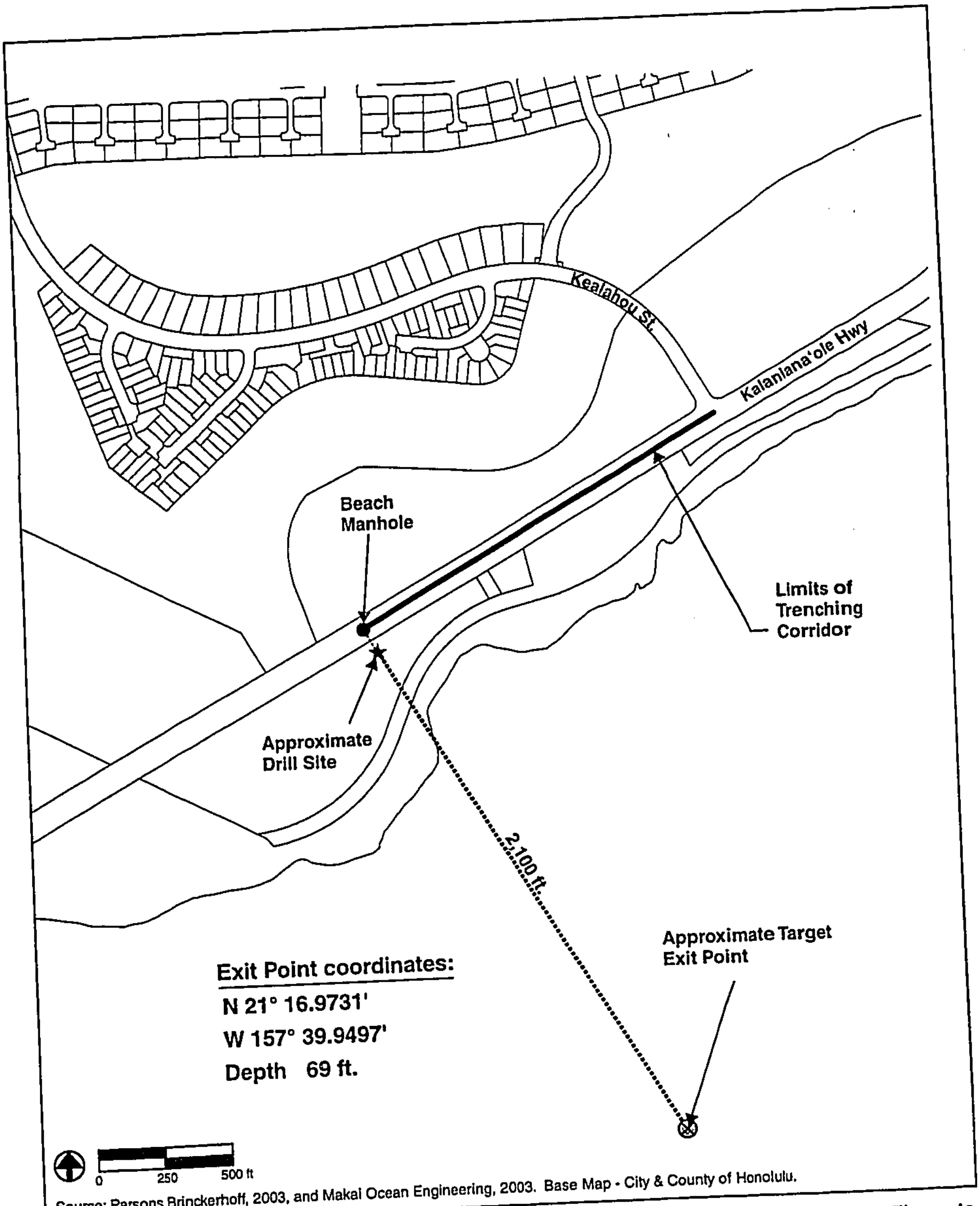
'Akialoa Road Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4A



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - City & County of Honolulu.

Sandwich Isles Communications, Inc.

Kili Drive Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4B



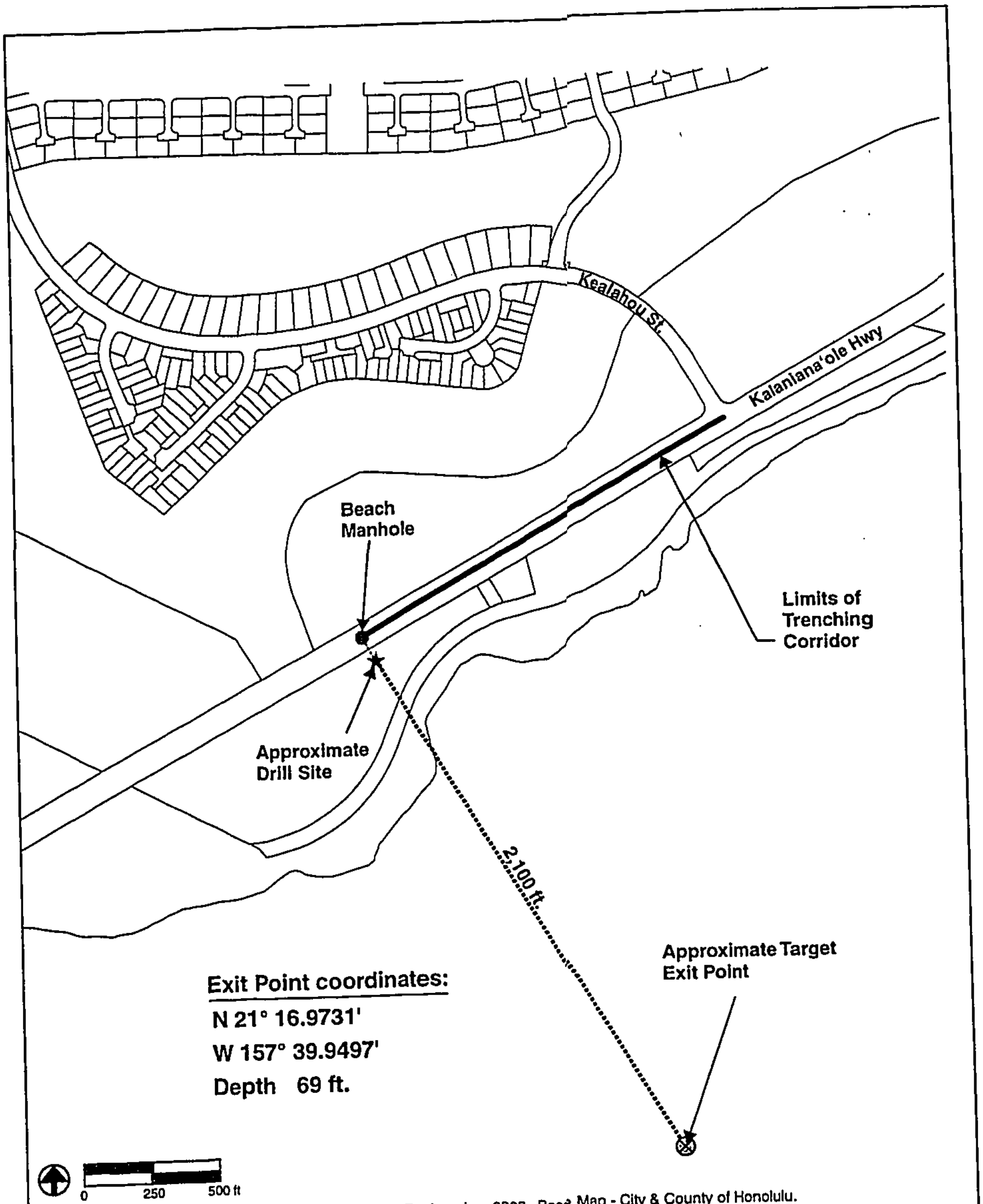
Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - City & County of Honolulu.

Sandwich Isles Communications, Inc.

Sandy Beach Park Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4C

CORRECTION

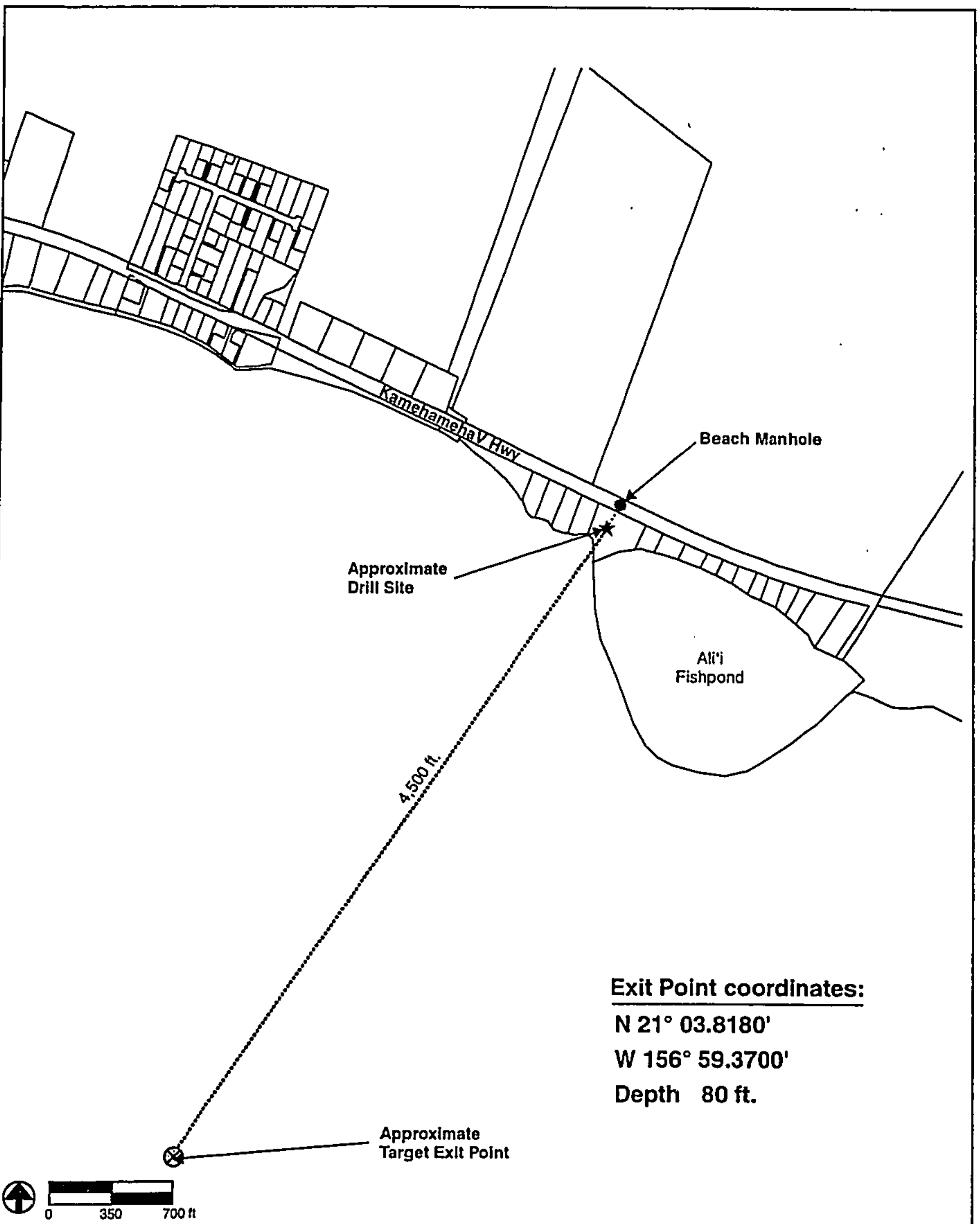
THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - City & County of Honolulu.

Sandwich Isles Communications, Inc.

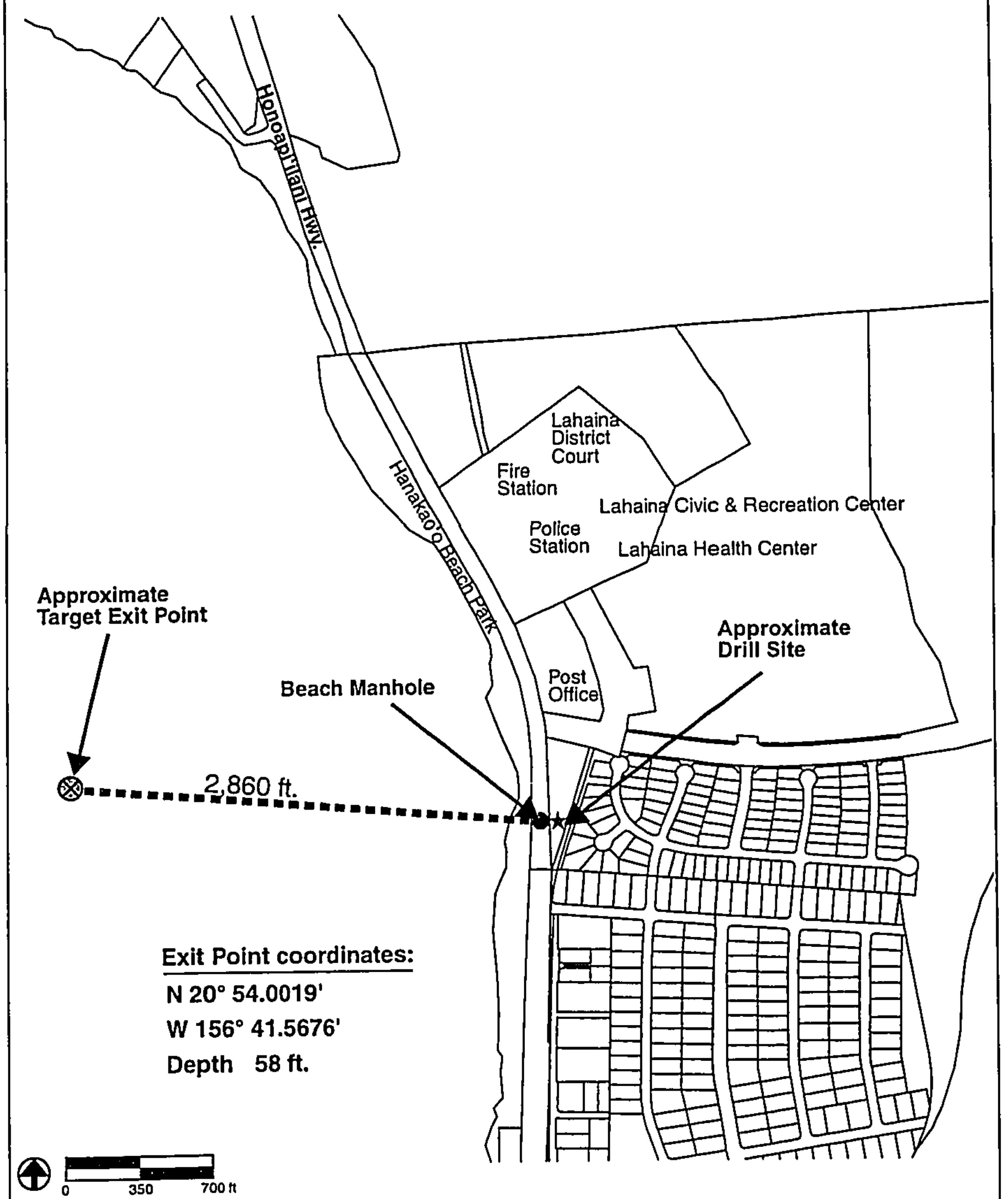
Sandy Beach Park Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4C



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

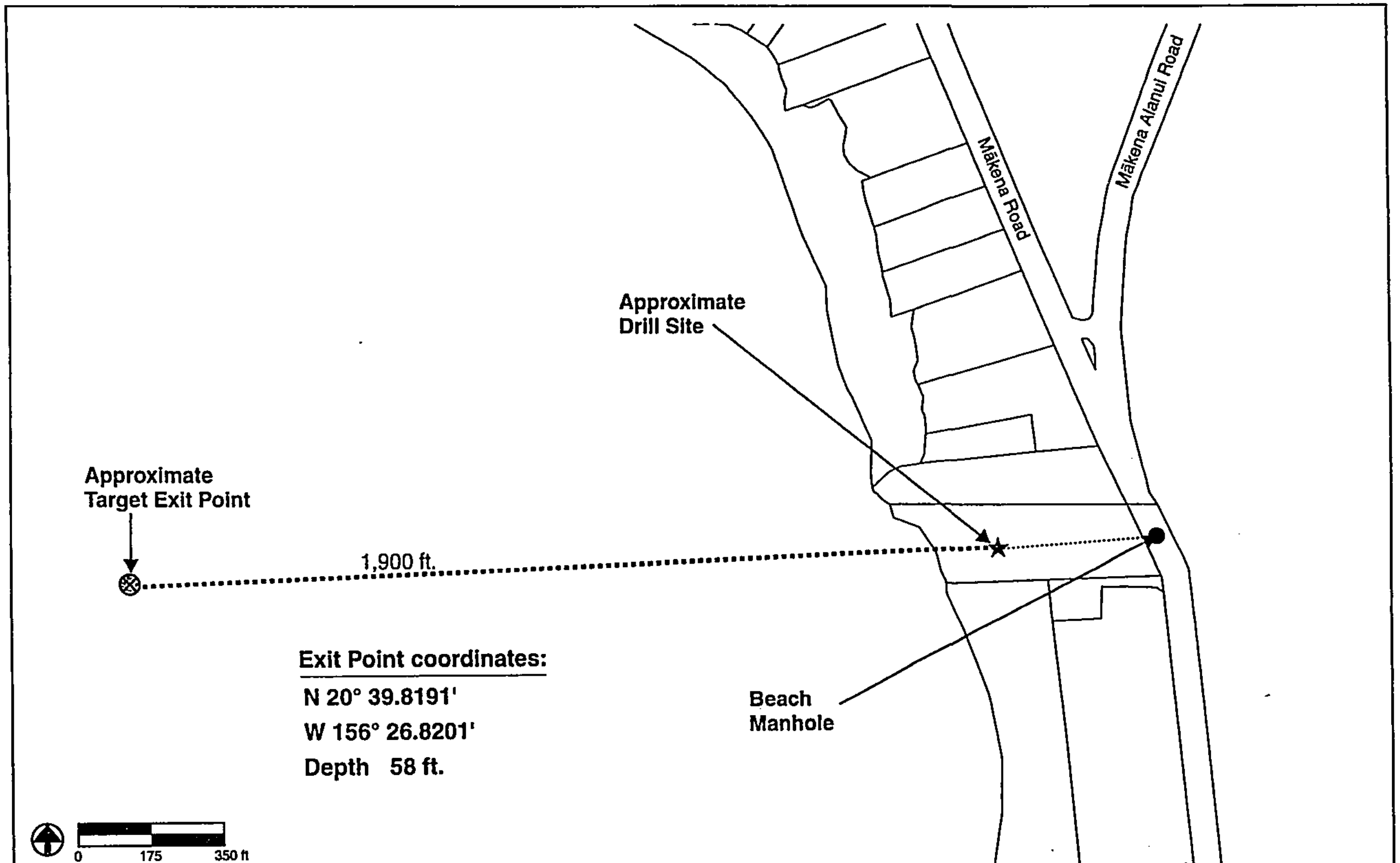
Oneali'i Homesteads Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4D



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

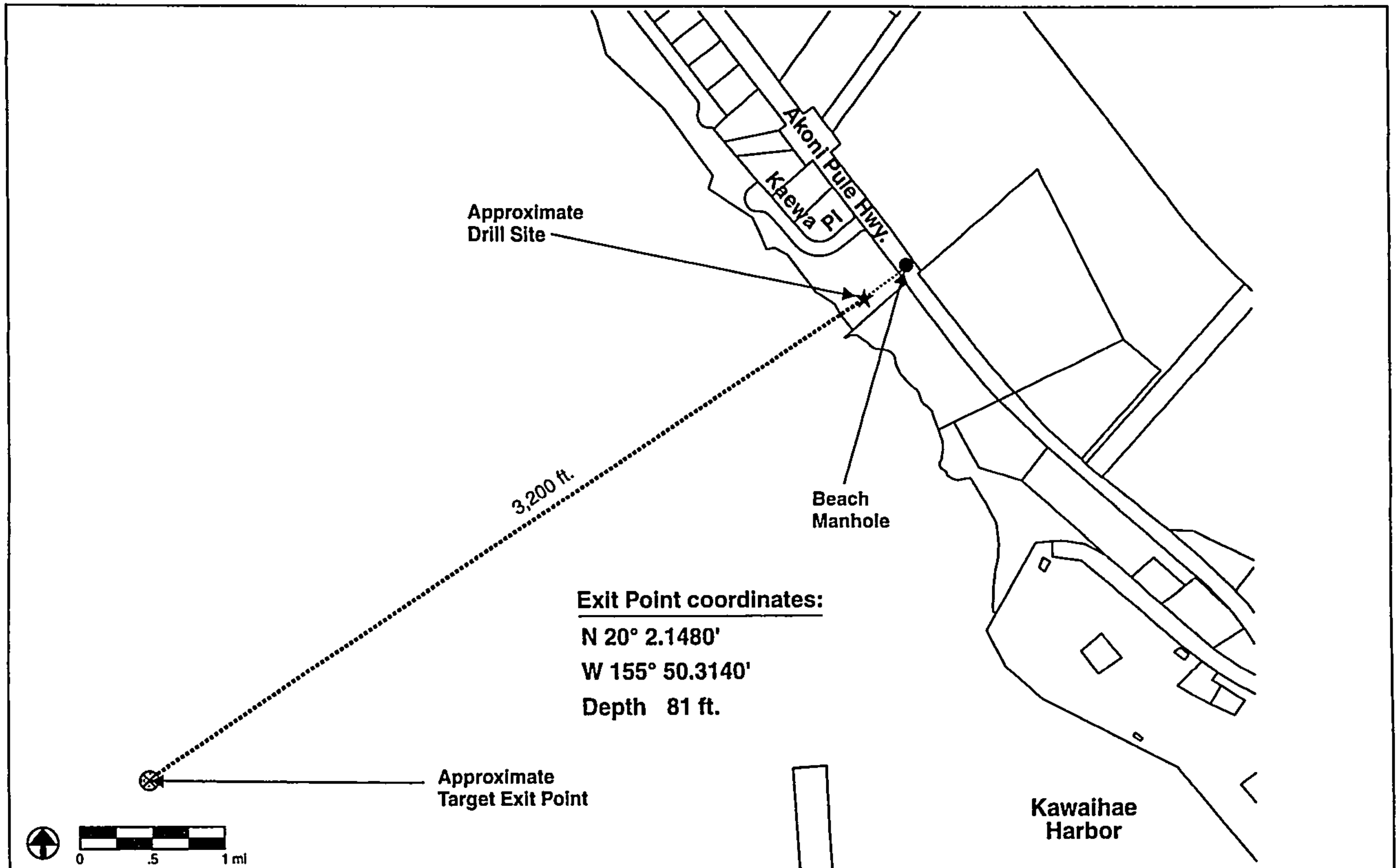
Wahikuli Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4E



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

Po'olenalena Park Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4F



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

Kaewa Place Landing Site Elements
Submarine Fiber-Optic Cable Project
Figure 1.4-4G

By contrast, SIC proposes to use horizontal directional drilling (HDD) to construct the underground cable conduit leading to the EP at each landing site. The primary benefit of HDD is that it is able to install underground pipes and conduits while minimizing surface disturbance. The use of HDD would avoid adversely affecting coastal and nearshore resources, requiring only a small diameter underground bore, rather than causing surface disturbance along the length of the cable run. The HDD process creates a guided, rigid, casing-lined underground conduit to an exit point on the ocean floor.

HDD construction generates minimal ground disturbance at the landing site. A work area of less than one acre would provide enough space for mobilization and drilling activities. The construction area would include an entrance pit (or drill site), material storage areas, centrifuges, tanks, and storage for excavated material and other equipment, such as several large trailer or mobile units (typically three units). Additional site equipment includes control stations, pumps, generators, front-end loaders, and trucks.

By avoiding trenching in roadway rights-of-way, HDD would reduce traffic impacts and traffic control requirements and minimize the need for construction dewatering. HDD technology is less labor-intensive than trenching, with minimal disturbance to the community at large.

Another advantage of HDD construction is that it can be conducted during rough ocean weather and high waves because the operation would be shore-based, and excavation would take place below the ocean floor.

HDD has been used in other local applications, including at Pearl Harbor, where HDD was used to construct a wastewater line connecting Ford Island to the intermediate pump station at the Pearl Harbor Naval Shipyard. A 2,000-foot bore of 20 inches in diameter was completed in 20 days in January 2002. Another earlier HDD project at Pearl Harbor constructed a 1,300-foot-long 10-inch bore for an oil and bilge wastewater pipeline.

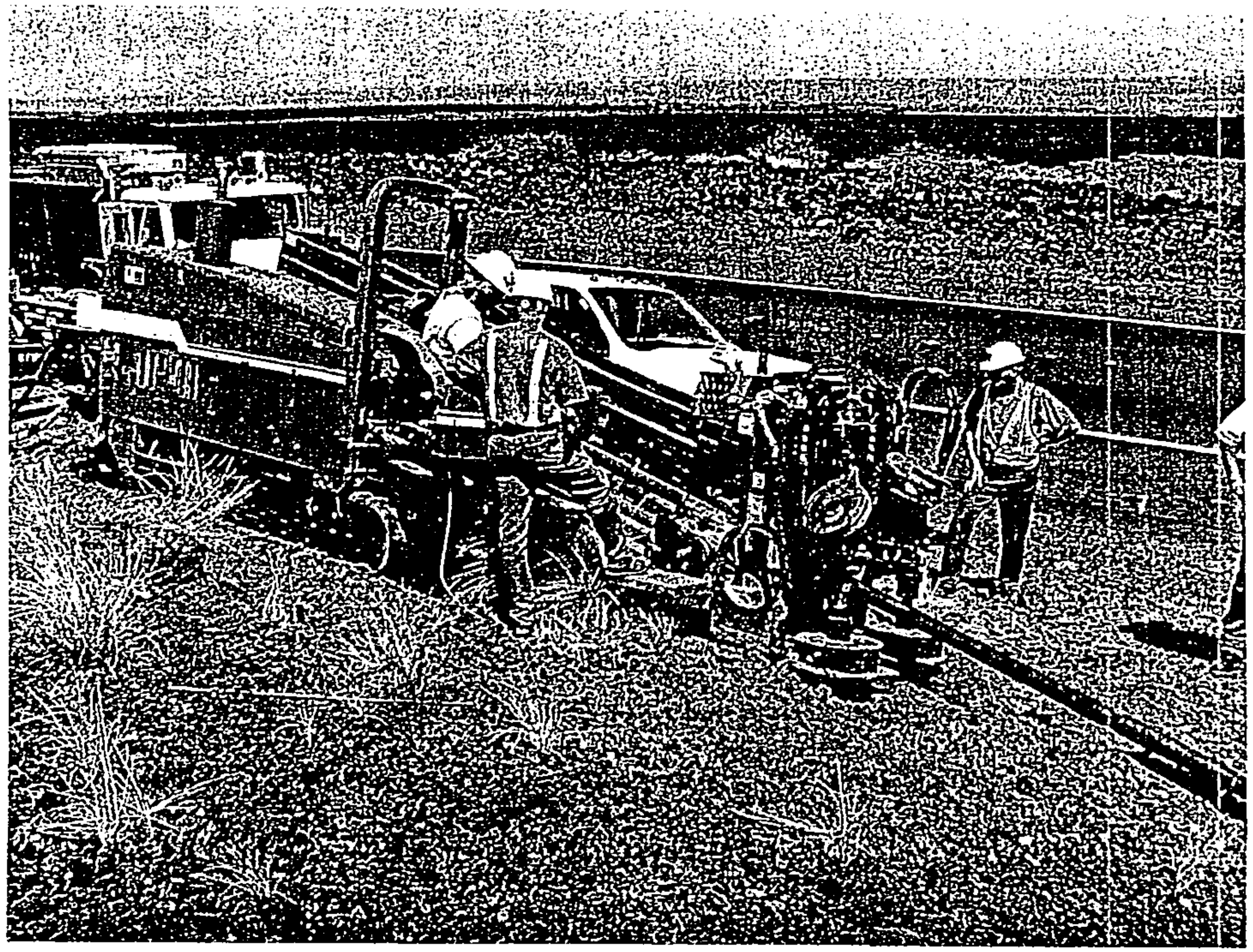
A brief summary of the HDD process follows.

An entrance pit (point of entry for the drill head) is excavated. The pit typically measures no larger than 10 feet by 20 feet. An HDD rig drives a rotating shaft, or drill rod, with a mounted cutter head into the entrance pit. A typical drill rig is shown in Figure 1.4-5. From the entrance pit, a remotely controlled drill head bores towards the ocean, as shown in Figure 1.4-3. A probe located near the drill head allows its position to be monitored at all times.

As the drill head bores through soil or rock, it creates a six to eight-inch diameter hole. Sections of pipe are added at the pit to push the drill head along. This drill shaft casing later becomes the fiber-optic cable conduit. The angle of the drilling is no more than 15 degrees from horizontal.

As the drill head bores its way underground, excavated soil and rock must be removed to create the hollow subterranean bore. The excavated material is called "cuttings". In addition, a slurry or "drilling mud," consisting of water and a naturally occurring, non-hazardous clay (bentonite) is injected into the hole to remove the cuttings, lubricate the pipe, reduce frictional drag, and cool the drill bit. To minimize discharges and to recycle the slurry, the slurry and cuttings are pumped to a centrifuge (called a desander or drilling fluid/mud handling tank) where the cuttings are separated from the slurry.

The cuttings would be disposed at a local landfill in accordance with all applicable regulations, and the returned slurry is recycled and re-injected into the bore hole. The contractor would make every effort to reclaim all slurry generated during drilling, and recycle it. Other excavated material generated by HDD would be stockpiled on site, and used as backfill or disposed at a landfill. Best Management Practices (BMPs) would be designed and implemented to control erosion from this temporary stockpile and the



Source: Parsons Brinckerhoff, 2003.

Sandwich Isles Communications, Inc.

Typical Horizontal Directional Drilling Rig
Submarine Fiber-Optic Cable Project
Figure 1.4-5

entire work area. Any excess material after backfilling would be disposed onshore in accordance with applicable requirements.

Some localized, horizontal geologic voids may be encountered during HDD. When the void is small, some slurry may be lost in filling the void. When the slurry does not return at all or does not return with sufficient quantity, the contractor would either alter the slurry mix consistency to make it thicker, or the contractor would grout the void locally.

The drill head is guided to the underwater EP, which would be 60 feet below mean sea level (msl) or deeper. This threshold depth was selected to reduce the potential for damage to the submarine cables from surface wave action. When the drill head approaches the EP, the bore is flushed with water to extract all of the slurry back to the onshore centrifuge, and the slurry in the bore is replaced with water. Therefore, when the drill head "pops out" into the ocean, there would be no discharge of slurry or cuttings into the ocean. Once the drill head exits the EP, the drill head is removed and the drill casing/cable conduit is capped until the contractor is ready to install the submarine fiber-optic cable.

After HDD is completed, the drill site and trench would be filled. The site is returned to its pre-construction condition. The only remaining visible landside element would be the beach manhole cover. Construction of the manhole is explained below.

1.4.4.1.2 Installation of Beach Manhole and Connection to Drill Site

The beach manhole is the first manhole the submarine cable would enter on each island. It would typically be located within a State or county road right-of-way (ROW). The interface between the submarine fiber-optic cables and the terrestrial cables would occur at the beach manhole. The inside dimensions of a typical beach manhole are twelve feet long, seven feet wide, and seven feet deep.

When the drill site is on the mauka side of the road, the beach manhole would intersect the HDD conduit and be installed in the ROW. Therefore, the submarine cables would connect with SIC's terrestrial system or with a connecting route at the beach manhole, and no additional conduit segment would be necessary. The following landing sites would be located on the mauka side of the roadway:

- 'Akialoa Road, Kekaha, Kaua'i;
- Kili Drive, Mākaha, O'ahu; and
- Wahikuli, Lahaina, Maui.

However, when the drill site is on the makai side of the road, the beach manhole site would be a separately excavated site in the ROW. A conduit would be installed between the drill site and the beach manhole using open trenching construction. The following landing sites would be located on the makai side of the roadway:

- Sandy Beach Park, Hawai'i Kai, O'ahu;
- Oneali'i Homesteads, Kaunakakai, Moloka'i;
- Po'olenalena Park, Mākena, Maui; and
- Kaewa Place, Kawaihae, Hawai'i.

1.4.4.2 Construction of Connecting Route to Terrestrial System

Lengths of connecting routes discussed in Section 1.4.3 are shown in Table 1.4-2. Connecting routes would be constructed in a manner similar to the construction of SIC's terrestrial system. The construction method for a particular section of cable would be determined on a case-by-case basis during the design phase of the project, but would most likely be installed by trenching along existing road rights-of-way.

HDD methods have been used in lieu of trenching to place pipelines beneath streams and roadways when geological conditions are favorable. For the Mākaha and Sandy Beach Park landing sites on O'ahu, SIC is also assessing the feasibility of placing cables in abandoned water lines.

Open trench construction typically involves excavating a trench about one foot wide and three feet deep. After laying the cable conduit, the trenches would be backfilled, and roadway shoulders and the pavement would be resurfaced. At bridge crossings, the design of the cable crossing would be determined on a case-by-case basis because of differences in design and materials among bridges. Options include bridge attachments or directional drilling under streams or gulches.

Cable installations in roadways would conform to design requirements in Title 19, Chapter 105 (Accommodation and Installation of Utilities on State Highways and Federal Aid County Highways) of the State DOT's Administrative Rules (DOT 1981) or Standard Details for Public Works Construction (DPW 1984). Coordination with the roadway owner (State DOT or County) would occur during the design phase, and the segments would be designed to avoid or minimize the impact on streams or other environmentally sensitive resources.

1.4.4.3 Installation of Submarine Cables

A cable-laying control system would be used to position the cables accurately on the seafloor and with the appropriate slack. The cable-laying process, statewide, is anticipated to take roughly four weeks.

After HDD is completed, the cable-laying ship would approach the EP using a global positioning system (GPS). Once the ship arrives in the vicinity of the EP, it would fix its position and begin laying out cable. Workers would attach suspension floats at regular intervals to the cable as it is laid, allowing the floating cable to be pulled toward the EP using a small motor boat or other mechanical means.

A diver would insert the cable from the ship into the landing site conduit, using a string left in the conduit when HDD was completed and the EP was capped. The cable would then be pulled back toward the beach manhole as it spools off reels on the ship (see Figure 1.4-3). The vessel would then lay the cable along a precisely selected alignment to the next landing site, paying out the cable to accommodate the bathymetry of the ocean bottom.

1.4.5 Committed Mitigation Measures

Mitigation measures are discussed in the site specific discussions in Chapters 3 through 9. However, the following committed mitigation measures would apply to the entire project:

- If it were necessary to restrict shoreline access temporarily during construction, such restrictions would be lifted as soon as possible after construction is completed. The SIC contractor would inform the community and/or post signs on-site about temporary access restrictions. Special arrangements would be made to provide safe passage through the construction area.
- Best management practices (BMP) plans would be developed during the design phase. Although some of the landing sites would not require an NPDES permit for Stormwater Associated with Construction Activity, the same BMP measures would be implemented at all sites because they involve basically the same excavation work. BMPs would also address procedures for testing and handling hazardous materials that may be encountered during construction.
- A spill response plan would be prepared to address appropriate countermeasures in the event of accidental spills of oils or other substances used during construction.
- To prevent potential rodent problems, SIC would comply with Hawai'i Administrative Rules, Chapter 11-26 on "Vector Control", including clearing vegetation harboring rodents and eradicating rodents in their facilities. However, because most of the cable infrastructure would be

installed underground and in public rights-of-way, potential rodent problems are anticipated to be minor.

- The underwater HDD pop-out event or cable hook-up would be suspended if a protected marine animal, such as the Hawaiian monk seal or green turtle, is observed in the immediate vicinity.
- If a humpback whale or other protected marine animal, such as spinner dolphins, is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, the operation would be halted until the animal(s) moves away from the vessel or cable deployment area of its own volition.
- The contractor would control off-site fugitive dust emissions by watering or covering exposed soils. The contractor would also be required to maintain his/her equipment in proper working order, including exhaust and noise suppression systems.
- SIC or its contractor would inform residents near the proposed landing sites about drilling noise and provide contact information for questions and complaints. The SIC contractor would be required to maintain his or her equipment in proper working order, including all noise suppression systems.
- All work within road rights-of-way would include the posting of flagmen to direct traffic safely around construction sites. For busier roads, police officers may also be used to direct traffic.
- Coordination with existing utilities will occur during the design phase.
- Construction plans affecting road rights-of-way (ROW) will be submitted for approval to the Hawai'i HDOT and the various County Departments of Public Works (DPWs) during the engineering phase.

1.4.6 Repair and Termination of Network

Any type of repair to the submarine fiber-optic cable network would be similar to the initial installation. Repairing a cable break seaward of the EP would require splicing a new section of cable into the system, replacing the damaged section of cable. If the damaged cable were within the under-seafloor conduit, the old cable would be removed, and a new cable would be pulled through the conduit from the EP to the beach manhole.

Fiber-optic technology is state-of-the-art in communications, which include voice, video and other forms of data. This technology is anticipated to be the main method of data transmission for the foreseeable future. However, like all technology, fiber-optics will become obsolete as more advanced forms of data transmissions are developed and implemented. Eventually, SIC will decide to terminate its fiber-optic cable networks in favor of newer technology, but this will not happen for many years. When SIC no longer needs its submarine fiber-optic cable infrastructure, they will inform DLNR. SIC will abide by DLNR's decision in regards to its removal.

1.5 PROJECT COST, SCHEDULE, AND FINANCING

After the environmental phase is completed, detailed engineering plans would be developed, and construction contracts would be awarded. Construction specifications would include requirements to implement the committed environmental mitigation measures during project construction.

The estimated construction cost is $33 million. Of that amount, $15 million is the cost of laying the submarine cable, and $18 million is the cost of HDD and landing site construction. The SIC project would be financed by long term, low interest federal loans from RUS.

Construction is anticipated to start approximately January 2006. The construction duration is anticipated to be roughly one calendar year for all landing sites statewide, including the time required to lay the submarine cables.

Chapter 2
Alternatives to the Proposed Project

Final Environmental Assessment/
Finding of No Significant Impact
Submarine Fiber-Optic Cable Project

CHAPTER TWO: ALTERNATIVES TO THE PROPOSED PROJECT

2.1 GENERAL APPROACH TO THE SELECTION OF LANDING SITES

This chapter discusses alternative landing sites that were investigated prior to selecting the proposed specific landing sites described in Chapter 1. Section 2.1.1 describes how general landing site regions were selected, and Section 2.1.2 describes the general framework used for locating sites within the selected region. Section 2.2 describes the specific factors considered in selecting the landing sites on each island.

2.1.1 Selection of Landing Regions

Because Sandwich Isles Communications (SIC) is proposing to develop a statewide fiber-optic communications network that would link Department of Hawaiian Home Land (DHHL) properties on five of the major Hawaiian islands (Kaua'i, O'ahu, Moloka'i, Maui, and Hawai'i (Big Island)), it was important to locate the landing sites so that they would provide connectivity to the remote DHHL properties on each island. Therefore, based on the ease of establishing a connection to the terrestrial fiber-optic system on each island, SIC selected general stretches of coastline (hereinafter "landing regions") near or adjacent to DHHL properties. See Figures 1.1-2A thru 1.1-2E to see the alignments of the terrestrial fiber-optic systems on each island.

2.1.2 Selection of Landing Sites Within Landing Regions

Multiple candidate (alternative) landing sites (i.e., specific parcels or locations on or near the coastline) were identified within each landing region. The initial criterion for screening candidate landing sites was the technical feasibility of using the horizontal directional drilling (HDD) construction method. (Section 1.4 describes the HDD process and explains why it is the preferred construction methods. Factors that were considered in assessing the technical feasibility of a site for using HDD included the following:

- Soil type: In general, HDD is feasible through most types of soils except for extremely rocky conditions. Therefore, for this project, a site's soil conditions did not result in screening out many sites.
- Length of bore and depth of exit point (EP): Feasibility becomes much more difficult if the distance between the on-shore drilling site and the proposed EP exceeds one mile. The proposed EP must also be at least 60 feet below mean sea level (msl), because 60 feet was determined to be the depth beyond which potential cable damage from wave action is minimized. Consequently, sites close to deep water where the bore length could be minimized were generally favored.
- Angle of bore: It is difficult for the HDD bore to dip at an angle greater than 15 degrees. Therefore, sites were considered infeasible if site geometrics indicated that there would be an inadequate setback of the drilling site to provide adequate cover over the conduit throughout the length of bore profile.
- Insufficient area: HDD staging involves several pieces of heavy equipment, vehicles, and bulky materials. Approximately one acre is required for the construction staging area.
- Access: Limited access, such as at isolated sites requiring grading, road building, or road-improving activities for the HDD equipment and vehicles to access the site, were considered infeasible.

If sites were deemed to be technically feasible, other factors were then weighed. With the exception of having to reach a 60-foot depth within about one mile of the drill site, nearshore ocean conditions were not a major factor in assessing technical feasibility of the proposed landing sites for the following reasons:

- Since HDD installs a small-diameter underground bore, there would be no surface disturbance except at the terminus of the bore. As a result, construction would not affect the surface of the water, and surface conditions also would not affect the construction. In comparison, subsurface conditions are much more important; therefore, geotechnical boring investigations were conducted as part of the landing site selection process.
- Areas with sandy bottoms were favored for potential EPs, both to minimize impacts on marine life and reduce potential damage to the cable conduits. Since the candidate landing sites within a landing region are relatively close, HDD construction would encounter similar ocean conditions at all or most candidate landing sites within a region. Therefore, bottom conditions would not be a differentiating factor.

Land ownership at the drilling site played a major role in site selection because of the need for long-term access by SIC to the site for maintenance activities. Since DHHL would be the direct beneficiary of the SIC network, DHHL properties were the first choice for drilling sites, if all other factors were equal. If DHHL land was not available, other government-owned (federal, State or county) properties were second choice. None of the sites finally selected is on private property.

Surrounding land use was a major factor used to identify candidate landing sites. Selection of landing sites was made so as to avoid residences and/or other areas potentially sensitive to construction activity.

Based on the factors above, multiple candidate landing sites were identified within each landing region using input from experts (subconsultants) and a geographic information system (GIS). This was called the desktop analysis phase. Using GIS, various mapped data layers including topography, land ownership, zoning, and bathymetry, were overlaid to identify suitable sites. In some cases, however, where available land use data could be outdated, some sites were eliminated based upon discovery of recent, ongoing, or proposed development through site visits or other investigations. Expert knowledge on archaeology and cultural practices, botany, and marine biology provided additional information on candidate sites.

Geotechnical investigations were also conducted at several of the remaining potential sites after initial investigations were performed. The purpose of the geotechnical investigations was to confirm that subsurface conditions were appropriate for HDD.

Preliminary coordination was also conducted with regulatory agencies to explore the possibility of using certain sites or regions (see Chapter 12 and Appendix 2 for details on agency coordination). Sites that were anticipated to have regulatory complications were eliminated.

All remaining candidate sites were field checked to confirm the results of the desktop analysis.

Finally, a comparative evaluation was performed to select the proposed landing site within each landing region. This evaluation is summarized for each landing region in the following section. The specific considerations used in these evaluations differed among landing regions to reflect local concerns and conditions. In some cases, the selection of the landing site was based on environmental factors, such as the presence of culturally significant archaeological sites. In other cases, especially if the landing region is highly urbanized, social factors were the principal factor, since certain sites may have a number of nearby residences that could be disturbed during construction. Community input was the major factor in the selection of some of the proposed landing sites (see Chapter 12 for information about the project's public involvement activities).

2.2 ANALYSIS OF ALTERNATIVE LANDING SITES

2.2.1 Kaua'i

2.2.1.1 Kekaha Landing Region

SIC's five proposed Kaua'i landing sites to serve the Kaua'i to Mākaha, O'ahu marine cable link are located in the Kekaha region on the southwest shore of the island (see Figure 2.2-1). The following alternative landing sites were developed for the Kekaha landing region:

- 'Akialoa Road
- 'Alae Road
- 'Iwa Road
- Akepa Road
- Kikīaola Harbor

The Kekaha district was selected as the landing region because candidate landing sites are in close proximity to DHHL property, while providing continuity to SIC's terrestrial fiber-optic cable system, which is currently under construction on Kaua'i. Water quality, ocean bottom, and marine biological conditions within the Kekaha region are generally consistent.

Proposed Landing Site - 'Akialoa Road

This County-owned site, TMK 4-13-001:999, is adjacent to a large DHHL-owned parcel (TMK 1-2-002:032). Burials are known to exist on the DHHL-owned parcel. However, based on previous archaeological research and subsurface testing, areas to the west and north of the proposed landing site have less probability of encountering burials and a cultural layer.

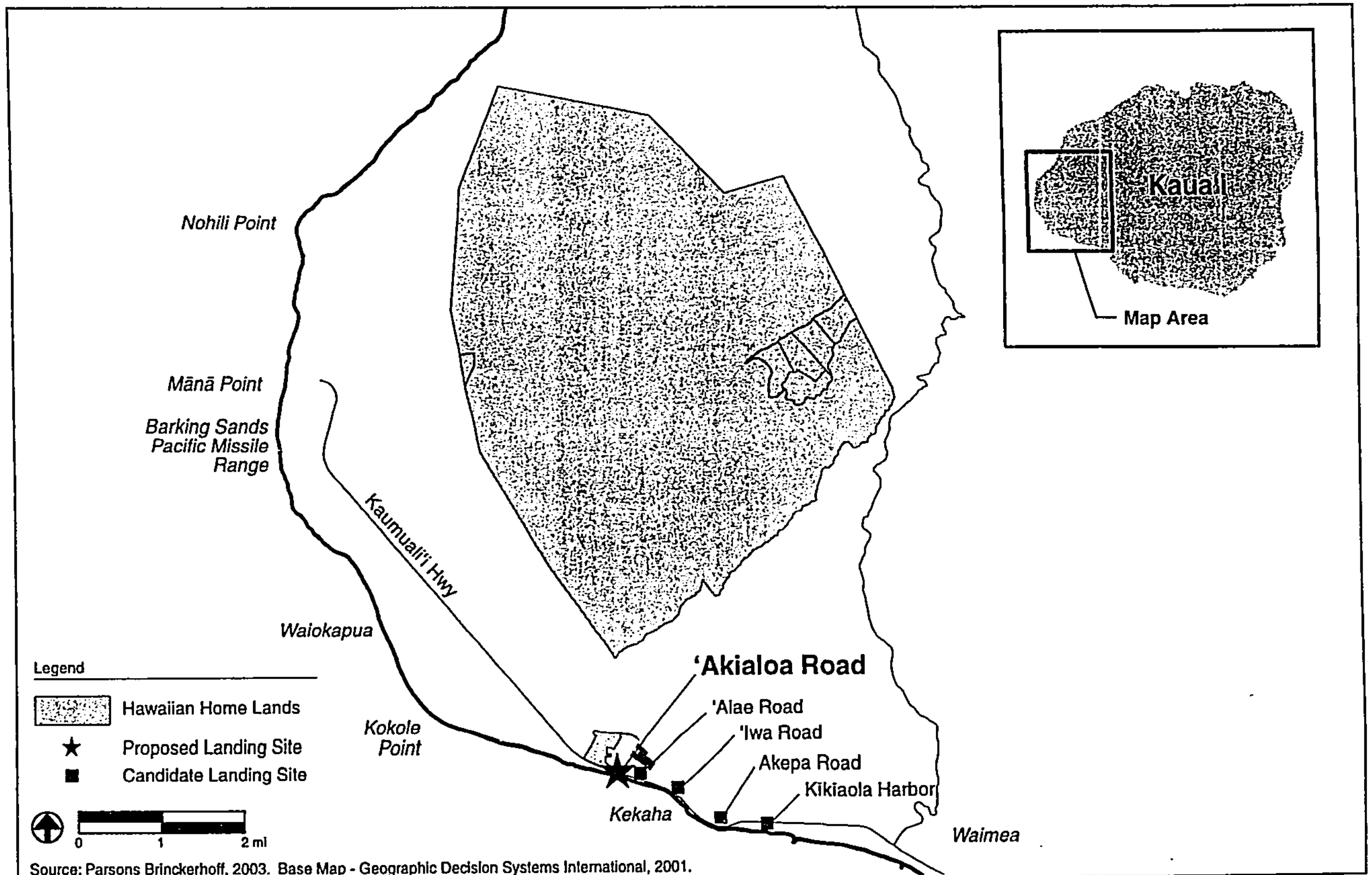
Further assessments were conducted as part of this project. Archaeological subsurface testing was conducted in late July 2003 (Cultural Surveys Hawai'i, July 2003) and consultation with the State Historic Preservation Division occurred. The site closer to 'Akialoa Road is preferred and is the proposed site. The mauka area of this site is presently being used as a stable (TMK 1-2-004:032, encumbered by Revocable Permit No. 7089 to Ross Fernandez for pasture purposes).

TMK 1-2-004:007, encumbered by Governor's Executive Order No. 1425 to County of Kaua'i for addition to Kekaha Beach Park, is immediately makai of the proposed landing site.

This parcel was determined to be the most appropriate location for the Kekaha landing site because it is closest to DHHL homestead lots which the project is being developed to serve, obtaining construction easements for use of this parcel will be easier because it is County-owned, and the target landing site at the corner of Kaumuali'i Highway and 'Akialoa Road is the closest point to a proposed Digital Loop Carrier building within an adjacent DHHL residential subdivision.

'Alae Road

This candidate landing site, TMK 4-13-001:002, is located within a County of Kaua'i district park known as Faye Park, mauka of Kaumuali'i Highway, and is the site of at least two large annual community-wide events. HDD construction requirements, although temporary, would be disruptive to the community's usage of this public facility.



Sandwich Isles Communications, Inc.

Candidate Landing Sites - Kekaha, Kaua'i
Submarine Fiber-Optic Cable Project
Figure 2.2-1

There are known burials in lots southeast of the candidate landing site in TMK nos. 4-1-3-03:015, 019, 023, just mauka of Kaumuali'i Highway. Because of these known sites, there is a probability that burials and a cultural layer exist within the candidate parcel. Archaeological monitoring would likely be required not only for the proposed HDD bore site but for the adjacent lot as well.

While this candidate site is County-owned, it was eliminated from further consideration because of its community usage and archaeological resources.

'Iwa Road

This candidate landing site, TMK 4-13-011:001, mauka of Kaumuali'i Highway, is owned by the State. There are known burials in lots to the northwest in TMK nos. 4-1-3-03:15,19,23) just mauka of Kaumuali'i Highway. Further, there is a possibility of burials and a cultural layer on or in close proximity to the candidate site because it is adjacent to a public cemetery. Therefore, this candidate was eliminated from further consideration.

Akepa Road

This candidate site, TMK 4-13-005:040, is located makai of Kaumuali'i Highway east of Ō'ōmanō Point. It is owned by the Eric A. Knudsen Trust. As a privately owned parcel, it is less desirable because of the level of difficulty for SIC to obtain easements.

Preliminary consultation with archaeologists knowledgeable about the Kekaha area indicated a possibility of burials and a cultural layer on or in close proximity to this site. Therefore, because of its ownership status and archaeological resource concerns, this site was eliminated from further consideration.

Kīkīaola Harbor

This small boat harbor, TMK 4-12-006:017, is under State jurisdiction. Although cable installation would cause temporary, short-term (one to two months) disruption to harbor activities, there were also concerns expressed regarding interference with ongoing harbor operations. Easements would also be required for use of this property.

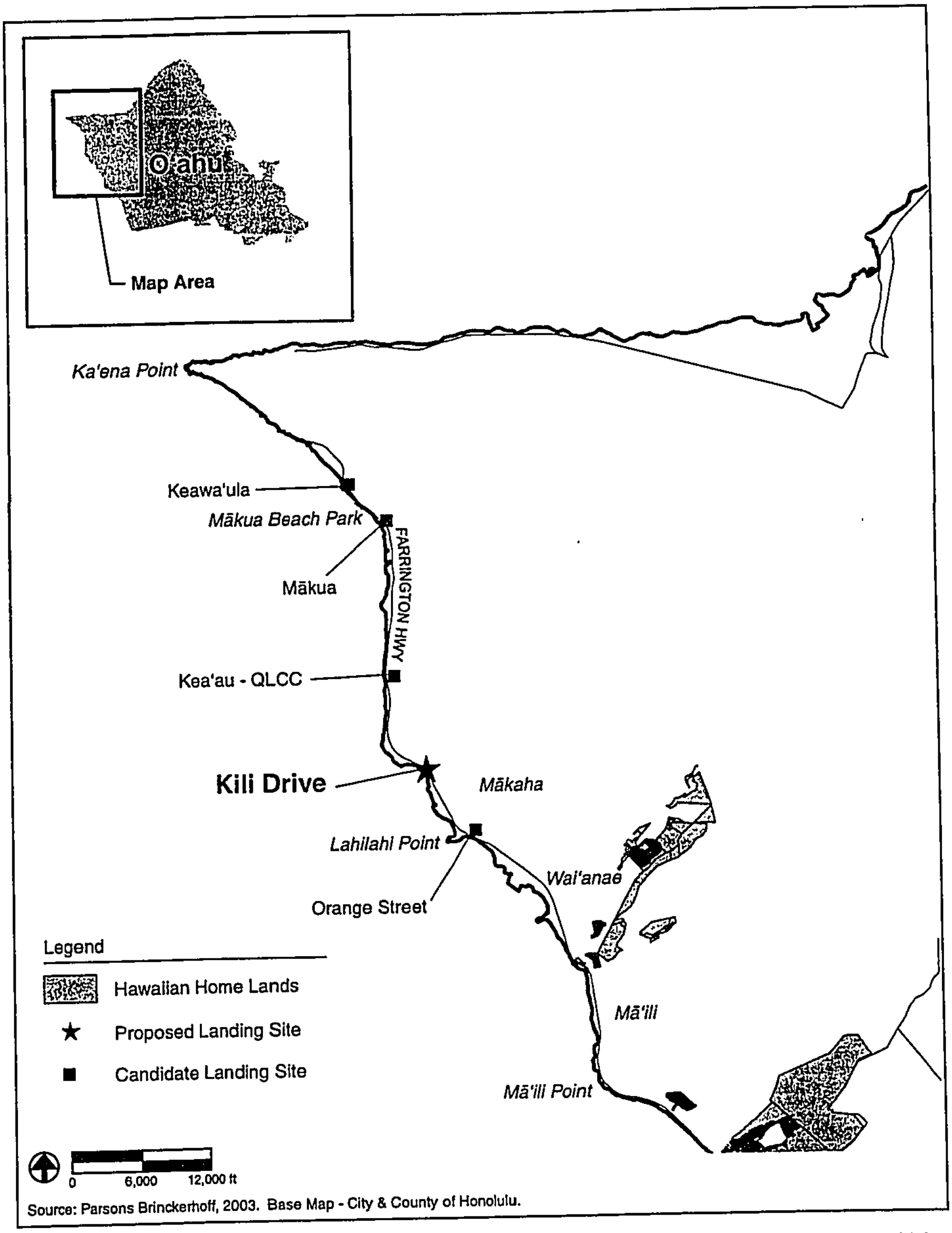
A soil survey indicated that the site would be suitable for HDD. However, because of concerns expressed by the Hawai'i Department of Transportation about potential interaction with harbor activities, this site was eliminated from further consideration.

2.2.2 O'ahu

O'ahu has two marine landing regions: Mākaha on the western end and Hawai'i Kai on the island's eastern shore. These regions are generally located at the farthest reaches of O'ahu's DHHL properties while also being the nearest landfalls to Kaua'i on the west and Moloka'i on the east.

2.2.2.1 Mākaha Landing Region

SIC's five candidate O'ahu landing sites for the Kaua'i to O'ahu link are located in Mākaha along the Wai'anae coast of the island's southwest shore (See Figure 2.2-2). Mākaha was selected as a landing region because candidate landing sites are within the fringes of DHHL land and this stretch of coastline has physical, biological and qualitative characteristics conducive to cable landings. The following landing sites were considered:



Sandwich Isles Communications, Inc.

Candidate Landing Sites - Mākaha, O'ahu
Submarine Fiber-Optic Cable Project
Figure 2.2-2

- Kili Drive
- Keawa'ula
- Mākua Beach Park/Punapōhaku (Federal Site)
- Kea'au-QLCC/Queen Lili'uokalani Children's Center
- Orange Street/Mauna Lahilahi

Proposed Landing Site - Kili Drive

The proposed landing site is Kili Drive, TMK 8-4-002:047, located on property owned by the City and County of Honolulu. Kili Drive is an undeveloped mauka portion of Mākaha Beach Park, a well-known surfing beach.

Makaha is an existing cable landing corridor. From a state regulatory interest, the Department of Land and Natural Resources and the Office of Planning prefer that future cable landings be located at existing marine cable corridors to minimize environmental impacts. The near shore bathymetry is well known and the broad sandy beach is connected to an offshore sand cell area via the Mākaha Channel. Several cables have been previously placed in this sand channel and landed on the beach. Generally these cables are buried but the seasonal movement of sand covers and uncovers portions of the cables.

One of the criteria used in selecting a preferred landing site is that the exit point, the point at which the under-seafloor drill casing pops out into the deep ocean, is within sandy bottom. The candidate landing site would be accessed through the Mākaha Channel *which is an ideal location for fiber-optic cable* landing from a biological perspective due to the presence of a sand bottom from shore to at least the 120-foot isobath.

The proposed alignment avoids existing cables in Mākaha Channel, and the EP is east of most existing cables. Also, HDD would avoid the exposure of the SIC cable to damaging conditions because of the seasonal movement of sand in the channel. Sand extends seaward of the EP at least another 115 feet (Richard Brock, EAC Report No. 2003-13).

One of the engineering design criteria in selecting undersea fiber optic cable routes is finding a route that will be the shortest distance between the two marine cable landings on each island to avoid the necessity of having repeaters and additional costs. The marine cable landing sites between Oahu and Kauai are the farthest distances. On the island of Kauai, the preferred landing site is Kekaha. While it is uncertain whether a repeater would be required from other candidate landing sites, the Makaha site is much closer to Kekaha than the others.

An inventory survey was done for the City and County of Honolulu's Mākaha Beach Park. During the 2001 survey, an isolated hearth dated A.D. 1440-1690 was found, which could be evidence of a broader cultural layer. However, this site is located about 200 feet west of the proposed SIC landing site. The proposed HDD work area and manhole site were inspected during the preliminary site evaluation and appear to have the appropriate characteristics for a manhole and landing site. The area has been washed out by floods, so there is a reduced chance that burials will be found.

The route connecting the proposed landing site to Wai'anae Valley Road is 3.3 miles, shorter than the distances required for the other candidate sites. Subsurface archaeological conditions for a portion of this alternative site are already known, because recent archaeological monitoring conducted for Board of Water Supply work along Farrington Highway from Kaulawaha Road to Jade Street did not encounter any significant cultural material or human burials (Tulchin and Hammatt, in progress). In addition, no human burials were encountered during recent archaeological monitoring completed for trenching along residential streets makai of Farrington Highway from Jade Street to Kili Drive (Pacific Legacy, in progress).

New DHHL subdivisions under construction along the Leeward Coast include Pahe'ehe'e Ridge, Freitas and Carlos Dairies, and there are several DHHL lessees within scattered lots in Nānākuli. The Kili Drive site would ideally span the service needs of these Wai'anae and Nānākuli lots. Initially, SIC was scheduled to coordinate its construction activities with TyCom and the Board of Water Supply. This would have alleviated some duplicative construction activities. Unfortunately, TyCom withdrew its plans to install fiber optic cables on the Leeward Coast. As a result, SIC needed to re-start its construction design and permitting process. This re-start has provided SIC an opportunity to research alternative methods of installing fiber-optic cables that may minimize traffic disturbance, i.e., the use of abandoned water mains or horizontal directional drilling.

Hence, the Kili Drive site was determined to offer the most appropriate characteristics for the Mākaha region landing site for engineering, biological, location and land tenure reasons.

Keawa'ula

The site is located along the Farrington Highway right-of-way at the juncture of the Air Force Tracking Facility Access Road and Ka'ena Point State Park, TMK 8-1-001:007. The park is parallel to the beach and has parking in several areas, including a large unpaved parking lot just northwest of the Tracking Station Access Road. During a site visit in August 2002, at approximately 11 a.m., the parking area was empty. Park users were observed sunbathing, relaxing, and swimming at the beach. Vehicles were parked along the park road.

Immediately mauka of the parking lot is a grassy lot measuring approximately 60 by 140 feet with a small garage and carport. There is vehicular access to the parking area. Maps indicate that the State is the owner of this parcel; it is not part of the Air Force facility. The grassy area is level and approximately six feet higher than the upper edge of the parking lot.

Both the parking lot and the grassed area have ample space for HDD equipment and operations. The site is easily accessible for large and heavy vehicles and equipment directly from Farrington Highway. It appears that the HDD operation would largely avoid direct impacts to park activities unless the parking lot is used much more during other parts of the week.

Two indicators of previously installed cables were found at the site. An AT&T manhole was located approximately 40 feet from the beginning of the parking lot, about 20 feet from the road's edge. A GTE hand hole was located southeast of the Tracking Station Access Road on the mauka side of Farrington Highway. Cable location markers for both were found in the area. The AT&T markers for its line were traced back to the Mākaha Undersea Terminal facility at 84-250 Farrington Highway. This facility is across from Mākaha Beach, several miles southeast of the Keawa'ula site. The remaining areas are overgrown with brush and tall grass.

There are considerable sand deposits offshore that make HDD cable landing conditions favorable. However, soils testing revealed that the subsurface contained boulders, making HDD difficult. Secondly, the distance from this landing site in Keawa'ula to Wai'anae Valley Road (terrestrial route end point) is too great to make this route feasible. This means that cable installation work would involve construction activities to connect the landing site with the terrestrial route end point at Wai'anae Valley Road over approximately 8.7 miles of Farrington Highway. Finally, the site is near the Keawa'ula Complex; if the landing site is in sand, there is potential for affecting a cultural layer and burials.

Mākua Beach Park/Punapōhaku (Federal Site)

The Mākua Beach Park/Punapōhaku site, TMK 8-1-001:007, was rejected for several reasons. First, the connection needed to Wai'anae Valley Road is too long to make this candidate landing site feasible.

Secondly, the geotechnical investigation disclosed numerous subsurface boulders that would make HDD difficult. Further, Kelly and Quintal (1977) reported the presence of the Mākua Fishing Village in the area of the landing site. Thus, there is potential for encountering subsurface cultural deposits. Because this is a very sensitive area with modern cultural concerns related to Mākua Valley, as well as rocky subsurface conditions, this landing site was eliminated.

Kea'au-QLCC/Queen Lili'uokalani Children's Center

The Kea'au-QLCC/Queen Lili'uokalani Children's Center parcel is privately owned by Lili'uokalani Trust, TMK 8-3-001:004. Unlike the other four candidate Mākaha sites, the offshore cable alignment for Kea'au would pass under a coral reef formation near the shoreline. There is also a relatively high density of archaeological sites north of this parcel. Previous archaeological research for the Mākaha Bridge 4 project by Tuggle in 1994 contains the most information. However, based on aerial photography, it appears that the landing site is in a previously disturbed area. While there may well be no known archaeological sites, this is a culturally sensitive area.

Because of the site's cultural sensitivity, location of the alignment relative to a coral reef, and the private ownership, the Kea'au site was eliminated from consideration.

Orange Street/Mauna Lahilahi

At the Orange Street/Mauna Lahilahi candidate landing site, TMK 8-4-013:002, the 60-foot isobath (proposed EP) occurs on a limestone bottom with some coral reef. If this alignment were used, the HDD would be extended to the 80-foot isobath where mixed sand/rubble limestone is encountered. Moving the EP to the 80-foot isobath would avoid a considerable area of coral reef, but would extend the HDD from approximately 3,170 feet to 3,610 feet.

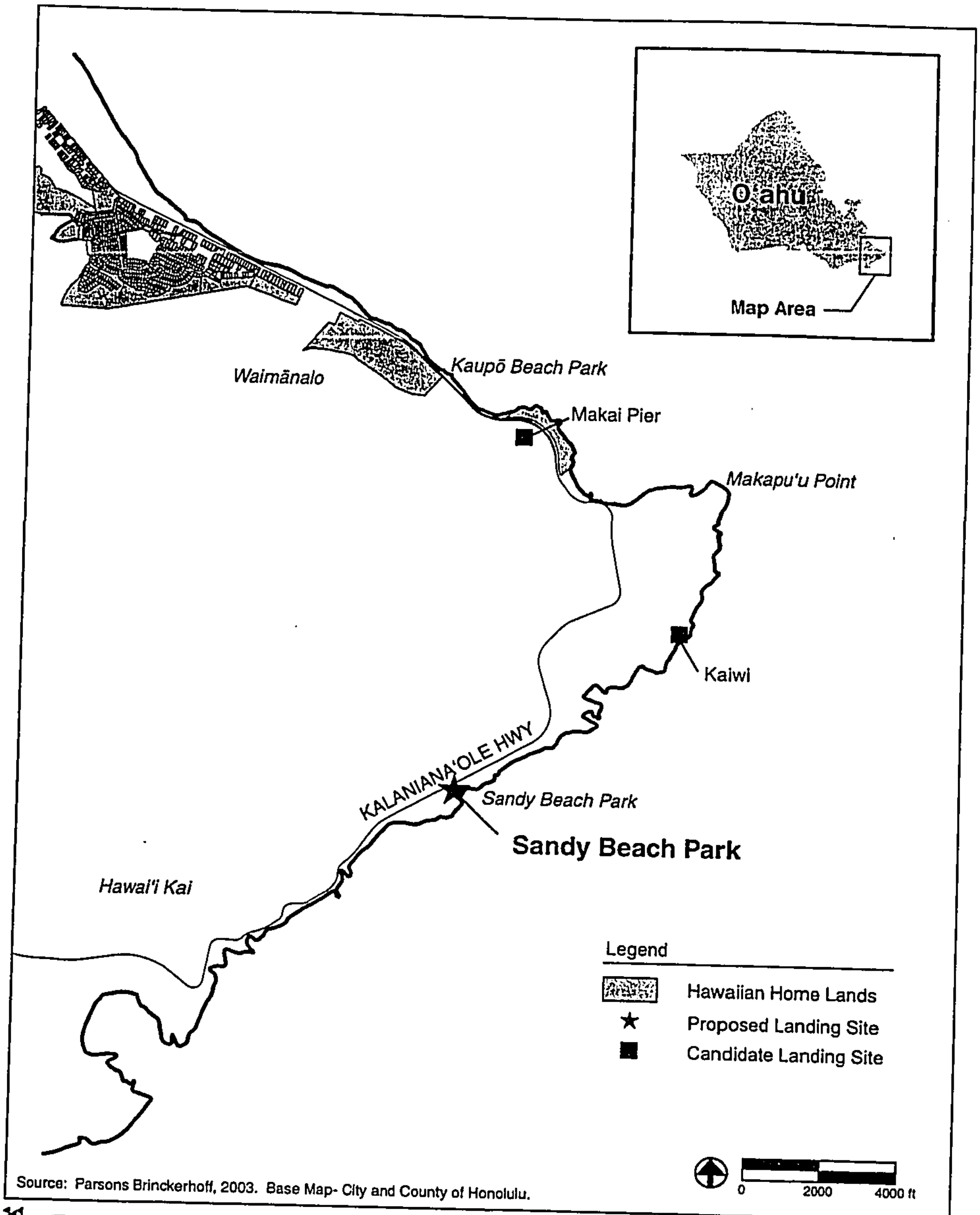
Recent waterline installation work uncovered burials near this candidate landing site. Further, this parcel is privately owned. Because the proposed EP may affect coral resources, the parcel is privately owned, and the site may be archaeologically sensitive, this candidate landing site was eliminated from consideration.

2.2.2.2 Hawai'i Kai Landing Region

SIC's three proposed east O'ahu landing sites for the O'ahu to Moloka'i cable link are located in the Hawai'i Kai to Waimānalo area on the eastern shore of the island (See Figure 2.2-3). This region was selected because it would allow the shortest route from O'ahu to Moloka'i. There is variation along this part of the coast with respect to water quality, seafloor topography, and marine benthic communities. The following three potential landing sites were considered in this region:

- Sandy Beach Park, Hawai'i Kai
- Makai Pier, Waimānalo
- Kaiwi

A site in Hawai'i Kai was selected. Site evaluations extended further toward Waimānalo, but the coral reef along this stretch would cause concerns, even though the HDD bore would pass under the reef. The distances to the EP at potential Waimānalo landing sites were also too great for use of HDD.



Source: Parsons Brinckerhoff, 2003. Base Map- City and County of Honolulu.

Sandwich Isles Communications, Inc.

Candidate Landing Sites - Hawai'i Kai, O'ahu
Submarine Fiber-Optic Cable Project
Figure 2.2-3

Proposed Landing Site - Sandy Beach Park, Hawai'i Kai

The Sandy Beach Park site, TMK 3-9-015:001, located at the easternmost portion of the park, was found to be the most appropriate landing site because of physical conditions, absence of known biological and archaeological resources, and proximity to existing linear easements. This site would require the shortest drilling distance to reach required depths. The site is near the existing Verizon fiber-optic cable and the City and County of Honolulu sewer outfall, which are immediately offshore of Sandy Beach Park.

An archaeological survey including subsurface testing found no subsurface cultural deposits. Although there is low potential for impacting cultural material, the potential exists for encountering a cultural layer or burials in the sand. There are no known threatened or endangered botanical resources at this site. Further, the site is regularly maintained by the City and County of Honolulu's Department of Parks and Recreation.

Makai Pier, Waimānalo

This candidate site, TMK 4-1-014:004, is in the Oceanic Institute (OI) parking lot. The ocean bottom at the EP is a mix of sand and emergent limestone with scattered corals. The extent of sand increases seaward. However, the site is relatively close to Makapu'u Point, which has relatively steep submarine topography. Therefore, a cable alignment at this location would traverse steeply sloping hard substratum.

Another disadvantage of this site is that the cable could traverse the well-known precious coral beds off Makapu'u, located at depths below 1,200 feet.

The landing site is in the OI parking lot, so construction would inconvenience employees and guests. Offshore waters are classified AA, which would make in-water construction difficult. There is also some concern with erosion, and land near Makai Pier is sliding.

This candidate landing site does not contain any known archaeological sites. Based on previous research, there were sites prior to Kalaniana'ole Highway construction in the 1930s, and Oceanic Institute/Sea Life Park construction in the 1960s. Recent research related to the new wedding chapel confirmed the absence of sites. However, certain Hawaiian groups view the area as very sensitive. Community accounts indicate that OI is on the site of a former Hawaiian village.

Because of the possible impact on existing precious coral beds in or near the proposed OI alignment, impact to Class AA waters, and community concerns regarding cultural resources, it has been determined that this is not a viable landing site.

Kaiwi

This site, TMK 3-9-011:002, is part of an area known as Queen's Beach that is being preserved as a park and scenic area. A burial was observed eroding from a sand dune southwest of the landing site, near Kalaniana'ole Highway. A historic road is located near Makapu'u Lookout to the north. Access to the site is restricted and not conducive to construction equipment or activity. This is a culturally sensitive area.

An inventory survey of the area was conducted by Cultural Surveys Hawai'i for previous projects. There are no known archaeological sites at the proposed landing site. This area was dredged by Kaiser Development Corp.

The substrate at the EP is a mix of sand and emergent limestone with scattered corals. In general sand extends seaward from the EP. However the site is relatively close to Makapu'u Point which has relatively steep submarine topography, so the cable would traverse steeply sloping hard substratum.

A botanical resource study conducted for the proposed Queen's Beach golf course revealed two endangered species near the dirt roads: *Cyperus trachisantos*, a sedge 1 to 2 feet tall, and 'ihi'ihi-lau-ākea (*Marsilea villosa*), a small fern with leaves that resemble a four-leaf clover. A large population of ma'o or Hawaiian cotton (*Gossypium tomentosum*) is found to the north of the landing site. Two insects, the Oliarus wild cotton plant hopper, (*Oliarus discrepans*) and a Hawaiian snout beetle (*Rhynocogonus simplex*), have been collected from ma'o plants in the Makapu'u area. Both are designated by the USFWS as species of concern.

Due to engineering concerns and biological and community sensitivities, this site is not considered an appropriate cable landing site.

2.2.3 Moloka'i

The following alternative landing sites on Moloka'i are located along the south shoreline of the island near the largest town, Kaunakakai (see Figure 2.2-4):

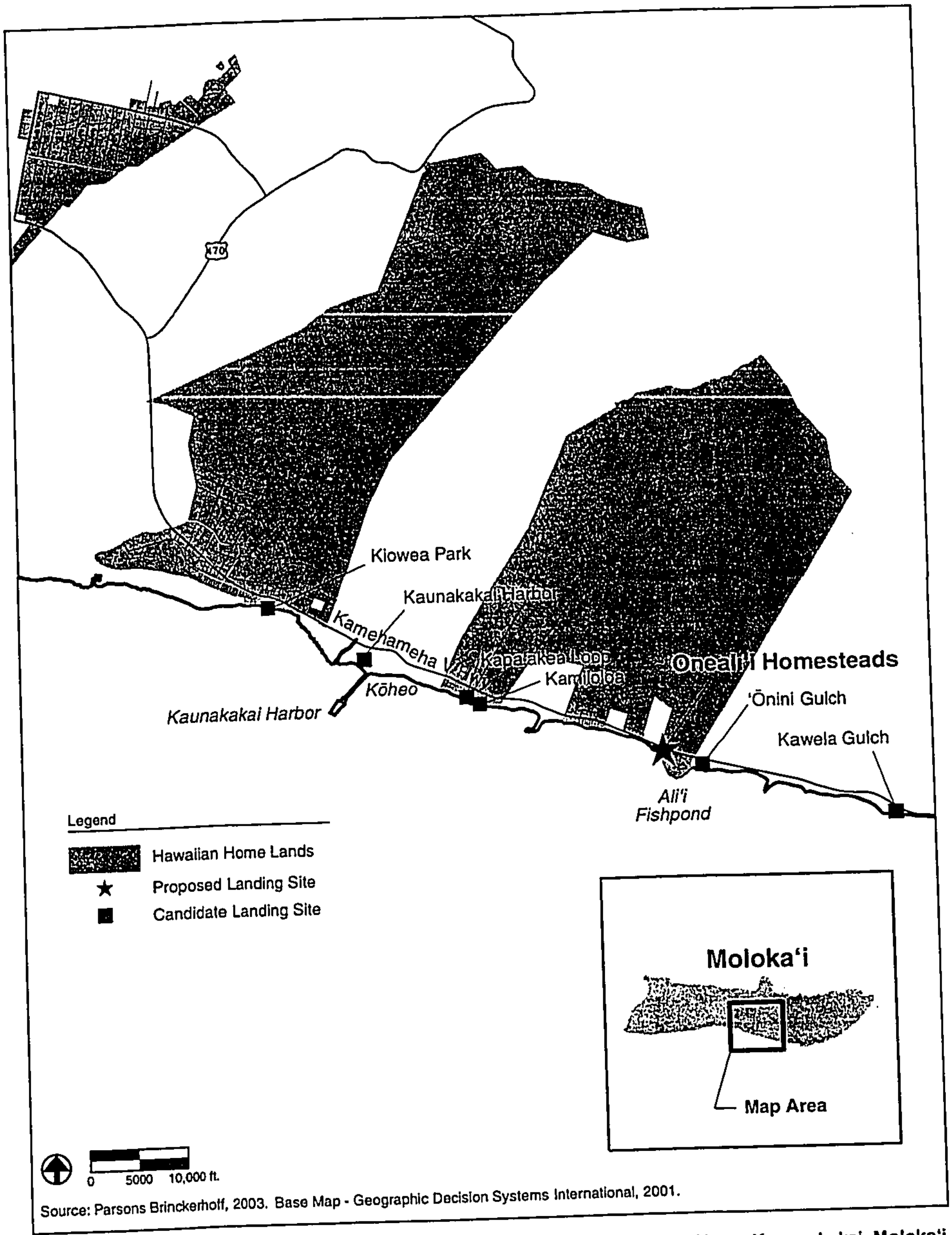
- Oneali'i Homesteads
- Kiowea Park
- Kaunakakai Harbor
- Kamiloloa
- 'Ōnini Gulch
- Kapa'akea Loop
- Kawela Gulch

As shown on Figure 2.2-4, the State Department of Hawaiian Home Lands (DHHL) Moloka'i properties are clustered in the central part of the island, but extend to both the south side near Kaunakakai and to the north side in Kalaupapa and to remote Ualapu'e, near the east end of the island. The candidate Kaunakakai landing sites are located in generally rural areas where there are no or few residences. Some of the sites are near fishponds, which are numerous throughout the south coastline of the island. In addition, the south coastline supported a pre-contact native Hawaiian population, as indicated by the large number of fishponds and other evidence. Therefore, kupuna iwi (native Hawaiian burials) are likely scattered throughout the coastal area, and in some areas, may be untouched by development.

All of the candidate landing sites would also encounter similar nearshore ocean conditions, with the exception of the Kaunakakai Harbor site. The South Moloka'i coastal area consists of a shallow reef crest of well-developed coral communities that encompass the entire coastline. The 60-foot isobath is approximately a mile from the shoreline. The nearshore waters along the shoreline are also used for the traditional and customary gathering of various types of limu (calcifying green alga) and other ocean resources.

Due to the similarity of the geographical and environmental conditions of the landing sites, SIC relied on local input and knowledge of the cultural sensitivities of each of the candidate landing sites.

Based on local input, SIC chose the Oneali'i Homesteads site, TMK 5-4-006:019, for its Moloka'i landing site. SIC chose to drop the other candidate Kaunakakai sites because none of them compared well against the Oneali'i Homesteads site due to reasons provided below.



Sandwich Isles Communications, Inc.

Candidate Landing Sites - Kauanakakai, Moloka'i
Submarine Fiber-Optic Cable Project
Figure 2.2-4

Proposed Landing Site – Oneali'i Homesteads

The Oneali'i Homesteads site, TMK 5-4-006:019, was suggested by community informants after they were asked for input on other candidate sites. The Oneali'i Homesteads site parcel is vacant and owned by DHHL. It is adjacent to and has direct access from Kamehameha V Highway. The drawback of the site is that the property is situated between two single-family residential lots, one of which is a DHHL property. Although the site is adjacent to a cultural site, Ali'i Fishpond, the HDD conduit would not be installed beneath the fishpond (see Figure 2.2-4), but rather adjacent to the fishpond. Community informants indicated that the site was disturbed by previous excavation activities by The Oceanic Institute, and that iwi (Hawaiian ancestral burials) are not likely to be encountered during HDD activities. They were also not aware of any other cultural sites on the property.

Kiowea Park

The Kiowea Park site, TMK 5-2-009:001, is owned by the DHHL. The advantage of the site is its close proximity to SIC's central Moloka'i office, located approximately 1,000 feet from the parcel. Disadvantages of the site are that it is heavily used by the community, and the forest of coconut trees on this property has high aesthetic value and cultural significance.

Kaunakakai Harbor

The Kaunakakai Harbor landing site is adjacent to the harbor pier and is owned by the County of Maui. The near shore conditions of this site include an existing ship channel dredged through the coral reef. The State of Hawai'i Department of Transportation, Harbors Division (DOT Harbors) asked that SIC drop this site from consideration due to potential conflicts with harbor operations, such as the conduit affecting maintenance dredging, future channel deepening and future harbor development (October 9, 2002). In addition, it was found that the pier piles would make HDD construction extremely difficult and risky.

Kamiloloa

The Kamiloloa site, TMK 5-4-003:009, is owned by DHHL. The site has direct access from Kamehameha V Highway, and is situated between single-family residential lots. Although the site is similar to the Oneali'i Homesteads site, SIC dropped this site from consideration because of community input regarding cultural sensitivity.

'Ōnini Gulch

The 'Ōnini Gulch site, TMK 5-4-003:023, is located within one of two park areas, Ali'i Park One and Ali'i Park Two. Although the property is privately owned by Kawela Plantation Homeowner's Association, the parks are managed by the county. The site provides ample open space for HDD staging, and it is most likely possible to conduct HDD operations without adversely affecting park activities. Nevertheless, SIC dropped this site from consideration because community informants indicated that the parks are heavily used by residents, and that some native Hawaiians may object to an HDD conduit between two nearby fishponds.

Kapa'akea Loop

The Kapa'akea Loop site is located at the end of a county road running perpendicular to the coastline. No vacant parcel is available for HDD staging at this site. The disadvantage of this site, other than having to use a county road for HDD staging, is that construction would be close to several single-family DHHL residences. Therefore, SIC dropped this site from consideration due to potential community impacts.

Kawela Gulch

The Kawela Gulch site, TMK 5-4-001:027, is owned by Moloka'i Ranch Ltd. SIC dropped this site from consideration because community informants indicated that the property was a site of a historic battle, and that human burials are known to exist on this site.

2.2.4 Maui

SIC proposes to place landing sites within the following two regions on the Island of Maui:

- Honokōwai-Lahaina
- Mākena-Kahikunui

2.2.4.1 Honokōwai-Lahaina

The following alternative landing sites were developed for the Honokōwai-Lahaina Landing Region (see Figure 2.2-5):

- Wahikuli
- Līpoa Point
- Old Kā'anapali Airport
- Nohea Drive 1
- Nohea Drive 2
- Honokōwai Beach Park
- Pōhaku Kā'anapali
- Kahoma Stream
- Hawai'i Omori
- Ala Moana Street
- Civic Center Road 1
- Civic Center Road 2

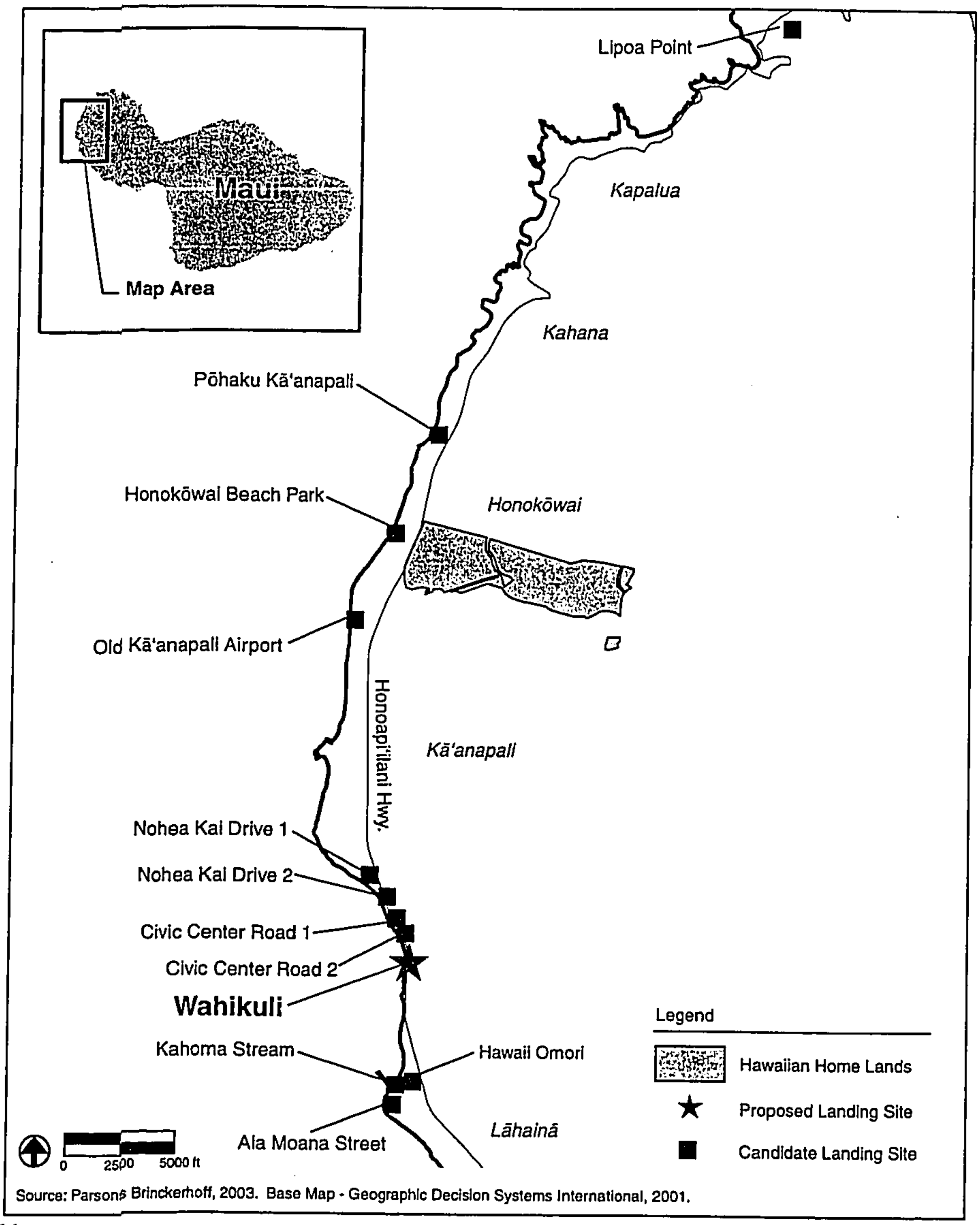
The proposed sites would encounter similar nearshore ocean conditions. Reef development of the areas is close to shore, and the marine communities at the 60-foot isobath are primarily sand and beds of the calcifying green alga, limu. There is an important and well-known green sea turtle nesting area fronting the Honokōwai area. However, regardless of its precise location, turtle nesting will not be affected by the project because of the proposed use of HDD, which can be directed to avoid turtle resting sites.

Much of the Honokōwai-Lahaina coastal area is highly urbanized, containing some of Maui's most luxurious resorts, hotels, and condominiums. Urban conditions along the Honokōwai-Lahaina coastal area make it difficult to find suitable public open space areas near the shoreline that are not adjacent to land uses that could be adversely affected by HDD construction.

In consideration of these environmental conditions, SIC chose the Wahikuli site, TMK 4-5-021:015, for the reasons provided below. SIC dropped the other candidate Honokōwai-Lahaina sites because none of them compared well against the Wahikuli site, as discussed below.

Proposed Landing Site – Wahikuli

The proposed landing site, Wahikuli (TMK 4-5-021:015), is a State-owned triangular parcel on the mauka side of Honoapi'ilani Highway in Lahaina. SIC found this parcel to be attractive as a HDD staging area in compared to other alternative sites because it is unoccupied except for public utility purposes, and has good accessibility from Honoapi'ilani Highway. Other alternative sites were in areas that contained high



Sandwich Isles Communications, Inc.

Candidate Landing Sites - Honokōwai-Lahaina, Maui
Submarine Fiber-Optic Cable Project
Figure 2.2-5

levels of human activity and residential use, presented cultural concerns with regards to burials, or were encumbered with legal and community disputes.

Lipoa Point

The Līpoa Point site, TMK 4-1-01:009, is owned by Maui Land and Pineapple Co., Inc., and is currently being used for agriculture. The site is the northernmost site among the Honokōwai-Lahaina sites.

SIC dropped this site from consideration because it would require installation of approximately seven miles of underground cable to connect with the terrestrial route terminus in Honokōwai.

Old Kā'anapali Airport

The Old Kā'anapali Airport site, TMK 4-4-014:005, is within a 10-acre parcel that was designated by the Maui Planning Commission as public open space, but is currently owned by AMFAC, which plans to develop parcels to the north and south of the property for commercial, residential or hotel development. The 10-acre parcel contains an open field, beach access, driveway access from Honoapiilani Highway and a 100-stall parking lot. The advantages of the Old Kā'anapali Airport site are that there is ample space for HDD staging either within the grassy field or the parking lot, and that the site is relatively isolated from residences. Nevertheless, SIC dropped the site from consideration because of the uncertainty as to whether infrastructure, such as SIC's underground fiber-optic cable, would be allowed under the conditions specified by the Planning Commission.

Nohea Kai Drive 1

The Nohea Kai Drive 1 site, TMK 4-4-013:007, is part of Hanaka'ō'ō Beach Park owned by the County of Maui. The drill site would be from a parking lot next to Hanaka'ō'ō Cemetery. SIC dropped this site from consideration because community informants indicated that conducting HDD staging next to this cemetery would be culturally insensitive, and poses the risk of adversely affecting unknown burials.

Nohea Kai Drive 2

The Nohea Kai Drive 2 site, TMK 4-4-006:070, is an undeveloped parcel on the mauka side of Honoapi'ilani Highway owned by Pioneer Mill Company, Ltd. SIC dropped this site from consideration because of its poor access conditions and because it would be more difficult to stage HDD operations from this site in comparison to other sites.

Honokōwai Beach Park

The Honokōwai Beach Park site, TMK 4-4-001:046, is large enough for HDD staging, but would require closing the entire park. In addition, the site is in a high profile location in the middle of Honokōwai town, with two-story apartment buildings situated along its northern boundary, and shops and houses located across the park along the main street. The park appears to be popular, with heavy use observed during a weekday. For these reasons, SIC dropped this site from consideration.

Pōhaku Kā'anapali

The Pōhaku Kā'anapali site, TMK 4-3-009:052, is a small park, that is part of a larger privately owned parcel. The park is narrow, with a small parking lot area, and is available to the general public. It appears to be popular, with heavy use observed during a weekday. SIC dropped this site from consideration because the entire park parcel would be needed for HDD staging.

Kahoma Stream

The Kahoma Stream site, TMK 4-5-4:2, would be adjacent to a drainage canal owned by the County of Maui. The drill site would be county property, and would not be expected to interfere with the canal. However, SIC dropped this site from consideration because it does not provide enough space to stage HDD activities.

Hawai'i Omori

The Hawai'i Omori site, TMK 4-5-11:3, is a privately owned parcel next to Lahaina Cannery Mall, and is currently used for bus parking. SIC dropped this site from consideration at the request of the landowner, Hawai'i Omori Corporation.

Ala Moana Street

The drill site of the Ala Moana Street site would be the street at a location next to a cemetery. SIC dropped this site from consideration because HDD operations will disrupt use of the street.

Civic Center Road 1

The Civic Center Road 1 site, TMK 4-5-021:014, is an undeveloped parcel owned by the Housing Finance and Development Corporation, a State of Hawai'i agency. SIC dropped this site from consideration because the site may be at too high an elevation in relation to its distance from the coastline.

Civic Center Road 2

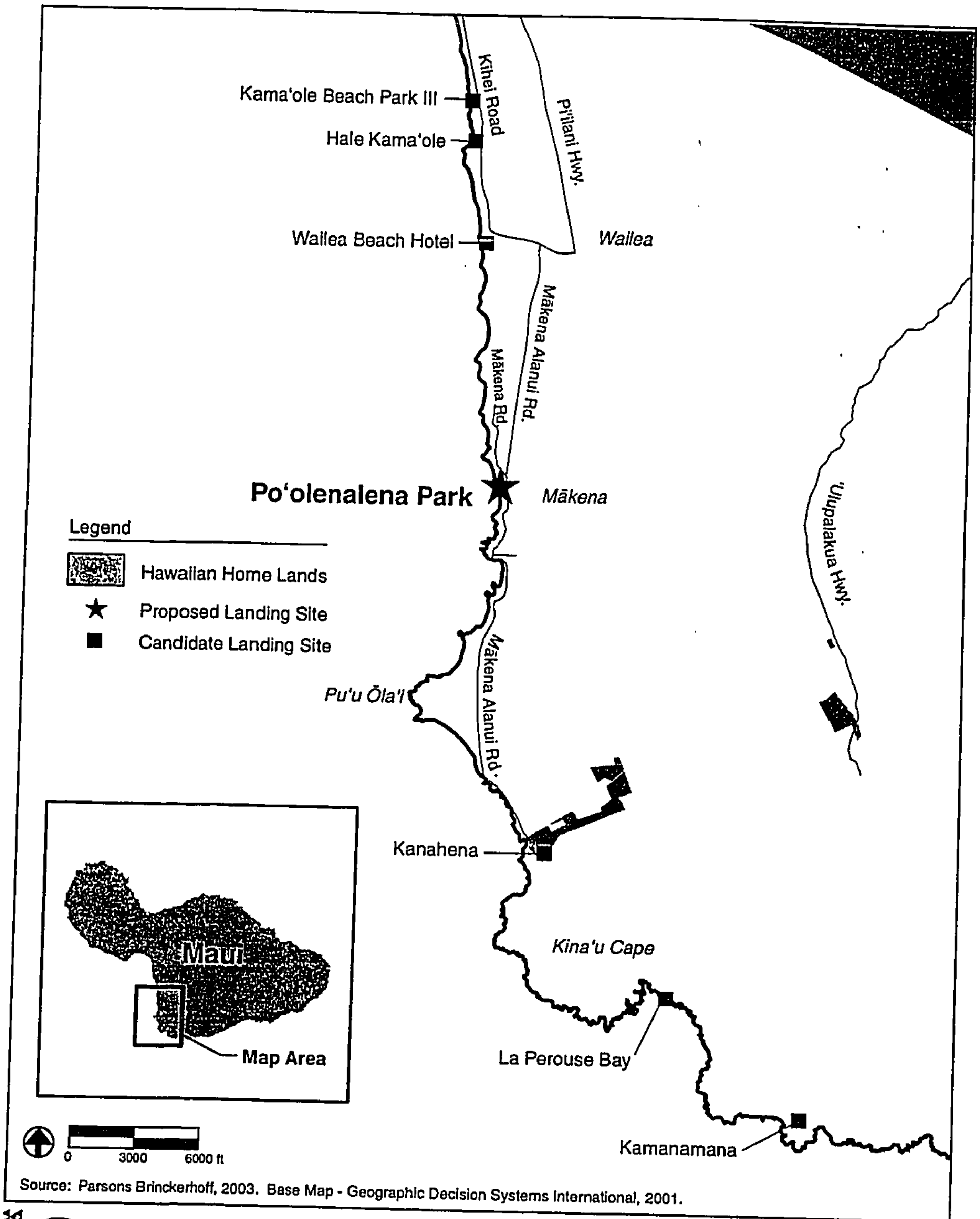
The Civic Center Road 2 site, TMK 4-5-21:16, is a well-maintained landscaped area fronting the Lahaina Police Station in an area surrounded by other government public institutions, including the County Civic and Recreation Center, Fire Station and District Courthouse. SIC dropped this site from consideration because the site is in a prominent location within the County Civic Center area.

2.2.4.2 Mākena-Kahikinui

The following alternative landing sites were developed for the Mākena-Kahikinui Landing Region (see Figure 2.2-6):

- Po'olenalena Park
- Kama'ole Beach Park III
- Wailea Beach Hotel
- Hale Kama'ole
- La Perouse Bay
- Kanahena
- Kamanamana

Similar to the Honokōwai-Lahaina area, the region of Maui from Mākena to Kahikinui contains a wide variety of land uses, such as single-family residences, townhouses, condominiums, small- to medium-sized shopping centers, hotels, and luxury resorts along the coastline. Therefore, areas suitable for HDD construction with no or few nearby residences or similar land uses, such as hotels, are not widely available.



Sandwich Isles Communications, Inc.

Candidate Landing Sites - Mākena-Kahikinui, Maui
Submarine Fiber-Optic Cable Project
Figure 2.2-6

Po'olenalena Park was selected as the landing site for the Mākena landing region. SIC chose to drop the other candidate Mākena-Kahikinui sites even though all the sites are feasible for HDD staging. They were dropped because they did not compare well against the Po'olenalena Park site for reasons provided below.

Proposed Landing Site – Po'olenalena Park

The Po'olenalena Park site, TMK 2-1-007:072, which is used as public parking for Po'olenalena Beach, was the only candidate site identified with no or few nearby sensitive land uses. The property is owned by the State of Hawai'i, but managed by the County of Maui, and includes an asphalt-paved driveway, a portable toilet, and an unpaved parking area with space for approximately 15 to 25 vehicles. A large beach front residence is on the lot immediately north of the site. The south side of the lot is currently unoccupied, but could be developed as a residence or similar land use. Of the sites considered for this landing region, the Po'olenalena Park site provided the closest proximity and ease of connection to island terrestrial fiber-optic systems.

Kama'ole Beach Park III

The Kama'ole Beach Park III site, TMK 3-9-004:048, is State-owned, but managed by the County as a public park. The site includes ample off-street parking, a comfort station, picnic tables and benches, grassy fields, several large trees, and a sandy beach. The park is heavily used. In addition, medium-density apartments are located immediately mauka of the park, across Kihei Road. The proposed HDD staging area would be on the south end of the park, which has a large grassy field with a gentle slope. From field observations, it appears that substantially fewer people use the southern end of the park, due probably to its lack of shady trees. Although HDD staging and operations would largely avoid direct impacts to most park activities, SIC dropped the site from consideration because it does not compare as well as the Po'olenalena site, where construction would be far less visible to the general public and would affect far fewer residences.

Wailea Beach Hotel

The Wailea Beach Hotel site, TMK 2-1-008:062, was considered because it is a site of an existing cable landing. SIC dropped the site from consideration because the property is currently being developed for residential use.

Hale Kama'ole

The Hale Kama'ole site, TMK 3-9-004:061, is directly south of Kama'ole Beach Park III, and is also owned by the State of Hawai'i. The site is used as a gravel parking lot for the Kihei Boat Ramp, located a short distance away. Undeveloped shrub land with interspersed kiawe trees surround the parking lot to the north and makai sides. Medium density apartments are located immediately mauka of the park, across Kihei Road. Similar to the Kama'ole Beach Park III site, HDD staging and operations would largely avoid direct impacts to boat ramp activities, and may not require temporary parking displacements. However, SIC dropped the site from consideration because use of the Hale Kama'ole site does not compare as well as the Po'olenalena Park site due to visibility and residential impact concerns.

La Perouse Bay, Kanahena, and Kamanamana

The La Perouse Bay (TMK 2-1-04:075), Kanahena (TMK 2-1-004:121) and Kamanamana (TMK 2-1-002:001) sites are all properties owned by the State of Hawai'i. All three sites are in environmental and culturally sensitive areas. The La Perouse Bay and Kanahena sites are within the Ahihi-Kinau Natural Area Reserve. These candidate sites were proposed because they are the sites most feasible for HDD operations nearest to DHHL properties in Kahikinui, located on the southern part of the island. However, SIC dropped the three sites from consideration due to the environmental and cultural sensitivities of these sites.

2.2.5 Hawai'i

The Island of Hawai'i will have one landing site connecting the cable system to Maui. The landing region selected is the 'Upolu Point/Kawaihae region. As shown in Figure 2.2-7, several DHHL properties are clustered around this area. Additional DHHL properties lie further south of Kawaihae in the Kailua-Kona area, or on the southern and northern tips of the island, and near the Hilo region. Other DHHL locations will be connected by the terrestrial network.

The island has generally hard, rocky coastlines and a relatively steep submarine topography. Because the island is geologically young, coral reefs are not widely developed. Therefore large areas of sand are not common. Additional details on the archaeological and cultural features in the landing regions are provided in the archaeological and cultural reports in Appendix 3. Additional details on coastal and marine conditions are provided in the marine biology report in Appendix 5 and the submarine engineering report prepared for this EA.

2.2.5.1 North Kohala/Kawaihae Landing Region

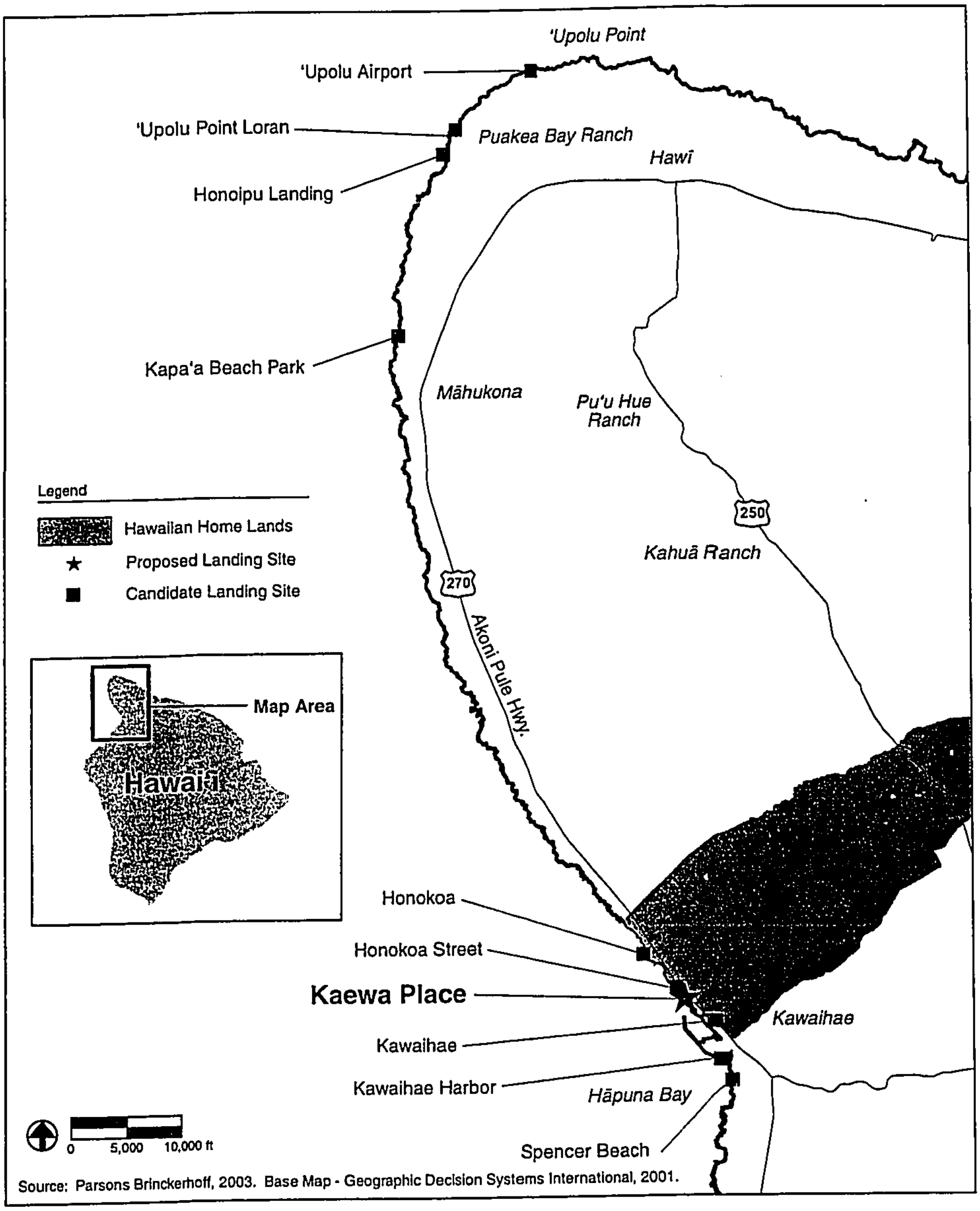
The following landing sites were considered for the North Kohala/Kawaihae landing region (see Figure 2.2-7):

- Kaewa Place, Kawaihae
- 'Upolu Airport, North Kohala
- 'Upolu Point Loran, North Kohala
- Honoipu Landing, North Kohala
- Kapa'a Beach Park, North Kohala
- Honokoa, Kawaihae
- Kawaihae Harbor
- Kawaihae
- Spencer Beach, Kawaihae
- Honokoa Street, Kawaihae

The northernmost landing site considered was at 'Upolu Airport on 'Upolu Point, and the southernmost landing site was at Spencer Beach Park south of Kawaihae Harbor. The region is arid, with minimal vegetation. The coastline tends to be rocky and rough, with limited sandy areas.

Several of these potential sites were eliminated from further consideration because of concerns about potential interactions with historic sites. In particular, the 'Upolu Point area is considered sacred by native Hawaiians. It is the birthplace and homeland of Kamehameha I and the location of Mo'okini Heiau. The area is also known for native Hawaiian burials and historic buildings. The coastline fronting Mo'okini Heiau has traditional salt pans. 'Upolu Point is also subject to heavy wave activity from waves generated by the prevailing trade winds.

Candidate sites further south in Kawaihae had similar issues concerning historic sites and burials, but were deemed to have less potential for archaeological and cultural impacts, and therefore would cause less community concern. Based on this information and other input developed during the desktop analysis and preliminary site visits, the Kaewa Place site at TMK 3-6-1-004:020 was selected to be the proposed landing site for the North Kohala/Kawaihae landing region.



Sandwich Isles Communications, Inc.

Candidate Landing Sites - North Kohala/Kawaihae, Hawai'i
Submarine Fiber-Optic Cable Project
Figure 2.2-7

Proposed Landing Site - Kaewa Place, Kawaihae

The proposed Kaewa Place landing site is located at the site of an old pier, roughly one mile north of Kawaihae Harbor. The pier structure is largely demolished, with only some parts of the foundation and

peripheral structures remaining. The property is owned by DHHL. A paved road runs the short distance from Akoni Pule Highway (Highway 270) to the coastline, where the remains of the pier stand. Evidence of use by squatters has been noted at the proposed landing site.

There is a developing DHHL homestead community immediately to the north of the proposed landing site, but the construction site is isolated from these homes by a buffer area covered with vegetation as well as open space. To the south of the property is an undeveloped Coast Guard Reservation on which a lighthouse is located.

The proposed cable alignment and landing site would not be co-located with another cable or other existing utility easement, but there is an existing telecommunications easement nearby held by Verizon. The easement starts roughly 1.4 miles south of the Kaewa Place landing site (less than half a mile south of Kawaihae Harbor) and runs generally west-northwest.

Because the Verizon easement runs towards the seaward end of the proposed SIC ocean cable route landing at Kaewa Place, the SIC line may cross the Verizon line. However, the proposed placement of all SIC cables has been designed to not interfere with the safe operation of other existing cables.

'Upolu Airport, North Kohala

The candidate site 'Upolu Airport (TMK 3-5-5-006:007) is owned by the State of Hawai'i. It is near 'Upolu Point, and is roughly 1.4 miles northeast of the Kamehameha I birthplace. As described above, 'Upolu Point is considered a sacred area by native Hawaiians. It has several burials and historic sites. Because of concerns about impacts on archaeological sites and potential community opposition, this site was eliminated from further consideration.

'Upolu Point Loran, North Kohala

The candidate site 'Upolu Point Loran (TMK 3-5-6-001:056) is a former U.S. Coast Guard LORAN Station. Ownership of the property has recently been transferred to DHHL. In addition to being roughly one-third of a mile south of Mo'okini Heiau and the Kamehameha I birthplace, it is also the previous site of historic buildings. Because of previous Coast Guard activity, there may by hazardous waste and contamination problems on this property. A preliminary geological assessment determined that this site would not have sufficient soil cover depth near the beach area for installing the cable conduit. A community organization called Na Huapala O Hawai'i also has an existing five-year lease from DHHL to use this property for cultural programs until 2006, with an option to renew. For these reasons, this site was eliminated from further consideration.

Honoipu Landing, North Kohala

Located roughly one-third of a mile south of 'Upolu Point Loran, the Honoipu Landing candidate site (TMK 3-5-6-001:074) is on private property owned by Richard Smart Trust and is in the Conservation District. In addition to the Landing itself, which is a historic site, there are several other historic sites associated with Honoipu Landing and the Puakea Ranch, of which the Landing is a part. In addition, this site would not have sufficient soil cover depth near the beach area for installing the cable conduit. Therefore, this site was eliminated from further consideration.

Kapa'a Beach Park, North Kohala

The Kapa'a Beach Park candidate site (TMK 3-5-6-001:060) is owned by the State of Hawai'i. A double platform burial is located in the northeast corner of the park. This site was eliminated from consideration because of the distance from the main highway to the site. The road connecting to the main highway is long and narrow, which would have made construction difficult. The site is also in a remote, isolated location not near any houses or other properties that could benefit from a telecommunications cable.

Honokoa, Kawaihae

The Honokoa candidate site (TMK 3-6-1-001:007) is owned by DHHL. This site was eliminated from consideration because of archaeological concerns readily apparent during a brief field visit with an archaeologist. The site appeared to contain multiple remains of Hawaiian habitation sites with potential archaeological significance. In addition, access to the site would be difficult for construction vehicles.

Kawaihae Harbor

The candidate site at Kawaihae Harbor (TMK 3-6-1-003:026), owned by the State of Hawai'i, was removed from consideration because of the potential for adverse interactions between the fiber-optic cable and vessel traffic utilizing this commercial harbor. In a meeting with the Administrator, DOT Harbors Division recommended that Kawaihae Harbor be removed from consideration (Okimoto, 2002). In addition, several culturally significant sites are in the vicinity of Kawaihae Harbor, including heiau (a sacred ground temple made out of stone to which access is strictly limited), Hawaiian battlegrounds, homes of chiefs, and traditional salt pans. The underwater Waikane Spring is also said to be in the vicinity, about 50 feet offshore and a little south of Mailekini Heiau.

Kawaihae

The Kawaihae candidate site (TMK 3-6-1-002:065) is owned by DHHL. This site is located on the mauka side of Akoni Pule Highway, directly mauka of the center of Kawaihae Harbor. Any HDD alignment from this property would have to cross Kawaihae Harbor. Therefore, this site was eliminated for the same reason as the Kawaihae Harbor candidate site, based on recommendations from DOT Harbors Division, as noted above.

Spencer Beach, Kawaihae

The Spencer Beach candidate site (TMK 3-6-2-002:008) is similar to Kawaihae Harbor in terms of potential cultural issues. There are multiple registered historic sites within Spencer Beach Park, a State of Hawai'i property. It is also close to the heiaus Pu'ukoholā, Mailekini, and Hale-o-Kapuni. As a result of concern for cultural and archaeological sites, this location was also eliminated from further consideration.

Honokoa Street, Kawaihae

The Honokoa Street candidate site (TMK 3-6-1-004:020) is owned by DHHL. This site was eliminated from consideration because it is within an existing residential subdivision. This subdivision lies immediately to the north of the proposed Kaewa Place landing site. Some lots already contain houses, while others have not yet been constructed. While this candidate property is not yet developed, the parcels in the vicinity have all been graded for use as residential lots. If the drilling site and subsequent cable manhole were to be on residential property, it would make access difficult for cable maintenance. In addition, there is a steep slope from the lot to the ocean that would make it difficult to conduct HDD.

Chapter 3

Kekaha, Kaua'i Landing Site:
Environmental Setting, Impacts, and Proposed Mitigation

CHAPTER THREE: KEKAHA, KAUA'I LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

3.1 TOPOGRAPHY AND GEOLOGIC CONDITIONS

3.1.1 Existing Conditions

The island of Kaua'i is the oldest of the major islands in the Hawaiian chain. The Kaua'i Volcanic shield built itself off the ocean floor approximately two to four million years ago. Rock formations belonging to this original shield are part of the Waimea Canyon Volcanic Series, a major portion of which are the thin lava flows of the Napali formation. Lying on the southwestern leeward coast, the Waimea ahupua'a[1] includes a broad, flat plain that stretches between the Waimea River delta and Polihale to the north.

The proposed 'Akialoa Road fiber optic cable landing site is located at the western edge of Kekaha town which is in the ahupua'a of Waimea. (See Figure 1.1-2A in Chapter 1.) This site is comprised predominantly of lithified sand dunes of Pleistocene age and loose sand of more recent origins deposited on the beach. Landward topography of the project site is level with a slight slope along the mauka boundary; the parcel has been bulldozed in the past. Site elevation is approximately ten feet above mean sea level. In order to connect the existing terrestrial line to the proposed cable landing site at 'Akialoa Road, the fiber optic cable connecting route will run east to 'Alae Road along Kaumuali'i Highway as well as north along 'Akialoa Road and west along Ulili Road.

Soil sampling at two locations on the mauka and makai side of the proposed landing site was conducted. Subsurface material encountered near the bore site was a beach sand layer from the surface to the maximum boring depth of 21.5 feet below the existing ground surface. The beach sand consists of loose to dense fine sand. Closer to the shoreline is a surface fill layer with a thickness of about 16 feet. The fill layer consists of medium dense to dense sand and basaltic boulders. It appears the boulders may have been part of an old sea wall. The fill layer was underlain by beach sands extending to about 25 feet below the existing ground surface. The beach sands generally consist of dense sand. Below the beach sands, a coral formation with soft to hard consistency was encountered extending to the maximum depth explored of about 40.5 feet below the existing ground surface at this landing site. Groundwater was encountered in the drilled borings at depths ranging from about 7.7 to 10.8 feet below the existing ground surface.

<u>Hazardous Materials</u>

Since present and historic land uses in the project area could have produced site contamination, a database search was conducted to investigate the potential that the site contains hazardous materials (see Appendix 6). Thirty State, federal and private databases were searched for sites containing hazardous materials in the project area utilizing the services of Environmental Data Resources (EDR) (July 15, 2003). Findings from this database search indicate: (1) The target property was not listed in any of the 30 databases searched; and (2) No sites of concern are located within a one-mile radius of the 'Akialoa Road landing site. The database search does not cover off-shore sites.

3.1.2 Construction or Short-Term Impacts

Construction work is not expected to have a significant impact on the existing topography or geology of the immediate area of the 'Akialoa Road landing site. There will be minimal grading at the onshore bore site to accommodate mobilization and drilling activities, material storage areas, centrifuges, tanks, and

[1] Land division usually extending from the uplands to the sea.

storage for excavated material and other equipment for about a one to three-month construction period. But these impacts are expected to be temporary and once HDD cable installation work is completed, equipment and machinery will be removed and the site will be restored to its original condition.

Impacts to the 4,500-foot (0.9-mile) connecting routes of 'Akialoa Road and Kaumuali'i Highway to Alae Road during cable installation will be temporary and confined to the immediate work area of each construction interval within the State and County rights-of-way. Construction work activities for cable installation in the 0.9-mile connecting route are expected to involve trenching or directional drilling in unpaved shoulders or paved travel lanes. No change to the existing topography in these areas is expected since all duct lines will be placed underground in conformance with both State and County design standards and requirements. Upon completion of cable installation, roadways and shoulders will also be restored in conformance with applicable design standards.

In-water HDD cable installation within the 3,600-foot alignment is not expected to adversely affect marine topographic or geological conditions because the cable will be installed, first of all, below the sea floor surface, and secondly, through a section that was found to not have any deep depressions.

3.1.3 Long-Term Impacts

No long-term impacts to topography or geology of the landing site are expected from the installation of SIC's fiber optic cable particularly since grading will be kept to a minimum only to accommodate HDD construction equipment and storage area at the bore site. A manhole within the 'Akialoa Road/Kaumuali'i Highway right-of-way will be all that will remain at the conclusion of HDD construction activities.

3.1.4 Mitigation Measures

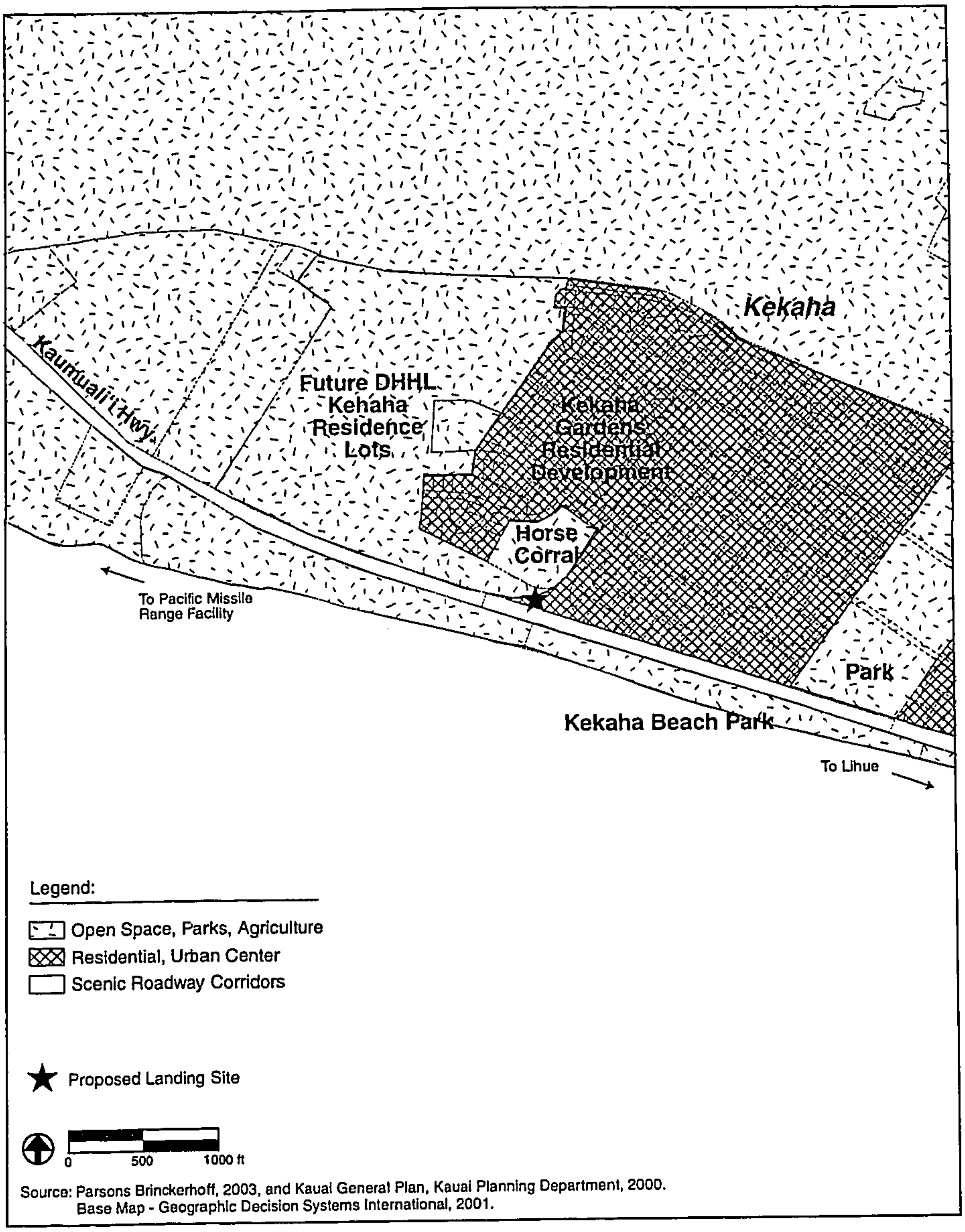
Mitigation is not required.

3.2 LAND USE

3.2.1 Existing Conditions

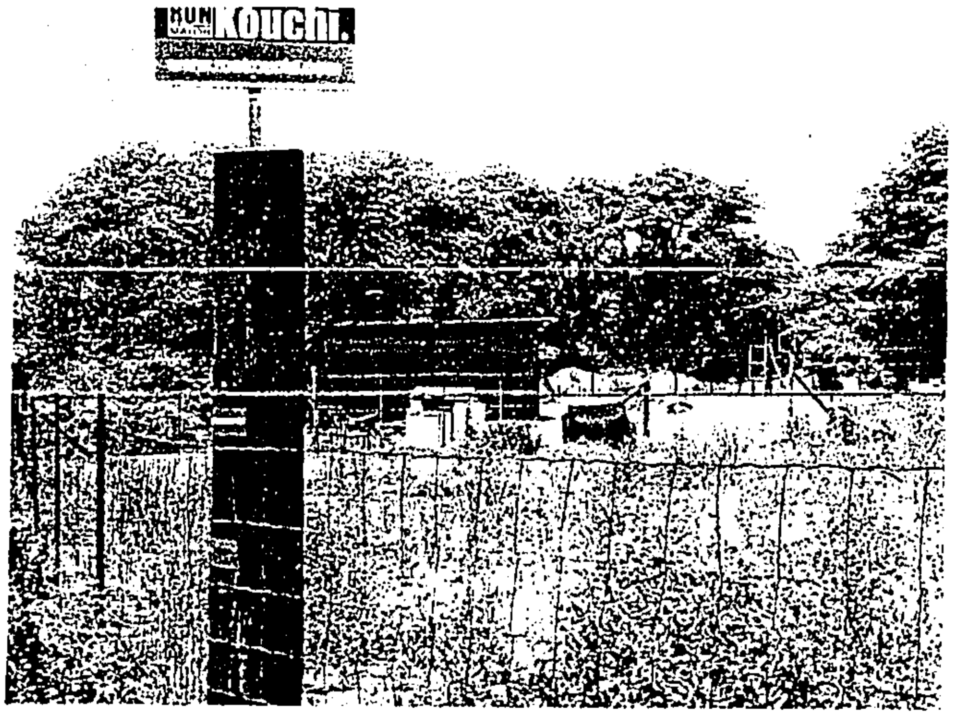
Referred to as Kaua'i's "West Side", the Waimea-Kekaha district is rural with broad expanses of agricultural land. The 'Akialoa Road project site is on County of Kaua'i property, Tax Map Key no. (4) 1-3-001:999, between the City of Kekaha and the Pacific Missile Range Facility at Barking Sands. Kekaha Beach Park is directly opposite of the 'Akialoa Road landing site. See Figure 3.2-1. Access to the site is directly off Kaumuali'i Highway, which runs along the southern or makai border, and 'Akialoa Street to the east. Figure 3.2-2 contains photographs of the project site. The makai portion of the project site is vacant and undeveloped while its mauka portion is divided by a perimeter fenced for use as a corral for horses by a lessee to the State of Hawai'i (Revocable Permit Number 7089). The ground is sparsely vegetated by weedy plants. Immediately mauka is a vacant parcel. Adjacent and to the west is a DHHL parcel.

Kekaha Gardens Subdivision, residential homestead lots developed in increments by the DHHL, border the project site to the north (mauka) and west. Land uses east of 'Akialoa Road contain private residential homes on larger lots, and Kekaha Beach Park, owned by the State of Hawai'i, is across from the project site, south (makai) of Kaumauali'i Highway. Along the shoreline are recreational uses associated with marine recreation such as swimming, surfing, and walking along the shore. A park is located to the west of 'Akialoa Street at the end of Ulili Road. Kekaha Residence Lots is a future, planned 20-acre DHHL development that will be located immediately west of Kekaha Gardens Subdivision approximately 0.25-mile from the project site. The planned development will contain a Sandwich Isles



Sandwich Isles Communications, Inc.

Existing Land Uses - 'Akialoa Road Landing Site
Submarine Fiber-Optic Cable Project
Figure 3.2-1



Mauka view from 'Akialoa Road

Northeast view from 'Akialoa Road

Source: Parsons Brinckerhoff, 2002.

Sandwich Isles Communications, Inc.

Photos of 'Akialoa Road Landing Site Parcel
Submarine Fiber-Optic Cable Project

Figure 3.2-2

Communications (SIC) unmanned 775 square foot communications (switching station) building, which is included in the SIC terrestrial project and located at the end of Ulili Road just mauka of the project parcel.

Agricultural land to the west of the project site is owned by the State of Hawai'i and controlled by the Department of Land and Natural Resources. This land is currently idle and not under cultivation. Further to the west, Pioneer Hi-Bred International, Inc. is cultivating seed corn.

The State of Hawai'i Land Use Classification of the project site is Urban. The project site is on a parcel designated "Residential" in the County of Kaua'i General Plan. The County of Kaua'i Comprehensive Zoning Ordinance designates the majority of the project site portion of the parcel as "Residential R-6" District.

3.2.2 Construction or Short-Term Impacts

Cable installation activities will temporarily impact a small portion of the County parcel and 'Akialoa Road and Kaumuali'i Highway intersection. Horses that usually graze within the corralled portion will be temporarily relocated to a vacant portion of the parcel in order to allow for sufficient work area, buffers, and construction equipment storage. When completed the cable route will result in very little to no visible impact to the surrounding area because the only visible infrastructure will be a manhole cover on the ground in the public right-of-way.

Access to residents living on 'Akialoa Road will not be adversely affected except for slight inconveniences due to the construction trucks and equipment moving in and out of the work area during the one to three month construction period. Beach and beach park access during construction would be limited for safety reasons.

The project site is committed to urban development as it serves as part of a County of Kaua'i road right-of-way in a rural Kekaha residential neighborhood, and thus, does not impact farmland as defined by the Farmland Protection Policy Act (FPPA) (§658.2, 7 U.S.C. 4201-4209).

3.2.3 Long-Term Impacts

No long-term impacts to existing and surrounding land uses are expected from development of the marine cable landing site in Kekaha. Once on-site work is completed, the ground will be returned to its previous condition, and there will be no additional disturbance at the landing site aside from access to the manhole for periodic maintenance. Existing beach and beach park access and nearshore ocean recreational activities will not be changed by the project in the long term.

3.2.4 Mitigation Measures

Potential impacts can be avoided or reduced to very minor levels by adherence to mitigation measures that will be developed in detail during the design phase and will be applied to the entire length of the project.

SIC or its designated contractor shall develop a traffic control plan that will outline the steps needed to minimize congestion and maintain access to adjacent properties at all times during construction. Implementation of construction activities shall be coordinated with agencies to prevent conflicts in the timing of other construction projects as well as planned County or community events at Kekaha Beach and other nearby parks and schools including Faye Park and St. Theresa's School.

SIC or its designated contractor shall post appropriate public notices per County and State requirements for lane closures, as necessary.

Best management practices (BMPs) will be specified during permitting stages, and will be strictly enforced by SIC on its contractor; for example, they would include development of plans to remove and dispose of unused materials and excess fill in an authorized waste disposal site. Plans will also incorporate BMPs that minimize sediment, construction materials, waste materials, or toxic substances falling, leaking, or washing into drainages or coastal waters.

3.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

3.3.1 Existing Conditions

A report entitled "Archaeological Inventory Survey for a Proposed Sandwich Isles Communications Cable Landing at 'Akialoa Road, Kekaha, Waimea Ahupua'a, Kona District, island of Kaua'i (TMK 4-1-3-001:999)" was prepared for the project in July 2003 (see Appendix 3). Findings pertinent to the project are summarized below.

Previous archaeological work in the vicinity of the project site finds that this and other areas in Kekaha were utilized in pre-contact times for local resources. A settlement pattern has emerged through the study of historical material concerning the Kekaha area.

Permanent habitation areas were mainly among the mauka foothills, at the bases of the shore-facing cliffs. Extending up the gulches were agricultural areas watered by rainfall and intermittent streams. This has been confirmed by the archaeological investigations of Bennett (1931:103) and Sinoto (1978:2-6). Makai of the foothills were fishponds and cultivated wetlands fed by springs. Beyond this was the great swamp, then the broad stretch of sandy lands that continued to the shoreline. Fishing camps and other temporary habitation areas existed on the beach, and in the inland stretches of the sand there were burials. This scenario was likely in place at the time of first western contact and remained relatively undisturbed throughout most of the 1800s.

Since then, much physical evidence of this settlement pattern has been obliterated by commercial agriculture and other operations. The foothills and wetland areas have been extensively planted in cane, livestock has been run up the gulches, and even the beach areas have been much disturbed by massive shoreline stabilization projects. As described in Section 5.1 the site has been bulldozed in the past.

In 1994 Masterson et al. (1994a) conducted an inventory survey with subsurface testing which covered the current project area. No surface sites were located. Extensive subsurface testing throughout the project area revealed two areas containing buried cultural layers (State Site #50-30-05-700,-703) and two human burials (50-30-05-701, -702). It was suggested additional human burials may be present due to the close proximity between the two discovered burials. Site -703 is located approximately 750 feet west of the project area. Sites -700, -701, and -702 are located approximately 900 feet northwest of the project area. Subsurface testing in the immediate vicinity of the project area did not encounter any significant cultural deposits or human burials.

Based on the settlement patterns and results of previous archaeological research, anticipated site types would include a subsurface cultural layer and human burials. However, in four backhoe trenches in close proximity to the proposed drilling locale, no cultural materials were encountered. Field inspections by project archaeologists found that no surface historic properties were observed. Subsurface testing was undertaken to determine the presence of any significant subsurface historic properties, such as a cultural layer or human remains. The test trench was excavated at the location of the proposed HDD drill site.

The excavation did not encounter any significant cultural materials. Thus, based on the background studies and fieldwork completed as part of this project, it is anticipated that the horizontal directional drilling associated with the SIC cable landing project will have no effect on any significant historic properties.

3.3.2 Construction or Short-Term Impacts

The 'Akialoa Road fiber optic cable landing site alignment will be to the east of the identified archaeological resources, and therefore none of these resources will be affected.

Construction activities will have "no effect" on any cultural or historic properties in the project area (Cultural Surveys Hawaii, May 2003). However, all work will cease and the Kaua'i Island Burial Council will be immediately notified if skeletal remains should be encountered during any segment of construction associated with the project.

Since soil sampling and backhoe trench subsurface testing were limited to the bore site, it is possible that trenching between and along the 'Akialoa Road connecting route may uncover "significant" materials or resources.

Since a federal loan is being used for the project, compliance with Section 106 of the National Historic *Preservation Act (NHPA) is required. In addition, the project is subject to review by the State Historic* Preservation Division (SHPD) in accordance with Section 6E-11 of the Hawai'i Revised Statutes (HRS) because the project requires permits or approvals from the State of Hawai'i and the County of Kaua'i. See Sections 11.1.1 and 11.2.4 for information regarding compliance with NHPA Section 106 and HRS Section 6E-11.

3.3.3 Long-Term Impacts

No long-term impacts to archaeological or historic resources are anticipated. The manhole that will demarcate the SIC Kekaha landing site will be located in the public right-of-way of 'Akialoa Road without long-term effects on resources in the area.

3.3.4 Mitigation Measures

On-site archaeological monitoring of Kaumuali'i Highway, 'Akialoa Road, and Ulili Road is recommended for all additional subsurface work associated with the project. If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist.

3.4 CULTURAL, SOCIAL, AND ECONOMIC ACTIVITIES

3.4.1 Existing Conditions

According to the 2000 U.S. Census, the resident population within the Waimea district of which Kekaha is part, numbered 8,723. The population of Kaua'i County as of 2000 was 58,463 and is projected to increase to 85,400 by 2025 (The State of Hawai'i Data Book, 2001).

A cultural resource assessment was conducted for the 'Akialoa landing site (see Appendix 3). Thirty (30) letters to individuals and organizations in the landing site area were sent in which the project and its purpose were described and input from the recipients was requested. Formal interviews with Aletha

Kaohi (Waimea kupuna [elder] and manager of the West Kaua'i Visitors Center), Teruo Oshiro (Kekaha resident, fisherman, and former plantation employee), and Kaipo Akana (West Kaua'i kama'aina [long-time resident of Hawai'i], Kekaha resident in the 1940s, and former member of the Kaua'i Burial Council). Each of the interviewees has reviewed the transcript of her/his interview and has approved its use in the assessment report.

Mrs. Kaohi was also kind enough to informally solicit responses from Kekaha area residents and they have not expressed any concerns about the project.

Specific information and concerns related to cultural issues noted by the three interviewees include:

- The possibility that burials may be encountered during excavation for the project.
- A concern that the installation of the cable and cable facilities do not detract from or destroy the beauty of the area.
- A concern that the cable is free of harmful emissions.
- The only traditional cultural practice associated with this section of Kekaha was fishing. The concern is that installation of the cable does not affect the reef and fishing resources along the coast.

The 'Akialoa Road landing site is directly mauka of Kekaha Beach, a facility frequented by shoreline fishermen, surfers, swimmers, and spear fishermen. Faye Park, an 8.5-acre district park, is managed by the County of Kauai, and is a popular site for community functions.

3.4.2 Construction or Short-Term Impacts

The cable is made of non-toxic armoring materials and is not expected to have any adverse effect on water quality and/or marine biology, on shoreline fishing, or on beach users.

As stated in Section 3.3.2, construction activities will have "no effect" on any cultural resources in the project area.

Construction of the project should have minor economic impacts associated with the creation of short-term design-engineering and construction related jobs. The increase in construction-related jobs is too small, however, to result in an increase in in-migrant residents to the island of Kaua'i. SIC's projects have provided construction-related employment and other job opportunities for DHHL beneficiaries with SIC and its contractors. SIC currently employs three who live in DHHL communities. There should not be any impact on State and County operational expenditures for public services on the island.

3.4.3 Long-Term Impacts

No long-term impacts are expected on the cultural resources in the area. The only evidence of a cable facility that will be visible will be a manhole cover within the State highway right-of-way at the intersection of 'Akialoa Road and Kaumuali'i Highway.

Because fiber optic cable will be buried underground the SIC system will not destroy or detract from the beauty of the area. The SIC system has been designed to avoid the use of submarine boosters or repeaters (equipment to maintain signal strength on long cable segments). Therefore, no harmful environmental impacts are anticipated from laying cables on the ocean bottom and operating these cables once the system is completed. The HDD construction method allows the underground bore to be placed below environmentally sensitive surface resources such as beaches, reefs, and the shoreline. The cable landing alignment was carefully selected so that the cable exit point about 3,600 feet from shore consists of a sandy bottom away from reef structures. Further, since the cable will be below the ocean bottom from shore to the exit point approximately 3,600 lineal feet away from shore, fishing resources are not expected to be affected.

Maintenance and servicing of the telecommunications lines are expected to support new permanent jobs including field and office positions. SIC is committed to providing training and educational opportunities, as required by its license agreement with DHHL. However, the number of long-term jobs created by the proposed project is expected to be low.

Fiscal impacts associated with this project are expected to primarily result from additional tax revenues to the State due to spending of construction workers' earnings. However, given the low number of employees anticipated, the fiscal impact would be minimal. Since County revenues are primarily limited to property taxes, there should be minimal change to County revenues.

No adverse impacts on resident and worker populations in the project area are expected. The project will be beneficial to those residing on Department of Hawaiian Home Lands by providing broadband services to the telecommunications users.

No significant impacts to the island's housing or resident population are expected as the project does not propose to add any housing units. The fiber optic cable project is not expected to permanently disrupt or change the unique characteristics associated with the Kekaha and Waimea communities. Cable lines will be located underground within existing State and County rights-of-way.

If the concerns raised during the cultural resource assessment are addressed, the 'Akialoa cable installation should not have any adverse impact upon native Hawaiian cultural resources, beliefs and practices.

3.4.4 Mitigation Measures

Mitigation is not necessary other than standard measures meant to protect public safety during construction. Impacts on shoreline fishing and gathering activities shall be minimized as much as possible. Restrictions on shoreline access shall last only for the duration of construction, and access shall be restored after work is completed and the site is returned to pre-construction conditions.

3.5 VISUAL AND AESTHETIC RESOURCES

3.5.1 Existing Conditions

Diversified agriculture companies and small farmers now cultivate the lands once used by the Kekaha Sugar Company. Visual resources in the Kekaha landing region are the open, spacious views of the coastline and mountains along the Kaumuali'i Highway corridor.

According to the Kaua'i General Plan (November 2000), Scenic Roadway Corridors consist of major roadways and the lands visible from those roadways. Kaumuali'i Highway is referred to as a Scenic Roadway Corridor on the West Kaua'i Heritage Resources Map in the County's General Plan. The purpose of designating Scenic Roadway Corridors is to conserve open space, scenic features, and views within and along Kaua'i's most heavily traveled routes. These corridors are identified on the General Plan's Heritage Resources Maps. Heritage Resources are described as physical features, structures, or views that are of historic, cultural, biological, or scenic value. Heritage resources are to be sustained for the use and enjoyment of future generations.

Overhead utility lines are also a part of the view along the mauka side of Kaumuali'i Highway.

3.5.2 Construction or Short-Term Impacts

There will be a temporary impact on coastal views due to HDD construction activities. During the construction period, construction vehicles and equipment will temporarily block some views of the ocean route from the highway. The construction period will be approximately three months long.

The beach, HDD bore and manhole site will be returned to its existing condition at the conclusion of the cable installation. Any excess material not utilized will be removed and disposed of in accordance with applicable County and State regulations.

Construction activities affecting the Kaumuali'i Highway connecting route may also impact existing street trees. To minimize impacts to such trees, design plans will need to conform to State and County construction standards associated with trench excavation, backfill, and pavement restoration within public rights-of-way.

3.5.3 Long-Term Impacts

Based on the relatively small scale and nature of proposed construction, no long-term impacts are anticipated. The resulting constructed cable lines will be situated underground and buried in the subsurface coastal zone, and therefore, will not affect existing viewplanes or scenic resources.

3.5.4 Mitigation Measures

No permanent visual impacts would occur as a result of the proposed project; therefore no mitigation measures are necessary.

3.6 WATER RESOURCES

3.6.1 Existing Conditions

Waters offshore of Kekaha Beach Park are in the Class A category as defined by the State of Hawai'i Department of Health (DOH). According to DOH administrative rules, marine waters are categorized as Class AA and Class A. Class AA waters are to "remain in the natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-cause source or actions." Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters. (Hawai'i Administrative Rules (HAR), Chapter 11-54, Water Quality Standards.)

Flood Insurance Rate Map (FIRM) mapping indicates that the landing site is within the 100-year flood plain.

Neither the project landing site nor the connecting route has or shows evidence of having any known wetland characteristics. This was confirmed during a site visit. No other surface waters exist in the project landing site area, and there are no perennial streams in the project area, as confirmed during the site visit.

3.6.2 Construction or Short-Term Impacts

The primary water quality concern during construction is the potential for sediments entering the ocean in the form of runoff from the project site. Construction activities could expose more soil and runoff from the project site, which could increase turbidity in the ocean, particularly if a heavy rain were to occur.

Installation of the fiber-optic cable conduit using HDD would not affect surface waters, such as the ocean, because the drill site would be set back from existing surface waters. HDD operations produce no surface discharges of pollutants. Construction activities, including installation of the connecting route, can generate hazardous waste, such as petroleum hydrocarbons, if spills occur. Therefore, the contractor would be instructed to implement best management practices (BMP) to prevent accidental spills.

All roadside construction projects that involve excavation have the potential, if unmitigated, for controlled excess sediment discharge from soil erosion during and after excavation and construction. Such discharges may impact natural watercourses, such as streams, and water quality. Contaminants associated with heavy equipment and other sources during construction may also affect receiving stream, ocean, and groundwater. However, construction will not alter existing drainage patterns or have any water requirements.

Oils and other mechanical fluids used with construction equipment would also be on-site during construction. Oils and other toxic fluids used on construction sites could leach into the ground if a spill were to occur. Therefore, contractors would be required to take caution when handling such substances.

HDD allows the underground bore to be placed below the environmentally sensitive surface resources such as beaches and streams. It is usually safer than trenching because the equipment is confined to the entrance pit work area, and the majority of construction operations occurs underground. The duration of construction activities is estimated to be three months.

The only onshore surface disturbance occurs at the entrance pit. Some localized grading may be required to accommodate the construction equipment. Once on-site work is completed, the ground is returned to its previous condition, and there will be no additional disturbance at the landing site aside from access to the manhole for periodic maintenance. If the work area required is one acre or more in size, an NPDES permit for construction grading activities will be required.

Excavation needed for trenching would probably not cause sedimentary pollutant impacts because these activities would not be near the ocean and the contractor would probably not conduct excavation work during a storm or heavy rain. The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). The bentonite slurry used for the HDD process would be confined to the drill pit and construction site. It should be noted that bentonite is a naturally occurring clay. Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore and be discharged into the environment. As noted in Section 1.4.4, bentonite is a naturally occurring clay material, which is not toxic nor harmful to the ocean environment.

Immediately prior to the drill head emerging into the ocean water from the exit point, the slurry would be flushed and replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the exit point. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and slurry could be inadvertently released into ocean water. In addition, ocean currents and/or wave action would dissipate the slurry relatively quickly, depending on the amount of slurry released, such that turbidity effects would be limited. Nevertheless, divers shall be stationed at the exit point during this activity (see Section 1.4.4).

If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 3.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

3.6.3 Long-Term Impacts

No long-term impacts are anticipated since the vacant lot at the intersection will be returned to its existing condition and revegetated as necessary after cable installation is completed and all equipment has been removed. Any flooding occurring on the property would not damage or affect the fiber-optic cable landing because all infrastructure would be underground and/or waterproofed (including within the manhole).

The sides of the HDD bore would be lined by the drill casing, which becomes the conduit. That conduit is anticipated to prevent interaction with groundwater after construction is completed.

3.6.4 Mitigation Measures

Best management practices will be specified during permitting stages and shall be strictly enforced by SIC on its contractor. To avoid impacts to water quality, measures such as the following shall be specified during the construction design phase.

The SIC contractor shall be required to conduct BMPs to prevent erosion and sedimentation, and have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles.

During drilling, the contractor would constantly monitor the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry shall immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the EP when the drill head emerges from the EP shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

3.7 MARINE AND NEARSHORE CONDITIONS

3.7.1 Existing Conditions

The Kekaha site has excellent ocean bottom conditions for a submarine cable breakout. The exit point is in an area of sand and rubble, consists of a wide HDD target of 150-foot radius and has an acceptable depth of 72 feet. The ocean bottom gently slopes at an average inclination ranging from about 50 horizontal to 1 vertical (50H:1V) to 140H:1V extending to 60-foot depths. The recommended breakout point (coordinate WGS 84) is located at N21°57.660', W159°43.590' approximately 3,600 feet from shore. Since sand dominates the substratum, benthic community development is low.

The seaward breakout is in 72 feet of water and approximately 3,600 feet bearing 187.55° True North of the onshore horizontal directional drill (HDD) coordinate. The bottom substrate consists of sand for at least a 150-foot radius and no deep depressions shoreward or seaward of the exit point. NOAA charts show no indication of any navigation hazards although there does exist a fish aggregation device (FAD) just offshore in deep water that was taken into consideration in the deep water cable route planning (Makai Ocean Engineering, Inc., July 2003). No depressions were observed that could complicate HDD operations.

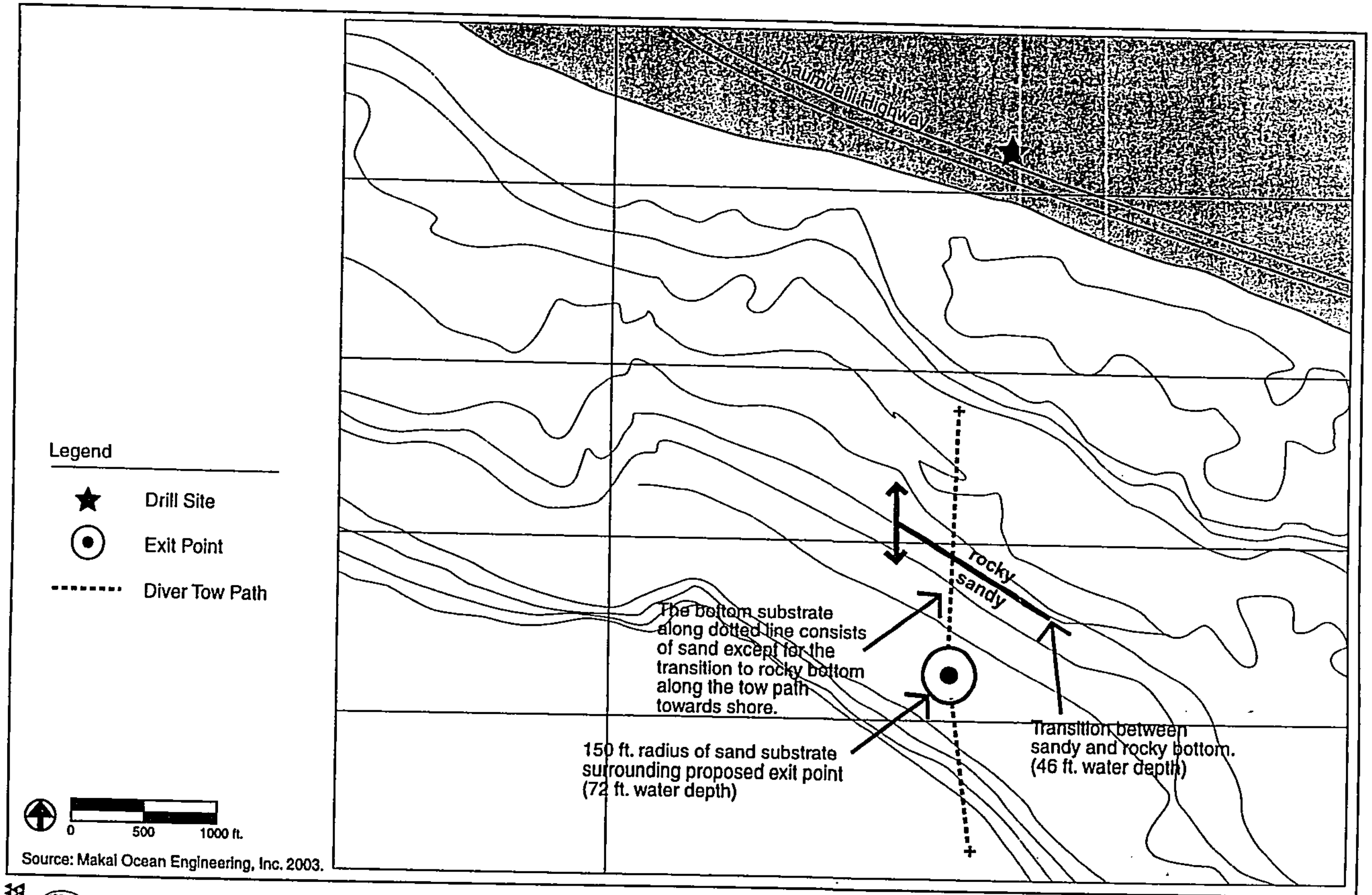
The SCUBA site survey revealed no bottom features other than the sand substrate. A measurement taken of a 150-foot radius again revealed nothing but sand surrounding the exit point. The depth of the sand layer at the site was at least 2 feet deep. Approximately 1,126 feet seaward of the breakout coordinate, at a water depth of 130 feet, a sand veneer over limestone substrate was observed indicating that the sand channel did not extend further into deep water. In the diver's shoreward reconnaissance no depressions were observed. This is important to determine whether bottom conditions would interfere with HDD operations. However, a transition between sand and rock substrate was observed approximately 915 feet shoreward of the breakout coordinate. See Figure 3.7-1.

Recreational activities observed were two fishing vessels passing well seaward of the proposed exit point and three groups of shoreline fishermen as well as several swimmers in the waters well inshore of the exit point.

Coastal or nearshore areas are vulnerable to a number of natural hazards, in particular storms, hurricanes, tsunamis, and high waves. These natural hazards are discussed below.

Storms and Hurricanes. The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward (north and northeast) sides of the islands in comparison to leeward areas (south and southwest).

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kaua'i. These two hurricanes, as well as other past hurricanes in recorded history, suggest that Kaua'i is the most vulnerable to hurricanes. However, meteorologists warn that no island is safe from hurricanes.



Sandwich Isles Communications, Inc.

Marine Survey of Proposed Exit Point at 'Akialoa Road Landing Site
Submarine Fiber-Optic Cable Project

Figure 3.7-1

Tsunamis. Tsunamis are a series of large waves caused by one of three geologic processes: (1) earthquakes (the most common); (2) landslides (either submarine or subaerial); and (3) explosive submarine volcanic events. The "Pacific Ring of Fire," which encircles the Pacific Basin reaching as far as Asia, North America, South America and Australia, is a zone of frequent earthquakes and volcanic activity. The Hawaiian Islands are roughly in the middle of the Ring, and therefore have experienced tsunamis originating from different locations. In the past 60 years, six tsunamis originating from the Ring were particularly destructive. Barrier and fringe reefs tend to absorb the energy of the waves and protect the shoreline.

High Waves. In Hawai'i, waves are caused by: (1) the north Pacific swell; (2) the northeast trade wind swell; (3) a south swell; and (4) kona storm swells. The north Pacific swell is generated by storms in the Aleutian Islands area, and it tends to produce wave heights 8 to 30 feet on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast trades produce wave heights 4 to 12 feet on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range one to four feet. Kona storm waves (see above) average 10 to 15 feet and can occur at any time of the year.

3.7.2 Construction or Short-Term Impacts

Installation of the cable between the shoreside landing site and the exit point approximately 3,600 feet from shore will be underground through the use of the HDD method. The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore, and discharged into the environment. If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. As noted in Section 1.4.4, bentonite is a naturally-occurring clay material, which is not toxic nor harmful to the ocean environment. In addition, the ocean currents or wave action would dissipate the slurry relatively quickly, such that turbidity effects would be limited. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 3.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

Immediately prior to the drill head emerging into the ocean water from the exit point, the slurry would be replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the exit point. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and slurry could be inadvertently released into the ocean water. As noted above, ocean currents would dissipate the slurry relatively quickly, depending on the amount of slurry released. Nevertheless, divers shall be stationed at the exit point during this activity (see Section 1.4.4).

3.7.3 Long-Term Impacts

Nearshore areas are subject to various coastal hazards, such as tsunamis, high waves, storms and volcanic/seismic events, some of which could damage cables lying on the ocean floor near the coastline. The USGS provided ratings regarding various coastal hazards along the entire shoreline of Hawai'i, including hazard assessments (Fletcher, 2002, as cited in Makai Ocean Engineering, 2003). The overall hazard assessment for the 'Akialoa Road, Kekaha coast is moderate (4) due to high hazard from storms and tsunami. The hazard from high waves and volcanic/seismic events is low. In general, the potential for erosion along the coast is moderately low, but is classified high (level 4) for the area comprising the cable landing site. With respect to the SIC cable landing project, engineering design solutions, including burial of the cable in the sand with the use of HDD methods, will significantly minimize the project's susceptibility to these naturally occurring hazards.

The SIC system has been designed to avoid the use of submarine boosters or repeaters (equipment to maintain signal strength on long cable segments). Therefore, no electromagnetic frequency (EMF) emissions are expected from operating these cables once the system is completed.

3.7.4 Mitigation Measures

During drilling, the contractor constantly monitors the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry would immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the exit point when the drill head emerges from the exit point shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped. Additional procedures to protect water quality shall be addressed in the project's BMPs which will be developed during the design phase.

3.8 TERRESTRIAL AND AQUATIC BIOLOGY

3.8.1 Existing Conditions

<u>Terrestrial</u>

According to the University of Hawai'i Natural Heritage Program, as of May 2002, although not included in the southeast portion of the parcel, the Hawaiian Duck (*Anas wyvilliana*) was last observed in the 1966 and the Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) was last observed in 1990, immediately mauka of the Kekaha Gardens subdivision, between the cane haul roads that run parallel to Kaumuali'i Highway. Also, in 1991, the Hawaiian Hoary Bat was last observed makai of Kaumuali'i Highway, about midway between 'Akialoa Road and Akeke Road. The Hawaiian Hoary Bat is a nocturnal mammal. However, the project landing site and connecting route do not contain specific breeding habitat for either species.

Field studies to assess the botanical resources on the proposed cable landing site were made on September 18, 2002. A survey was also made along the land route from the landing site, up 'Akialoa Road, and terminating at the switch building; and from the cable landing site to the land route identified by SIC. The primary objectives of the field studies were to identify and describe general vegetation on the cable landing or HDD site and along the connecting routes, and to search for threatened and endangered species as well as species of concern.

Vegetation on the cable landing sites and the connecting land routes are dominated by introduced or alien species, most of which are considered weedy. None of the plants found on the areas to be affected by the project is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999a, 1999b; Wagner et al. 1999).

The following detailed description of plant types found in the project areas is contained in a botanical resource assessment prepared by Char & Associates (November-December, 2002) and can be found its entirety in Appendix 4 of this Draft Environmental Assessment.

Plant names used in this section follow Wagner et al. The few recent name changes are those reported in the Hawai'i Biological Survey series (Evenhuis and Eldredge, eds., 1999-2002).

The vegetation composition is very simple because the site is used as a corral for horses and is heavily disturbed. It consists of scattered patches of Bermuda or manienie grass (*Cynodon dactylon*) and numerous plants of golden crown-beard (*Vebesina encelioides*), an annual weedy herb, 1 to 2 feet. tall, with clusters of yellow, daisy-like flowers. A few plants of spiny amaranth or pakai kuku (*Amaranthus spinosus*) and fuzzy rattlepod or kukaehoki (*Crotalaria incana*) are occasionally encountered. Along the mauka boundary is a stand of kiawe trees (*Prosopis pallida*).

The *Nama sandwicensis* (no common name) found in an area at least 0.3-mile west, but not on the 'Akialoa Road site, is considered a species of concern (SOC) by the U.S. Fish and Wildlife Service (1999). However, it is a low priority item since plants are widespread. They occur in coastal situations on all of the main islands (except Kahoolawe) and on Lisianski and Laysan islands. SOC generally means that there is a need for more biological and/or taxonomic information regarding whether a species might need conservation actions in the future. SOC do not receive legal protection under Federal and State Endangered Species laws, and use of the term does not mean that the species will eventually be listed as threatened or endangered.

Because the *Nama sandwicensis* was not found outside of the proposed landing site area, no further biological and/or taxonomic investigation is anticipated at this time. The HDD bore site work area will be well-contained and away from the area where this species was found.

The connecting routes are located within the right-of-way along the roads and highway. The right-of-way is periodically maintained (mowed or "weed-whacked").

Ruderal or roadside vegetation consists primarily of low mats of Bermuda grass. Weedy plants form scattered low patches. Some of the more commonly observed plants include swollen fingergrass (*Chloris barbata*), goose grass (*Eleusine indica*), golden crown-beard, hairy spurge (*Chamaesyce hirta*), lovegrass (*Eragrostis amablis*), pitted beardgrass (*Bothriocholoa pertusa*), and buffelgrass (*Cenchrus ciliaris*).

<u>Aquatic</u>

The proposed breakout point is located in an area of sand and rubble having a depth of 70 feet. Since sand dominates the substratum, benthic community development is low. Species seen in the vicinity of the exit point include a juvenile white or "haole" crab (*Portunus sanguinolentus*), two juvenile sand wrasses or nabeta (*Xyrichthys pavo*) and a small auger shell (*Terebra inconstans*). Within 120 feet inshore of the exit point is an area of emerging limestone substratum (N21°57.804', W159°43.596'). This limestone occurs as a narrow 6- to 12-foot-wide band running approximately parallel to shore and having a length of about 150 feet. This limestone band is the first of several until an area of solid limestone is encountered about 90 feet inshore of the first limestone band. Since some corals were present on the most seaward part of the limestone, a transect was established to quantify the marine community present. This transect had an orientation parallel to shore and carried out the first limestone inshore of the proposed exit point.

Seven algal species (*Amansia glomerata, Dotyella hawaiiensis, Halimeda opuntia, Sphacelaria furcigera, Spyridia filamentosa, Corallina sp.* and *Gracilaria sp.*) had a mean coverage of 2.8percent and five coral species (*Porites lobata, Pocillopora meandrina, Pocillopora eydouxi, Pavona varians* and *Montipora patula*) had a mean coverage of 3.4 percent. Also noted was the delicate branching bryozoan (*Bugula neritima*). Diurnally exposed macroinvertebrates seen in the 4 meter x 25 meter census area included the leopard cone shell (*Conus leopardus*), the 7-11 crab (*Carpilius macalatus*) and the black short-spined sea urchin (*Tripneustes gratilla*). The results of the fish census carried out at this station are: in total, 11 species and 53 individual fishes were censused in the study area. The most common species included the elegant wrasse (*Coris venusta*), the arc-eye hawkfish or piliko'a (*Paracirrhites arcatus*) and the sidespot goatfish or malu (*Parupeneus bifasciatus*). The biomass of fish was estimated to be 24 g/m² and the species contributing most heavily to this biomass included elegant wrasse (*Coris venusta* – 27 percent of the total) and the barred filefish or 'o'ili (*Cantherhines dumerilii*) comprising 34 percent of the total estimated standing crop at this station.

Marine community development along the 3,600-lineal-foot in-water alignment, coral communities are not well developed probably due to the low topographical relief of the limestone and near-constant movement of sand with passing waves. During periods of high surf, this sand probably abrades the substratum which would retard the development of corals.

3.8.2 Construction or Short-Term Impacts

No impacts on terrestrial or marine resources are anticipated as a result of construction activities at the 'Akialoa Road landing site nor along the connecting route. Construction impact activities will be confined to daylight hours within the HDD bore site at the corner of 'Akialoa Road and Kaumuali'i Highway, and total construction period will be of short duration (approximately three months).

The proposed deployment of directional drilling avoids problems with deploying cables on the surface of the seafloor and possibly impacting sessile species (permanently attached or fixed) such as corals. An added benefit to the use of directional drilling is the protection afforded to the cable in the shallow water where storm surf could result in cable failure. The proposed alignment will utilize directional drilling thereby avoiding marine communities and any impact to them in the coastal waters. The bentonite and water mixture used for drilling slurry would be replaced by water immediately prior to the HDD drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP. In the event of an accidental discharge of slurry during drilling or at the EP (see Section 6.6.2), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidity relatively quickly. Also, slurry is not toxic or hazardous to marine life.

As part of the proposed construction project, the exposed areas within the cable easement will be replanted as needed to ensure stability of the site.

When laying cable, caution must be taken to avoid adverse interactions with protected species of marine mammals that occur in Hawai'i's waters. Although humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying operations within these months. If a whale or other protected species is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation would also be halted until the animal moves away of its own volition. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

3.8.3 Long-Term Impacts

No long-term impacts on terrestrial botanical resources are anticipated as all construction equipment and machinery will be removed from the landing site once construction and installation is completed. The site and connecting route will be restored to existing conditions following removal of construction equipment.

No long-term impacts on marine communities are anticipated, particularly since the cable will be laid on sand substratum and will "sink" into the sand. The shifting nature of sand and its continual movement will usually bury any deployed cable with time. Marine species found in sand habitats have evolved to live in this continually moving substratum thus placing a cable on this substratum which will become buried will not materially hinder any of these species.

The presence of the cable or manhole is not anticipated to cause any long-term adverse interaction with protected species. There is no evidence to suggest that impact occurs with cable operation. There are a number of fiber-optic cables operating on the leeward coast of O'ahu, where marine mammals are present, with no known adverse impacts on those animals.

3.8.4 Mitigation Measures

Because the proposed action would have no short- or long-term adverse impacts on any flora or terrestrial fauna, threatened and endangered species, or their critical habitat, no mitigation measures are required. After construction is completed, the contractor will return the site to its pre-construction condition.

The mitigation measures below are proposed to avoid adverse interactions with marine animals during construction.

Immediately before and during the pop-out event, an underwater diver shall observe the environment before attaching the cable. If a protected animal is observed in the immediate vicinity of the EP, the pop-out event shall be delayed until the animal moves away from the project area of its own volition.

If any protected species is detected during construction, including marine mammals and sea turtles, cable deployment shall be halted until they move away from the vessel or the cable deployment area.

The bentonite and water mixture used for drilling slurry will be replaced by water immediately prior to the HDD drill head emerging from the EP preventing bentonite from releasing into the ocean.

3.9 AIR QUALITY

3.9.1 Existing Conditions

Air quality in the State of Hawai'i is typically excellent, due to offshore trade winds that help disperse most urban air pollutants. Data collected by the State Department of Health (SDOH) indicate that the State has some of the best air quality conditions in the nation. To monitor air quality, the SDOH operates a network of stations at various locations throughout the islands. Kaua'i's climate is comfortably uniform and is characterized by the northeast tradewinds generated by regions of high pressure to the north. The consistent approach of the tradewinds from the northeast distinguishes the island into windward and leeward sides. The windward side is exposed to wind; on the islands, this is typically the eastern side. The leeward side is not exposed to prevailing winds; on the islands, this is typically the western side.

The average air quality on Kaua'i is excellent. Levels of pollutants, including ozone, nitrogen dioxide, carbon monoxide, sulfur dioxide, particulate matter, and airborne lead, are generally below the U.S. Environmental Protection Agency National Ambient Air Quality Standards as well as the standards set by the State of Hawai'i (Kaua'i Electric 1999).

3.9.2 Construction or Short-Term Impacts

Excavation will be required to install the manhole in the 'Akialoa/Kaumuali'i road right-of-way. Noticeable dust emissions may occur from the manhole excavation especially if the excavated soil is dry and weather conditions are windy. Fugitive dust emissions are not expected to cause noticeable disturbance or annoyance to surrounding properties along affected roadways. The installation of the fiber optic duct lines will involve a very narrow trench or trenchless methods that will not result in substantial disturbance to existing pavement and shoulder areas.

The HDD drill rig, compressor, and other construction vehicles emit engine exhaust which would contribute to air pollutants in the vicinity of the work area. Most of the equipment and vehicles, including the drill rig and compressor, are diesel-powered, and will emit relatively high levels of nitrogen oxide (NOx) in comparison to gasoline-powered equipment. However, standards for such pollutants are set on a regional basis and would therefore not be violated by short-term construction equipment emissions.

3.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality is anticipated because the work site will be restored to its original condition after the cable-laying process is completed and construction equipment is removed. After construction is completed and the landing site would experience no further activity that could potentially degrade air quality.

3.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality such as no visible emissions outside the affected parcel. BMPs will also be implemented to minimize unnecessary air quality impacts. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants. This will help control escape of fugitive dust beyond the construction site.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses.

As required by State regulations, upon completion of work the project site shall be revegetated as appropriate to control erosion and release of dust by the wind.

3.10 NOISE

3.10.1 Existing Conditions

The Kekaha cable landing site area typifies a tranquil, rural Kaua'i neighborhood that does not generate nor is impacted by large amounts of noise. Occasional resident and visitor vehicular traffic, and Pacific Missile Range Facility (PMRF) and agricultural activity-related truck traffic along Kaumuali'i Highway, fronting the project area, add to the beachfront community's noise levels. Ambient noise levels are typical of a rural coastal community, including that of dogs, roosters, and horses. The nearest residence is on 'Akialoa Road approximately 90 feet from the proposed landing site.

3.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of noise is expected to come from use of heavy machinery, such as bulldozers, directional boring rig, and trucks entering and leaving the site during the drilling period, expected to last approximately three months. Noise produced by this operation may occasionally be as high as 90 to 94 decibels at 50 feet away, which is comparable to the noise from a lawnmower. HDD operations and other construction activities will be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would more than likely violate Community Noise Control Standards; therefore, the SIC contractor would require a noise permit from the SDOH.

3.10.3 Long-Term Impacts

No long-term impacts are expected as there will be no operational requirements for the manhole site except for an occasional maintenance repair technician visiting the site on an as needed basis.

3.10.4 Mitigation Measures

HDD operations and other construction activities shall be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would likely violate Community Noise Control Standards; therefore the SIC contractor would require a noise permit from the SDOH.

Prior to the start of construction, SIC or its contractor shall inform the nearby community about the proposed construction schedule and anticipated noise impact. SIC shall provide contact information where residents may call to ask questions or report problems.

The SIC contractor shall be required to maintain his or her HDD drilling equipment in proper working order, especially all noise suppression systems, such as the rig's muffler. Noise generated from machinery shall be mitigated by requiring contractors to adhere to State noise regulations. In general, the contractor shall be the point of contact to the community during construction. However, members of the community shall be able to contact SIC if they are dissatisfied with how the contractor resolves noise or other problems, or have complaints about the contractor.

3.11 PUBLIC FACILITIES

3.11.1 Existing Conditions

The project site is served by Kaumuali'i Highway (State Route No. 50), a two-lane arterial road, which is the primary highway connecting the West Side to Lihue and points eastward. 'Akialoa Road, a north-south local road that serves the residences, intersects Kaumuali'i Highway.

The Department of Water (DOW) of the County of Kaua'i has water mains and laterals located within paved travel lanes and along shoulder areas within the rights-of-way of both State highways and County roadways. Kaua'i Electric (KE) services the project area. The main transmission line for the West Side, of which Kekaha is a part, extends from Port (Pt.) Allen to Mana along Kaumuali'i Highway, including double circuits between Pt. Allen and Kekaha. Telephone services are available through Verizon Hawaii (formerly GTE Hawaiian Tel). Services are distributed via overhead lines following highways and roadways. Detailed descriptions and locations of utilities located with the right-of-way will be analyzed during final design.

3.11.2 Construction or Short-Term Impacts

The fiber-optic landing site would connect directly to SIC's terrestrial network within the existing right-of-way. The landing site beach manhole would be placed within the highway right-of-way for ease of access by SIC personnel. The beach manhole would be designed to not interfere with existing waterlines within the highway right-of-way.

During construction there may be restricted traffic flow, including the temporary closure of one lane along the roadway. This is not expected to cause substantial delays. There is no anticipated impact on emergency vehicle access, as traffic coordinators would allow vehicles to pass in the case of emergencies.

3.11.3 Long-Term Impacts

After construction, contractors would be required to return the project site to pre-construction conditions. Therefore, no adverse long-term impacts to any public utilities, facilities, or services are anticipated after the fiber-optic cable installation is completed. The project would not affect expansion of existing infrastructure or installation of new infrastructure.

Long-term impacts to transportation systems, infrastructure and utility systems, educational, medical, and recreational facilities are not expected mainly because the project will not generate an increased demand for these public and private services and systems.

The project is not expected to result in long-term impacts on the police or fire department's ability to provide protective services in Kekaha. Once the fiber optic cable is installed, there will be no personal or business activities occurring with these underground cables that may require added police or fire protection services.

3.11.4 Mitigation Measures

The mitigation measures below are proposed along the entire route to ensure that public facilities are not impacted.

SIC shall coordinate work on Kaumualii Highway with the State of Hawaii Department of Transportation to prevent conflicts in activities.

SIC shall post appropriate public notices per County and State requirements for lane closures, as necessary.

Flagmen and/or police officers will be posted to direct traffic safely around the construction of the proposed manhole and installation work within the Kaumuali'i Highway connecting route

SIC shall coordinate with County departments and utility companies to ensure that the landing site and connecting route construction activities will not damage water, sewer, and utility lines.

Chapter 4

Mākaha, O'ahu Landing Site :
Environmental Setting, Impacts, and Proposed Mitigation

CHAPTER FOUR: MĀKAHA, O'AHU LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

4.1 TOPOGRAPHY AND GEOLOGIC CONDITIONS

4.1.1 Existing Conditions

The island of O'ahu was created by the extrusion of basaltic lavas from two shield volcanoes, Wai'anae and Ko'olau. The older volcano, Wai'anae, is estimated to be middle to late Pliocene in age and forms the bulk of the western one-third of the island. The younger shield, Ko'olau, is estimated to be late Pliocene to early Pleistocene (Ice Age) in age and forms the majority of the eastern two-thirds of the island. Wai'anae became extinct while Ko'olau was still active, and its eastern flank was partially buried below Ko'olau lavas banking against its eastern flank forming a broad plateau, now known as the Schofield Plateau.

During the Pleistocene Epoch, sea levels fluctuated in response to cycles of continental glaciation. The higher sea level stands caused the formation of deltas and fans of accumulated terrigenous sediments in the heads of old bays, accumulated reef deposits at correspondingly higher elevations, and deposited lagoonal/marine sediments in the quiet waters protected by fringing reefs. The lower sea stands caused streams to carve valleys in the sediments and reef deposits. Subaerial exposure of the sediments and calcareous materials caused consolidation of the lagoonal deposits and induration (hardening) of the calcareous reef materials.

During the late Pleistocene Epoch, there was a renewal of volcanic activity with the eruptions of vents of the Honolulu Volcanic Series. These vents broke through existing coral reefs and along the mountainsides. The vents of Diamond Head, Salt Lake, Punchbowl, and Koko craters emerged through the coral reef formations. Along the mountainsides, Kalihi, Nuuanu, Kaneohe, Castle, Tantalus, and Sugar Loaf vents erupted and poured lavas into the nearby valleys.

The proposed Kili Drive fiber-optic cable landing site is located at the makai end of the Mākaha Ahupua'a of O'ahu's Wai'anae coast (see Figure 1.1-2B in Chapter 1).

The project site is underlain by unconsolidated non-calcareous deposits and unconsolidated marine calcareous sediments. The non-calcareous deposits are mainly composed of younger alluvial deposits. This deposit also includes colluvial deposits consisting of angular talus material deposited near the base of the mountainsides. The calcareous sediments consist of beach sand.

At the shoreline entry point for the Kili Drive landing site, the existing ground surface elevation ranges from 10 to 30 feet above mean sea level (AMSL).

Geology of the 3.3-mile long connecting route that commences at the Kili Drive and Farrington Highway intersection, continues along Farrington Highway in an easterly direction, and ends at the Wai'anae Valley Road and Farrington Highway intersection, is generally characterized as that of Lualualei Plain. Topography of this route reflects that of the existing roadway and rights-of-way. Since the cable would be installed along a corridor within the State right-of-way, affected areas consist of unpaved shoulders, paved shoulders, or paved travel lanes. As a result, the present topography of these areas range from flat within paved travel lanes and shoulder to gently sloping unpaved areas within public rights-of-way. Topography changes from flat to relatively steep at the two stream crossings along the Farrington Highway connecting route.

Soil sampling at two locations at the mauka and makai side of the proposed landing site was conducted. Subsurface conditions encountered an alluvial deposit at the ground surface with a thickness of about seven feet. The alluvial deposit generally consists of stiff to hard clayey silt with basaltic cobbles. The alluvial deposit was underlain by a soft-to medium-hard coral formation to the maximum drill depth of 21.5 feet below the existing ground surface. Closer to the shoreline is a surface fill layer with a thickness of about nine feet. The fill layer consists of medium-dense sand. The fill layer was underlain by dense sand with gravel and cobbles to 11.5 feet depth and followed by a hard coral formation to a depth of 24.5 feet below the existing ground surface. Below the coral formation, reef detritus and alluvial deposits were encountered down to 31 feet. The reef detritus consists of dense sandy gravel and the alluvial deposit comprised very stiff silty clay. The reef detritus and alluvial deposits were underlain by a soft coral formation about 2.5 feet in thickness followed by a marine clay deposit to the maximum boring depth of 42.5 feet below the existing ground surface. The marine clay consists of very stiff clay with sand. Groundwater levels encountered in the borings varied from about 9 to 11.3 feet below the existing ground surface.

Hazardous Materials

Since present and historic land uses in the project area could have produced site contamination, a database search was conducted to investigate the potential that the site contains hazardous materials (see Appendix 6). Thirty State, federal and private databases were searched for sites containing hazardous materials in the project area utilizing the services of Environmental Data Resources (EDR) (July 15, 2003). The database search does not cover off-shore sites. Findings from this database search indicate: (1) The target property was not listed in any of the 30 databases searched; and (2) One site within one-half mile of the project was recorded in the databases: EPA Site ID number U003221975 (event ID 910013) was a Leaking Underground Storage Tank (LUST) located at the Mākaha Cable Terminal, 84-250 Farrington Highway, northwest of the Kili Drive landing site. According to the status report dated June 1994, site cleanup was completed. Because the site has been cleaned up, this would not likely be a source of contamination to the project site.

4.1.2 Construction or Short-Term Impacts

Construction work is not expected to have a significant impact on the existing topography or geology of the immediate area of the Kili Drive landing site. There will be minimal grading at the onshore bore hole site to accommodate mobilization and drilling activities, material storage areas, centrifuges, tanks, and storage for excavated material and other equipment for about a three-month construction period. These impacts will be temporary and once HDD cable installation work is completed, equipment and machinery will be removed and the site will be restored to its pre-construction condition.

Impacts to the Farrington Highway connecting route during cable installation will be temporary and confined to the immediate work area of each construction interval within the State right-of-way. Construction work activities are expected to involve trenching or directional drilling in unpaved shoulders, paved shoulders, or paved travel lanes. No change to the existing topography in these areas is expected since all duct lines will be placed underground in conformance with both State and City and County design standards and requirements. Upon completion of cable installation, roadways and shoulders will also be restored in conformance with applicable design standards.

At stream locations along the connecting route, the design and installation of cables will be determined on a case-by-case basis due to the unique conditions of that particular area surrounding the bridge structure. The design of such crossings may involve bridge attachments for the cable that would have no effect on the existing topography or geological conditions. If trenchless methods, such as directional drilling, are used, minimal impact on topography is expected since the cable will be installed under the stream bottom.

4.1.3 Long-Term Impacts

No long-term impacts to topography or geology of the Kili Drive landing site are expected from the installation of SIC's fiber-optic cable, particularly since grading will be minimal only to accommodate HDD construction equipment and for storage area at the construction site. A manhole within the State highway right-of-way will be all that will remain at the conclusion of HDD construction activities.

4.1.4 Mitigation Measures

Mitigation is not required. Appropriate early coordination with pertinent agencies shall be conducted to help design engineers prepare practical and effective Best Management Practices (BMPs) during design phases. The landing site and connecting route shall be restored to their pre-construction conditions once construction and installation of the duct lines and manhole are completed.

4.2 LAND USE

4.2.1 Existing Conditions

The Wai'anae coastline of O'ahu is largely rural with most of the urban and suburban development clustered in the Farrington Highway corridor, along with expanses of beaches and beach parks. See Figure 4.2-1.

The fiber-optic cable landing site location is within an uncleared mauka portion of Mākaha Beach Park that lies at the base of the Wai'anae Mountains, approximately 500 feet mauka of the shoreline at the intersection of Kili Drive with Farrington Highway (TMK 8-4-02:047). The City and County of Honolulu owns the parcel. Please see landing site photographs, Figure 4.2-2.

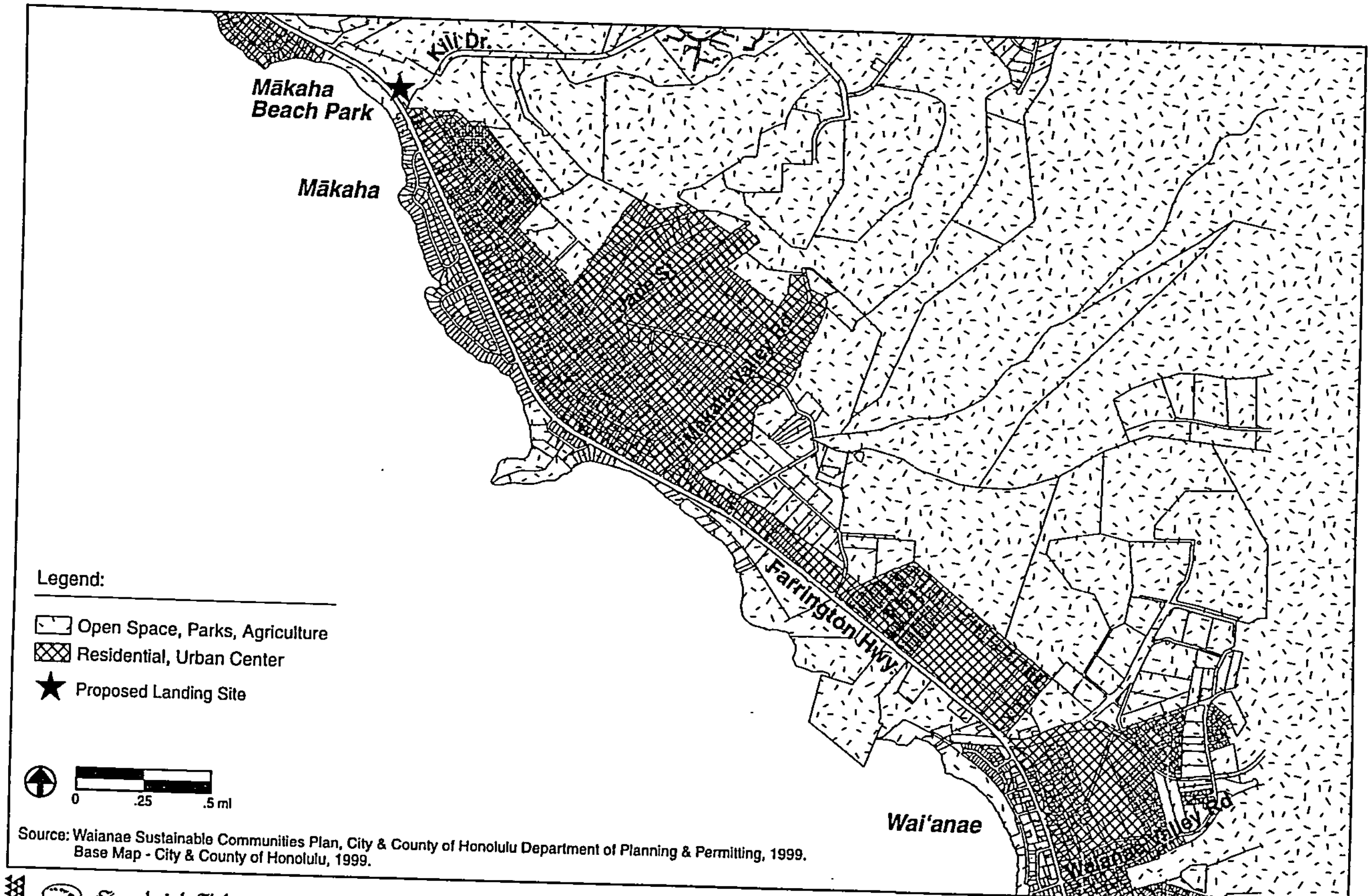
The project site is a vacant mauka portion of the City and County's Mākaha Beach Park. It is overgrown with trees and shrubs. West, or makai of the landing site across Farrington Highway, is the well-known surfing beach. Mākaha Beach has also been the site of several cable landings over the years. South of the park (towards Wai'anae) is a comfort station and parking lot built in 1999 by the City and County of Honolulu for Mākaha Beach Park visitors. Just beyond this park extension (towards Wai'anae) are single-family residential homes. On the northern end of the beach (towards Ka'ena) is a multifamily condominium structure.

The connecting route between Kili Drive and Wai'anae Valley Road passes through developed, urban lands consisting of Mākaha and Wai'anae towns, residential developments, Wai'anae High School, Regional Park complexes, and beach parks.

The State Land Use Commission designates the subject parcel as in the Urban district. It is in the General Preservation (P-2) zoning district as defined by the City and County's Land Use Ordinance and is in the Special Management Area (SMA), as designated by Chapter 205 HRS and managed by the City and County of Honolulu.

4.2.2 Construction or Short-Term Impacts

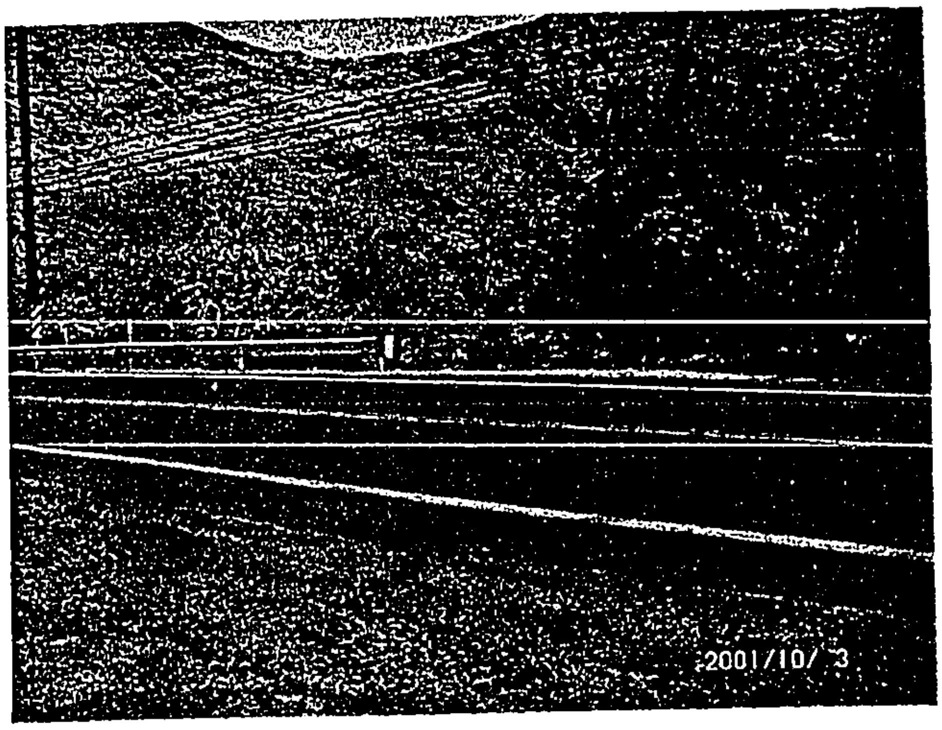
Cable installation activities will temporarily impact land and shoreside recreational uses. During construction, portions of the shoreside area will have to be closed for safety reasons. Lateral access will be provided in designated areas. Access to residential properties will be kept open at all times during



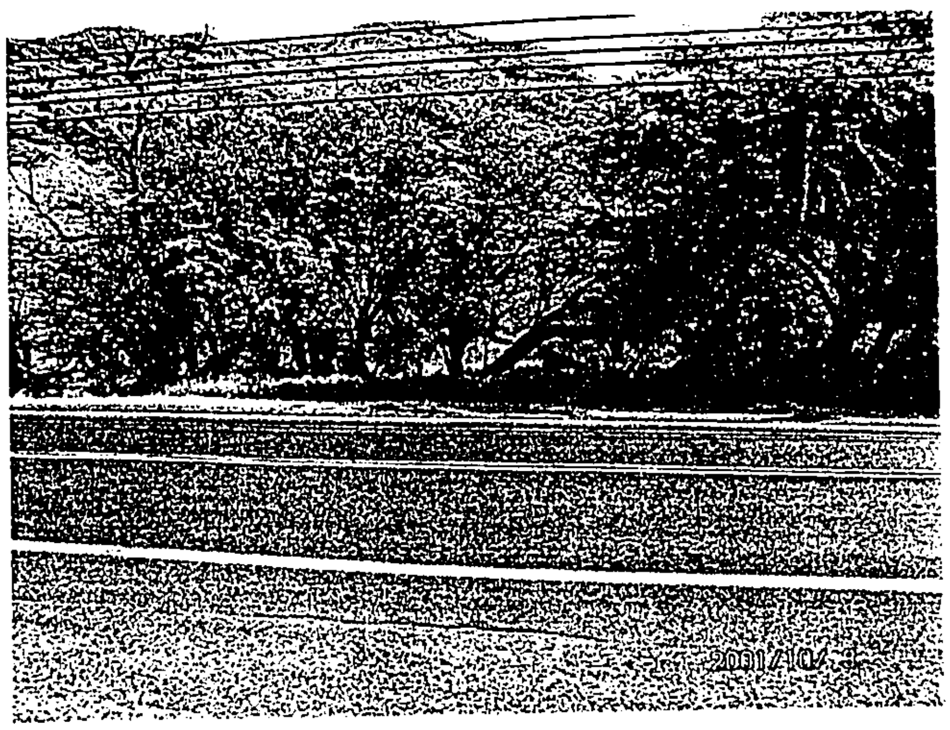
Sandwich Isles Communications, Inc.

Existing Land Uses - Kili Drive Landing Site
Submarine Fiber-Optic Cable Project

Figure 4.2-1



Southwest view from Farrington Highway



Mauka view from Farrington Highway

Source: Parsons Brinckerhoff, 2002.

Sandwich Isles Communications, Inc.

Photos of Kili Drive Landing Site Parcel
Submarine Fiber-Optic Cable Project
Figure 4.2-2

construction, so residents living in the vicinity of project landing site will not be adversely affected except for slight inconveniences due to the construction trucks and equipment during the three-month period.

The project site is designated as Prime Agricultural land according to the Agricultural Lands of Importance to the State of Hawai'i (ALISH) system. Prime agricultural land has agricultural value by virtue of current agricultural use or high value for future agricultural use, suitable for crop growing, grazing and livestock raising, flower cultivation, nurseries, orchards, aquaculture, or similar activities. However, it is not known to have been in active agricultural production for many years. Further, according to the National Resource Conservation Service (NRCS), the amount of land involved in this project is too small to have an adverse impact on lands of importance to agriculture on O'ahu. The Kili Drive landing site has, in fact, been committed to urban development as it serves as part of a City and County park in a rural Wai'anae coast neighborhood, and thus does not impact farmland as defined by the Farmland Protection Policy Act (FPPA) (§658.2, 7 U.S.C. 4201-4209). The predominant soil type classified by U.S. Department of Agriculture, Soil Conservation Service is Hale'iwa silty clay, which is described as a moderate to poorly drained clay occurring in alluvial fans and drainage ways (Foote et al. 1972). Beaches and public parks have no value for agriculture but where accessible they are highly suitable for recreational uses.

4.2.3 Long-Term Impacts

No long-term impacts on surrounding land uses, the beach park, and ocean recreational activities are expected from the development of the proposed SIC Kili Drive landing site. Installation of the fiber-optic cable system will result in very little to no visible impact on surrounding land uses in the Mākaha area.

Once on-site work is completed, the ground will be returned to its previous condition, and there will be no additional disturbance at the landing site aside from access to the manhole for periodic maintenance.

4.2.4 Mitigation Measures

Potential impacts shall be avoided or reduced to very minor levels by adherence to mitigation measures that will be developed in detail during the design phase and will be applied to the entire length of the project.

SIC or its designated contractor shall develop a traffic control plan that will outline the steps needed to minimize congestion and maintain access to adjacent properties at all times during construction. Implementation of construction activities shall be coordinated with agencies to prevent conflicts in the timing of other construction projects as well as planned community functions.

SIC or its designated contractor shall post appropriate public notices per City and County and State requirements for lane closures, as necessary.

Best management practices (BMPs) will be specified during permitting stages and shall be strictly enforced by SIC on its contractor. For example, they would include development of plans to remove and dispose of unused materials and excess fill in an authorized waste disposal site.

4.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

4.3.1 Existing Conditions

An archaeological inventory survey was conducted for the project and a report is included in Appendix 3. The findings are summarized in this section.

The Mākaha Valley Historical Project (Green 1969, 1970, 1980; Ladd and Yen 1972; and Ladd 1973), involved fieldwork conducted between 1968 and 1970, and studied most all of Mākaha Valley. More than 600 archaeological features were recorded in the upper valley and 1,131 features were recorded in the lower valley. Settlement was focused on the primary water source, Mākaha Stream. Subsequently, with increased population, expansion into kula lands occurred. By the 16th Century the expansion occurred in the "upper valley" with changes in subsistence to irrigated taro systems (i.e., lo'i)(Green 1980:75).

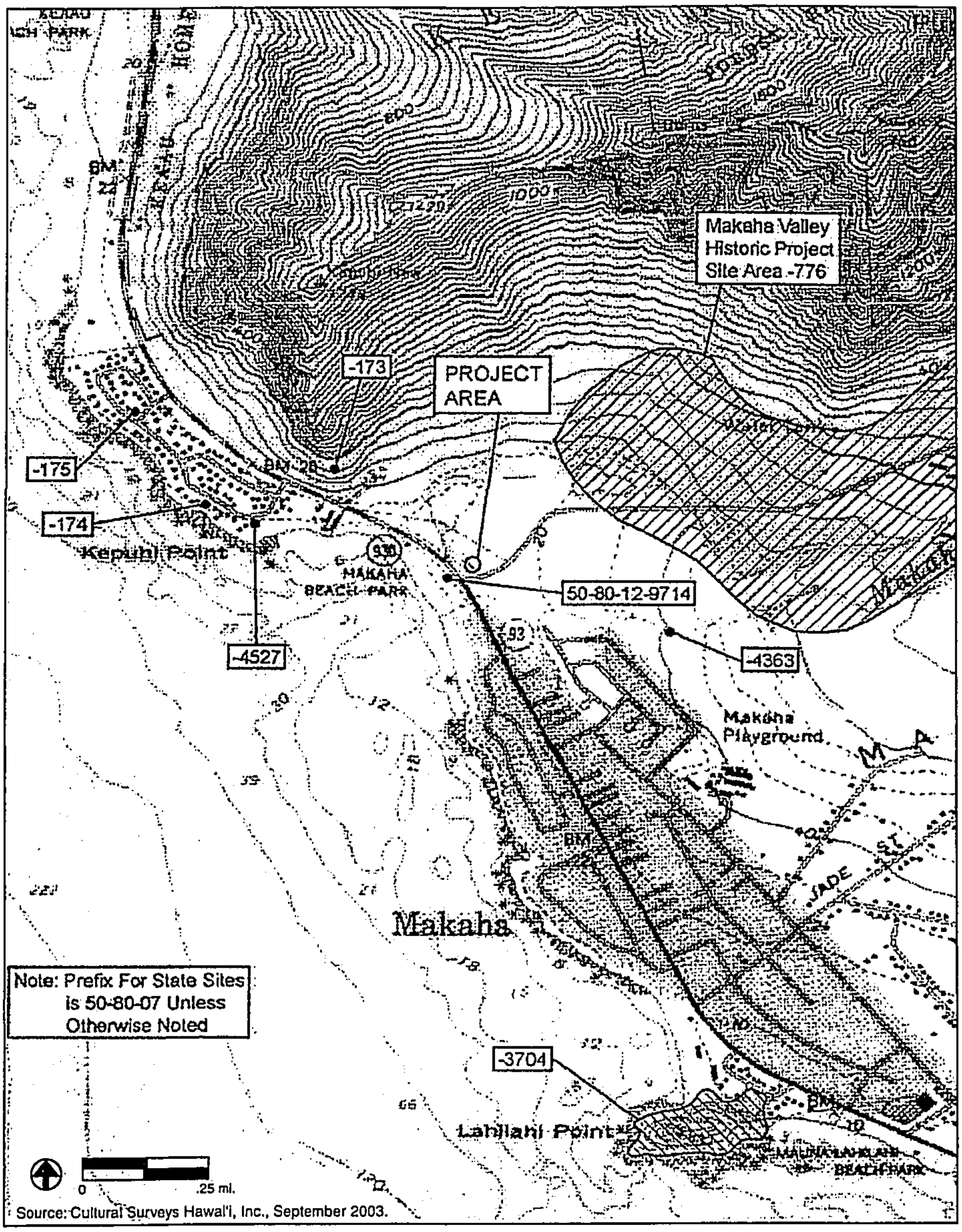
In 1997, test excavations associated with the inventory survey were conducted for the "New Mākaha Beach Park Comfort Station and Parking Area" mauka of Farrington Highway by Paul Cleghorn. This survey identified a cultural layer in an area approximately 240 feet mauka of Farrington Highway near the entrance to Kili Drive (See Figure 4.3-1). Radiocarbon analysis indicated an age range of A.D. 1440-1690. The deposit was suggested to be "evidence of a small encampment near the coast" (Cleghorn 1997:32). Also present are remains of structures associated with the O.R. & L. Railroad (State site 50-80-12-9714). Cleghorn indicates the presence of a bridge foundation located in an unnamed stream just north of Kili Drive, makai of the highway (ibid. 1997:11).

Based on the settlement patterns and the results of previous archaeological research, it is expected that any archaeological sites identified within the current project area would be in the form of subsurface cultural deposits. However, the cultural layer identified by Cleghorn in 1997, which is assumed to be the closest known archaeological resource to the SIC Mākaha landing site, is located at least 200 feet away from the project construction, HDD bore and beach manhole sites. Field investigation of the Kili Drive HDD drill site further indicated a lack of any significant surface or subsurface historic properties. Subsurface testing consisted of archaeological monitoring of two geotechnical boring excavations. The project archaeologist was present at the Mākaha landing site during soil-testing activities. No evidence of archaeological or historic resources was found during the boring- and soil-sampling activities as well as during a review of lab analysis (Cultural Surveys Hawai'i, July 2003). Based on the background studies and fieldwork completed as part of this project, it is anticipated that the horizontal directional drilling associated with the project will have no effect on any significant historic properties.

4.3.2 Construction or Short-Term Impacts

HDD construction activities are not expected to have any impacts on archaeological or historic resources at the project site. The nearest recorded archaeological resource is located at least 200 feet mauka of the bore hole site. Construction activities will be confined to a small fenced area of less than one acre that will be accessed from the Kili Drive right-of-way near the Farrington Highway intersection such that this resource will be protected.

Since a federal loan is being used for the project, compliance with Section 106 of the National Historic Preservation Act (NHPA) is required. In addition, the project is subject to review by the State Historic Preservation Division (SHPD) in accordance with Section 6E-11 of the Hawai'i Revised Statutes (HRS) because the project requires permits or approvals from the State of Hawai'i and the City and County of Honolulu. See Sections 11.1.1 and 11.2.4 for information regarding compliance with NHPA Section 106 and HRS Section 6E-11.



Sandwich Isles
Communications, Inc.

Historic Sites in General Vicinity of Kili Drive Landing Site
Submarine Fiber-Optic Cable Project
Figure 4.3-1

4.3.3 Long-Term Impacts

No long-term impacts to archaeological or historic resources are anticipated. The manhole that will demarcate the SIC Mākaha landing site will be located in the public right-of-way at the corner of Kili Drive near Farrington Highway without affecting resources in the area.

4.3.4 Mitigation Measures

Due to the possibility of encountering significant cultural materials including human burials as well as community sensitivity to burial issues, on-site archaeological monitoring shall be conducted for all additional subsurface work associated with the SIC cable landing project. If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist.

4.4 CULTURAL, SOCIAL AND ECONOMIC ACTIVITIES

4.4.1 Existing Conditions

According to the 2000 U.S. Census, the resident population within the Mākaha area (Census Tract 98.02) numbered 7,753 and in the Wai'anae area numbered 10,506. The population of Honolulu County as of 2000 was 1,197,309 and is projected to increase to 1,461,626 by 2025 (The State of Hawai'i Data Book, 2001).

A cultural resource assessment was conducted for the Kili Drive landing site area (the report can be found in Appendix 3). Twenty-five area kupuna (elder) and kama'aina (long-time resident of Hawai'i) were contacted by the project team cultural assessor. The main concern raised was how the project may affect ocean resources. Specific questions raised by individuals included:

- Will the cable emit harmful electric waves?
- Will any cable emissions have a harmful effect on fish and reef animals?
- Will installation of the cable harm or destroy the reef itself?

People expressed concern over the existing cable line at Mākaha Beach which protrudes out of the sand and which is a safety hazard. They are concerned that the proposed cable project will be similarly disruptive to the beach.

An additional concern expressed was that if and when this cable project is undertaken, a cultural monitor should be present during all excavation activities in case any inadvertent finds are encountered.

Mākaha Beach Park is in the immediate vicinity of the project site. Mākaha is a popular recreational beach and world famous surfing site with surfing contests held here yearly which attract thousands of visitors. The entire park is used for swimming, sunbathing, skin diving, surfing, fishing and picnicking. Surfing occurs primarily along the western end of the park. Throughout the year the park is the site for a number of international and local surfing competitions. A comfort station and parking lot, located adjacent to the project site to the north (mauka of Farrington Highway) are recent improvements built in 1999 by the City and County of Honolulu. The City and County's Department of Parks and Recreation is proposing to reroute Farrington Highway into the valley to increase park space.

Other parks along the connecting route are Mauna Lahilahi Beach Park, Wai'anae Regional Park, and Pōka'i Bay Beach Park.

Mākaha Valley was one of the population centers from the earliest days of native Hawaiian settlement in the Wai'anae region. Today, Mākaha Valley is the only one of the major valleys of the Wai'anae district that has substantial urban development and resort development. These include:

- Mākaha resort
- Mākaha Valley Towers condominiums
- Mākaha Valley Plantation townhouses
- Mākaha Estates gated community
- Two 18-hole golf courses

4.4.2 Construction or Short-Term Impacts

The cable is made of non-toxic armoring materials and is not expected to have any adverse effect on water quality and/or marine biology, or on fishermen or beach users.

It should be noted that in the past, fiber-optic cable projects were installed by using trenching (or open-cut) methods in the shoreline area. The proposed SIC marine cable landing project, on the other hand, will employ HDD which is usually safer and faster than trenching because the equipment is confined to the entrance pit work area, and the majority of construction operations occur underground. A more detailed description of the proposed HDD method is included in Section 1.4.4. The duration of construction activities at the site is estimated to be three months. Thus, unlike nine prior cables, the proposed SIC project is not expected to disturb the beach as installation will be underground. The exit point of the cable will be in the Mākaha Channel approximately 0.67 mile seaward from the Kili Drive landing site, in a continuous sand substratum, thereby avoiding reefs.

No adverse impacts on resident and worker populations in the project area are expected. The project will be beneficial to those residing on Department of Hawaiian Home Lands by providing high bandwidth capacity.

Construction of the project should have minor economic impacts associated with the creation of short-term design-engineering and construction related jobs. Project construction is expected to generate additional personal income for construction workers. The increase in construction-related jobs is too small, however, to result in an increase of in-migrant residents to the island of O'ahu. SIC's projects have provided construction-related employment and other job opportunities for DHHL beneficiaries with SIC and its contractors. There should not be any impact on State and County operational expenditures for public services on the island.

4.4.3 Long-Term Impacts

No changes to existing beach and beach park access are expected in the long term.

Long-term impacts are expected to be an increase in project-related jobs. Maintenance and servicing of the telecommunications lines are expected to support new permanent jobs including field and office positions. SIC is committed to providing training and educational opportunities as required by its license agreement with DHHL. However, the number of long-term jobs created by the proposed project is expected to be low.

Fiscal impacts associated with this project are expected to primarily result from additional tax revenues to the State due to spending of construction workers' earnings. However, given the low number of employees anticipated, the fiscal impact would be minimal. Since City and County revenues are primarily limited to property taxes, there should be minimal change to City and County revenues.

No significant impacts to the island's housing or resident population are expected as the project does not propose to add any housing units. The fiber-optic cable project is not expected to permanently disrupt or change the unique characteristics associated with the Mākaha community. Cable lines will be located underground within existing State and City and County rights-of-way.

4.4.4 Mitigation Measures

Consultation with the State Historic Preservation Division shall continue through the project design phases. During the design phase, an archaeological monitoring plan shall be prepared.

Mitigation is not necessary other than standard measures meant to protect public safety during construction. Impacts on shoreline fishing and gathering activities shall be minimized as much as possible. Restrictions, if any, on shoreline access shall last only for the duration of construction, and access shall be restored after work is completed and the site is returned to pre-construction conditions.

4.5 VISUAL AND AESTHETIC RESOURCES

4.5.1 Existing Conditions

The "Coastal View Study" commissioned by the City and County Department of Land Utilization (reorganized as Department of Planning and Permitting in 2000) and published in 1987 identifies Mākaha Beach Park, among other Wai'anae coast landmarks, as a "significant stationary view."

The area is generally void of manmade structures except for the road, bridge, and beach park amenities, such as showers and comfort stations, on the beach side makai of Farrington Highway as well as mauka in the recently completed parking area, north and adjacent to the project site. A small communications facility is also located immediately mauka and adjacent to the City and County park, and a residential condominium structure is located on the northwest side.

4.5.2 Construction or Short-Term Impacts

There will be a temporary impact on coastal views due to HDD construction activities. During the three-month long construction period, the beach and mauka corner of Farrington Highway and Kili Drive will house HDD equipment and machinery and will function as the staging area for SIC construction activities associated with the Mākaha landing site.

The beach, HDD bore and manhole site will be returned to its pre-existing condition at the conclusion of cable installation. Any excess material not utilized will be removed and disposed of in accordance with applicable City and County and State regulations.

4.5.3 Long-Term Impacts

Based on the relatively small scale and nature of proposed construction, no long-term impacts are anticipated. No long-term impacts to street trees are expected since the contractor will be required to restore excavated areas within public rights-of-way. Further, the resulting constructed cable lines will not be visible since they will be situated underground and buried in the subsurface coastal zone.

4.5.4 Mitigation Measures

No mitigation measures are necessary to address temporary view impacts because construction equipment will be removed after installation of the cable system.

4.6 WATER RESOURCES

4.6.1 Existing Conditions

Mākaha Beach is approximately 3,300 feet long, and is bounded on each end by a rocky shoreline. The annual mean high water level is approximately 1-foot 6.2-inches, and the annual mean low water level - 1.2-inches. The average tidal range is about 1-foot 7.4-inches (University of Hawai'i, 1983). The beach is wide with an average width of 240 feet, and consists primarily of fine grained, calcareous sand.

Waters offshore of Mākaha Beach Park are in the Class A category as defined by the Hawai'i Department of Health (DOH). According to DOH administrative rules, marine waters are categorized as Class AA and Class A. Class AA waters are to "remain in the natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-cause source or actions." Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters (Hawai'i Administrative Rules (HAR), Chapter 11-54, Water Quality Standards).

Flood Insurance Rate Maps (FIRM) describe the Mākaha to Wai'anae coastline area as Special Flood Hazard Areas inundated by the 100-year flood. The designation for these shoreline areas is generally Zone VE indicating coastal flood with additional hazards associated with storm waves. Inland of these flood with velocity hazard areas are flood areas designated Zone AE (base flood elevations determined) which are further defined by the O'ahu Civil Defense Agency as areas subject to inundation by the 100-year flood.

A small wetland was identified during the botanical resource survey (see Section 4.8.1) within a low-lying area on the northwest portion of the parcel. The soils in this area of the parcel are poorly drained, and the wetland is dominated by pickleweed.

No other surface waters exist in the project area as confirmed during a site visit.

There are no perennial streams in the project area. While the southern branch of Mākaha Stream is referred to as "perennial," there is a distinction made in the Wai'anae Sustainable Communities Plan (January 2000) between the upper reaches and lower reaches of streams in Mākaha: Streams in the upper reaches of Wai'anae Valley and Mākaha Valley are considered "perennial" (flowing all year round) and "intermittent" (flowing only after significant rainfalls) in the lower parts of these two valleys (Wai'anae Sustainable Communities Plan, page 3-16, January 2000). Mākaha Stream South is intermittent in the project area. The relative absence of perennial streams here is a reflection of the generally arid climate and the alluvial soils of the valleys through which streams become nonvisible "underflow."

Three intermittent streams are found within and between the Mākaha landing site area and the end of the terrestrial connecting route. Mākaha Stream, which originates in the valley, is intermittent, and branches into two secondary streams. Mākaha Stream South crosses Farrington Highway just townside of the Kili

Drive intersection. Mākaha Stream North cross the highway on the Ka'ena side of the Kili Drive landing site and is therefore considered outside of the project area.

The second intermittent stream in the project area crosses Farrington Highway between Mākaha Valley Road and Maiuu Road, while the third (a convergence of Kawiwi and Kaupuni Streams) crosses Farrington Highway north of Pōka'i Bay.

Groundwater for the area is basal in sediments and is not a source for domestic use (*Atlas of Hawai'i*, 1998).

4.6.2 Construction or Short-Term Impacts

The primary water quality concern during construction is the potential for sediments entering the ocean in the form of runoff from the project site. Construction activities could expose more soil and runoff from the project site, which could increase turbidity in the ocean, particularly if a heavy rain were to occur.

Installation of the fiber-optic cable conduit using HDD would not affect surface waters, such as the ocean, because the drill site would be set back from existing surface waters. HDD operations produce no surface discharges of pollutants. Construction activities, including installation of the connecting route, can generate hazardous waste, such as petroleum hydrocarbons, if spills occur. Therefore, the contractor would be instructed to implement best management practices (BMP) to prevent accidental spills.

Excavation needed for trenching would probably not cause sedimentary pollutant impacts because these activities would not be near the ocean and the contractor would probably not conduct excavation work during a storm or heavy rain.

All roadside construction projects that involve excavation have the potential, if unmitigated, for controlled excess sediment discharge from soil erosion during and after excavation and construction. Such discharges may impact natural watercourses, such as streams, and water quality. Contaminants associated with heavy equipment and other sources during construction may also affect receiving stream, ocean, and groundwater. However, construction will not alter existing drainage patterns or have any water requirements.

Oils and other mechanical fluids used with construction equipment would be on-site during construction. Oils and other toxic fluids used on construction sites could leach into the ground if a spill were to occur. Therefore, contractors would be required to take caution when handling such substances.

The construction area, which includes the drill site and beach manhole, will not be located within the wetland. As stated above, the wetland is located on the northwest side of the landing site property. The drill site, which will include the drill rig and associated equipment and supplies, will be located on the south side of the property near Kili Drive. The beach manhole will be within the Farrington Highway right-of-way, immediately makai of the drill site. In addition, the HDD alignment will not be within the wetland. Nevertheless, the HDD alignment is basically an underground bore, which can be placed below environmentally sensitive surface resources, such as beaches, streams and wetlands.

Beach access would be limited temporarily during construction in order to ensure public safety in and around the construction site.

The only onshore surface disturbance occurs at the entrance pit. Some localized grading may be required to accommodate construction equipment. Once on-site work is completed, the ground is returned to its previous condition, and there will be no additional disturbance at the landing site aside from access to the manhole for periodic maintenance. If the work area required is one acre or more in size, an NPDES permit for construction grading activities will be required.

No intensive construction effort is required in the coastal aquatic environment. Further, to ensure minimal potential harm to the stream environments, it is highly recommended that stream crossings along the terrestrial connecting route be conducted with a directional drilling or attaching the cable to the bridge structure.

The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). The bentonite slurry used for the HDD process would be confined to the drill pit and construction site. It should be noted that bentonite is a naturally occurring clay. Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore and be discharged into the environment. As noted in Section 1.4.4, bentonite is a naturally occurring clay material, which is not toxic or harmful to the ocean environment.

Immediately prior to the drill head emerging into the ocean water from the exit point, the slurry would be flushed and replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the exit point. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and *slurry could be inadvertently released* into ocean water. In addition, ocean currents and/or wave action would dissipate the slurry relatively quickly, depending on the amount of slurry released, such that turbidity effects would be limited. Nevertheless, divers shall be stationed at the exit point during this activity (see Section 1.4.4).

If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 4.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

4.6.3 Long-Term Impacts

No long-term impacts are anticipated as upon completion of installation of the cable and beach manhole the grounds will be returned to their pre-existing condition and revegetated. Full beach access will not be affected in the long term. Any flooding occurring on the property would not damage or affect the fiber-optic cable landing because all infrastructure would be underground and/or waterproofed (including equipment within the beach manhole).

The sides of the HDD bore would be lined by the drill casing, which becomes the conduit. That conduit is anticipated to prevent interaction with groundwater after construction is completed.

4.6.4 Mitigation Measures

Best management practices will be specified during permitting stages and shall be strictly enforced by SIC on its contractor. These shall include erecting a flagged barrier with buffer to identify the wetland boundary so that equipment mobilization and construction work will occur away from the resource. Further, to avoid impacts to water quality, measures such as the following shall be specified during the construction design phase.

The SIC contractor shall be required to conduct BMPs to prevent erosion and sedimentation, and have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles.

To ensure that construction does not affect the wetlands within the landing site parcel, a botanist shall identify a buffer zone between the construction site and wetland. The SIC contractor shall be instructed to avoid conducting activities, such as materials storage, within the buffer zone.

During drilling, the contractor would constantly monitor the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry shall immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the EP when the drill head emerges from the EP shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

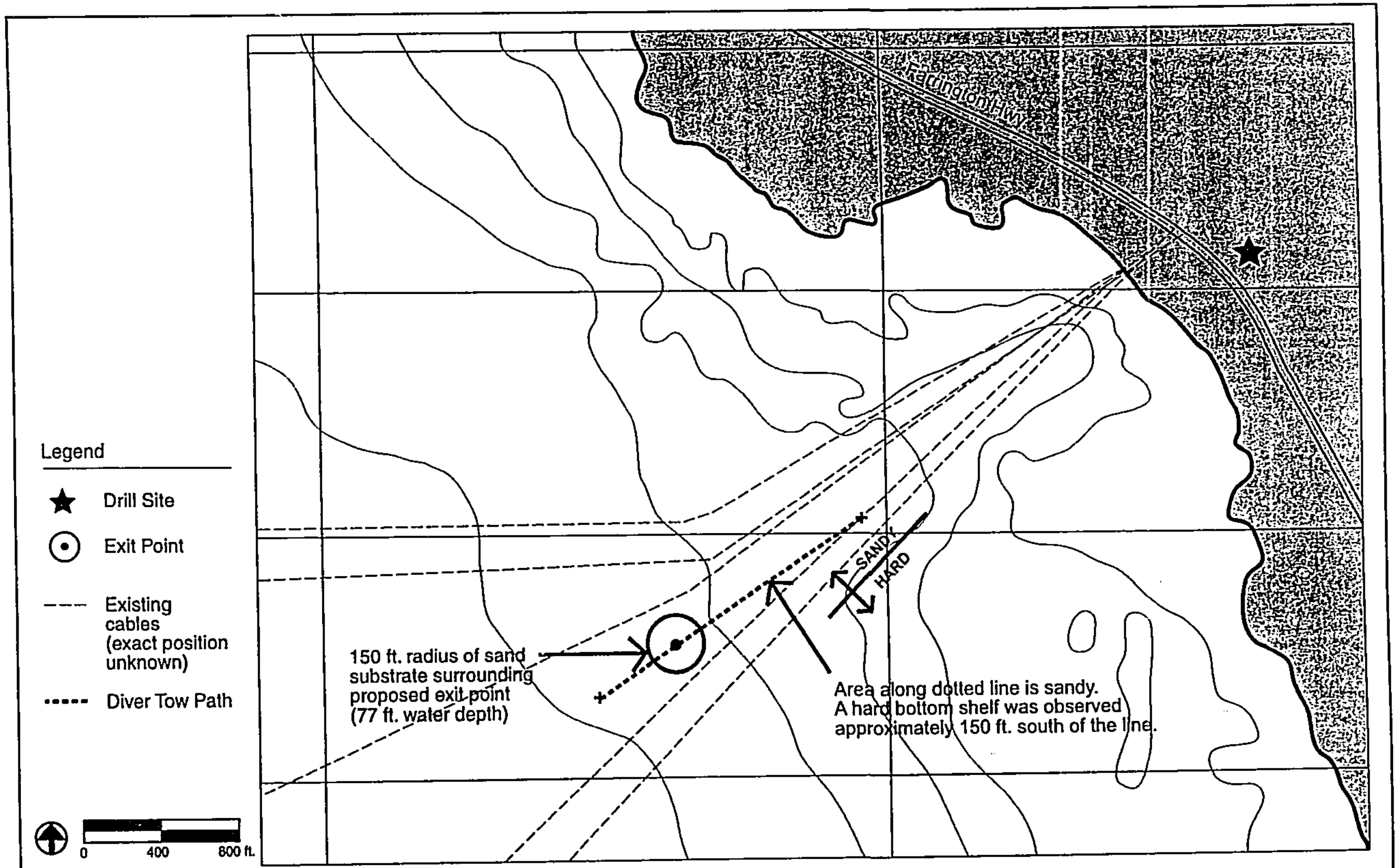
All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

4.7 MARINE AND NEARSHORE CONDITIONS

4.7.1 Existing Conditions

Mākaha Beach is a common entry point for submarine telecommunications cables with at least nine cables running ashore. The offshore exit point (EP) for the proposed SIC cable is in 77 feet of water, is positioned in a sand channel extending offshore from the HDD site and is approximately 3,500 bearing 236.26° True North of the HDD point. The ocean bottom generally slopes toward the 60-foot depth with an average slope inclination ranging from about 40 horizontal to 1 vertical (40H:1V) to 45H:1V. Within 100 feet of the shoreline the bottom depth is -15 feet, and within 200 feet of the shoreline it is -20 feet. The EP is positioned in a sand channel extending offshore from the HDD site. The target radius is at least 150 feet and the sand was tested to a depth of 2 feet. No deep depressions were observed shoreward of the breakout position (Makai Ocean Engineering, Inc., July 2003). See Figure: 4.7-1.

Mākaha has been the site of several cable landings over the years. The nearshore bathymetry is well known and the broad sandy beach is connected to an offshore sand cell via the Mākaha Channel. Cables have been landed through this sand floor channel and onto the beach. Generally, these cables are buried in the sand but seasonal sand movement covers and uncovers portions of these cables. The proposed SIC cable would be connected to the shoreline via an underground alignment that avoids the numerous surface-deployed cables that pass through the Mākaha Channel. The exit point is located east of most extant cables.



Source: Makai Ocean Engineering, Inc. 2003.

Sandwich Isles Communications, Inc.

Marine Survey of Proposed Exit Point at Kili Drive Landing Site
Submarine Fiber-Optic Cable Project
Figure 4.7-1

A SCUBA survey revealed a sandy bottom exists within a 150-foot radius of the recommended EP, and that no depressions were found within the proposed alignment as the diver was towed shoreward to observe bottom conditions that may interfere with HDD operations. No depressions were found. All in all, the Kili Drive landing site offers excellent bottom conditions for a submarine cable landing because the sandy area is large (minimum 150-foot radius target) and the sand layer extends to a depth of at least 2 feet.

Coastal or nearshore areas are vulnerable to a number of natural hazards, in particular storms, hurricanes, tsunamis, and high waves. These natural hazards are discussed below.

Storms and Hurricanes. The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward (north and northeast) sides of the islands in comparison to leeward areas (south and southwest).

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kaua'i. However, meteorologists warn that no island is safe from hurricanes.

Tsunamis. Tsunamis are a series of large waves caused by one of three geologic processes: (1) earthquakes (the most common); (2) landslides (either submarine or subaerial); and (3) explosive submarine volcanic events. The "Pacific Ring of Fire," which encircles the Pacific Basin reaching as far as Asia, North America, South America and Australia, is a zone of frequent earthquakes and volcanic activity. The Hawaiian Islands are roughly in the middle of the Ring, and therefore have experienced tsunamis originating from different locations. In the past 60 years, six tsunamis originating from the Ring were particularly destructive. Barrier and fringe reefs tend to absorb the energy of the waves and protect the shoreline. For example, the 1946 tsunami had wave heights reaching 20 feet at Mokapu Head on O'ahu, but only two feet at the nearby Kanē'ohe Bay, which is protected by a barrier reef.

High Waves. In Hawai'i, waves are caused by: (1) the north Pacific swell; (2) the northeast trade wind swell; (3) a south swell; and (4) kona storm swells. The north Pacific swell is generated by storms in the Aleutian Islands area, and it tends to produce wave heights 8 to 30 feet on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast trades produce wave heights 4 to 12 feet on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range one to four feet. Kona storm waves (see above) average 10 to 15 feet and can occur at any time of the year.

4.7.2 Construction or Short-Term Impacts

Installation of the cable between the shoreside landing site and the EP approximately 3,500 from shore will be underground through the use of the HDD method. In-water HDD cable installation within the 3,506-foot alignment is not expected to adversely affect marine topographic or geological conditions because the cable will be installed, first of all, at well below the sea floor surface, and secondly, through a section that was found not to have any deep depressions.

The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore, and discharged into the environment. If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. As noted in Section 1.4.4, bentonite is a naturally occurring clay material that is not toxic nor harmful to the ocean environment. In addition, ocean currents or wave action would dissipate the slurry relatively quickly, such that turbidity effects would be limited. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 4.7.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

Immediately prior to the drill head emerging into the ocean water from the exit point, the slurry would be replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the exit point. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange and slurry could be inadvertently released into the ocean water. As noted above, ocean currents would dissipate the slurry relatively quickly, depending on the amount of slurry released. Nevertheless, divers shall be stationed at the EP during this activity (see Section 1.4.4).

4.7.3 Long-Term Impacts

Nearshore areas are subject to various coastal hazards, such as tsunamis, high waves, storms and volcanic/seismic events, some of which could damage cables lying on the ocean floor near the coastline. The USGS provided ratings regarding various coastal hazards along the entire shoreline of Hawai'i, including hazard assessments (Fletcher, 2002, as cited in Makai Ocean Engineering, 2003). Overall hazard assessment for the coast of the Kili Drive landing site is rated high due to high danger from tsunamis, high waves, storms and stream flooding. The hazard from erosion and volcanic/seismic events is moderately high (level 3) in the area identified for the project landing site. With respect to the SIC cable landing project, engineering design solutions, including burial of the cable in the Mākaha channel with the use of HDD methods, will significantly minimize the project's susceptibility to these naturally occurring hazards.

The SIC system has been designed to avoid the use of submarine boosters or repeaters (equipment to maintain signal strength on long cable segments). Therefore, no EMF emissions are expected from the cables when the system is operating.

4.7.4 Mitigation Measures

During drilling, the contractor constantly monitors the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry would immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the exit point when the drill head emerges EP shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

Additional procedures to protect water quality shall be addressed in the project's BMPs which will be developed during the design phase.

4.8 TERRESTRIAL AND AQUATIC BIOLOGY

4.8.1 Existing Conditions

Terrestrial

A terrestrial botanical resource study was conducted by Char & Associates for the project, and a report is included in Appendix 4. The findings are summarized in this section.

Vegetation on the cable landing site and connecting route is dominated by introduced species such as kiawe, koa haole, Guinea grass, buffelgrass, *Sida ciliaris*, etc. Introduced or alien species are those plants brought to Hawai'i by humans, intentionally or accidentally, after Western contact (i.e., Cook's arrival in Hawai'i in 1778). The only native plants observed on the project site were the 'uhaloa (*Waltheria indica*) and 'ilima (*Sida fallax*); both of these species are indigenous, that is, they are native to Hawai'i and elsewhere. Makai of the highway is a narrow band of kiawe trees with Guinea grass and buffelgrass. A broad, sandy beach is found seaward of the kiawe trees.

The connecting land route between the Kili Drive cable landing site and the project's terrestrial route at Wai'anae Valley Road is approximately 3.3 miles long and follows along the Farrington Highway right-of-way. The route passes through developed, urban lands and the right-of-way is regularly mowed. Bermuda grass and *Sida ciliaris* are the most abundant plants, and there are intermittent street trees along the right-of-way. Large sections of the right-of-way are covered with a crushed coral/sand mixture or coarse blue-rock gravel.

None of the plants found during the field studies is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999a, 1999b; Wagner et al. 1999). All of the plants can be found in similar lowland, disturbed habitats throughout Hawai'i.

The small wetland on the northwest portion of the cable landing site parcel is of concern and should be avoided. It is dominated by pickleweed (*Batis maritima*). Pickleweed is an obligate wetland indicator species (Reed 1997); obligate species occur almost always (estimated probability greater than 99 percent) under natural conditions in wetlands. Wetlands are of particular interest to Federal and State regulatory agencies. Any activities within wetlands would be subject to permitting and review. The cable landing site can be located within the much larger non-wetland area occupied by kiawe trees and koa haole shrubs.

Aquatic

Coral communities are well-developed along the sides and adjacent hard substratum on either side of the Mākaha Channel. The proposed exit point for the SIC cable is located in an area of sand more than 240 feet seaward of these coral communities. An examination of the sand plain for marine species around the proposed exit point noted one small sand wrasse or nabeta (*Xyrichthys pavo*) and a juvenile kona crab (*Rania rania*). This relatively depauperate (stunted) community is not unusual for Hawaiian sand communities at this depth. Inshore of this along the sides of the Mākaha sand Channel on hard substratum the coral communities are well developed. A quantitative station was established on the hard substratum along the north edge of the Mākaha Channel to provide some contrast in marine community development on these different substrates. The quadrant survey noted five algal species (*Amansia glomerata, Porolithon onkodes, Halimdea opuntia, Asparagopsis taxiformis* and *Galaxura fastigata*) having a mean coverage of 6.5 percent, one soft coral (*Anthelia edmonsoni*) with a mean coverage of 0.1 percent and five coral species (*Porites lobata, Porites compressa, Pocillopora meandrina, Montiport verrucosa* and *Montipora patula*) having a mean coverage of 5.9 percent. The census of macroinvertebrates noted seven species (the cone shell – *Conus lividus*, rock oyster – *Spondylus tenebrosus*, black-lipped pearl oyster (*Pinctada margaritifera*, shrimp – *Saron marmoratus*, short-spined black urchin – *Tripneustes gratilla*, green urchin – *Echinometra mathaei* and the black urchin or wana – *Echinothrix diadema*. Twenty species and 109 individual fishes were observed in a census of the transect area. The most common species were the brown surgeonfish or ma'i'i'i (*Acanthurus nigrofuscus*) and the saddleback wrasse or hinalea lauwili (*Thalssoma duperrey*). The standing crop of fishes at this station was estimated to be 33 g/m² (grams per square meter) and the species making the greatest contribution to this standing crop included the hinalea lauwili (*Thalassoma duperrey*) and the ma'i'i'i (*Acanthurus nigrofuscus*).

Approximately 450 feet inshore and west of the proposed exit point, a single green turtle was seen (straight-line carapace length estimated at 60 centimeters [cm] [approximately 2 feet]). This turtle was seen on the surface and was some distance from the vessel; thus the presence of tags or tumors could not be ascertained.

Despite the low numbers of participants seen, all landing sites in this study do receive some recreational and fishery use. In the case of Mākaha, the mackerel scad or opelu (*Decapterus macarellus*) were seen in the vicinity of several proposed breakout points including the Kili Drive, Mākaha landing site. The Mākaha Beach area is said to be a "Koa" for ahi and akule (N. Armitage, 2003). Both species migrate along the coast and Mākaha is an important waypoint for them. A local annual fishing tournament is usually held around June.

Rare and threatened species that may be found along the area include the federally protected green sea turtle and, during the winter months, humpback whales. A 60-cm green turtle was seen about 450 feet inshore and west of the EP offshore of the Kili Drive site. It appeared to be just passing through the area of the alignment as there is no current evidence that nesting of green sea turtles has occurred at Mākaha Beach.

Pods of spinner dolphins (*Stenella longirostris*) are frequently encountered along O'ahu's leeward coast. During the course of vessel transiting for fieldwork, spinner dolphins were seen on several occasions, usually about 2 or more kilometers (approximately 1.2 miles) from shore, usually traveling parallel to the coast. Like other marine mammals, this species is also protected under the Endangered Species Act. The endangered humpback whale (*Megaptera novaeangliae*) is known to frequent island waters in their annual migrations to Hawaiian wintering grounds. They normally arrive in island waters about December and depart by April. In general, their distribution in Hawai'i appears to be limited to 180 meter (m) (100 fathom) isobath and in shallower waters (Nitta and Naughton 1989). Whales were not seen or heard (singing) during any of the field operations for this study. However, they are a common element offshore of these sites during their annual wintering time in the Hawaiian Islands.

4.8.2 Construction or Short-Term Impacts

No impacts on terrestrial botanical resources are anticipated as no threatened or endangered species are known to exist at the Kili Drive landing site nor along the connecting route. There is potential for disturbance of the identified wetland located at the mauka portion of the project parcel. All construction activities and equipment storage shall occur well within a clearly demarcated work site away from the wetland. There is sufficient area for construction activities to not disturb this resource.

After construction is completed, the contractor would return the site as much as possible to its pre-construction condition. The exposed areas within the cable easement will be replanted as needed to ensure stability of the site. The area is expected to revegetate quickly. The dominant plant species found on the project site are common, introduced species that grow quickly. Therefore, no adverse short-term impact on flora is anticipated.

Construction activities affecting the Farrington Highway connecting route may also impact existing street trees. To minimize impacts to such trees, design plans will need to conform to State and County construction standards associated with trench excavation, backfill, and pavement restoration within public rights-of-way.

The proposed deployment of directional drilling avoids problems with deploying cables on the surface of the seafloor and possibly impacting sessile species (permanently attached or fixed) such as corals. An added benefit to the use of directional drilling is the protection afforded to the cable in the shallow water where storm surf could result in cable failure. The proposed alignment will utilize directional drilling thereby avoiding marine communities and any impact to them in the coastal waters. The bentonite and water mixture used for drilling slurry would be replaced by water immediately prior to the HDD drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP. In the event of an accidental discharge of slurry during drilling or at the EP (see Section 6.6.2), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidy relatively quickly. Also, slurry is not toxic or hazardous to marine life.

When laying cable, caution must be taken to avoid adverse interactions with protected species of marine mammals that occur in Hawai'i's waters. Although humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying operations within these months. If a whale or other protected species is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation would also be halted until the animal moves away of its own volition. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

4.8.3 Long-Term Impacts

No long-term impacts on terrestrial botanical resources or the wetland are anticipated as all construction equipment and machinery will be removed from the landing site once construction and installation is completed. The site and connecting route will be restored to pre-existing conditions following removal of construction equipment.

Regarding treatment of street trees, during the design phase, plans will be reviewed to reflect how street tree roots affected by construction activities would be pruned to promote healing and avoid potential infection normally associated with roots damaged from excavation machinery.

No long-term impacts on marine communities are anticipated, particularly since the cable will be laid on sand substratum and will "sink" into the sand. The shifting nature of sand and its continual movement will usually bury any deployed cable with time. Marine species found in sand habitats have evolved to live in this continually moving substratum, thus placing a cable on this substratum which will become buried will not materially hinder any of these species.

The presence of the cable or manhole is not anticipated to cause any long-term adverse interaction with protected species. There is no evidence to suggest that impact occurs with cable operation. There are a number of fiber-optic cables operating on the leeward coast of O'ahu, where marine mammals are present, with no known adverse impacts on those animals.

4.8.4 Mitigation Measures

A qualified botanist shall be retained during design phases to identify a no-pass zone for construction work activities to avoid impacting the wetland on the mauka portion of the parcel, and to ensure that strict measures and steps are incorporated into the construction notes to direct the contractor to protect the sensitive resource. After construction is completed, the contractor will return the site to its pre-construction condition.

To minimize potential damages to street trees, SIC will require the contractor to include a certified arborist to assist in the development of proper tree treatment plans during the design and construction management phases.

The mitigation measures below are proposed to avoid adverse interactions with marine animals during construction.

Immediately before and during the pop-out event, an underwater diver shall observe the environment before attaching the cable. If a protected animal is observed in the immediate vicinity of the EP, the pop-out event shall be delayed until the animal moves away from the project area of its own volition.

If any protected species is detected during construction, including marine mammals and sea turtles, cable deployment shall be halted until they move away from the vessel or the cable deployment area.

The bentonite and water mixture used for drilling slurry will be replaced by water immediately prior to the HDD drill head emerging from the EP preventing bentonite from releasing into the ocean.

4.9 AIR QUALITY

4.9.1 Existing Conditions

Air quality in the State of Hawai'i is typically excellent, due to offshore trade winds that help disperse most urban air pollutants. Data collected by the State Department of Health (SDOH) indicate that the State has some of the best air quality conditions in the nation. To monitor air quality, the SDOH operates a network of stations at various locations throughout the islands. The climate of Mākaha is generally hot and dry along the coastal area and in the lower sections of the valley. Air quality in the proposed project area is good due to low emission levels and the almost continual presence of trade winds or on-shore breezes. The major factor affecting air quality in this area is vehicular traffic.

4.9.2 Construction or Short-Term Impacts

Excavation will be required to install the manhole in the road right-of-way. Noticeable dust emissions may occur from the manhole excavation especially if the excavated soil is dry and weather conditions are windy. Fugitive dust emissions are not expected to cause noticeable disturbance or annoyance to surrounding properties along affected roadways. The installation of fiber-optic duct lines will involve very narrow trench or trenchless methods that will not result in substantial disturbance to existing pavement and shoulder areas.

The HDD drill rig, compressor, and other construction vehicles emit engine exhaust which would contribute to air pollutants in the vicinity of the work area. Most of the equipment and vehicles, including the drill rig and compressor, are diesel-powered, and will emit relatively high levels of nitrogen oxide (NOx) in comparison to gasoline-powered equipment. However, standards for such pollutants are set on a regional basis and would therefore not be violated by short-term construction equipment emissions.

4.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality are anticipated because the work site will be restored to its original condition after the cable-laying process is completed and construction equipment is removed.

4.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality such as no visible emissions outside the affected parcel. BMPs shall also be implemented to minimize unnecessary air quality impacts. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants. This will help control escape of fugitive dust beyond the construction site.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses.

As required by State regulations, upon completion of work the project site shall be revegetated to control erosion and release of dust by the wind.

4.10 NOISE

4.10.1 Existing Conditions

Ambient noise levels in the nearshore project area are predominantly from local vehicular traffic on Farrington Highway, ocean surf, occasional stereos from cars and nearby homes, high school activities, and animals such as dogs and roosters.

The nearest residential unit is approximately 60 feet southeast of the Kili Drive landing site where bore hole excavation activities are expected to occur.

4.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. . However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of the noise is expected to come from use of heavy machinery, such as bulldozers, the directional boring rig, and trucks entering and leaving the site during the drilling period, which is expected to last approximately three months. Noise produced by this

CORRECTION

THE PRECEDING DOCUMENT(S) HAS BEEN REPHOTOGRAPHED TO ASSURE LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

windy. Fugitive dust emissions are not expected to cause noticeable disturbance or annoyance to surrounding properties along affected roadways. The installation of fiber-optic duct lines will involve very narrow trench or trenchless methods that will not result in substantial disturbance to existing pavement and shoulder areas.

The HDD drill rig, compressor, and other construction vehicles emit engine exhaust which would contribute to air pollutants in the vicinity of the work area. Most of the equipment and vehicles, including the drill rig and compressor, are diesel-powered, and will emit relatively high levels of nitrogen oxide (NOx) in comparison to gasoline-powered equipment. However, standards for such pollutants are set on a regional basis and would therefore not be violated by short-term construction equipment emissions.

4.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality are anticipated because the work site will be restored to its original condition after the cable-laying process is completed and construction equipment is removed.

4.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality such as no visible emissions outside the affected parcel. BMPs shall also be implemented to minimize unnecessary air quality impacts. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants. This will help control escape of fugitive dust beyond the construction site.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses.

As required by State regulations, upon completion of work the project site shall be revegetated to control erosion and release of dust by the wind.

4.10 NOISE

4.10.1 Existing Conditions

Ambient noise levels in the nearshore project area are predominantly from local vehicular traffic on Farrington Highway, ocean surf, occasional stereos from cars and nearby homes, high school activities, and animals such as dogs and roosters.

The nearest residential unit is approximately 60 feet southeast of the Kili Drive landing site where bore hole excavation activities are expected to occur.

4.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. . However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of the noise is expected to come from use of heavy machinery, such as bulldozers, the directional boring rig, and trucks entering and leaving the site during the drilling period, which is expected to last approximately three months. Noise produced by this operation may occasionally be as high as 90 to 94 decibels at 50 feet, which is comparable to the noise from a lawnmower. HDD operations and other construction activities will be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would more than likely violate Community Noise Control Standards; therefore, the SIC contractor would require a noise permit from the SDOH.

4.10.3 Long-Term Impacts

There would be no project-related noise once construction is completed. No long-term impacts are expected as there will be no operational requirements for the manhole site except for an occasional maintenance repair technician visiting the site on an as-needed basis.

4.10.4 Mitigation Measures

HDD operations and other construction activities shall be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would likely violate Community Noise Control Standards; therefore the SIC contractor would require a noise permit from the SDOH.

Prior to the start of construction, SIC or its contractor shall inform all nearby residences about the proposed construction schedule and anticipated noise impact. SIC shall provide contact information where residents may call to ask questions or report problems.

The SIC contractor shall be required to maintain his or her HDD drilling equipment in proper working order, especially all noise suppression systems, such as the rig's muffler. Noise generated from machinery shall be mitigated by requiring contractors to adhere to State noise regulations. In general, the contractor shall be the point of contact to the community during construction. However, members of the community shall be able to contact SIC if they are dissatisfied with how the contractor resolves noise or other problems, or have complaints about the contractor..

4.11 PUBLIC FACILITIES

4.11.1 Existing Conditions

The project site is served by Farrington Highway (State Route No. 930). The right-of-way width fronting the project site is 50 feet. Kili Drive is a City and County public road with a 40-foot right-of-way and provides mauka-makai access to residents in the area. The City and County have established traffic controls at Kili Drive (DTS, 2003).

Water supply is provided by the City and County of Honolulu Board of Water Supply (BWS). Within the rights-of-way of both State highways and County roadways, the BWS has water mains and laterals located within paved travel lanes and along shoulder areas. Sanitary sewer systems are present within both State and City and County roadway rights-of-way. These sewer systems vary in size and are owned and maintained by the City and County's Department of Environmental Services. Stormwater conveyance systems including culverts, inlets, catch basins, and storm sewer lines are primarily maintained by the City and County and are present within State and City and County roadway rights-of-ways.

4.11.2 Construction or Short-Term Impacts

The fiber-optic landing site would connect directly to SIC's terrestrial network within the existing right-of-way. The landing site beach manhole would be designed to not interfere with existing waterlines and placed within the highway right-of-way for ease of access by SIC personnel.

During construction there may be restricted traffic flow, including the temporary closure of one lane along the roadway. This is not expected to cause substantial delays. There is no anticipated impact on emergency vehicle access, as traffic coordinators would allow vehicles to pass in the case of emergencies.

4.11.3 Long-Term Impacts

After construction, contractors would be required to return the project site to pre-construction conditions. Therefore, no adverse long-term impacts to any public utilities, facilities, or services are anticipated after the fiber-optic cable installation is completed. The project would not affect expansion of existing infrastructure or installation of new infrastructure.

Long term impacts to transportation systems, infrastructure and utility systems, educational, medical, and recreational facilities are not expected, mainly because the project will not generate an increased demand for these public and private services and systems.

The project is not expected to result in long-term impacts on the police or fire department's ability to provide protective services in the Mākaha and Wai'anae communities. Once the fiber-optic cable is installed, there will be no personal or business activities occurring with these underground cables that may require added police or fire protection services.

4.11.4 Mitigation Measures

The following mitigation measures are proposed to ensure that public facilities are not impacted.

SIC shall develop a traffic control plan during the design phase of the project that will outline steps needed to minimize congestion and maintain access to adjacent properties at all times during construction. Implementation of construction shall be coordinated with agencies, including the State of Hawaii Department of Transportation and the City and County's Departments of Parks and Recreation and Transportation Services, to prevent conflicts in activities.

SIC shall post appropriate public notices per County and State requirements for lane closures, as necessary.

Flagmen and/or police officers shall be posted to direct traffic safely around the construction of the proposed manhole and installation work within the Farrington Highway connecting route.

SIC shall coordinate with City and County departments and utility companies to ensure that the landing site and connecting route construction activities will not damage water, sewer, and utility lines.

SIC shall continue to research alternative methods of installing fiber-optic cables that may minimize traffic disturbance, i.e., directional drilling in the connecting route.

Chapter 5
Hawai'i Kai, O'ahu Landing Site:
Environmental Setting, Impacts, and Proposed Mitigation

CHAPTER FIVE: HAWAI'I KAI, O'AHU LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

5.1 TOPOGRAPHY AND GEOLOGIC CONDITIONS

5.1.1 Existing Conditions

The island of O'ahu was created by the extrusion of basaltic lavas from two shield volcanoes, Waianae and Ko'olau. The older volcano, Waianae, is estimated to be middle to late Pliocene in age and forms the bulk of the western one-third of the island. The younger shield, Ko'olau, is estimated to be late Pliocene to early Pleistocene (Ice Age) in age and forms the majority of the eastern two-thirds of the island. Waianae became extinct while Ko'olau was still active, and its eastern flank was partially buried below Ko'olau lavas banking against its eastern flank forming a broad plateau, now known as the Schofield Plateau.

During the Pleistocene Epoch, sea levels fluctuated in response to the cycles of continental glaciation. Higher sea level stands caused the formation of deltas and fans of accumulated terrigenous sediments in the heads of old bays, accumulated reef deposits at correspondingly higher elevations, and deposited lagoonal/marine sediments in the quiet waters protected by fringing reefs. The lower sea stands caused streams to carve valleys in the sediments and reef deposits. Subaerial exposure of the sediments and calcareous materials caused consolidation of the lagoonal deposits and induration (hardening) of the calcareous reef materials.

During the late Pleistocene Epoch, there was a renewal of volcanic activity with the eruptions of vents of the Honolulu Volcanic Series. These vents broke through existing coral reefs and along the mountainsides. The vents of Diamond Head, Salt Lake, Punchbowl, and Koko craters emerged through the coral reef formations. Along the mountainsides, Kalihi, Nu'uanu, Kanē'ohe, Castle, Tantalus, and Sugar Loaf vents erupted and poured lavas into the nearby valleys.

The proposed fiber-optic cable landing site is within Sandy Beach Park, which is located along the island's southeastern coast between Hanauma Bay and Makapu'u Point (see Figure 1.1-2C in Chapter 1). The construction or HDD staging area is flat with estimated ground surface elevation of about 20 feet above mean sea level (AMSL). Soil sampling at two locations on the mauka and makai side of the proposed landing site encountered a surface fill layer with a thickness of about 1.5 feet. The fill layer comprised stiff to very stiff clayey silt with some sand. The fill layer was underlain by medium hard to very hard basalt rock formation to 17 feet below the existing ground surface. Voids were encountered with the basalt formation. Below the basalt formation, a clinker layer was encountered to the maximum boring depth of 24.5 feet. The clinker layer consists of medium dense basaltic gravel.

Closer to the shoreline is a surface fill layer approximately 0.5-foot thick. The fill layer consists of stiff clayey silt. The fill layer was underlain by a beach sand deposit to a depth of 7 feet below the existing ground surface. The beach sand was composed of medium dense sand. Below the beach sand, weathered tuff and cemented sandstone and cinders were encountered to a depth of 14 feet. The weathered tuff consists of stiff sandy silt and the cemented sandstone and cinders were dense in consistency. The tuff and sandstone were underlain by a hard to very hard basalt rock formation to the maximum drill depth of 40 feet below the existing ground surface. Groundwater was encountered in the drilled borings at depths ranging from about 9.5 to 12 feet below the existing ground surface.

Hazardous Materials

Since present and historic land uses in the area surrounding the proposed landing sites could have produced site contamination, a database search was conducted to investigate the potential that the project site contains hazardous materials (see Appendix 6). The search included federal and State environmental databases in accordance with the American Society for Testing and Materials standards for environmental site assessments (E1527-00). The database search does not cover off-shore sites. The database search found no records of hazardous materials sites on the Sandy Beach Park parcel, but did identify the Hawai'i Kai Wastewater Treatment Plant (WWTP), located mauka of Sandy Beach Park across Kalaniana'ole Highway, as a Solid Hazardous Waste Site (SHWS). However, the State of Hawai'i Department of Health (SDOH) has determined that "no further action" is required regarding this site.

5.1.2 Construction or Short-Term Impacts

Based on the geologic conditions of the landing site parcel, problems in conducting HDD operations from the Sandy Beach Park property are not anticipated. Some grading or excavation to accommodate mobilization and drilling activities, material storage areas, centrifuges, tanks, and storage for excavated material and other equipment would be required. These impacts would be temporary and once cable installation work is completed, the site would be restored to its pre-construction condition.

Excavation along the Kalaniana'ole Highway connecting route for cable installation would be required, but would be confined to the immediate work area within the State right-of-way, such as unpaved shoulders, paved shoulders, or paved travel lanes. The 0.3-mile connecting route would involve either trenching or directional drilling. Upon completion of the connecting route, pavement and/or shoulders of the highway would be restored to its pre-construction condition or applicable design standards.

Soils contaminated by hazardous materials are not expected to be encountered during HDD operations or other excavation activities, such as along the connecting route.

5.1.3 Long-Term Impacts

No long-term impacts to topography or geology of the Sandy Beach landing site or Kalaniana'ole Highway connecting route are expected from installation of the fiber optic cable. Once completed, the fiber-optic cable conduit within the Sandy Beach Park property and Kalaniana'ole Highway right-of-way would be underground and would not change these areas' grade or topography. The only evidence of the landing site would be a beach manhole cover within the highway right-of-way.

5.1.4 Mitigation Measures

Mitigation is not required. However, to minimize potential short-term impacts during construction activities, erosion control plans shall be prepared during design phases of the landing site and the connecting route and implemented during construction. Appropriate early coordination with pertinent agencies shall be conducted to help design engineers prepare practical and effective Best Management Practices during the design phases. The landing site and connecting route shall be restored to their pre-construction conditions once construction and installation of the duct lines and manhole are completed.

5.2 LAND USE

5.2.1 Existing Conditions

The proposed landing site is located at the easternmost (Waimanalo side) portion of Sandy Beach Park (Tax Map Key Number (3) 9-015:001), which is owned by the City and County of Honolulu (see Figure 5.2-1). The proposed drill site would be on the Waimanalo-end of the park's grassy field. The Diamond Head side of the park includes the parking area, two comfort stations, and a very popular sandy beach, which is about 1,200 feet long. The rest of the shoreline along the park is rocky.

The regional shoreline area includes the Ka Iwi coastline, an undeveloped of area with high scenic value, Hawai'i Kai Golf Course, the Hanauma Bay Marine Life Conservation District, and a scenic rocky coastline between Hanauma Bay and Sandy Beach with the famous Halona Blow Hole Lookout. Directly across Sandy Beach Park mauka of Kalaniana'ole Highway is the Hawai'i Kai WWTP, which discharges treated wastewater off Sandy Beach from an outfall located between the proposed onshore drill site and EP. Also, mauka of the park is the Kalama Valley residential neighborhood, which is part of the larger Hawai'i Kai community. See Figure 5.2-2 for photographs of the landing site.

5.2.2 Construction or Short-Term Impacts

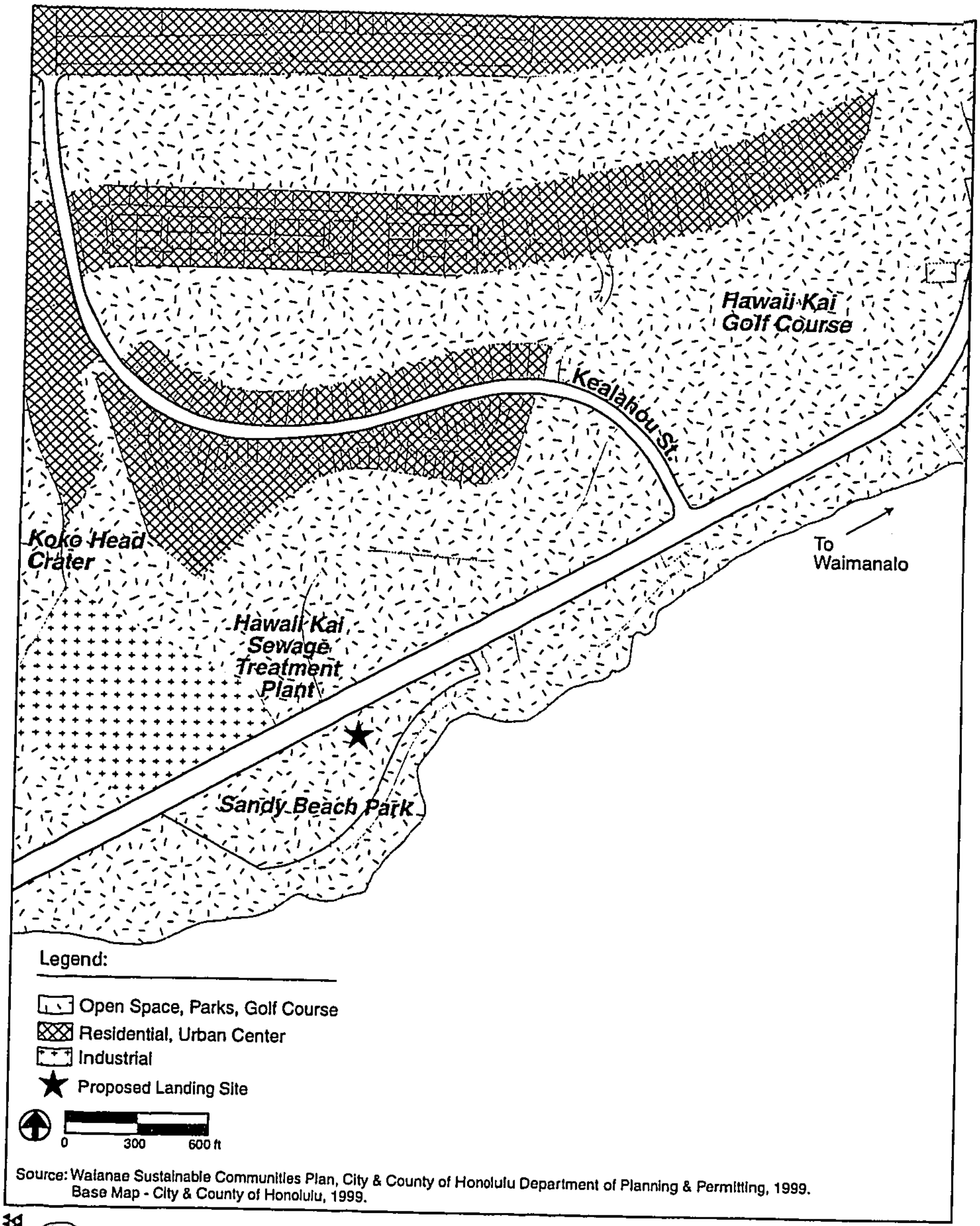
The drill site would be located on the Waimanalo side of Sandy Beach Park's grassy field. Although cable installation activities, which include HDD operations and trenching, would temporarily restrict a portion of the field from the general public due to safety reasons (see Section 5.4.2 for additional discussion), no existing building or structure would be affected. Once completed, the portion of the park and roadway affected by cable installation would be restored to their pre-construction conditions. The landing site beach manhole would be the only evidence of construction, but would be located within the highway right-of-way, not within the park property.

5.2.3 Long-Term Impacts

SIC would seek a conduit easement from the City and County of Honolulu, Department of Parks and Recreation (DPR) of about ten feet wide between the shoreline and Kalaniana'ole Highway. SIC would also seek a conduit easement of the State of Hawai'i Department of Transportation (SDOT) for the connecting route on the highway. Although the easement on park property would prohibit many types of structures, DPR would probably not develop structures within the park property over the easement because such structures would affect current park activities, which include kite flying and hang glider landings (see Section 5.4.1). The proposed Sandy Beach landing site would require a State Conservation District Use Permit (CDUP) for its landside and seaside portions (see Section 11.2.3).

5.2.4 Mitigation Measures

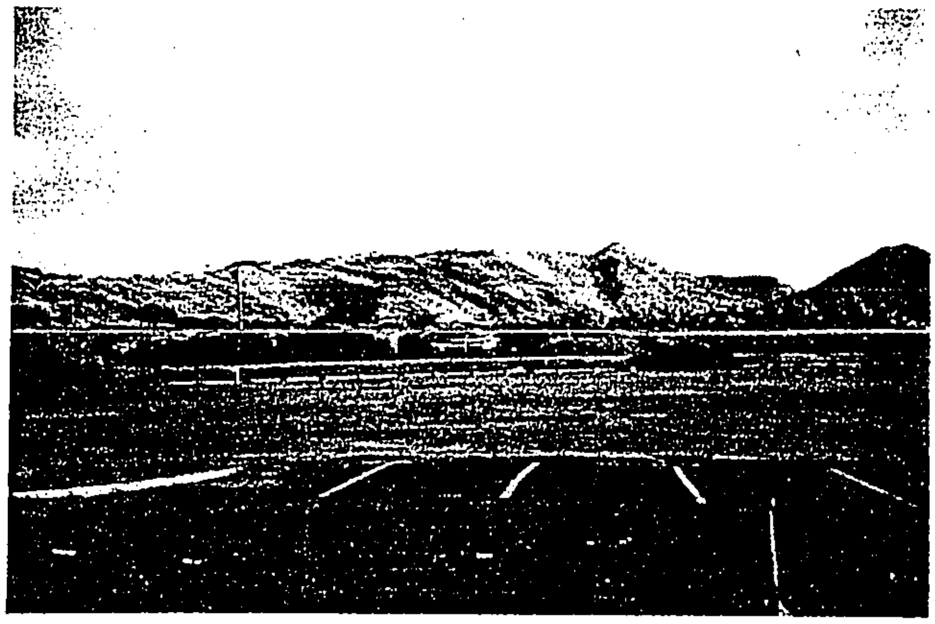
SIC will coordinate with DPR to obtain the required utility easement through the park. Implementation of construction activities shall be coordinated with the City and County agencies to minimize conflicts in the timing of other construction projects as well as planned park events.



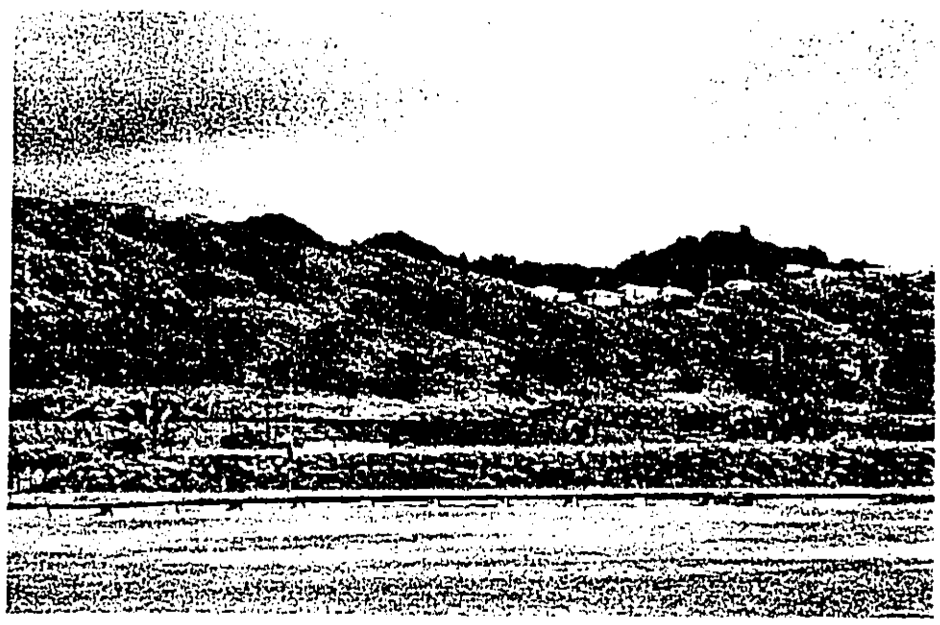
Sandwich Isles Communications, Inc.

Existing Land Uses - Sandy Beach Park Landing Site
Submarine Fiber-Optic Cable Project

Figure 5.2-1



Mauka view from Sandy Beach Park (1)



Mauka view from Sandy Beach Park (2)

Source: Parsons Brinckerhoff, 2002.

Sandwich Isles Communications, Inc.

Photos of Sandy Beach, Hawai'i Kai Landing Site Parcel
Submarine Fiber-Optic Cable Project
Figure 5.2-2

5.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

5.3.1 Existing Conditions

An archaeological inventory survey of the project area was conducted (see Appendix 3). The survey area included the proposed cable landing manhole locale, the cable route within the beach park, and the connecting route along Kalaniana'ole Highway to Kealahou Street.

No historic properties were identified within the survey area, which is not surprising considering this area was substantially modified for roadway and park construction. The original (ca. 1930-1946) Kalaniana'ole Highway was aligned further makai than the existing highway. Remnants of the asphalt "old road" can still be seen within the beach park just east of the Waimanalo side entrance to the park. The "old road" modified the landscape of the interior beach access road and the area of the proposed fiber-optic cable route. A major tsunami in 1946 extensively damaged the highway and the Alan Davis Ranch at Kaloko (i.e., Ka Iwi). The ranch was abandoned, but the highway was realigned to its present location. Sandy Beach Park was developed in the 1960s.

5.3.2 Construction or Short-Term Impacts

Based on historic documentation, the land use alterations that have occurred in the past few decades, and the survey conducted for this project, installation of the fiber-optic cable at the proposed Sandy Beach Park landing site and connecting route would not affect archaeological or historic resources.

Since a federal loan is being used for the project, compliance with Section 106 of the National Historic Preservation Act (NHPA) is required. In addition, the project is subject to review by the State Historic Preservation Division (SHPD) in accordance with Section 6E-11 of the Hawai'i Revised Statutes (HRS). This is because the project requires permits or approvals from the State of Hawai'i and the City and County of Honolulu. See Sections 11.1.1 and 11.2.4 for information regarding compliance with NHPA Section 106 and HRS Section 6E-11.

5.3.3 Long-Term Impacts

Once completed, the Sandy Beach Park landing site and connecting route infrastructure would not affect archaeological or historic resources.

5.3.4 Mitigation Measures

Since it is not expected that archaeological resources or artifacts, or burial sites, would be uncovered during construction, no mitigation is required. However, all work shall cease and the O'ahu Island Burial Council shall be immediately notified if human remains should be encountered during any segment of construction associated with the project.

5.4 CULTURAL, SOCIAL, AND ECONOMIC ACTIVITIES

5.4.1 Existing Conditions

According to the 2000 U.S. Census, the resident population of Hawai'i Kai numbered 27,657. The population of Honolulu County as of 2000 was 1,197,309 and is projected to increase to 1,461,626 by 2025 (The State of Hawai'i Data Book, 2001).

A cultural resource assessment was conducted for the Sandy Beach Park landing site (see Appendix 3), which included interviews with Kama'aina (long-time resident of Hawai'i), and kupuna (elder) with knowledge of the Ka Iwi and Sandy Beach area.

The Ka Iwi and Sandy Beach area is well known for its ocean resources, such as limu (seaweed), and different varieties of fish, including uhu, palani, and kala.

Sandy Beach Park is well known for its beach that offers challenging body surfing and boarding conditions because of its a very strong rip current and harsh shore breaks. The park is also used for swimming, snorkeling, sunbathing and fishing along the shoreline, and is highly popular for kite flying within the park's large grassy field. A large portion of the field is designated as a landing area for hang gliders that take off from Koko Head Crater.

There are no documented burial sites within the project area and no one consulted mentioned burials.

5.4.2 Construction or Short-Term Impacts

The cable is made of non-toxic armoring materials and is not expected to have any adverse effect on water quality and/or marine biology, or on beach users.

The construction site would be located in Waimanalo side of the park's large grassy field. It would not be near the beach where most of the park's recreational activities occur. The construction site would also be located outside the designated hang glider landing area. However, HDD staging and other construction activities, such as trenching, would temporarily restrict access to a portion of the field for safety reasons. This restriction would mostly affect kite flying as it is the dominate recreational activity within the grassy field. Construction may take up to three months.

HDD staging and other construction activities would not affect shoreline access because such activities would be setback several hundred feet from the shoreline. People wanting to access the rocky shoreline fronting the drill site for fishing, gathering or other shoreline-related activities would be able to do so throughout construction or cable installation work.

5.4.3 Long-Term Impacts

All landing site infrastructure, including the connecting route, would be underground, and the area of the park affected by construction would be restored to its pre-construction condition. Therefore, once completed, the landing site would not affect any recreational activity of Sandy Beach Park, including kite flying.

Long-term impacts are expected to be an increase in project-related jobs. Maintenance and servicing of the telecommunications lines are expected to support new permanent jobs including field and office positions. SIC is committed to providing training and educational opportunities, as required by its license agreement with DHHL. However, the number of long-term jobs created by the proposed project is expected to be low.

Fiscal impacts associated with this project are expected to primarily result from additional tax revenues to the State due to spending of construction workers' earnings. However, given the low number of employees anticipated, the fiscal impact would be minimal. Since City and County revenues are primarily limited to property taxes, there should be minimal change to City and County revenues.

No adverse impacts on resident and worker populations in the project area are expected. The project will be beneficial to those residing on Department of Hawaiian Home Lands by providing broadband services to the telecommunications users.

No significant impacts to the island's housing or resident population are expected as the project does not propose to add any housing units.

5.4.4 Mitigation Measures

Mitigation is not necessary other than standard measures to protect public safety during construction.

5.5 VISUAL AND AESTHETIC RESOURCES

5.5.1 Existing Conditions

The Sandy Beach Park parcel is generally free of man-made structures except for light poles along Kalaniana'ole Highway, and beach park amenities such as showers and comfort stations. Therefore, wide expanses of picturesque ocean, shoreline, and rugged mountain and coastal views are available from many vantage points in the park.

5.5.2 Construction or Short-Term Impacts

Construction vehicles and equipment associated with the HDD operation would temporarily block coastal views from the perspective of Kalaniana'ole Highway and other similar locations. Construction vehicles and equipment associated with cable installation of the connecting route would also block coastal or mountain views from the perspective of passing vehicles.

5.5.3 Long-Term Impacts

Based on the relatively small scale and nature of proposed construction, no long-term or significant impacts are anticipated. After construction is completed, the property would be returned to its pre-construction condition. All infrastructure associated with the landing site and connecting route would be underground, and therefore would not affect existing viewplanes or scenic resources.

5.5.4 Mitigation Measures

No permanent visual impacts would occur as a result of the proposed project; therefore no mitigation measures are necessary.

5.6 WATER RESOURCES

5.6.1 Existing Conditions

Waters offshore of Sandy Beach Park are rated Class A by the State Department of Health (DOH). According to DOH administrative rules, marine waters are categorized as Class AA and Class A. Class AA waters are to "remain in the natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-cause source or actions." Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters. (Hawai'i Administrative Rules (HAR), Chapter 11-54, Water Quality Standards.)

The Sandy Beach Park landing site parcel is adjacent to the shoreline and Pacific Ocean. The waters near the shoreline experience considerable turbidity even when surf is minimal. Waters further from the shoreline, however, are very clear with excellent underwater visibility over reef slopes. Water temperature and salinity are normal for ocean water in this area, with evidence of fresh water inflow along the shore.

Sandy Beach Park contains no perennial or intermittent streams, wetlands or other surface water (other than the ocean), as confirmed by the desktop study and site visits (see Chapter 2). The major drainage feature in the vicinity of the parcel is an unnamed gulch from Kalama Valley to the Ka Iwi area, which is dry except under very rainy conditions.

Groundwater in the area is not used as a potable source (Atlas of Hawai'i, 1998).

The lower portion of the Sandy Beach Park parcel is within 100-year floodplain according to the Flood Insurance Rating Map, which may include part of the drill site. The rest of the parcel, including areas mauka of Kalaniana'ole Highway, is beyond the floodplain.

5.6.2 Construction or Short-Term Impacts

The primary water quality concern during construction is the potential for sediments entering the ocean in the form of runoff from the project site. Construction activities could expose more soil and runoff from the project site, which could increase turbidity in the ocean, particularly if a heavy rain were to occur.

Installation of the fiber-optic cable conduit using HDD would not affect surface waters, such as the ocean, because the drill site would be set back from existing surface waters. HDD operations produce no surface discharges of pollutants. Construction activities, including installation of the connecting route, can generate hazardous waste, such as petroleum hydrocarbons, if spills occur. Therefore, the contractor would be instructed to implement best management practices (BMP) to prevent accidental spills. Excavation needed for trenching would probably not cause sedimentary pollutant impacts because these activities would not be near the ocean and the contractor would probably not conduct excavation work during a storm or heavy rain. Nevertheless, a National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Associated with Construction Activity would be needed because the construction area, which includes the drill site and connecting route, would be more than one acre. The NPDES permits require that a site-specific BMP plan be prepared.

The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore, and discharged into the environment. If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. As noted in Section 1.4.4, bentonite is a naturally occurring clay material, which is not toxic nor harmful to the ocean environment. In addition, the ocean currents or wave action would dissipate the slurry relatively quickly, such that turbidity effects would be limited. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 5.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

Immediately prior to the drill head emerging into the ocean water from the exit point (EP), the slurry would be replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the EP. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and slurry could be inadvertently released into the ocean water. As noted above, ocean currents would dissipate the slurry relatively quickly, depending on the amount of slurry released. Nevertheless, divers shall be stationed at the EP during this activity (see Section 1.4.4).

All roadside construction projects that involve excavation have the potential, if unmitigated, for controlled excess sediment discharge from soil erosion during and after excavation and construction. Such discharges may impact natural watercourses, such as streams, and water quality. Contaminants associated with heavy equipment and other sources during construction may also affect receiving stream, ocean, and groundwater. However, construction will not alter existing drainage patterns or have any water requirements.

Oils and other mechanical fluids used with construction equipment would also be on-site during construction. Oils and other toxic fluids used on construction sites could leach into the ground if a spill were to occur. Therefore, contractors would be required to take caution when handling such substances.

HDD allows the underground bore to be placed below the environmentally sensitive surface resources such as beaches and streams. It is usually safer and faster than trenching because the equipment is confined to the entrance pit work area, and the majority of construction operations occurs underground. The duration of construction activities is estimated to be three months.

No intensive construction effort is required in the coastal aquatic environment. Further, to ensure minimal potential harm to the stream environments, it is highly recommended that stream crossings along the terrestrial connecting route be conducted with a directional drilling or attaching the cable to the bridge structure.

5.6.3 Long-Term Impacts

Once completed, the HDD conduit and connecting route would be underground and therefore would not affect the quality of the ocean. Any flooding occurring on the property would not damage or affect the fiber-optic cable landing because all infrastructure would be underground and/or waterproofed.

The sides of the HDD bore would be lined by the drill casing, which becomes the conduit. That conduit is anticipated to prevent interaction with groundwater after construction is completed.

5.6.4 Mitigation Measures

Best management practices will be specified during permitting stages and shall be strictly enforced by SIC on its contractor. To avoid impacts to water quality, measures such as the following shall be specified during the construction design phase.

The SIC contractor shall be required to conduct BMPs to prevent erosion and sedimentation, and have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles.

During drilling, the contractor would constantly monitor the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry would immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the EP when the drill head emerges from the EP shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

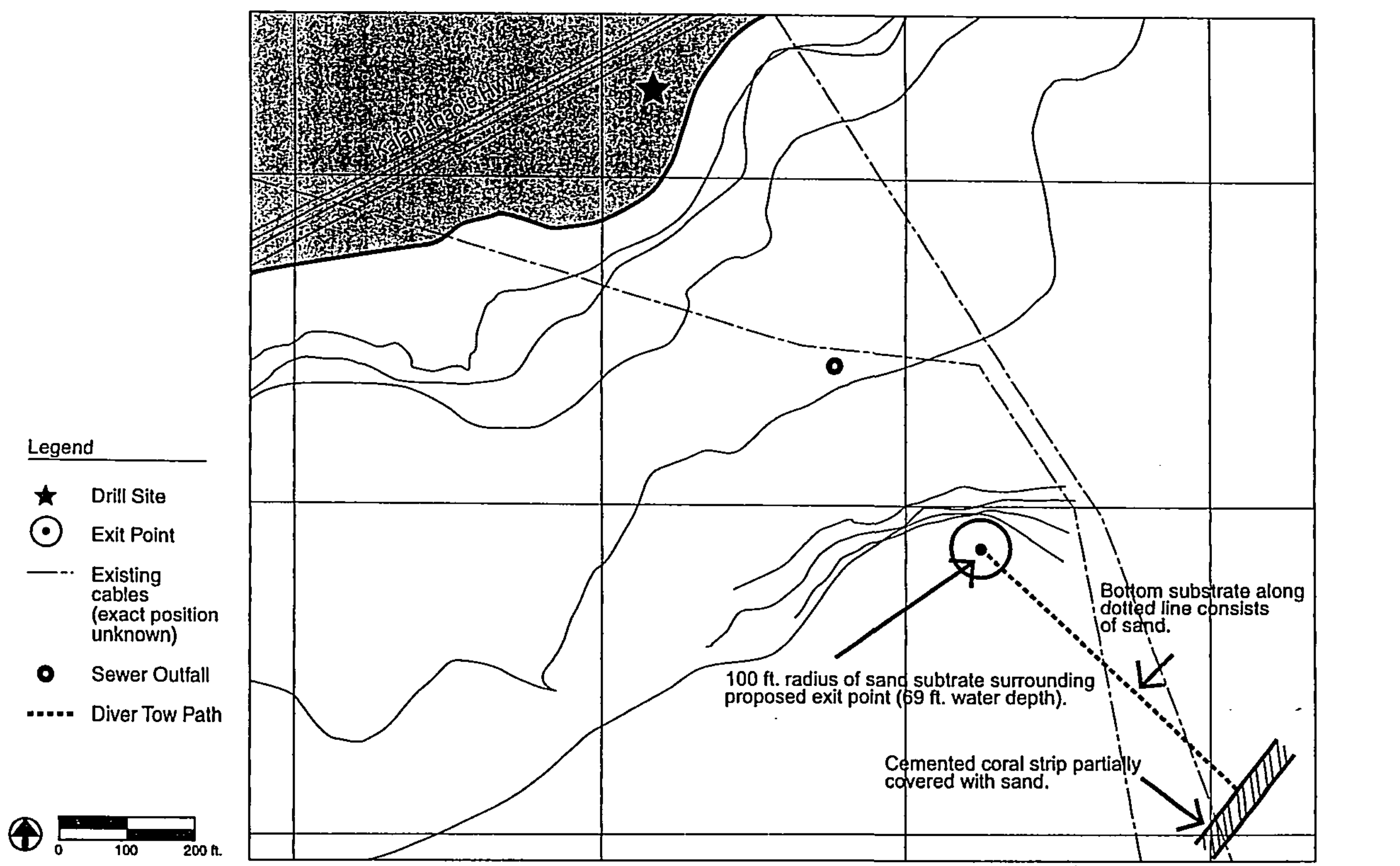
All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

5.7 MARINE AND NEARSHORE CONDITIONS

5.7.1 Existing Conditions

A SCUBA survey conducted for the project located a sandy area of a radius of about 50-foot at depth close to 70 feet approximately 2,100 feet from the drill site bearing about 145 degrees True North. This underwater site was selected as the proposed HDD EP for the Sandy Beach Park landing site (see Figure 5.7-1). In general, the selected site has excellent bottom conditions for an EP. The sandy bottom extends south-southwest from the EP for a distance of about 200 feet. In the north-northeast direction from the EP at a distance of between 50 to 100 feet, the ocean floor is sparsely littered with small (0.65-foot) dead coral heads (i.e., 1 in every 100 square feet). No deep depressions were observed in the SCUBA survey. The sewage outfall for the Hawai'i Kai WWTP and two submarine communications cables owned by other private operators are located near the EP (see Figure 5.7-1).

The substratum at the EP is a mix of sand and small areas of emergent limestone. The sand depth at the EP is at least two feet. Thee hard bottom limestone areas range in size from about one foot by one foot up to six feet by 24 feet in size, and are spaced from six to 105 feet apart. Plant communities do not appear to well developed, probably due to the scouring action of sand from wave activity (see Section 5.8.1.1). The limestone substratum is more prominent inshore of the EP, and also about 600 feet seaward of the EP. A hard bottom cemented coral was observed approximately 1,200 feet southeast



Source: Makai Ocean Engineering, Inc. 2003.

Sandwich Isles Communications, Inc.

Marine Survey of Proposed Exit Point at Sandy Beach Park Landing Site
Submarine Fiber-Optic Cable Project

Figure 5.7-1

from the EP. In general, coral development is very low (less than one percent coverage) probably due to the scouring of the substratum that must occur with occasional storms. Also, no deep depressions were identified in the SCUBA survey.

Coastal or nearshore areas are vulnerable to a number of natural hazards, in particular storms, hurricanes, tsunamis, and high waves. These natural hazards are discussed below.

Storms and Hurricanes. The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward (north and northeast) sides of the islands in comparison to leeward areas (south and southwest).

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kaua'i. However, meteorologists warn that no island is safe from hurricanes.

Tsunamis. Tsunamis are a series of large waves caused by one of three geologic processes: (1) earthquakes (the most common); (2) landslides (either submarine or subaerial); and (3) explosive submarine volcanic events. The "Pacific Ring of Fire," which encircles the Pacific Basin reaching as far as Asia, North America, South America and Australia, is a zone of frequent earthquakes and volcanic activity. The Hawaiian Islands are roughly in the middle of the Ring, and therefore have experienced tsunamis originating from different locations. In the past 60 years, six tsunamis originating from the Ring were particularly destructive. Barrier and fringe reefs tend to absorb the energy of the waves and protect the shoreline. For example, the 1946 tsunami had wave heights reaching 20 feet at Mokapu Head on O'ahu, but only two feet at the nearby Kanē'ohe Bay, which is protected by a barrier reef.

High Waves. In Hawai'i, waves are caused by: (1) the north Pacific swell; (2) the northeast trade wind swell; (3) a south swell; and (4) kona storm swells. The north Pacific swell is generated by storms in the Aleutian Islands area, and it tends to produce wave heights 8 to 30 feet on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast trades produce wave heights 4 to 12 feet on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range one to four feet. Kona storm waves (see above) average 10 to 15 feet and can occur at any time of the year.

5.7.2 Construction or Short-Term Impacts

The 50-foot-radius sandy/hard limestone area located about 2,100 feet from the drill location at a depth of 70 feet is suitable as a HDD EP. The directional finding capabilities of HDD technology are more than adequate in targeting this location.

As stated in Sections 1.2.1 and 5.6.2, the bentonite and water mixture used for drilling slurry would be replaced by water prior to the drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP (also see Section 5.6.2).

5.7.3 Long-Term Impacts

The USGS has provided ratings regarding various coastal hazards along the entire shoreline of Hawai'i, including overall hazard assessments. For the Sandy Beach Park landing site parcel, the USGS provided an overall hazard assessment of moderate to low. However, USGS evaluated the hazard from erosion and volcanic/seismic events as low to moderately high based on the site's proximity to the Moloka'i Seismic Zone, and evaluated the hazard form tsunami and storms as high.

A seismic event occurring offshore from the Sandy Beach Park landing site parcel could potentially damage landing site infrastructure or sever or break the underwater fiber optic cable. The underwater cable would have double armor protection at depths shallower than 350 feet (see Chapter 1), which could prevent damage should a seismic event occur near the parcel.

It is highly unlikely that a tsunami would damage the landing site infrastructure of the Sandy Beach Park parcel because the fiber-optic cable would be underground and wave action caused by the tsunami would not have much effect at a depth of 70 feet, the depth of the proposed EP. A tsunami may cause landside debris to damage or break a cable as the water recedes from the shore. However, as noted above, the underwater cable would have double armor protection at shallow depths.

5.7.4 Mitigation Measures

Other than proper placement of the fiber optic cable at the EP and the ocean floor, mitigation is not necessary.

5.8 TERRESTRIAL AND AQUATIC BIOLOGY

5.8.1 Existing Conditions

Terrestrial

A terrestrial botanical resource assessment was conducted (see Appendix 4). The drill site would be in an open grassy lawn that is maintained by the City and County DPR (i.e., it is regularly mowed). The lawn is a mixture of pitted beardgrass (*Bothriochloa pertusa*) and Bermuda grass (*Cynodon dactylon*) with various herbaceous species, including false mallow (*Malvastrum coromandelianum*), khaki weed (*Alternantera pungens*), nutgrass (*Cyperus rotundus*), goose grass (*Eleusine indica*), pigweed (*Portulaca oleracea*), creeping indigo (*Indigofera hendecaphylla*), and *Calyptocarpus vialis*. The latter two species can become locally abundant and form fairly large-sized mats. A large planting of *Clerodendron inerme* shrubs and milo trees (*Thespesia populnea*) are found also within the lawn area.

Vegetation along the highway includes a narrow band of low, windswept koa haole (*Leucaena leucocephala*) scrub vegetation of about five to six feet tall. Lumpy mats of Chinese violet (*Asystasia gangetica*) and clumps of Guinea grass (*Panicum maximum*) are interspersed between the shrubs. Other weedy species along the highway include buffel-grass (*Cenchrus ciliaris*), *Boerhavia coccinea*, golden crown-beard (*Verbesina encelioides*), crabgrass (*Digitaria sp.*), and running pop (*Passiflora foetida*).

On the makai of the beach access road (the park road on the Waimanalo side), shrubs of naupaka kahakai or beach naupaka (*Scaevola sericea*) form scattered patches, three to five feet high on sandy substrate. In between the naupaka patches are open areas with 'aki'aki or seashore rushgrass (*Sporobolus virginicus*) and low mats of 'ilima papa (*Sida fallax*), kipukai (*Heliotropium curassavicum*), Australian saltbush (*Atriplex semibaccata*), and pa'uohi'iaka (*Jacquemontia ovalifolia* ssp. *Sandwicensis*).

The vegetation on the rocky, basaltic coastline includes a few small shrubs of 'ohelo kai (*Lycium sanwicense*) and beach naupaka, and low mats of 'akulikuli (*Sesuvium portulacastrum*).

With respect to animal wildlife for the area, no rare, endangered or threatened animals are known to inhabit the project site. The area has a dry climate and sparse vegetation and does not provide good habitat for rare animals.

As described in Section 5.2.1, the proposed landing site parcel is in a major park and the area affected by construction is heavily used by kite flyers. Therefore, the parcel is probably not being used (as habitat) extensively by fauna species, and if it were being used, it would be populated by int oduced species that are common throughout the Hawaiian Islands.

Aquatic

A survey to quantify the benthic community present in the area of the proposed EP was conducted for the project (see Appendix 5). The survey noted two algal species (*Halimeda opuntia* and *Lyngbya majucula*) having a mean coverage of 0.7 percent and two coral species (*Porites lobata* and *Pocillopora meandrina*) with a mean coverage of 1.6 percent. The macroinvertebrate census noted one species, the Christmas tree worm (*Spirobranchus giganteus*). The fish census noted four species of fishes (9 individuals) with the most species being the lined wrasse or malamalama (*Coris ballieui*) with a standing crop estimated at 15 g/m^2 (grams per meter squared). This species comprised 93 percent of the biomass. Fishery resources noted in the survey included he'e (*Octopus cyanea*) and one small slipper lobster (*Paribaccus antarcticus*).

Protected species that may be using the waters fronting the landing site include the federally protected green sea turtle, spinner dolphins (*Stenella longirostris*), and humpback whales *(Megaptera novaeangliae*). During fieldwork activities, spinner dolphins were seen on several occasions, usually about one and a half or more miles from shore. They normally swim parallel to the coast. Dolphins and green sea turtles, like other marine mammals, are protected under the Marine Mammals Protection Act (see Section 11.1.2). The endangered humpback whales visit the Hawaiian waters from about December and to April. They are a common element offshore from the landing site parcel during this time.

5.8.2 Construction or Short-Term Impacts

Construction would clear part of the park's grassy lawn at the drill spot and along the trenched alignment from the drill spot to the highway and within the highway right-of-way for the connecting route. The trench to the highway and for the connecting route would also clear some koa haole near the road. Vehicles and equipment parked and supplies stockpiled on site may damage some of the grass in the lawn. These impacts are considered very minor since the vegetation affected is regionally abundant.

After construction is completed, the contractor would return the site as much as possible to its pre-construction condition. The exposed areas within the cable easement will be replanted as needed to ensure stability of the site. The lawn area is expected to revegetate with grass quickly. Therefore, no adverse short-term impact on flora is anticipated. Using the sandy area as the EP, as proposed in Section 1.2.3 for the Sandy Beach Park landing site, would avoid potential adverse impacts to the aquatic biological environment.

The proposed deployment of directional drilling avoids problems with deploying cables on the surface of the seafloor and possibly impacting sessile species (permanently attached or fixed) such as corals. An added benefit to the use of directional drilling is the protection afforded to the cable in the shallow water where storm surf could result in cable failure. The proposed alignment will utilize directional drilling thereby avoiding marine communities and any impact to them in the coastal waters. The bentonite and water mixture used for drilling slurry would be replaced by water immediately prior to the HDD drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP. In the event of an accidental discharge of slurry during drilling or at the EP (see Section 6.6.2), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidy relatively quickly. Also, slurry is not toxic or hazardous to marine life.

When laying cable, caution must be taken to avoid adverse interactions with protected species of marine mammals that occur in Hawai'i's waters. Although humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying operations within these months. If a whale or other protected species is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation would also be halted until the animal moves away of its own volition. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

5.8.3 Long-Term Impacts

The drill spot and trench would be backfilled, and vegetation would probably return to its pre-construction botanical condition. No long-term impacts to the parcels' flora and fauna conditions are expected because the fiber-optic cable would be placed underground.

No long-term impacts on marine communities are anticipated particularly since the cable will be laid on sand substratum and will "sink" into the sand. The shifting nature of sand and its continual movement will usually bury any deployed cable with time. Marine species found in sand habitats have evolved to live in this continually moving substratum. Thus placing a cable on this substratum, which will become buried will not materially hinder any of these species.

The presence of the cable or manhole is not anticipated to cause any long-term adverse interaction with protected species. There is no evidence to suggest that impact occurs with cable operation. There are a number of fiber-optic cables operating on the leeward coast of O'ahu, where marine mammals are present, with no known adverse impacts on those animals.

5.8.4 Mitigation Measures

Because the proposed action would have no short- or long-term adverse impacts on any flora or terrestrial fauna, threatened and endangered species, or their critical habitat, no mitigation measures are required for their removal. However, after construction is completed, the contractor will return the site to its pre-construction condition.

The mitigation measures below are proposed to avoid adverse interactions with marine animals during construction.

Immediately before and during the pop-out event, an underwater diver shall observe the environment before attaching the cable. If a protected animal is observed in the immediate vicinity of the EP, the pop-out event shall be delayed until the animal moves away from the project area of its own volition.

If any protected species is detected during construction, including marine mammals and sea turtles, cable deployment shall be halted until they move away from the vessel or the cable deployment area.

The bentonite and water mixture used for drilling slurry will be replaced by water immediately prior to the HDD drill head emerging from the EP preventing bentonite from releasing into the ocean.

5.9 AIR QUALITY

5.9.1 Existing Conditions

Air quality in the State of Hawai'i is typically excellent, due to offshore trade winds that help disperse most urban air pollutants. Data collected by the State Department of Health (SDOH) indicate that the State has some of the best air quality conditions in the nation. To monitor air quality, the SDOH operates a network of stations at various locations throughout the islands. Southeastern O'ahu is generally warm and dry. The mean annual temperature is between 72 and 75 degrees Fahrenheit and the annual rainfall is between 15 and 25 inches, most of it occurring during winter months (*Atlas of Hawai'i*, 1998).

Air quality in the project area of Hawai'i Kai Sandy Beach Park is good due to low emission levels and the almost continual presence of trade winds or on-shore breezes. The major factor affecting air quality in this area is vehicular traffic.

5.9.2 Construction or Short-Term Impacts

Some excavation work would be required to set up the drilling operation, but more importantly, excavation would be required for trenching and to install the beach manhole within the highway right-of-way. Noticeable dust emissions may occur from the excavation, especially if the excavated soil is dry and weather conditions are windy. However, the installation of the fiber-optic duct lines would involve a narrow trench of about one foot wide and three feet deep.

The HDD drill rig, compressor and other construction-related vehicles emit engine exhaust which would contribute to air pollutants in the vicinity of the work area. Most of the equipment and vehicles, including the drill rig and compressor, are diesel-powered, and will emit relatively high levels of nitrogen oxide (NOx) in comparison to gasoline-powered equipment. However, standards for such pollutants are set on a regional basis and would therefore not be violated by short-term construction equipment emissions.

5.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality is anticipated because the work site will be restored to its original condition after the cable-laying process is completed and construction equipment is removed. After construction is completed Sandy Beach Park landing site would experience no further activity that could potentially degrade air quality.

5.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality. BMPs shall also be implemented to minimize unnecessary air quality impacts. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants. This will help control escape of fugitive dust beyond the construction site.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses

As required by State regulations, upon completion of work the project site shall be revegetated to control erosion and release of dust by the wind.

5.10 NOISE

5.10.1 Existing Conditions

Ambient noise levels in the nearshore project area are predominantly from vehicular traffic on Kalaniana'ole Highway, which depending on the traffic volume, could approach 70 decibels. Other sources of noise in the project area include ocean surf, and park visitors and cars (e.g., car stereos, and sounds from sports events or other activities and festivals).

5.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of noise is expected to come from use of heavy machinery, such as bulldozers, directional boring rig, and trucks entering and leaving the site during the drilling period, expected to last approximately three months. Noise produced by this operation may occasionally be as high as 90 to 94 decibels at 50 feet away, which is comparable to the noise from a lawnmower. HDD operations and other construction activities will be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would more than likely violate Community Noise Control Standards; therefore, the SIC contractor would require a noise permit from the SDOH.

The noise generated by HDD operations at the Sandy Beach Park could disturb park users. However, the park is large, and the users that would be most affected by the noise would be kite flyers, but this activity is not considered noise sensitive. Based on geological conditions of the landing site (see Section 6.1.1), and the approximately 2,100-foot distance between the drill site and the ocean EP, it is estimated that the drilling operation would last approximately three months.

5.10.3 Long-Term Impacts

There would be no project-related noise once construction is completed. No long-term impacts are expected as there will be no operational requirements for the manhole site except for an occasional maintenance repair technician visiting the site on an as-needed basis.

5.10.4 Mitigation Measures

HDD operations and other construction activities shall be conducted within the hours allowed for construction under State law, i.e, 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would likely violate Community Noise Control Standards; therefore the SIC contractor would require a noise permit from the SDOH.

Prior to the start of construction, SIC or its contractor shall inform all nearby residences about the proposed construction schedule and anticipated noise impact. SIC shall provide contact information where residents may call to ask questions or report problems.

The SIC contractor shall be required to maintain his or her HDD drilling equipment in proper working order, especially all noise suppression systems, such as the rig's muffler. Noise generated from machinery shall be mitigated by requiring contractors to adhere to State noise regulations. In general, the contractor shall be the point of contact to the community during construction. However, members of the community shall be able to contact SIC if they are dissatisfied with how the contractor resolves noise or other problems, or have complaints about the contractor.

5.11 PUBLIC FACILITIES

5.11.1 Existing Conditions

Kalaniana'ole Highway, which is owned and maintained by the SDOT, immediately fronts the proposed Sandy Beach Park landing site parcel. The highway includes two-lanes (one lane in each direction), and its right-of-way is used for other infrastructure, including electrical and communications lines, water mains, and sewer lines. As noted in Section 5.7.1, Sandy Beach Park is used as two fiber-optic cable landing sites by other private entities. Detailed descriptions and locations of utilities located with the right-of-way will be analyzed during final design.

5.11.2 Construction or Short-Term Impacts

The fiber-optic landing site would connect directly to SIC's terrestrial network within the Kalaniana'ole Highway right-of-way. The landing site beach manhole would be placed within the highway right-of-way for ease of access by SIC personnel. The beach manhole, and connecting route would be designed to not interfere with existing infrastructure within the highway right-of-way.

During construction there may be restricted traffic flow, including the temporary closure of the two traffic lanes. However, SIC would try to avoid the full closure of a traffic lane during construction. Lane closures would cause traffic congestion and delay because the highway is relatively busy. Congestion would be the worse during weekends or holidays when the park is busy. Any lane closure would not affect Sandy Beach Park's main entrance (driveway into the park's parking lot), but could affect the Waimanalo-side entrance. There is no anticipated impact on emergency vehicle access, as traffic coordinators would allow vehicles to pass in the case of emergencies.

5.11.3 Long-Term Impacts

After construction, contractors would be required to return the project site to pre-construction conditions. Therefore, no adverse long-term impacts to any public utilities, facilities, or services are anticipated after the fiber-optic cable installation is completed. The project would not affect expansion of existing infrastructure or installation of new infrastructure.

Landing site infrastructure, which includes a fiber-optic conduit and beach manhole, would not affect maintenance of the highway or its other infrastructure, nor would it prevent the expansion of existing infrastructure or installation of new infrastructure within the highway right-of-way.

5.11.4 Mitigation Measures

The following mitigation measures are proposed along the entire route to ensure that public facilities are not impacted.

SIC shall develop a traffic control plan during the design phase of the project that will outline steps needed to minimize congestion and maintain access to adjacent properties at all times during construction. Implementation of construction shall be coordinated with agencies, including the State of Hawaii Department of Transportation and the City and County's Departments of Parks and Recreation and Transportation Services, to prevent conflicts in activities.

SIC shall post appropriate public notices per City and County and State requirements for lane closures, as necessary.

Flagmen and/or police officers shall be posted to direct traffic safely around the construction of the proposed manhole connecting route.

SIC shall coordinate with City and County departments and utility companies to ensure that the landing site and connecting route construction activities will not damage water, sewer, and utility lines.

Chapter 6

Kaunakakai, Moloka'i Landing Site:
Environmental Setting, Impacts, and Proposed Mitigation

Final Environmental Assessment/
Finding of No Significant Impact

Submarine Fiber-Optic Cable Project

CHAPTER SIX: KAUNAKAKAI, MOLOKA'I LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

6.1 TOPOGRAPHY AND GEOLOGIC CONDITIONS

6.1.1 Existing Conditions

The island of Moloka'i was formed by basaltic lava flows from two shield volcanoes, East and West Moloka'i Mountains, during the early and middle Pleistocene Epoch. Ho'olehua Plain, located roughly in the middle part of the island, is composed of lava flows from the East Moloka'i Volcano banking against the lava flows of the older West Moloka'i Volcano. During the late shield stage of the East Moloka'i Volcano, an enormous landslide slid northward, now evident by steep cliffs of up to 4,900 feet that characterize the north Moloka'i coastline. Sea level changes and stream erosion caused the formation of deltas and fans of alluvial soils along the southern coastline.

The proposed Oneali'i Homesteads fiber-optic cable landing site parcel is located on the southern coastline. The entire parcel is approximately one and a half acres in size. The site is flat and is no more than a few feet above mean sea level.

Soil sampling was conducted at two locations on the makai and mauka sides of the proposed landing site parcel. Geologic conditions of the parcel consist of a layer of medium dense sand with some silt from the surface to a depth of about seven to eight feet. Below this layer are loose silty sands and sandy coral gravels to depths ranging from 21 to 32 feet below the surface. A very hard basalt rock formation was encountered 38 feet. Groundwater was encountered at depths of 1.2 to 3.3 feet below the surface.

<u>Hazardous Materials</u>

Since present and historic land uses in the project area could have produced site contamination, a database search was conducted to investigate potential hazardous materials on the project site (see Appendix 6). The search included Federal and State environmental databases in accordance with the American Society for Testing and Materials standards for environmental site assessments (E1527-00). The database search found no records of hazardous materials sites on the Oneali'i Homesteads parcel, nor within one mile of the parcel. The database search does not cover off-shore sites.

6.1.2 Construction or Short-Term Impacts

Based on the geologic conditions of the landing site parcel, problems in conducting HDD operations from the Oneali'i Homesteads parcel are not anticipated. Unlike the other proposed landing sites, the Oneali'i Homesteads landing site is the terminus of two ocean cable routes. Therefore, two bores would be drilled. The vertical alignment of the bores would avoid the basalt rock formation between the distance of the drill spot and the shoreline. There is no information on the depth of the basalt formation below the ocean floor.

A beach manhole would be placed within the Kamehameha V Highway right-of-way, and would require excavation. In addition, trenching of approximately three feet deep and one foot wide would be required to install fiber-optic cables between the drill site and the beach manhole. Soils contaminated by hazardous materials are not expected to be encountered during HDD operations or other excavation activities. Excavated areas would be backfilled with the same material. Excess excavated material, such as from the beach manhole site, would be disposed of properly in accordance with State Department of

Health (SDOH) regulations. Construction time is anticipated to be five months long instead of the three months anticipated for the other landing sites because as noted above, two bores would be drilled. Once the landing site has been completed, the affected parcel would be restored to its pre-construction condition.

6.1.3 Long-Term Impacts

Once completed, the fiber-optic cable conduit would be underground and would not change the grade or topography of the landing site parcel. The only evidence of the landing site would be a beach manhole cover within the Kamehameha V Highway right-of-way.

6.1.4 Mitigation Measures

Mitigation is not required.

6.2 LAND USE

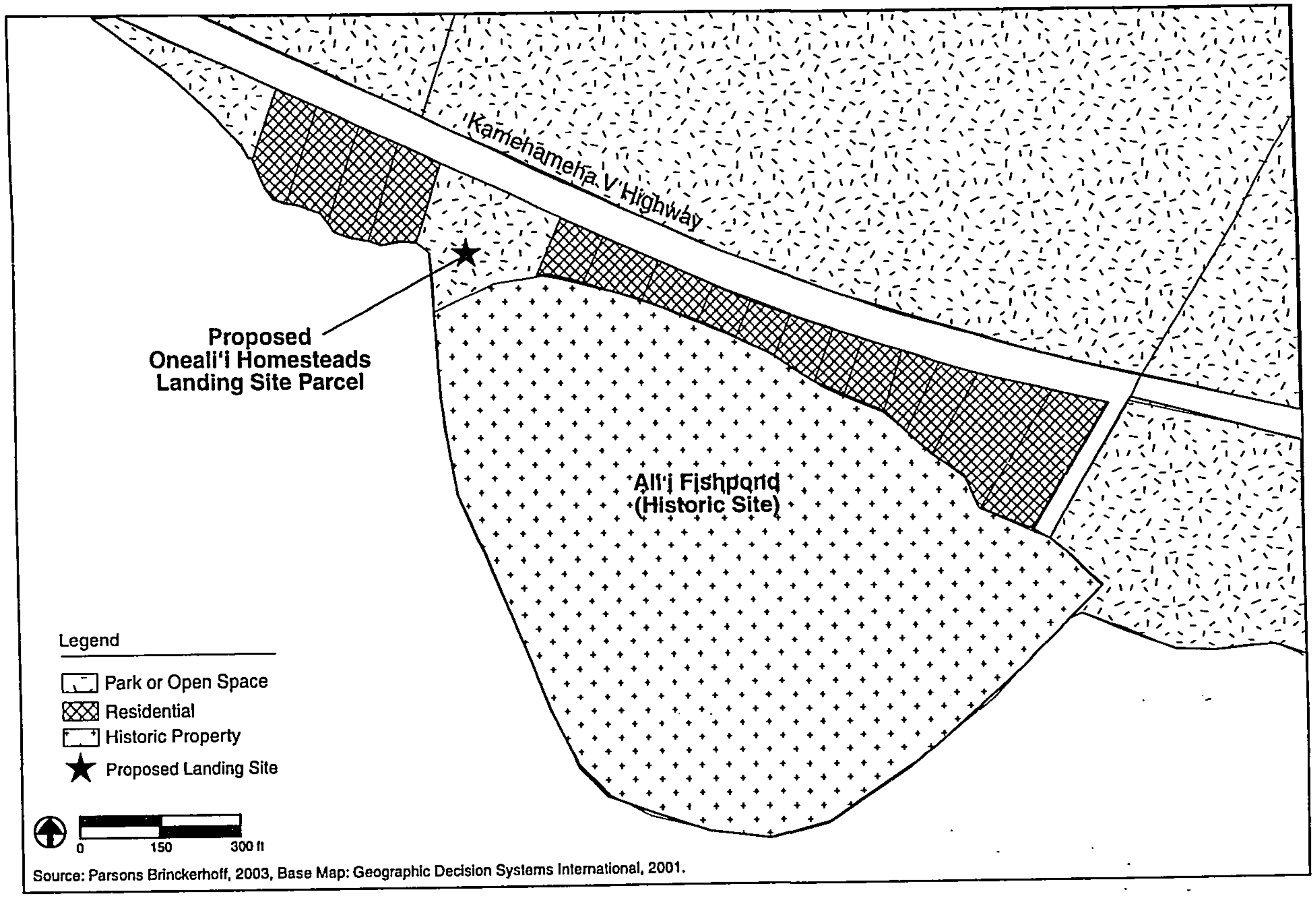
6.2.1 Existing Conditions

The southern coastline of Moloka'i east of Kaunakakai, the island's main town and commercial and public services center, is largely rural residential, with expansive areas of undeveloped landscapes that are used for agriculture, grazing and open space. Kamehameha V Highway, which passes through Kaunakakai, is the main thoroughfare on the southeast coastline. The low-density residential areas, which vary from suburban subdivisions to isolated residences of various types (e.g., modest to luxury), are generally located along or near the highway. The Sandwich Isles Communications (SIC) Moloka'i terrestrial network uses the Kamehameha V Highway right-of-way for its fiber-optic cable ductline.

The proposed landing site (TMK 2-5-4-006:019) has direct access off of Kamehameha V Highway, and is about two miles east of Kaunakakai (see Figure 6.2-1). The 1.46-acre parcel is vacant, but is sandwiched between a row of single-family residential lots between the highway and the coastline. The parcel's manmade structures are limited to a utility handhole and a masonry box of unknown purpose (possibly a barbeque pit) approximately four feet tall, three feet wide and ten feet long, which was filled with coconuts at the time of a site visit. The utilities and a gravel-dirt driveway off of the highway provide evidence that the parcel may have housed a structure(s). Community informants stated that the parcel was used by The Oceanic Institute to restore the nearby Ali'i Fishpond.

The mauka half of the property near the highway is largely an open field with weedy grasses and low shrubs (see Section 6.8.1). A low rock wall of the adjacent residence demarcates the east side of the property. The residence is visible from the proposed landing site. A dense thicket of palm trees lines the west side of the property. This vegetation blocks the view of the residence on the west side from much of the landing site property. (See Figure 6.2-2 for photographs of the landing site.)

The makai side of the property contains a few dozen coconut palm trees. This area also borders the northwest side of Ali'i Fishpond, a cultural and historic resource. The fishpond property is owned by the State of Hawai'i, and is not in active use.



Sandwich Isles Communications, Inc.

Existing Land Uses - Oneali'i Homesteads Landing Site
Submarine Fiber-Optic Cable Project
Figure 6.2-1

Makai view from Kamehameha V Highway

Makai view from proposed drill site

Source: Parsons Brinckerhoff, 2002.

Sandwich Isles Communications, Inc.

Photos of Oneali'i Homesteads Landing Site Parcel
Submarine Fiber-Optic Cable Project

Figure 6.2-2

6.2.2 Construction or Short-Term Impacts

The drill site would be located on the west side of the property, and the HDD alignment would be on the west side of Ali'i Fishpond to avoid potential archaeological and/or cultural impacts. No existing building or structure would be affected by construction. Once completed, the parcel would be restored to its pre-construction condition. The landing site beach manhole would be the only evidence of construction, but would be located within the highway right-of-way, not within the property.

6.2.3 Long-Term Impacts

SIC would seek a conduit easement about ten feet wide between the shoreline and Kamehameha V Highway near the western boundary of the property. The landing site easement would be placed as near to the western side of TMK 5-4-006:019 as possible to provide DHHL with maximum development potential on the remaining portion of this 1.46-acre parcel. Although the easement would prohibit many types of structures, there would still be ample space on the remaining area of the property for development, in accordance with its current zoning.

6.2.4 Mitigation Measures

Mitigation is not required.

6.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

6.3.1 Existing Conditions

As stated in Section 6.2, the makai portion of the Oneali'i Homesteads landing site parcel borders the northwest part of Ali'i Fishpond (State Site # 50-60-03-135), a site listed on the State Register of Historic Places in 1981. The site is "significant" (see Section 11.1.1 regarding Significance Evaluations) under Criteria C, D and E (see Figure 6.2-1). This historic property is a good example of a pre-contact Hawaiian fishpond; it may yield or has yielded information on the history of Hawaiian fishpond construction and aquaculture, and it has important traditional cultural value to native Hawaiians. Although the fishpond is not in active use, the overall fishpond appears to be in fair to good condition, although the eastern portion (the area farthest from the landing site parcel) appears to be filled with silt. The fishpond's western wall nearest to the landing site parcel appears to have been modified and widened. A narrow waterway containing the remains of two concrete and rock gate supports bisects the western wall on the ocean side of the fishpond.

Previous archaeological work in the general vicinity of the project site suggests that this and other areas along the south Moloka'i coastline was utilized in pre-contact times for habitation, coastal marine exploitation, fishpond aquaculture and ceremonial purposes. The landing site parcel itself has been disturbed and contains no surface archaeological, historic or cultural resources. To determine if the site contains subsurface resources, the project archaeologist obtained samples during the soil sampling described in Section 6.1.1. Following lab analysis, no "significant" materials or resources were identified.

6.3.2 Construction or Short-Term Impacts

The Oneali'i Homesteads fiber-optic cable landing site alignment would be on the west side of the Ali'i Fishpond wall (see Section 1.2.1). The widened portion of the western wall does not extend to the western end of the landing site parcel. Therefore, Ali'i Fishpond would not be affected by the development of the landing site.

Since soil sampling was conducted in a relatively limited area within the parcel (see Section 6.1), it is possible that trenching between the drill site and Kamehameha V Highway may uncover "significant" materials or resources.

Since a federal loan is being used for the project, compliance with Section 106 of the National Historic Preservation Act (NHPA) is required. In addition, the project is subject to review by the State Historic Preservation Division in accordance with Section 6E-8 of the Hawai'i Revised Statutes (HRS) because the project requires permits or approvals from the State of Hawai'i and the County of Maui. See Sections 11.1.1 and 11.2.4 for information regarding compliance with NHPA Section 106 and HRS Section 6E-8.

6.3.3 Long-Term Impacts

Once completed, the Oneali'i Homesteads landing site infrastructure would not affect archaeological or historic resources.

6.3.4 Mitigation Measures

An archaeologist shall be on-site to monitor trenching for the fiber-optic cable between the drill site and Kamehameha V Highway and excavation for the beach manhole within the highway right-of-way, to ensure that any "significant" material or resource is not inadvertently damaged during these activities. If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist.

6.4 CULTURAL, SOCIAL, AND ECONOMIC ACTIVITIES

6.4.1 Existing Conditions

Among the seven major islands, Moloka'i had the second smallest population in 2000 at 7,404 (State Data Book, 2001). However, the island has the highest percentage of residents with native Hawaiian ancestry, and almost a quarter of the population resides on Hawaiian Home Lands (U.S. Census Bureau). The proposed landing site parcel is unoccupied.

There are no governmental or DHHL sanctioned social, cultural or economic activities currently on the proposed landing site parcel. Due to the parcel's proximity to Ali'i Fishpond, a "significant" cultural and historic resource (see Section 6.3 for additional information), the Oceanic Institute conducted restoration activities from the parcel in the 1970s, which included the study of both ancient Hawaiian and modern fish culture techniques and experimental fish stocking (Oceanic Institute website). Although the fishpond is currently not in active use, the proposed landing site parcel provides a convenient location for staging future fishpond experimentation and aquaculture activities.

The parcel provides one of two avenues to access the fishpond. The other access is the 'Ōnini Gulch site, on the east side of the fishpond from Ali'i Parks One and Two, which was also an alternative landing site (see Section 2.2.4). Although the fishpond is not in current use, native Hawaiians and others may be using the parcel to access the fishpond for cultural purposes. In addition, people may also access the property to pick or gather coconuts (see Section 6.8).

6.4.2 Construction or Short-Term Impacts

HDD staging would not require the entire parcel. Therefore, it is not anticipated that HDD activities would restrict access to the fishpond and the coconut trees.

Temporary short-term engineering and construction jobs will be created.

6.4.3 Long-Term Impacts

Once completed, the landing site would not affect future fishpond access and restoration, cultural, or economic activities that may be staged or conducted from the parcel.

Maintenance and servicing of the telecommunications lines are expected to support several new permanent jobs including field and office positions. SIC is committed to providing training and educational opportunities, as required by its license agreement with DHHL. However, the number of long-term jobs created by the proposed project is expected to be quite low.

Fiscal impacts associated with this project are expected to primarily result from additional tax revenues to the State due to spending of construction workers' earnings. However, given the low number of employees anticipated, the fiscal impact would be minimal. Since County revenues are primarily limited to property taxes, there should be minimal change to County revenues.

No adverse impacts on resident and worker populations in the project area are expected. The project will be beneficial to those residing on Department of Hawaiian Home Lands by providing broadband services to the telecommunications users.

No significant impacts to the island's housing or resident population are expected as the project does not propose to add any housing units.

6.4.4 Mitigation Measures

In the unlikely event that fishpond access would be restricted due to public safety concerns, SIC shall consult with the community. If necessary, special arrangements shall be made to provide safe passage through the construction area.

6.5 VISUAL AND AESTHETIC RESOURCES

6.5.1 Existing Conditions

Looking in the makai direction from the perspective of Kamahameha V Highway, the Oneali'i Homesteads parcel provides a picturesque view of the ocean, a grove of coconut trees, and Ali'i Fishpond, although the fishpond may not be that visible from the highway. In the mauka direction from the parcel, picturesque views of the East Moloka'i Mountains in the background and a forest of trees just mauka of the highway in the foreground are visible.

6.5.2 Construction or Short-Term Impacts

During the construction period, construction vehicles and equipment will temporarily block some views of the ocean and coconut trees from the highway. This would be a temporary impact during the construction period which is approximately five months.

6.5.3 Long-Term Impacts

All infrastructure associated with the landing site would be underground, and therefore would not affect existing viewplanes or scenic resources.

6.5.4 Mitigation Measures

No permanent visual impacts would occur as a result of the proposed project; therefore no mitigation measures are necessary.

6.6 WATER RESOURCES

6.6.1 Existing Conditions

The Oneali'i Homesteads landing site parcel is adjacent to the shoreline and Pacific Ocean. As noted in Section 6.2.1, Ali'i Fishpond, a 27-acre surface water body enclosed by a manmade wall, is located on the southeast side of the property. The nearshore ocean area fronting the Oneali'i Homesteads landing site parcel is a Class AA water. In accordance with Chapter 11-54 of the Hawai'i Administrative Rules, Water Quality Standards, Class AA waters are to "remain in the natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-cause source or actions."

According to the U.S. Geological Survey Quad Map of the project site, a stream passes through the west side of the proposed landing site parcel. However, perennial streams on the southern slopes of the East Moloka'i Volcano usually do not reach the ocean because of evaporation and seepage. During ordinary weather, water from these streams percolates into permeable basalts. During a site visit, no evidence of a streambed was found, but it may be possible that the streambed is within a dense thicket of vegetation on the west side of the property or within the adjacent westside property.

The entire island overlies a sole source aquifer, which was designated by the U.S. Environmental Protection Agency in May 1994. However, most of Moloka'i's fresh groundwater is within the East Moloka'i Volcano. Due to low rainfall and recharge rates, the basal lens beneath West Moloka'i, the Ho'olehua Plain, and the southern shore of East Moloka'i is entirely brackish. The project site is within the Kamiloloa Aquifer System of the Southeast Aquifer Sector, which is located between Kaunakakai and 'Ōnini gulches. The system is rated as suitable for drinking, and is regarded as irreplaceable and vulnerable to contamination. The caprock along the south Moloka'i coast, including the project site, is weak, which means that it does not prevent the seaward migration of groundwater very well. The weak caprock along the southern Moloka'i coast has caused the formation of numerous springs that feed fresh groundwater into the sea. The springs allowed pre-contact native Hawaiians to develop numerous fishponds along the south shoreline, such as Ali'i Fishpond, which is located next to the project site. Brackish water is ideal for raising certain fish. In a meeting held on March 17, 2003, staff from the Commission on Water Resource Management stated that there is at least one spring in the vicinity of the Oneali'i Homesteads Landing Site.

The lower portion of the parcel is within the 100-year floodplain according to the Flood Insurance Rate Map.

6.6.2 Construction or Short-Term Impacts

Installation of the fiber-optic cable conduit using HDD would not affect surface waters, such as Ali'i Fishpond and the ocean. The construction area would be set back from existing surface waters, HDD operations produce no surface discharges of pollutants, and the contractor would be instructed to implement best management practices (BMPs) to prevent soil erosion and sedimentation at the construction site. The contractor would also have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Excavation needed for trenching and to install the beach manhole on Kamehameha V Highway would probably not cause sedimentary pollutant impacts because these activities would not be near the ocean and the contractor would probably not conduct excavation work during a storm or heavy rain.

The entire construction site would probably be less than one acre. Therefore, a National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Associated with Construction Activity would probably not be needed.

The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore, and discharged into the environment. If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. As noted in Section 1.4.4, bentonite is a naturally-occurring clay material, which is not toxic nor harmful to the ocean environment. In addition, the ocean currents or wave action would dissipate the slurry relatively quickly, such that turbidity effects would be limited. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 6.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

Immediately prior to the drill head emerging into the ocean water from the exit point (EP), the slurry would be replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the EP. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and slurry could be inadvertently released into the ocean water. As noted above, ocean currents would dissipate the slurry relatively quickly, depending on the amount of slurry released. Nevertheless, divers shall be stationed at the EP during this activity (see Section 1.4.4).

HDD operations would not contaminate important groundwater resources, such as the Moloka'i Aquifer, because installation of the landing site conduit would be conducted near the coastline, recharge of the aquifer occurs at upland locations, and the aquifer gradient flows seaward. Although contact with the underlying basalt approximately 32 feet below the surface (see Section 6.1.1) could affect the aquifer, HDD provides directional flexibility both horizontally and vertically, and only a minimum vertical depth of 10 feet from the ground surface is required for the HDD. Therefore, the underlying basalt would not be encountered during construction. See Section 11.1.3 for information regarding compliance with Section 1424(e) of the Safe Drinking Water Act. This regulation addresses the impact of federally financed projects on designated sole source aquifers.

6.6.3 Long-Term Impacts

Once completed the HDD conduit would be underground and therefore would not affect the quality of surface waters, such as Ali'i Fishpond, and groundwater resources. Any flooding occurring on the property would not damage or affect the fiber-optic cable landing because all infrastructure would be underground or waterproofed.

The sides of the HDD bore would be lined by the drill casing, which becomes the conduit. That conduit is anticipated to prevent interaction with groundwater after construction is completed.

6.6.4 Mitigation Measures

The SIC contractor shall be required to conduct BMPs to prevent erosion and sedimentation, and have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Although the Oneali'i Homesteads landing site does not require an NPDES permit for stormwater discharges associated with construction, the same BMPs that would be used under NPDES permits for other sites (see Section 11.4) would also be used for this site.

During drilling, the contractor would constantly monitor the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry would immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the EP when the drill head emerges from the EP shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

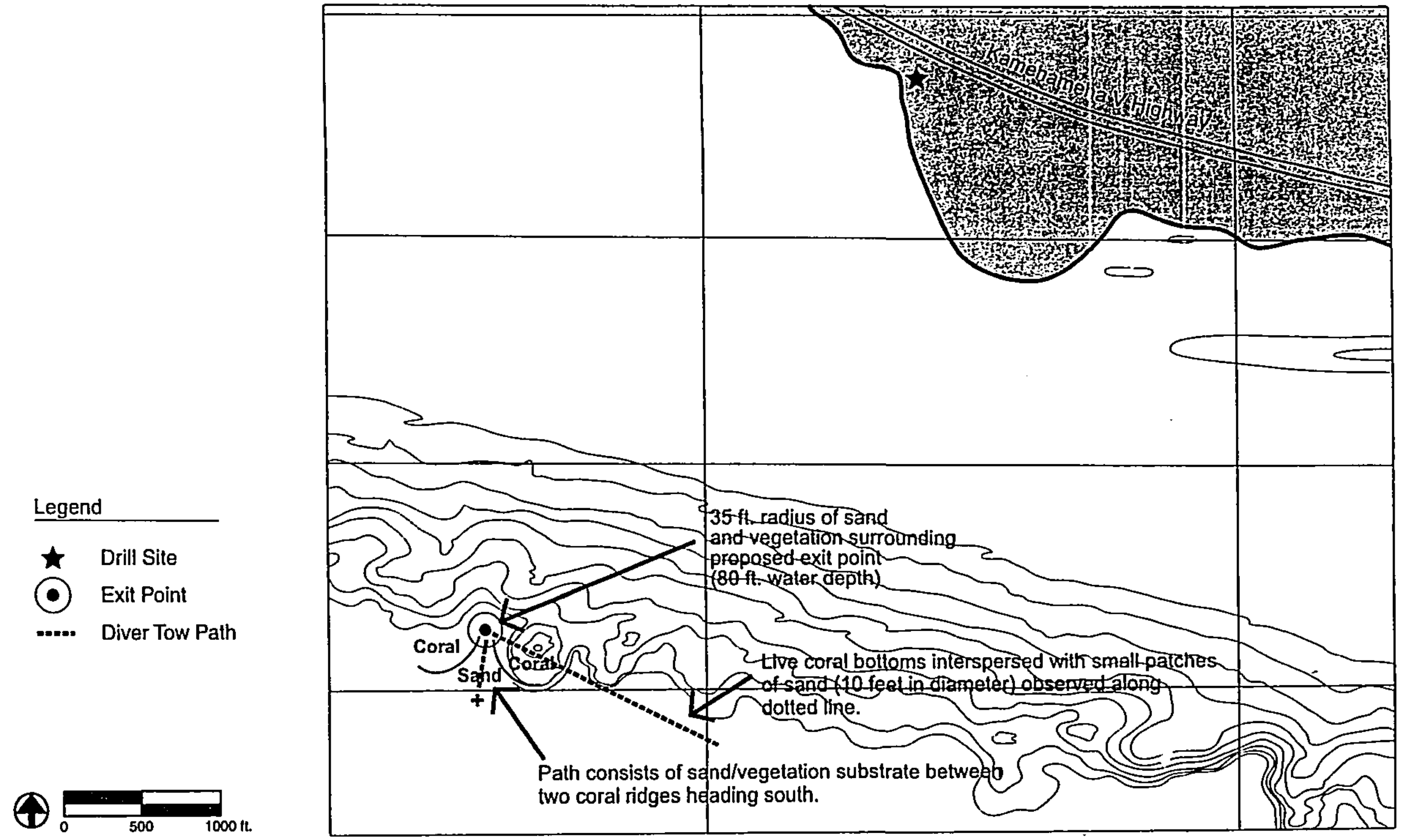
A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

6.7 MARINE AND NEARSHORE CONDITIONS

6.7.1 Existing Conditions

Seaward of the coastline along the south Moloka'i is a flat reef containing well-developed coral communities that extends up to a mile from the shoreline. Nearshore bathymetry data indicates an irregular ocean bottom of numerous mounds and slopes (see Figure 6.7-1). A SCUBA survey conducted for the project located a small sandy area with a radius of about 35 feet at a depth of 80 feet approximately 4,500 feet from the drill location. This site was selected as the proposed HDD EP for the Oneali'i Homesteads landing site (see Section 1.2.3). No depressions were observed shoreward of the EP that could complicate HDD operations. Although there are live coral beds surrounding the sandy



Source: Makai Ocean Engineering, Inc. 2003.

Sandwich Isles Communications, Inc.

Marine Survey of Proposed Exit Point at Oneali'i Homesteads Landing Site
Submarine Fiber-Optic Cable Project
Figure 6.7-1

area, there is a narrow 25-foot channel heading seaward. This corridor was checked to determine if it led to open water (i.e., lack of coral beds), which it did: 400 feet from the exit location at a depth of 102 feet.

Coastal or nearshore areas are vulnerable to a number of natural hazards, in particular storms, hurricanes, tsunamis, and high waves. These natural hazards are discussed below.

Storms and Hurricanes. The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward (north and northeast) sides of the islands in comparison to leeward areas (south and southwest).

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, Kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kaua'i. However, meteorologists warn that no island is safe from hurricanes.

Tsunamis. Tsunamis are a series of large waves caused by one of three geologic processes: (1) earthquakes (the most common); (2) landslides (either submarine or subaerial); and (3) explosive submarine volcanic events. The "Pacific Ring of Fire," which encircles the Pacific Basin reaching as far as Asia, North America, South America and Australia, is a zone of frequent earthquakes and volcanic activity. The Hawaiian Islands are roughly in the middle of the Ring, and therefore have experienced tsunamis originating from different locations. In the past 60 years, six tsunamis originating from the Ring were particularly destructive. Barrier and fringe reefs tend to absorb the energy of the waves and protect the shoreline.

High Waves. In Hawai'i, waves are caused by: (1) the north Pacific swell; (2) the northeast trade wind swell; (3) a south swell; and (4) Kona storm swells. The north Pacific swell is generated by storms in the Aleutian Islands area, and it tends to produce wave heights 8 to 30 feet on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast trades produce wave heights 4 to 12 feet on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range one to four feet. Kona storm (see above) waves average 10 to 15 feet and can occur at any time of the year.

6.7.2 Construction or Short-Term Impacts

The 35-foot-radius sandy area located about 4,500 feet from the drill location at a depth of 80 feet is suitable as a HDD EP. The directional finding capabilities of HDD technology are more than adequate in targeting this location. Seaward of the EP, the cable would be positioned along the 25-foot-wide sandy corridor for about 400 feet. These measures would prevent damage to coral beds.

As stated in Sections 1.2.1 and 6.6.2, the bentonite and water mixture used for drilling slurry would be replaced by water prior to the drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP (also see Section 6.6.2).

6.7.3 Long-Term Impacts

The USGS has provided ratings regarding various coastal hazards along the entire shoreline of Hawai'i, including overall hazard assessments. For the Oneali'i Homesteads landing site parcel, the USGS provided an overall moderately low hazard assessment (level 3 on a scale from 1 to 7) due to potential hazards from storms, rise in sea level and volcanic or seismic events.

It is highly unlikely that a storm would damage the Oneali'i Homesteads landing site infrastructure because the fiber-optic cable would be underground and wave action caused by storms would not have much effect at 80 feet, the proposed depth of the EP. Nevertheless, the underwater cable would have double armor protection at depths shallower than about 350 feet (see Chapter 1).

A rise in sea level along the southern Moloka'i coast would be a catastrophic event to the community. Should such an event cause the relocation of Kamehameha V Highway to a mauka location, this would force the relocation of the SIC's terrestrial network and cause a modification to the landing site.

Depending on the location of the volcanic or seismic event, the fiber-optic cable landing could be damaged.

6.7.4 Mitigation Measures

Since the 25-foot-wide sand corridor is relatively narrow, manual positioning of the cable shall be required to accurately follow the corridor from open ocean to the EP.

6.8 TERRESTRIAL AND AQUATIC BIOLOGY

6.8.1 Existing Conditions

Terrestrial

A terrestrial flora survey was conducted for the project on the Oneali'i Homesteads landing site parcel (see Appendix 4). The vegetation on the parcel is dominated by buffelgrass (*Cenchrus ciliaris*) of one to two feet tall, which is common in dry areas and sandy soils in a wide variety of disturbed habitats throughout the islands. Within scattered clumps or patches among the buffelgrass are shrubs of Indian pluchea (*Pluchea indica*), sourbush (*Pluchea carolinensis*), koa haole (*Leucaena leucocephala*), and klu (*Acacia farnesiana*). Two common native species, the 'uhaloa (*Waltheria indica*) and 'ilima (*Sida fallax*), are also interspersed with the other species. The east side of the property adjacent to the next house lot supports weedy species sporadically among the buffelgreass that include spiny amaranth (*Amaranthus spinosus*), Guinea grass (*Panicum maximum*), garden spurge (*Chamaesyce hirta*), hairy horseweed (*Conyza bonariensis*), little ironweed (*Cyanthillium cinereum*), and pitted beardgrass (*Bothriochloa pertusa*).

The west side of the parcel is lined by a row of coconut palms (*Cocos nucifera*) that are about 25 to 35 feet tall, and a large false kamani or tropical almond tree (*Terminalia catappa*). There are also a few small mangrove trees (*Rhizophora mangle*) about 15 to 20 feet inland from the shore, which suggests this area may be intermittently wet during high tide.

A small grove of coconut palms that are about 50 to 60 feet tall is the most distinctive feature on the makai side of the property near the shoreline and Ali'i Fishpond. Much of the makai area is overlaid with bare sandy soil with patchy ground cover of two native coastal species, 'akulikuli (*Sesuvium* *portulacastrum*) and kipukai (*Heliotropium curassavicum*). However, the dominant vegetation near the shoreline is pickleweed (*Batis maritima*) and mangrove, which also dominates the rock wall that encloses the fishpond.

The four native species on the property, 'Uhaloa, 'ilima, Kipukai and 'akulikuli, are indigenous (native to the Hawaiian Islands and elsewhere), and these and other species found on the Oneali'i Homesteads site are not listed as threatened or endangered species or a species of concern by the U.S. Fish and Wildlife Service (USFWS). In general, the parcel has been greatly disturbed and is dominated primarily by introduced species.

As described in Section 6.2, the proposed landing site parcel is in a rural area, adjacent to a few single-family residences. Therefore, the parcel may be used by introduced fauna species that are common throughout the Hawaiian Islands, such as feral pigs, rats, mice, cats and dogs. Avifauna common to the area include the northern and red-crested cardinal, common mynah, Japanese white-eye, house finch and house sparrow.

Aquatic

The ocean bottom at the EP of the Oneali'i Homesteads landing site is sandy with a community of well-developed *Halimeda incrassata*, a calcifying green algal species normally found in West Maui, which covered about 25 percent of the sandy area (see Appendix 5). Finding this species was unexpected. The microinvertebrate census conducted for the project noted a flea cone shell (*Conus pulicaris*) and a black sea cucumber (*Holothuria atra*) (see Appendix 5). The fish survey encountered three species of fish (six individuals), and the estimated standing crop of fish was 0.6 g/m^2 (grams per square meter).

Surrounding the sandy area is a near continuous ridge of live coral, except for a 25-foot-wide sandy channel aligned in a seaward direction that is described in Section 6.7. A survey of a section of this coral noted five coral species covering an area of about 82 percent, with *Porites compressa* and *Montipora verrucosa* being the dominate species (see Appendix 5). The microinvertebrate census noted four species and the fish survey observed eighteen species (183 individuals). The most abundant species of fish were the black surgeonfish (*Acanthurus thompsoni*), the goldring surgeonfish or kole (*Ctenochaetus strigosus*) and the yellow tang or Lau'ipala (*Zebrasoma flavescens*). The standing crop of fish at the survey station was estimated at 61 g/m^2.

6.8.2 Construction or Short-Term Impacts

After construction is completed, the contractor would return the site as much as possible to its pre-construction condition. The plant species most affected, buffelgrass, as well as the other plants and weedy species affected by construction, would revegetate quickly.

Using the sandy area as the EP, as proposed in Section 1.2.3 for the Oneali'i Homesteads landing site, and using the sandy channel to lay the cable seaward from the 80-foot isobath would avoid potential adverse impacts to well-developed coral communities that surround these areas, as well as the overall aquatic biological environment.

The proposed deployment of directional drilling avoids problems with deploying cables on the surface of the seafloor and possibly impacting sessile species (permanently attached or fixed) such as corals. An added benefit to the use of directional drilling is the protection afforded to the cable in the shallow water where storm surf could result in cable failure. The proposed alignment will utilize directional drilling thereby avoiding marine communities and any impacts in coastal waters. The bentonite and water mixture used for drilling slurry would be replaced by water immediately prior to the HDD drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP. In the event of an accidental discharge of slurry during drilling or at the EP (see Section 6.6.2), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidy relatively quickly. Also, slurry is not toxic or hazardous to marine life.

When laying cable, caution must be taken to avoid adverse interactions with protected species of marine mammals that occur in Hawai'i's waters. Although humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying operations within these months. If a whale or other protected species is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation would also be halted until the animal moves away of its own volition. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

6.8.3 Long-Term Impacts

No long-term impacts on terrestrial botanical resources are anticipated as all construction equipment and machinery will be removed from the landing site once construction and installation is completed. The site and connecting route will be restored to existing conditions following removal of construction equipment.

No long-term impacts on marine communities are anticipated, particularly since the cable will be laid on sand substratum and will "sink" into the sand. The shifting nature of sand and its continual movement will usually bury any deployed cable with time. Marine species found in sand habitats have evolved to live in this continually moving substratum thus placing a cable on this substratum which will become buried will not materially hinder any of these species.

6.8.4 Mitigation Measures

Because the proposed action would have no short- or long-term adverse impacts on any flora or terrestrial fauna, threatened and endangered species, or their critical habitat, no mitigation measures are required. After construction is completed, the contractor will return the site to its pre-construction condition.

The mitigation measures below are proposed to avoid adverse interactions with marine animals during construction.

Immediately before and during the pop-out event, an underwater diver shall observe the environment before attaching the cable. If a protected animal is observed in the immediate vicinity of the EP, the pop-out event shall be delayed until the animal moves away from the project area of its own volition.

If any protected species is detected during construction, including marine mammals and sea turtles, cable deployment shall be halted until they move away from the vessel or the cable deployment area.

The bentonite and water mixture used for drilling slurry will be replaced by water immediately prior to the HDD drill head emerging from the EP preventing bentonite from releasing into the ocean.

6.9 AIR QUALITY

6.9.1 Existing Conditions

Air quality in the State of Hawai'i is helped by offshore trade winds that disperse urban air pollutants. Data collected by the State of Hawai'i Department of Health (SDOH) indicate that the State has some of the best air quality conditions in the nation. To monitor air quality, the SDOH operates a network of stations at various locations throughout the islands. Moloka'i generally has good air quality because it does not support conditions that typically lead to air quality problems such as very urban conditions (i.e., traffic congestion), polluting industries or agriculture activities (e.g., sugarcane burning).

6.9.2 Construction or Short-Term Impacts

Some excavation work would be required to set up the drilling operation, but more importantly, excavation would be required to install the beach manhole within the Kamehameha V Highway right-of-way and trenching between the drill spot and the beach manhole. Noticeable dust emissions may occur from the trenching and beach manhole excavations especially if the excavated soil is dry and weather conditions are windy. Since groundwater was encountered at relatively shallow depths during soil sampling (see *Section 6.1.1), the expectation is that the excavated soil would be wet.*

The HDD drill rig, compressor and other construction-related vehicles emit engine exhaust, which would temporarily contribute to air pollutants in the vicinity of the work area. Most of the equipment and vehicles, including the drill rig and compressor, are diesel-powered, which emit relatively high levels of nitrogen oxide (NO_X) in comparison to gasoline-powered equipment. However, standards for such pollutants are set on a regional basis, and would therefore not be violated by short-term construction equipment emissions.

6.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality is anticipated because the work site will be restored to its original condition after the cable-laying process is completed and construction equipment is removed. After construction is completed and the Oneali'i Homesteads landing site would experience no further activity that could potentially degrade air quality.

6.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality, such as no visible dust emissions outside the affected parcel. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses.

Upon completion of work the project site shall be re-vegetated as appropriate.

6.10 NOISE

6.10.1 Existing Conditions

There are no industrial sources of noise near the Oneali'i Homesteads landing site parcel other than occasional construction activities. Although the parcel is adjacent to Kamehameha V Highway, the roadway experiences very low traffic volumes, keeping noise levels relatively low.

6.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of noise is expected to come from use of heavy machinery, such as bulldozers, directional boring rig, and trucks entering and leaving the site during the drilling period, expected to last up five months. Noise produced by this operation may occasionally be as high as 90 to 94 decibels at 50 feet away, which is comparable to the noise from a lawnmower. HDD operations and other construction activities will be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would more than likely violate Community Noise Control Standards; therefore, the SIC contractor would require a noise permit from the SDOH.

The noise generated by HDD operations and other construction activities at the Oneali'i Homesteads landing site parcel would disturb residents of at least two houses located on both the east and west sides of the parcel. The duration of overall construction, which includes HDD staging and breakdown, drilling operations, and trenching, would be about five months. This is about two months longer than the other sites because two bores would have to be drilled. The Oneali'i Homesteads landing site is the only site that is the terminus of two ocean cable routes.

6.10.3 Long-Term Impacts

There would be no project-related noise once construction is completed. No long-term impacts are expected as there will be no operational requirements for the manhole site except for an occasional maintenance repair technician visiting the site on an as-needed basis.

6.10.4 Mitigation Measures

HDD operations and other construction activities shall be conducted within the hours allowed for construction under State law, i.e, 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would likely violate Community Noise Control Standards; therefore the SIC contractor would require a noise permit from the SDOH.

Prior to the start of construction, SIC or its contractor shall inform all nearby residences about the proposed construction schedule and anticipated noise impact. SIC shall provide contact information where residents may call to ask questions or report problems. In general, the contractor shall be the point of contact to the community during construction. However, members of the community shall be able to contact SIC if they are dissatisfied with how the contractor resolves noise or other problems, or have complaints about the contractor.

The SIC contractor shall be required to maintain his or her HDD drilling equipment in proper working order, especially all noise suppression systems, such as the rig's muffler.

6.11 PUBLIC FACILITIES

6.11.1 Existing Conditions

Kamehameha V Highway, which is owned and maintained by the State of Hawai'i Department of Transportatin (SDOT), immediately fronts the proposed landing site parcel. The highway has two lanes (one-lane in each direction) and serves as a main thoroughfare on the southeast coastline and passes through Kaunakaka.

The highway right-of-way is used for other infrastructure, including overhead power and telephone lines on the mauka side of the highway and domestic waterlines on the makai side of the highway. It does not contain wastewater transmission lines since land uses east of Kaunakakai use cesspools or septic tanks to handle wastewater. SIC is currently constructing its terrestrial fiber-optic duct network within this and other highway rights-of-way. Detailed descriptions and locations of utilities located with the right-of-way will be analyzed during final design.

6.11.2 Construction or Short-Term Impacts

The fiber-optic landing site would connect directly to SIC's terrestrial network within the Kamehameha V Highway right-of-way. The landing site beach manhole would be placed within the highway right-of-way for ease of access by SIC personnel. The beach manhole would be designed to not interfere with existing waterlines within the highway right-of-way.

Construction of the beach manhole may require temporary closure of a traffic lane. Traffic congestion is not expected even during peak hours due to the small number of vehicles using the highway.

6.11.3 Long-Term Impacts

After construction, the SIC contractor would be required to return the project site to pre-construction conditions. Therefore, landing site infrastructure, which includes a fiber-optic conduit and beach manhole, would not affect maintenance of the highway or its other infrastructure, nor would it prevent the expansion of existing infrastructure or installation of new infrastructure within the highway right-of-way.

6.11.4 Mitigation Measures

SIC shall coordinate work on Kamehameha V Highway with the SDOT, including ensuring that design specifications meet SDOT standards. Design plans shall be reviewed by SDOT.

During construction work on Kamehameha V Highway, flagmen and/or police officers shall be posted to direct traffic safely around the construction of the proposed manhole.

SIC shall coordinate with the County of Maui to ensure that the landing site connection to the terrestrial duct line and placement of the beach manhole would not damage its waterlines or interfere with future utility plans.

Chapter 7

Lahaina, Maui Landing Site: Environmental Setting, Impacts, and Proposed Mitigation

CHAPTER SEVEN: LAHAINA, MAUI LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

7.1 TOPOGRAPHY AND GEOLOGIC CONDITIONS

7.1.1 Existing Conditions

Maui consists of two major volcanoes, the West Maui Mountains and Haleakalā. The older volcano, the West Maui Mountains, may be extinct. It consists of steep valleys and peaks carved by numerous streams. The younger volcano is Haleakalā. Unlike the West Maui Mountains, Haleakala is a classic rounded dome typical of a shield volcano. Both volcanoes are connected by the Maui Isthmus, a relatively narrow, gently sloping plain.

The proposed Wahikuli fiber-optic cable landing site parcel is located on the western coastline of Maui in north Lahaina. The entire parcel is approximately one acre in size. It is basically flat and about ten feet above sea level. The parcel is separated from the shoreline by HonoaPi'ilani Highway and a beach park.

Soil sampling was conducted within the parcel and at a location near the shoreline across the highway. Geologic conditions of the drill site parcel consist of a nine-foot-thick layer of fill consisting of medium-stiff to hard sandy/clayey silt and dense to very dense basalt gravel, cobbles and boulders. Below this layer is medium-dense silty gravel with sand and basalt cobbles to a depth of about 18 feet below the surface. A hard basalt rock formation was encountered at a depth of about 21 feet. Groundwater was encountered at a depth of about 11 feet below the surface. Geologic conditions near the coastline consist of medium-dense silty sand and gravel of about eight feet below the surface. Below this layer is a clinker layer consisting of medium dense sandy gravel with boulders to a depth of about 16 feet below the surface, followed by dense silty sand to a depth of about 26 feet. A very hard basalt rock formation was encountered at a depth of about 51 feet.

Hazardous Materials

Since present and historic land uses in the project area could have produced site contamination, a database search was conducted to investigate the potential for the project site to contain hazardous materials (see Appendix 6). The search included federal and State environmental databases in accordance with the American Society for Testing and Materials standards for environmental site assessments (E1527-00). The database search found no records of hazardous material sites on the Wahikuli parcel, nor within one mile of the parcel. The database search does not cover off-shore sites.

7.1.2 Construction or Short-Term Impacts

Based on geologic conditions of the Wahikuli landing site parcel and near the shoreline, problems in conducting HDD operations from the parcel are not anticipated. The vertical alignment of the bore would avoid the basalt rock formation between the distance of the drill spot and the shoreline. The vertical alignment of the bore would probably not travel through basalt seaward of the shoreline. The difference in depth (30 feet) of the basalt formation between the drill site and the sampling location near the shoreline suggests that the depth of the basalt formation is increasing at a much faster rate than the elevation above and below the mean sea level.

The beach manhole would be placed within the Honoapi'ilani Highway right-of-way, and would require excavation. Soils contaminated by hazardous materials are not expected to be encountered during HDD operations or other excavation activities. Excavated areas would be backfilled with the same material. Excess excavated material, such as from the beach manhole site, would be disposed of properly in accordance with State Department of Health (SDOH) regulations. Once the landing site has been completed, the affected parcel would be restored to its pre-construction condition.

7.1.3 Long-Term Impacts

Once completed, fiber-optic cable conduit would be underground, and would not change the grade or topography of the landing site parcel. The only evidence of the landing site would be a manhole cover within the HonoaPi'ilani Highway right-of-way.

7.1.4 Mitigation Measures

Mitigation is not required.

7.2 LAND USE

7.2.1 Existing Conditions

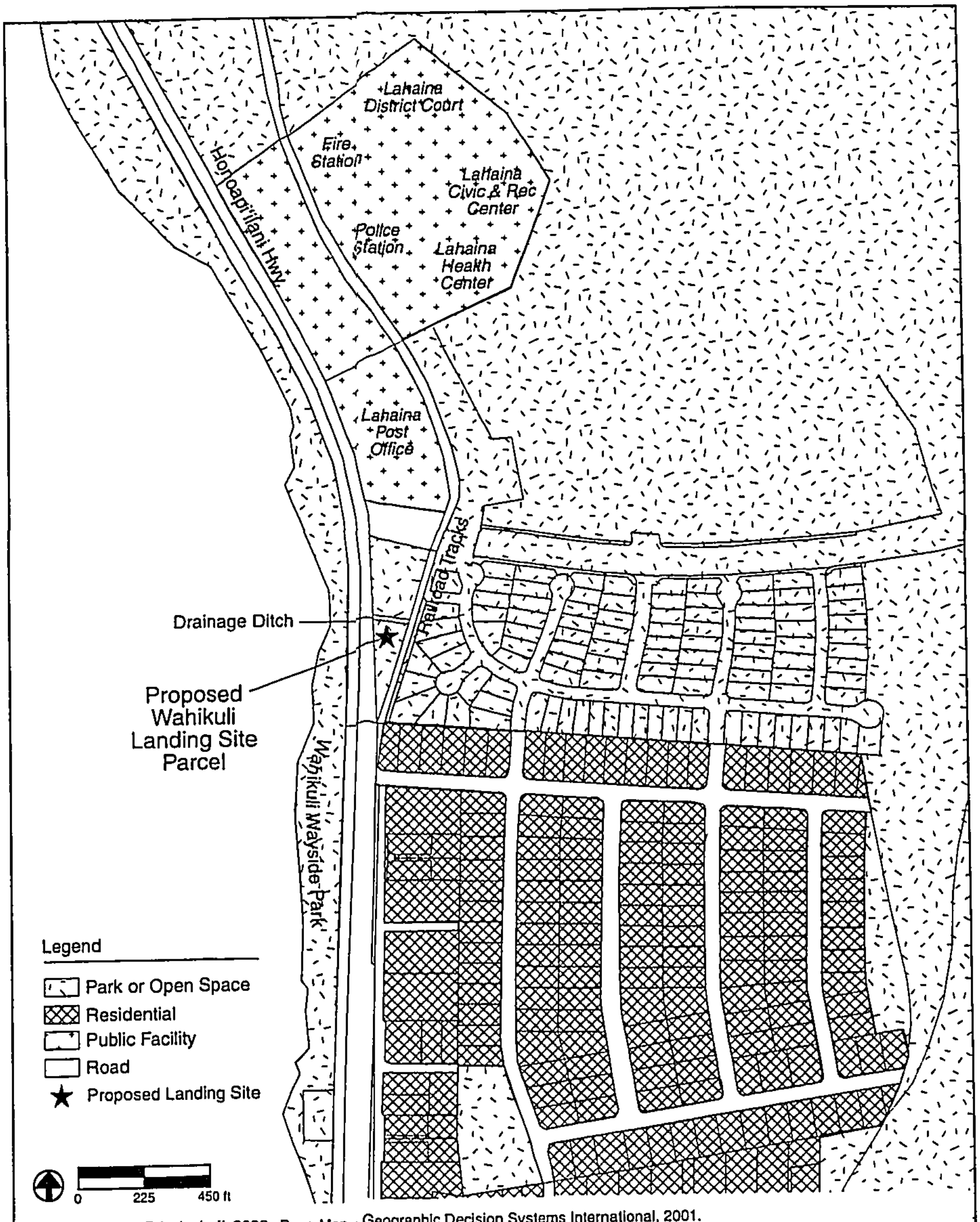
The proposed Wahikuli landing site parcel is located on the north side of Lahaina, a town on the western side of the island (see Figure 1.1-2D). Historic downtown Lahaina, a former capital of Hawaii is a well-known visitor attraction that features small shops and restaurants lies about a mile and a half south of the landing site. Kā'anapali, a major visitor accommodation area that includes luxury resorts and hotels, is located about one mile north of the landing site.

The proposed landing site is within a vacant one-acre parcel (TMK 2-4-5-021:015) owned by the State of Hawai'i, Department of Land and Natural Resources (DLNR) (see Figure 7.2-1). The parcel is triangular-shaped and is sandwiched between the HonoaPi'ilani Highway and the Lahaina Kā'anapali and Pacific Railroad narrow-gage tracks. The railroad is used for the "Sugar Cane Train," a popular visitor attraction, offering open-air train rides. On the west side of the proposed landing site parcel across the train tracks is an open field that is planned to be developed into single-family residences. The Lahaina Post Office occupies the property immediately north of the Wahikuli site parcel. Land uses beyond the post office include the Lahaina Police Station, Fire Station, Civic and Recreation Center and District Court. On the west side of the landing site parcel across HonoaPi'ilani Highway is the County owned and operated Wahikuli Wayside Park. The entrance into the park is just south of the landing site parcel. A residential community of single-family houses occupies the land to the south of the landing site parcel.

As noted above, the landing site parcel is vacant. (Figure 7.2-2 provides photographs of the Wahikuli landing site parcel.) The parcel is bisected by a rock-lined drainage ditch roughly in the middle of the parcel. The north side of the ditch is relatively well landscaped consisting of a grass lawn. This area is used to place overhead utilities underground. The area to the south of the ditch would be used as the drilling site. The ground vegetation in this area is weedy (see Section 7.8), but appears to be periodically mowed.

7.2.2 Construction or Short-Term Impacts

The drill site would be located within the area south of the drainage ditch. No existing building or structure would be affected by construction. HDD operations would also not interfere with the railway, Wahikuli Park usage, the post office or any other County facility to the north of the parcel. Once completed, the parcel would be restored to its pre-construction condition. The landing site beach



Source: Parsons Brinckerhoff, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

Existing Land Uses - Wahikuli Landing Site
Submarine Fiber-Optic Cable Project
Figure 7.2-1

South view of parcel

North view of parcel

Source: Parsons Brinckerhoff, 2002.

Sandwich Isles Communications, Inc.

Photos of Wahikuli Landing Site Parcel
Submarine Fiber-Optic Cable Project
Figure 7.2-2

manhole would be placed within the highway right-of-way and would connect directly with SIC's terrestrial route planned to be installed within the highway right-of-way.

7.2.3 Long-Term Impacts

The landing site's fiber-optic cable would not be placed within the drill site property. It would terminate at the beach manhole within the Honoapi'ilani Highway right-of-way. Although a utility easement for the beach manhole would be obtained from the State Department of Transportation (SDOT), the owner of the highway, a permanent easement would not be needed from DLNR. An easement would be obtained from the County of Maui within the Wahikuli Wayside Park property.

7.2.4 Mitigation Measures

Mitigation is not necessary.

7.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

7.3.1 Existing Conditions

As described in Section 7.2, the proposed Wahikuli landing site parcel is vacant. It has no visible evidence of archaeological or historic resources on the surface. To determine if the parcel contains subsurface resources, seven backhoe trenches were dug and examined under the supervision of an archaeologist. This inventory survey excavation found no evidence of significant historic resources (see Appendix 3).

7.3.2 Construction or Short-Term Impacts

Installation of the fiber-optic cable at the proposed Wahikuli landing site would not affect archaeological or historic resources.

Since a federal loan is being used for the project, compliance with Section 106 of the National Historic Preservation Act (NHPA) is required. In addition, the project is subject to review by the State Historic Preservation Division in accordance with Section 6E-8 of the Hawai'i Revised Statutes (HRS) because the project requires permits or approvals from the State of Hawai'i and the County of Maui. See Sections 11.1.1 and 11.2.4 for information regarding compliance with NHPA Section 106 and HRS Section 6E-8.

7.3.3 Long-Term Impacts

Once completed, the Wahikuli landing site infrastructure would not affect archaeological or historic resources.

7.3.4 Mitigation Measures

An archaeologist shall be on-site to monitor excavation for the HDD slurry pit to ensure that any "significant" material or resource is not inadvertently damaged during this activity. If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist.

7.4 CULTURAL, SOCIAL, AND ECONOMIC ACTIVITIES

7.4.1 Existing Conditions

The resident population in Lahaina was 9,238 in 2000 (U.S. Census Bureau). The area of Lahaina was occupied in pre-contact times, supported by brackish and fresh water ponds, and was home to many high ranking chiefs. Kamehameha I resided in Lahaina after defeating the Maui ruler, Kahekili, until he established his court in Honolulu. Lahaina was an important town for the whaling industry during the mid-part of the 19th Century. The town during the latter part of the 19th Century became important in the sugar cane cultivation industry. Pioneer Mill Company became the dominant commercial sugar cane production business in the region, developing a five-mile-long railroad from its mill in Lahaina north to Pu'ukoli'i Village in Hanaka'o'o to haul sugar cane. The Company is known today as Amfac, Inc. Sugar cane continued to be Lahaina's most important industry throughout the 20th Century. Tourism is Lahaina's principal industry today and has been for the past few decades. Sugar cane is no longer cultivated in West Maui. The Front Street area in the town center features dozens of restaurants and retail shops and is a popular locale for tourists.

As stated in Section 7.2, the Wahikuli landing site parcel is vacant. It does not provide recreational, social, cultural or economic uses. The property is remnant land that is currently used for utility and drainage purposes. Recreational facilities are provided at the popular Wahikuli Wayside Park located across HonoaPi'ilani Highway along the shoreline. The park provides picnicking and swimming amenities. Access to the park from HonoaPi'ilani Highway is located several hundred feet south from the landing site parcel, across from the residential subdivision described in Section 7.2. The historic railroad tracks adjacent to the property are used by "The Sugar Cane Train," a popular recreational activity for tourists and residents.

7.4.2 Construction or Short-Term Impacts

Use of the Wahikuli landing site parcel to install SIC's fiber-optic cable landing site would not affect any cultural, recreational, social or economic activity. For example, construction would not affect park users, especially since the construction site and park are separated by a busy highway. Users of the railroad would see the HDD operation when passing by the property during the construction period, which would be up to three months long.

Temporary short-term engineering and construction jobs will be created.

7.4.3 Long-Term Impacts

Once completed, the landing site would not affect cultural, recreational, social or economic activities, including park or railroad use.

Maintenance and servicing of the telecommunications lines are expected to support several new permanent jobs including field and office positions. SIC is committed to providing training and educational opportunities, as required by its license agreement with DHHL. However, the number of long-term jobs created by the proposed project is expected to be quite low.

Fiscal impacts associated with this project are expected to primarily result from additional tax revenues to the State due to spending of construction workers' earnings. However, given the low number of employees anticipated, the fiscal impact would be minimal. Since County revenues are primarily limited to property taxes, there should be minimal change to County revenues.

No adverse impacts on resident and worker populations in the project area are expected. The project will be beneficial to those residing on Department of Hawaiian Home Lands by providing broadband services to the telecommunications users.

No significant impacts to the island's housing or resident population are expected as the project does not propose to add any housing units.

7.4.4 Mitigation Measures

Mitigation is not necessary other than standard measures meant to protect public safety during construction.

7.5 VISUAL AND AESTHETIC RESOURCES

7.5.1 Existing Conditions

The Wahikuli landing site parcel is not considered a scenic resource, other than providing mauka and makai open space viewplanes between a residential subdivision and public buildings from the perspective of Honoapi'ilani Highway and the railroad, respectively (see Section 7.2). The area mauka of the site is an open field planned to be developed into single-family residences.

7.5.2 Construction or Short-Term Impacts

Construction vehicles and equipment would temporarily block some views of the mauka area from the perspective of the highway, and some makai views from the perspective of the railroad. This would be a temporary impact during the construction period which would be up to three months.

7.5.3 Long-Term Impacts

All infrastructure associated with the landing site would be underground, and therefore would not affect existing viewplanes or scenic resources.

7.5.4 Mitigation Measures

No permanent visual impacts would occur as a result of the proposed project; therefore no mitigation measures are necessary.

7.6 WATER RESOURCES

7.6.1 Existing Conditions

The Wahikuli landing site parcel is adjacent to the shoreline and Pacific Ocean, but separated by Wahikuli Wayside Park and HonoaPi'ilani Highway. The nearshore ocean area fronting the Wahikuli landing site parcel is a Class A water. In accordance with Chapter 11-54 of the Hawai'i Administrative Rules, Water Quality Standards, Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters.

According to the U.S. Geological Survey Quad Map of the project site, an intermittent stream passes through the property. As described in Section 7.2, this stream is a drainage ditch that bisects the property roughly in the middle. The inlet (mauka side) and outlet (makai side under the highway) of the ditch are by pipe.

As stated in Section 7.1, groundwater was encountered at a depth of 11 feet during soil sampling. Due to the location of the project site near the coastline, this water is probably brackish.

The northern portion of the property is within a 100-year floodplain according to the Flood Insurance Rate Map.

7.6.2 Construction or Short-Term Impacts

Installation of the fiber-optic cable conduit using HDD would not affect the ocean. The construction area would be set back from the ocean. HDD operations produce no surface discharges of pollutants, and the contractor would be instructed to implement best management practices (BMPs) to prevent soil erosion and sedimentation at the construction site. The contractor would also have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Excavation needed to install the beach manhole on Honoapi'ilani Highway would probably not cause *sedimentary pollutant impacts* because this activity would not be near the ocean and the contractor would probably not conduct excavation work during a storm or heavy rain.

The entire construction site would be less than one acre. Therefore, a National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Associated with Construction Activity would probably not be needed.

The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore, and discharged into the environment. If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. As noted in Section 1.4.4, bentonite is a naturally-occurring clay material, which is not toxic nor harmful to the ocean environment. In addition, the ocean currents or wave action would dissipate the slurry relatively quickly, such that turbidity effects would be limited. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 7.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

Immediately prior to the drill head emerging into the ocean water from the exit point (EP), the slurry would be replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the EP. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and slurry could be inadvertently released into the ocean water. As noted above, ocean currents would dissipate the slurry relatively quickly, depending on the amount of slurry released. Nevertheless, divers shall be stationed at the EP during this activity (see Section 1.4.4).

7.6.3 Long-Term Impacts

Once completed, the HDD conduit would be underground and therefore would not affect the quality of the Pacific Ocean or groundwater resources. Any flooding occurring on the property would not damage or affect the fiber-optic cable landing because all infrastructure would be underground or waterproofed.

The sides of the HDD bore would be lined by the drill casing, which becomes the conduit. That conduit is anticipated to prevent interaction with groundwater after construction is completed.

7.6.4 Mitigation Measures

The SIC contractor shall be required to conduct BMPs to prevent erosion and sedimentation, and have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Although the Wahikuli landing site does not require an NPDES permit for stormwater discharges associated with construction, the same BMPs that would be used under NPDES permits for other sites (see Section 11.4) would also be used for this site.

During drilling, the contractor would constantly monitor the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry would immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the EP when the drill head emerges from the EP shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

7.7 MARINE AND NEARSHORE CONDITIONS

7.7.1 Existing Conditions

Seaward of the coastline from the Wahikuli Landing site parcel is primarily basalt rock with a steep angle of repose (see Section 7.1.1). A limestone platform extends from the shoreline about 130 feet to 260 feet. A deeper zone of sand and Halimeda (calcifying green algal species) beds extend seaward beyond the limestone platform. Nearshore bathymetry data is provided in Figure 7.7-1.

Using an estimated EP developed from existing bathymetric data, a SCUBA survey conducted for the project identified a bottom substrate of sand and scattered vegetation at a depth of 58 feet approximately 2,860 feet from the drill location. This site was selected as the proposed HDD EP for the Wahikuli landing site (see Section 1.2.3). Only sand at least two feet deep and vegetation were observed within and beyond a 100-foot radius of the EP. No depressions that could complicate HDD operations were observed shoreward of the EP.

Coastal or nearshore areas are vulnerable to a number of natural hazards, in particular storms, hurricanes, tsunamis, and high waves. These natural hazards are discussed below.

Storms and Hurricanes. The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward (north and northeast) sides of the islands in comparison to leeward areas (south and southwest).

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, Kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kaua'i. However, meteorologists warn that no Hawaiian island is safe from tropical cyclones.

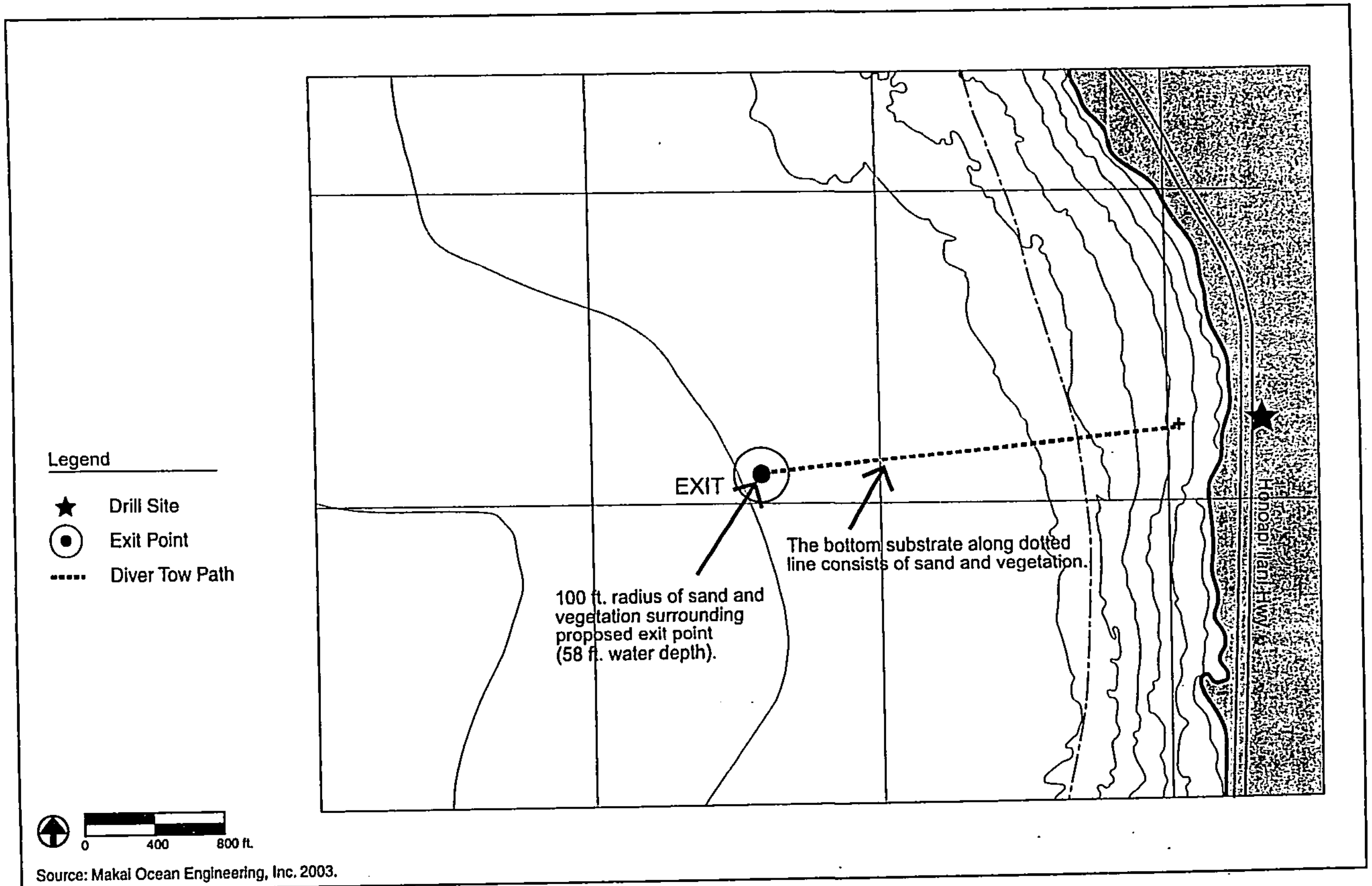
Tsunamis. Tsunamis, a series of large waves, are caused by one of three geologic processes: (1) earthquakes (the most common); (2) landslides (either submarine or subaerial); and (3) explosive submarine volcanic events. The "Pacific Ring of Fire," which encircles the Pacific Basin reaching as far as Asia, North America, South America and Australia, is a zone of frequent earthquakes and volcanic activity. The Hawaiian Islands are roughly in the middle of the Ring, and therefore, have experienced tsunamis originating from different locations. In the past 60 years, six tsunamis originating from the Ring were particularly destructive. Barrier and fringe reefs tend to absorb the energy of the waves and protect the shoreline.

High Waves. In Hawai'i, waves are caused by: (1) the North Pacific swell; (2) the northeast trade wind swell; (3) a south swell; and (4) Kona storm swells. The North Pacific swell is generated by storms in the Aleutian Islands area, and it tends to produce wave heights 8 to 30 feet on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast trades produce wave heights 4 to 12 feet on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range one to four feet. Kona storm (see above) waves average 10 to 15 feet and can occur at any time of the year.

7.7.2 Construction or Short-Term Impacts

The sandy/vegetative area located about 2,860 feet from the drill location at a depth of 58 feet is suitable as a HDD EP. The directional finding capabilities of HDD technology are more than adequate in targeting this location, especially since the margin of error is a radius of 100 feet.

As stated in Sections1.2.1 and 8.6.2, the bentonite and water mixture used for drilling slurry would be replaced by water prior to the drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP (also see Section 7.6.2).



Sandwich Isles Communications, Inc.

Marine Survey of Proposed Exit Point at Wahikuli Landing Site
Submarine Fiber-Optic Cable Project
Figure 7.7-1

7.7.3 Long-Term Impacts

The USGS has provided ratings regarding various coastal hazards along the entire shoreline of Hawai'i, including overall hazard assessments. For the Wahikuli landing site parcel, the USGS provided an overall hazard assessment of moderate (level 4 in a scale from 1 to 7) due to potential hazards from tsunami and stream flooding.

It is highly unlikely that a tsunami would damage the landing site infrastructure of Wahikuli parcel because the fiber-optic cable would be underground and wave action caused by the tsunami would not have much effect at a depth of 58 feet, the depth of the proposed EP. However, a tsunami may cause landside debris to flow into the ocean as the water recedes from the shore. This debris could damage or break a cable. Therefore, the underwater cable would have double armor protection at depths shallower than about 350 feet.

7.7.4 Mitigation Measures

Mitigation is not necessary.

7.8 TERRESTRIAL AND AQUATIC BIOLOGY

7.8.1 Existing Conditions

Terrestrial

A terrestrial flora survey was conducted for the project on the Wahikuli landing site parcel (see Appendix 4). As noted in Section 7.2.1, one half of the parcel is a grass lawn, and the other half is weedy, but appears to be periodically mowed. These areas are separated by a drainage ditch. The vegetation of the weedy area consists primarily of buffelgrass (*Cenchrus ciliaris*) and a large number of weedy species that are commonly associated with ruderal or wayside areas. The vegetation in the drainage ditch includes 8- to 12-foot tall clumps of Guinea grass (*Panicum maximum*) and Koa haole (*Leucaena leucocephala*), with dense buffelgrass along the drainage banks. The only native species found in the weedy area and the ditch is the 'Uhaloa (*Waltheria indica*), an indigenous species (i.e., native to Hawai'i and elsewhere). All other species found on the parcel are introduced or alien, and are common or abundant throughout the islands.

No flora species found on the Wahikuli Park site are listed as a threatened or endangered species or a species of concern by the U.S. Fish and Wildlife Service (USFWS).

As described in Section 7.2.1, the proposed Wahikuli landing site parcel is within Lahaina, with nearby urban uses including residences and civic institutions. The site is also mostly cleared (see above), and offers very little habitat for feral mammals or avifauna.

Aquatic

The ocean bottom at the EP for the Wahikuli landing site is in a zone of sand and *Halimeda incrassata* (a green algal species) beds. This zone extended uninterrupted over a hundred feet. The *Halimeda* and another algal species (*Grateloupia filicina*) have mean coverage of 37 percent, with most being the *Halimeda*.

A microinvertebrate census conducted for the project noted two species, the flea cone shell (*Conus pulicaris*) and a juvenile auger shell (*Terbra sp.*) (see Appendix 5). The fish survey encountered three species of fish (one individual each), and the estimated standing crop of fish was 1 g/m^2 (grams per square meter). During the survey, four green sea turtles were observed approximately 300 feet offshore. The behavior of the turtles suggested a nearby turtle resting site, which seemed to be a few hundred feet offshore from the Wahikuli landing site, but shoreside of the EP.

Like other areas across the Hawaiian islands, humpback whales migrate to the West Maui coastline annually during the winter months. During a site visit, at least one humpback whale was observed within a few hundred feet of the shoreline near the Wahikuli landing site parcel. Additional information about humpback whales and other protected marine species is provided in Section 11.1.2.

7.8.2 Construction or Short-Term Impacts

After construction is completed, the contractor would return the site as much as possible to its pre-construction condition. The plant species most affected, buffelgrass, as well as the other plants and weedy species affected by construction, would revegetate quickly.

Using the sandy/vegetative area as the EP, as proposed in Section 1.2.3, for the Wahikuli landing at the 58-foot isobath would avoid potential adverse impacts to the aquatic biological environment.

The proposed deployment of directional drilling avoids problems with deploying cables on the surface of the seafloor and possibly impacting sessile species (permanently attached or fixed) such as corals. An added benefit to the use of directional drilling is the protection afforded to the cable in the shallow water where storm surf could result in cable failure. The proposed alignment will utilize directional drilling thereby avoiding marine communities and any impacts in coastal waters. The bentonite and water mixture used for drilling slurry would be replaced by water immediately prior to the HDD drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP. In the event of an accidental discharge of slurry during drilling or at the EP (see Section 7.6.2), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidy relatively quickly. Also, slurry is not toxic or hazardous to marine life.

When laying cable, caution must be taken to avoid adverse interactions with protected species of marine mammals that occur in Hawai'i's waters. Although humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying operations within these months. If a whale or other protected species is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation would also be halted until the animal moves away of its own volition. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

7.8.3 Long-Term Impacts

No long-term impacts on terrestrial botanical resources are anticipated as all construction equipment and machinery will be removed from the landing site once construction and installation is completed. The site and connecting route will be restored to existing conditions following removal of construction equipment.

No long-term impacts on marine communities are anticipated, particularly since the cable will be laid on sand substratum and will "sink" into the sand. The shifting nature of sand and its continual movement will usually bury any deployed cable with time. Marine species found in sand habitats have evolved to live in this continually moving substratum thus placing a cable on this substratum which will become buried will not materially hinder any of these species.

7.8.4 Mitigation Measures

Because the proposed action would have no short- or long-term adverse impacts on any flora or terrestrial fauna, threatened and endangered species, or their critical habitat, no mitigation measures are required. After construction is completed, the contractor will return the site to its pre-construction condition.

The mitigation measures below are proposed to avoid adverse interactions with marine animals during construction.

Immediately before and during the pop-out event, an underwater diver shall observe the environment before attaching the cable. If a protected animal is observed in the immediate vicinity of the EP, the pop-out event shall be delayed until the animal moves away from the project area of its own volition.

If any protected species is detected during construction, including marine mammals and sea turtles, cable deployment shall be halted until they move away from the vessel or the cable deployment area.

The bentonite and water mixture used for drilling slurry will be replaced by water immediately prior to the HDD drill head emerging from the EP preventing bentonite from releasing into the ocean.

7.9 AIR QUALITY

7.9.1 Existing Conditions

Data collected by the State Department of Health (SDOH) indicate that the State has some of the best air quality conditions in the nation. To monitor air quality, the SDOH operates a network of stations at various locations throughout the islands. In West Maui, the major sources of air quality pollutants are from traffic and fugitive dust generated from active and fallow agricultural lands. Cane burning used to cause air quality problems, but sugar cane is no longer cultivated in West Maui. In general, regional air quality conditions of the region are good, similar to all other places in the State; however, there may be problems at spot locations.

7.9.2 Construction or Short-Term Impacts

Some excavation work would be required to set up the drilling operation, but more importantly, excavation would be required to install the beach manhole on Honoapi'ilani Highway. Noticeable dust emissions may occur from the beach manhole excavation, especially if the excavated soil is dry and weather conditions are windy. Soil sampling on the parcel(see Section 7.1.1) did not encounter groundwater until a depth of 11 feet. Therefore, the expectation is that much of the soil from the beach manhole excavation would be dry.

The HDD drill rig, compressor and other construction-related vehicles emit engine exhaust, which would temporarily contribute to air pollutants in the vicinity of the work area. Most of the equipment and vehicles, including the drill rig and compressor, are diesel-powered, which emit relatively high levels of nitrogen oxide (NO_X) in comparison to gasoline-powered equipment. However, standards for such pollutants are set on a regional basis, and would therefore not be violated by short-term construction equipment emissions.

7.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality is anticipated because the work site will be restored to its original condition after the cable-laying process is completed and construction equipment is removed. After construction is completed and the Wahikuli landing site would experience no further activity that could potentially degrade air quality.

7.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality, such as no visible dust emissions outside the affected parcel. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses

Upon completion of work the project site shall be re-vegetated as appropriate.

7.10 NOISE

7.10.1 Existing Conditions

The primary source of noise at the proposed Wahikuli landing site parcel is traffic on Honoapi'ilani Highway. Although measurements have not been taken, noise levels may be in the 70-decibel range because the highway services relatively high traffic volumes.

7.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of noise is expected to come from use of heavy machinery, such as bulldozers, directional boring rig, and trucks entering and leaving the site during the drilling period, expected to last up to three months. Noise produced by this operation may occasionally be as high as 90 to 94 decibels at 50 feet away, which is comparable to the noise from a lawnmower. HDD operations and other construction activities will be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would more than likely violate Community Noise Control Standards; therefore, the SIC contractor would require a noise permit from the SDOH.

The noise generated by HDD operations and other construction activities at the Wahikuli landing site parcel may disturb several residences that are part of a subdivision to the south of the parcel (see Section 7.2.1). The duration of overall construction, which includes HDD staging and breakdown, and drilling operations, would be about three months.

7.10.3 Long-Term Impacts

There would be no project-related noise once construction is completed. No long-term impacts are expected as there will be no operational requirements for the manhole site except for an occasional maintenance repair technician visiting the site on an as-needed basis.

7.10.4 Mitigation Measures

HDD operations and other construction activities shall be conducted within the hours allowed for construction under State law, i.e, 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would likely violate Community Noise Control Standards; therefore the SIC contractor would require a noise permit from the SDOH.

Prior to the start of construction, SIC or its contractor shall inform all nearby residences about the proposed construction schedule and anticipated noise impact. SIC shall provide contact information where residents may call to ask questions or report problems. In general, the contractor shall be the point of contact to the community during construction. However, members of the community shall be able to contact SIC if they are dissatisfied with how the contractor resolves noise or other problems, or have complaints about the contractor.

The SIC contractor shall be required to maintain his or her HDD drilling equipment in proper working order, especially all noise suppression systems, such as the rig's muffler.

7.11 PUBLIC FACILITIES

7.11.1 Existing Conditions

Honoapi'ilani Highway, a two- and four-lane arterial, is the main transportation facility on West Maui. It provides access to all the towns and resorts along the western coastline. In Lahaina, including the section fronting the proposed Wahikuli landing site parcel, the highway has four through lanes with shoulders approximately eight feet wide. There are no sidewalks along the highway fronting the parcel. Guardrails separate the highway right-of-way from the landing site parcel except along the southern section. There are a high number of tourists traveling by rental cars along this highway causing an increase in traffic above average levels for a comparable facility.

The highway right-of-way is used for County water and sewer lines, and overhead utilities. Detailed descriptions and locations of utilities located with the right-of-way will be analyzed during final design.

7.11.2 Construction or Short-Term Impacts

SIC is planning on the installation of its terrestrial fiber-optic lines within the Honoapi'ilani Highway right-of-way, and is currently coordinating with utility owners to ensure that the underground conduit does not interfere or damage their facilities. The Wahikuli landing site beach manhole, also to be placed within the highway right-of-way, would provide a direct connection to the terrestrial system.

During construction there may be restricted traffic flow, including the temporary closure of one lane along the highway. This can cause queues and delays because of the high traffic volumes of the highway. There is no anticipated impact on emergency vehicle access, as traffic coordinators would allow vehicles to pass in the case of emergencies.

7.11.3 Long-Term Impacts

After construction, the SIC contractor would be required to return the project site to pre-construction conditions. Therefore, landing site infrastructure, which includes a fiber-optic conduit and beach manhole, would not affect maintenance of the highway or its other infrastructure, nor would it prevent the expansion of existing infrastructure or installation of new infrastructure within the highway right-of-way.

7.11.4 Mitigation Measures

SIC shall coordinate work on Honoapi'ilani Highway with the SDOT, including ensuring that design specifications meet SDOT standards. Design plans shall be reviewed by SDOT.

During construction work on Honoapi'ilani Highway, flagmen and/or police officers shall be posted to direct traffic safely around the construction of the proposed manhole.

SIC shall coordinate with the County of Maui to ensure that the landing site connection to the terrestrial duct line and placement of the beach manhole would not damage its water and sewer lines or interfere with future utility plans.

7.11.3 Long-Term Impacts

After construction, the SIC contractor would be required to return the project site to pre-construction conditions. Therefore, landing site infrastructure, which includes a fiber-optic conduit and beach manhole, would not affect maintenance of the highway or its other infrastructure, nor would it prevent the expansion of existing infrastructure or installation of new infrastructure within the highway right-of-way.

7.11.4 Mitigation Measures

SIC shall coordinate work on Honoapi'ilani Highway with the SDOT, including ensuring that design specifications meet SDOT standards. Design plans shall be reviewed by SDOT.

During construction work on Honoapi'ilani Highway, flagmen and/or police officers shall be posted to direct traffic safely around the construction of the proposed manhole.

SIC shall coordinate with the County of Maui to ensure that the landing site connection to the terrestrial duct line and placement of the beach manhole would not damage its water and sewer lines or interfere with future utility plans.

Chapter 8
Mākena, Maui Landing Site:
Environmental Setting, Impacts, and Proposed Mitigation

CHAPTER EIGHT: MĀKENA, MAUI LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS, AND PROPOSED MITIGATION

8.1 TOPOGRAPHY AND GEOLOGIC CONDITIONS

8.1.1 Existing Conditions

Maui is the summit of two major volcanoes that merged, the West Maui Mountains and Haleakalā. The older volcano, the West Maui Mountains, may be extinct. It consists of steep valleys and peaks carved by numerous streams. The younger volcano is Haleakalā. Unlike the West Maui Mountains, Haleakalā is a classic rounded dome typical of a shield volcano. Both volcanoes are connected by the Maui Isthmus, a relatively narrow, gently sloping plain.

The proposed Po'olenalena Park fiber-optic cable landing site parcel is located on the south Maui coastline in the Kīhei-Mākena region. The lower portion of the parcel is flat and only a few feet above sea level. *The east side of the parcel along Mākena Alanui Road is about 8 to10 feet* higher than the west side of the parcel next to the beach.

Soil sampling at two locations on the makai and mauka side of the proposed landing site parcel was conducted. Geologic conditions of the parcel consist of a of layer medium-dense sand and gravel that ranged in depth from three to seven feet. Below this layer are very hard and clinker layers consisting of basaltic sands and gravels. The soil sampling near the shoreline encountered a void between the 10.5- and 12-foot depths within the basalt formation. No groundwater was encountered during soil sampling.

<u>Hazardous Materials</u>

Since present and historic land uses in the project area could have produced site contamination, a database search was conducted to investigate whether the project site contains hazardous materials (see Appendix 6). The search included federal and State environmental databases in accordance with the American Society for Testing and Materials standards for environmental site assessments (E1527-00). The database search found no records of hazardous materials sites on the affected parcel, nor within one mile of the parcel. The database search does not cover off-shore sites.

8.1.2 Construction or Short-Term Impacts

Although the alignment bore would go through hard basalt, major problems in conducting HDD operations from the Po'olenalena Park parcel are not anticipated because the contractor would be informed of the geologic conditions of the site and would plan accordingly (e.g., use appropriate drill bits). Voids may be encountered during drilling that could cause the loss of slurry.

The beach manhole would be placed within the Mākena Alanui Road right-of-way and would require excavation. In addition, trenching of about three feet deep and one foot wide would be required to install fiber-optic cables between the drill site and the beach manhole. Soils contaminated by hazardous materials are not expected to be encountered during HDD operations or other excavation activities. Excavated areas would be backfilled with the same material. Excess excavated material, such as from the beach manhole site, would be disposed of properly in accordance with State Department of Health (SDOH) regulations. Once the landing site has been completed, the affected parcel would be restored to its pre-construction condition.

8.1.3 Long-Term Impacts

Once completed, the fiber-optic cable conduit would be underground and would not change the grade or topography of the landing site parcel. The only evidence of the landing site would be a manhole cover within the Mākena Alanui Road right-of-way.

8.1.4 Mitigation Measures

If voids are encountered, the contractor shall monitor the returning slurry. If the slurry does not return or returns in insufficient quantities, the contractor shall make the slurry thicker, or grout (i.e., fill) the void.

8.2 LAND USE

8.2.1 Existing Conditions

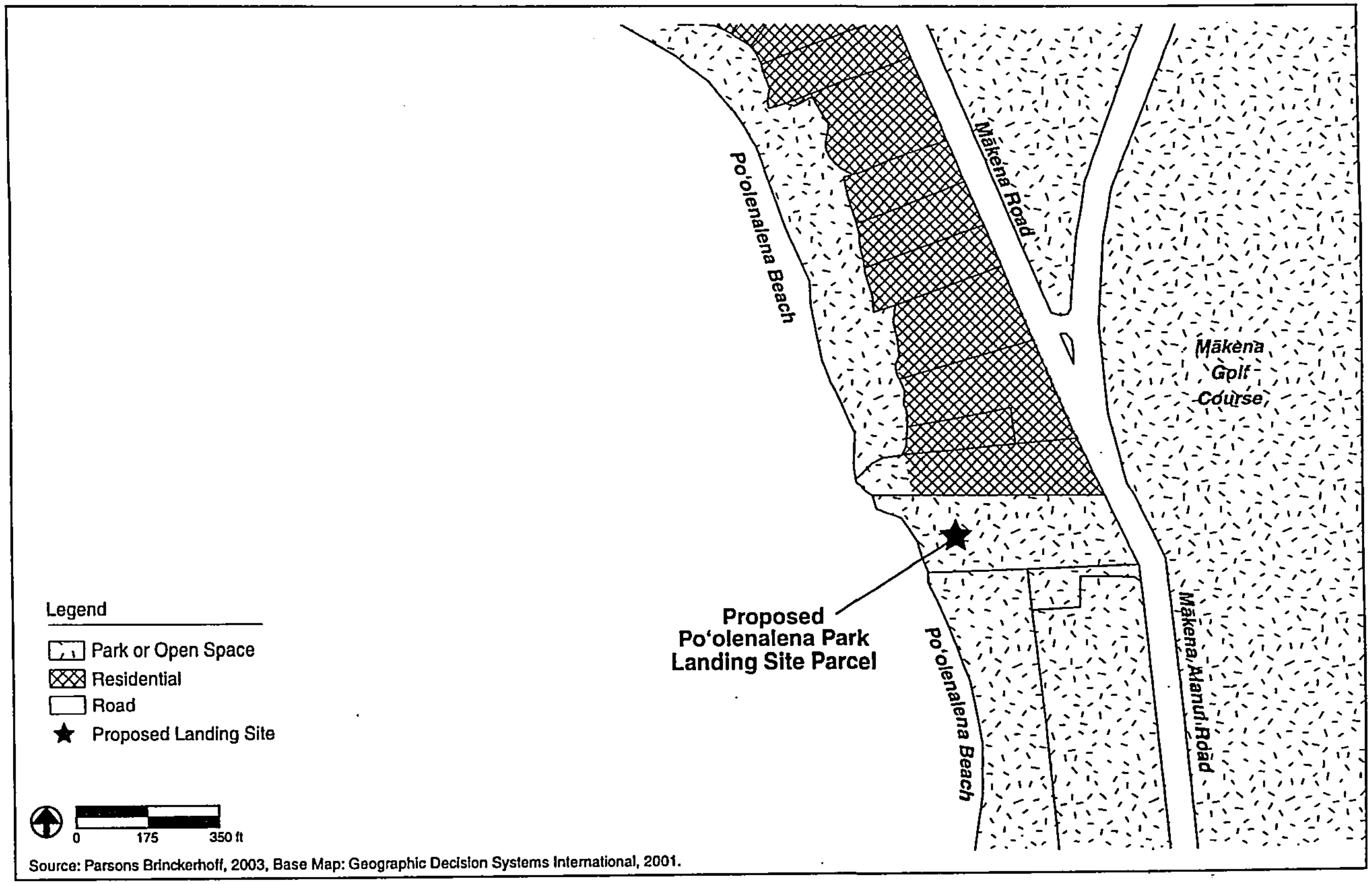
The landing site parcel is within the coastal community of Mākena, which is part of the larger Kīhei-Mākena region located along the western coastal area from Haleakalā. This region stretches from Maui Isthmus near Kaelia Pond to near the southern part of the island. It is characterized by urban mixed uses found in Kīhei and resort land uses of Wailea and Mākena. Wailea-Mākena contains some of Maui's most luxurious condominiums and resort hotels, such as the Grand Wailea Resort Hotel & Spa, the Maui Inter-Continental Resort, the Four Seasons Resort, and the Maui Prince Hotel. It also includes luxury single-family residences, many of which front the coastline.

The proposed landing site (TMK 2-2-1-007:072) is within a two-acre beachfront parcel owned by the State of Hawai'i, and managed by the County of Maui Department of Parks and Recreation for Po'olenalena Beach access and parking (see Figure 8.2-1). Roadway access is from Mākena Alanui Road located on the parcel's western side. The parcel includes an unimproved (i.e., curb- and gutter-less) asphalt-paved driveway off of Mākena Alanui Road, a flat dirt/gravel area with a few trees used for unmarked parking and a portable toilet. A barrier and several boulders two to three feet in diameter are provided to prevent vehicles from entering or parking on the beach. The parking area appears to have space for 20 to 30 vehicles, depending on how cars are parked. The lack of marked spaces may result in the inefficient use of parking, which may be a problem if there is high demand for parking. Also, dense vegetation (see Section 8.8) on the north side of the property along an approximately 15-foot-tall white wall that separates the parcel from a large residence on the adjacent parcel further limits the site's parking capacity.

The large residence is set back from a rock outcropping on the coastline that separates two beaches. A path is provided from the proposed landing site parcel to the beach on the other side of the large residence. There are no residences on the south side of the parcel. Figure 8.2-2 provides photographs of the Po'olenalena Park landing site parcel.

8.2.2 Construction or Short-Term Impacts

The drill site would be located on the south edge of the parking area as near the beach as possible to minimize parking impacts during construction. Although HDD staging and operations may require about a half-acre, the activity would not interfere with or block the property's driveway off of Mākena Alanui Road. Therefore, the public would continue to be allowed beach access through and parking on the parcel throughout the duration of construction staging, drilling and breakdown. However, the construction site would temporarily displace a portion of the parking area, reducing it by an estimated 15 to 20 spaces, for up to three months.



Source: Parsons Brinckerhoff, 2003, Base Map: Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

August 19, 2003

Existing Land Uses - Po'olenalena Park Landing Site
Submarine Fiber-Optic Cable Project
Figure 8.2-1

Makai view from Mākena Alanui Road

Mauka view from parking area

Source: Parsons Brinckerhoff, 2002.

Sandwich Isles Communications, Inc.

Photos of Po'olenalena Park Landing Site Parcel
Submarine Fiber-Optic Cable Project
Figure 8.2-2

The landing site beach manhole would be placed within the Mākena Alanui Road right-of-way. Trenching would be required between the drill site and the beach manhole location. The trench would be dug on the side or edge of the driveway so that access onto the property is maintained during this activity.

8.2.3 Long-Term Impacts

SIC would seek a conduit easement about ten feet wide between the shoreline through the drill site to Mākena Alanui Road. The easement on the State property would not affect the site's use for beach access and parking.

8.2.4 Mitigation Measures

The contractor shall be required to institute measures to protect the public during construction, such as making sure members of the public do not venture onto the construction site where safety could be compromised.

8.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

8.3.1 Existing Conditions

Early consultation with the State Historic Preservation Division (SHPD) Maui archaeologist indicated the potential that cultural deposts (evidence of habitation of pre-contact Hawaiians) may be buried within the Po'olenalena Park landing site parcel. In addition, members of the Maui/Lana'i Islands Burial Council (MLIBC) expressed concern about installing a fiber-optic cable constructed using HDD directly beneath burial sites. Based on these comments, the SHPD Maui archaeologist recommended a subsurface inventory survey of the proposed HDD alignment. The total length of the survey was 140 feet, which extended from end of the parking lot (proposed drill site) to the active beach area.

The subsurface inventory survey at the Po'olenalena Park parcel encountered three cultural layers, which were identified as Layers IIIa, IIIb and V, and were interpreted as coastal habitation sites from different periods in Hawaiian history. The depost was given a State Site number: 50-50-14-5486. The layers extend about 80 feet from the drill location towards the beach. No burial sites were encountered within any of the archaeological excavations. See Section 8.4.1 for information regarding cultural impact concerns relating to burial sites.

The uppermost deposit, Layer IIIa was encountered near the surface to about 30 inches below the surface, and ranged in thickness from two to six inches. This layer was interpreted as a late pre-contact to early post-contact coastal habitation site, as evidenced by food midden remains such as marine shellfish, sea urchin, and fish bones, in addition to two small pieces of copper, which suggested the post-contact assessment.

The middle layer, Layer IIIb, when present ranged in thickness from 2 to 30 inches. The layer is dark brown and contained food midden materials, such as a substantial amount of marine shellfish remains, sea urchin and fish bone, and marine-related artifacts, such as coral files and abraders. Evidence of pits and postholes were also found, and were interpreted as fire hearths and refuse pits. The layer was interpreted as a mid to late pre-contact coastal habitation site.

The lower layer, Layer V, was interpreted as an early occupation site of a date similar to Layer IIIb. The layer is a brown sandy clay, but is rocky, and contains small amounts of food midden, primarly fish bone.

The presence of a waterworn pavement section at the mauka section of the trench suggests a ceremonial function of the site. Site 5486 may be associated with a culturally significant site (State Site 1362), a kauhale (household) complex, which was previously found north of the Po'olẹnalena Park parcel. While the cultural materials recovered from Site 5486 are similar to mateials recovered from other nearby, archaeological sites, the extent of Site 5486 is not known such that it remains unclear if it is contiguous with one or more previously identified sites.

8.3.2 Construction or Short-Term Impacts

The Po'olenalena Park landing site fiber-optic cable alignment would penetrate and break through Site 5486. Shortly beyond the drill point area, the HDD would be aligned below the three cultural layers. Trenching through or adjacent to the parking area to install fiber-optic cable from the drill site to the beach manhole site on Mākena Alanui Road may encounter one or more of the cultural layers. The extent and depth of the layers mauka of the drill point, within the parking and driveway area, are not known, but are probably within the sand formation, which does not extend to the roadway.

Since a federal loan is being used for the project, compliance with Section 106 of the National Historic Preservation Act (NHPA) is required. In addition, the project is subject to review by the State Historic Preservation Division in accordance with Section 6E-8 of the *Hawai'i Revised Statutes* (HRS) *because* the project requires permits or approvals from the State of Hawai'i and the County of Maui. See Sections 11.1.1 and 11.2.4 for information regarding compliance with NHPA Section 106 and HRS Section 6E-8.

8.3.3 Long-Term Impacts

Once completed, the Po'olenalena Park landing site infrastructure would not affect archaeological or historic resources. See Section 8.4.3 regarding potential cultural impacts to burial sites.

8.3.4 Mitigation Measures

As recommended by the SHPD Maui archaeologist (see Appendix 2), a supplemental subsurface inventory survey of the HDD staging area shall be conducted. In addition, the supplemental survey shall include the portion of the alignment of fiber-optic cable conduit between the drill site and Mākena Alanui Road within the sand formation. The purpose of the inventory survey would be to better define and evaluate the Site 5486.

If a burial site is uncovered during the inventory survey, the SHPD shall be immediately notified. Treatment of any burial remains found during the archaeological survey shall be in accordance with HRS Chapter 6E, and shall involve the MLIBC. Also, the discovery of a burial site may cause the realignment of the fiber-optic cable. The new or modified alignment shall then undergo an additional subsurface inventory survey.

SIC shall prepare a preservation plan for the habitation site as recommended by the SHPD Maui archaeologist.

8.4 CULTURAL, SOCIAL, AND ECONOMIC ACTIVITIES

8.4.1 Existing Conditions

The resident population in Wailea-Mākena was 3,070 in 2000 (U.S. Census Bureau). However, almost half of the approximately 2,800 housing units in this area were vacant. In addition, Census data states that this area supports only 1,416 households, suggesting that a large portion of the housing units is for seasonal or recreational purposes. Wailea-Mākena is known to be a popular locale for seasonal or part-time residents. The region contains some of Maui's most luxurious resorts and hotels.

As stated in Section 8.2, the Po'olenalena Park landing site parcel is used for beach access and parking. The major purpose of the parcel is to support park and recreational activities that may include sunbathing, swimming, diving, fishing and other ocean-related activities.

Consultation with SHPD and the MLIBC indicated that human burial sites are known to exist along the Mākena coastal area (see Section 8.3). In fact, a burial site was uncovered a short distance to the south of the landing site parcel. The MLIBC did not express concern about trenching to install fiber-optic cables provided that monitoring was conducted and the construction work performed in a responsible manner. State law provides for the treatment of burial sites if inadvertently uncovered. The MLIBC was more concerned about the use of HDD. Although this technology can avoid direct impacts to burial sites (i.e., the drill site or slurry pit can be excavated deep enough to ensure that no burial remains are affected), it can cause an indirect impact to burial remains because members of the MILBC feel that placement of modern materials, such as fiber-optic cables, under Native Hawaiian burials is culturally inappropriate or offensive. To ensure that no burials would be indirectly affected by fiber-optic cable installed by HDD, a test trench along the proposed alignment was excavated and surveyed by the project archaeologist (see Section 8.3.1).

8.4.2 Construction or Short-Term Impacts

The public would continue to be allowed beach access through and parking on the Po'olenalena Park landing site parcel throughout the duration of HDD construction staging, drilling and breakdown, as well as during trenching between the drill site and Mākena Alanui Road. Total construction may last up to three months, even though actual drilling may take about two weeks (see Section 8.10.2) because of other activities, such as set-up, trenching, installation of the beach manhole and clean-up. As stated in Section 8.2.2, HDD staging and operations would temporarily displace a portion of the parking area, reducing it by half. It is estimated that space for approximately 15 to 20 vehicles would be displaced during construction. If, during construction, the demand for parking exceeds the capacity of the remaining lot, some users would have to find another location to park or they would have to use another beach. In either case, it would be an inconvenience to the users.

Construction activities will be conducted in a manner that would not interfere with swimming, sunbathing or other recreational, social or cultural activities on the beach. In addition, construction activities would not block or restrict access to the path described in Section 8.2.1, which provides access to the beach on the other side of the large residence.

See Section 8.10.2, regarding noise impacts to beach users.

As stated in Section 8.3.1, no human burial remains were uncovered within the test trench, which was along the proposed alignment of the fiber-optic cable installed by HDD. In addition, the fiber-optic cable alignment from the drill site to the beach manhole wiould be checked by an inventory survey (see Section 8.3.4). Therefore, no direct or indirect impacts to burial sites are anticipated from the fiber-optic cable or cable installation.

Temporary short-term engineering and construction jobs will be created.

8.4.3 Long-Term Impacts

Once completed, the Po'olenalena Park landing site would not affect beach access and parking, or use of the beach.

Maintenance and servicing of the telecommunications lines are expected to support several new permanent jobs including field and office positions. SIC is committed to providing training and educational opportunities, as required by its license agreement with DHHL. However, the number of long-term jobs created by the proposed project is expected to be quite low.

Fiscal impacts associated with this project are expected to primarily result from additional tax revenues to the State due to spending of construction workers' earnings. However, given the low number of employees anticipated, the fiscal impact would be minimal. Since County revenues are primarily limited to property taxes, there should be minimal change to County revenues.

No adverse impacts on resident and worker populations in the project area are expected. The project will be beneficial to those residing on Department of Hawaiian Home Lands by providing broadband services to the telecommunications users.

No significant impacts to the island's housing or resident population are expected as the project does not propose to add any housing units.

8.4.4 Mitigation Measures

SIC shall coordinate with the County Department of Parks and Recreation to schedule construction to avoid certain periods of the year when beach use is known to be high. Since the public uses the property, the contractor shall be required to have good safety protocols in place.

8.5 VISUAL AND AESTHETIC RESOURCES

8.5.1 Existing Conditions

The Po'olenalena Park parking lot does not appear to be a scenic resource. However, views from the edge of the parking lot looking towards the ocean could be considered picturesque or visually pleasing.

8.5.2 Construction or Short-Term Impacts

Since the construction staging area would be located in the Po'olenalena Beach parking lot, important viewsheds or scenic resources are not anticipated to be blocked during construction.

8.5.3 Long-Term Impacts

All infrastructure associated with the landing site would be underground, and therefore would not affect existing viewplanes or scenic resources.

8.5.4 Mitigation Measures

No permanent visual impacts would occur as a result of the proposed project; therefore no mitigation measures are necessary.

8.6 WATER RESOURCES

8.6.1 Existing Conditions

The Po'olenalena Park landing site parcel is adjacent to the shoreline and Pacific Ocean, but separated by a wide sandy beach. The nearshore ocean area fronting the Po'olenalena Park site parcel is a Class A water. In accordance with Chapter 11-54 of the Hawai'i Administrative Rules, Water Quality Standards, Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters.

According to the U.S. Geological Survey Quad Map of the project site, there are no surface waters at or near the parcel. This was confirmed by a site visit.

As stated in Section 8.1, no groundwater was encountered during soil sampling.

The lower portion of the property is within a 100-year floodplain according to the Flood Insurance Rate Map.

8.6.2 Construction or Short-Term Impacts

Installation of the fiber-optic cable conduit using HDD would not affect the ocean. The construction area would be set back from the ocean, HDD operations produce no surface discharges of pollutants, and the contractor would be instructed to implement best management practices (BMPs) to prevent soil erosion and sedimentation at the construction site. The contractor would also have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Excavation needed for trenching and to install the beach manhole on Mākena Alanui Road would not cause sedimentary pollutant impacts because these activities would not be near the ocean and would be separated from the ocean by a wide sandy beach. In addition, the contractor would not conduct excavation work during a storm or heavy rain.

The entire construction site is anticipated to be less than one acre. Therefore, a National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Associated with Construction Activity would probably not be needed.

The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore, and discharged into the environment. If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. As noted in Section 1.4.4, bentonite is a naturally-occurring clay material, which is not toxic nor harmful to the ocean environment. In addition, the ocean currents or wave action would dissipate the slurry relatively quickly, such that turbidity effects would be limited. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 8.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

Immediately prior to the drill head emerging into the ocean water from the exit point (EP), the slurry would be replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the EP. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and slurry could be inadvertently released into the ocean water. As noted above, ocean currents would dissipate the slurry relatively quickly, depending on the amount of slurry released. Nevertheless, divers shall be stationed at the EP during this activity (see Section 1.4.4).

8.6.3 Long-Term Impacts

Once completed the HDD conduit would be underground and therefore would not affect the quality of the Pacific Ocean. Any flooding occurring on the property would not damage or affect the fiber-optic cable landing site because all infrastructure would be underground or waterproofed.

The sides of the HDD bore would be lined by the drill casing, which becomes the conduit. That conduit is anticipated to prevent interaction with groundwater after construction is completed.

8.6.4 Mitigation Measures

The SIC contractor shall be required to conduct BMPs to prevent erosion and sedimentation, and have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Although the Po'olenalena Park landing site does not require an NPDES permit for stormwater discharges associated with construction, the same BMPs that would be used under NPDES permits for other sites (see Section 11.4) would also be used for this site.

During drilling, the contractor would constantly monitor the amount of returning slurry to check for unexpected losses. If the slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry would immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials, such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the EP when the drill head emerges from the EP shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If slurry discharges occur, it shall be collected in the bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. The slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

8.7 MARINE AND NEARSHORE CONDITIONS

8.7.1 Existing Conditions

Seaward of the coastline from the Po'olenalena Park landing site is a subtidal rocky area with considerable coral cover that extends about 500 feet seaward from the coastline. Nearshore bathymetry data indicate a gently sloping terrain at depths greater than 50 feet (see Figure 8.7-1). The proposed HDD EP is well seaward of this feature.

Using an estimated EP developed from existing bathymetric data, a SCUBA survey conducted for the project identified a bottom substrate of sand, vegetation and scattered pieces of coral at a depth of 58 feet approximately 1,900 feet from the drill location. This site was selected as the proposed HDD EP for the Po'olenalena Park landing site (see Section 1.2.3). A substrate of sand and vegetation was observed directly at the EP. The sandy bottom was replaced by scattered coral approximately 50 feet north of the EP and to the east towards the shoreline. No depressions were observed shoreward of the EP that could complicate HDD operations. Also, no drastic changes in the seafloor topography west (seaward) of the EP were detected using an echo-sounder.

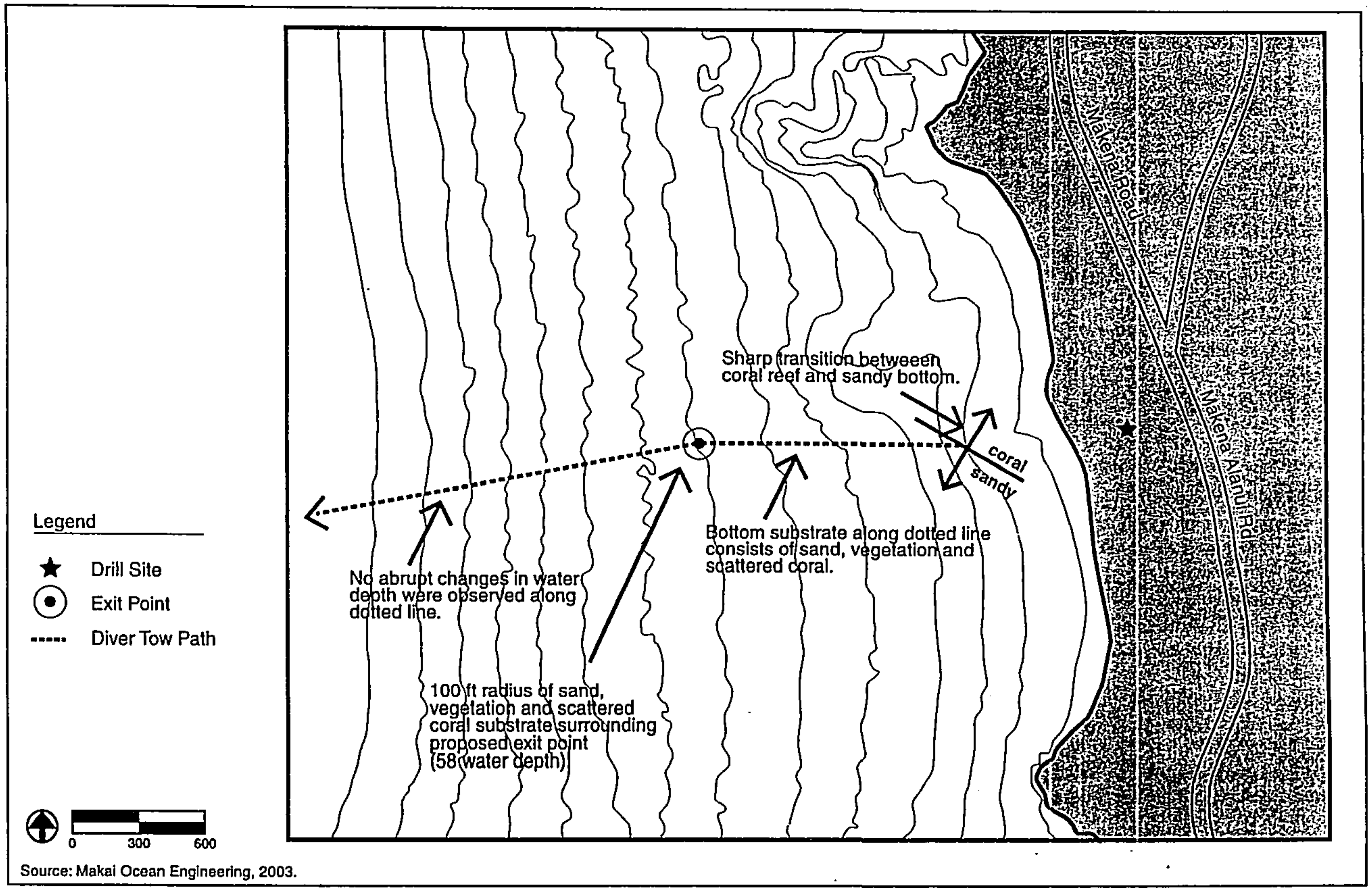
Coastal or nearshore areas are vulnerable to a number of natural hazards, in particular storms, hurricanes, tsunamis, and high waves. These natural hazards are discussed below.

Storms and Hurricanes. The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward (north and northeast) sides of the islands in comparison to leeward areas (south and southwest).

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, Kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kaua'i. However, meteorologists warn that no island is safe from tropical cyclones.

Tsunamis. Tsunamis, a series of large waves, are caused by one of three geologic processes: (1) earthquakes (the most common); (2) landslides (either submarine or subaerial); and (3) explosive submarine volcanic events. The "Pacific Ring of Fire," which encircles the Pacific Basin reaching as far as Asia, North America, South America and Australia, is a zone of frequent earthquakes and volcanic activity. The Hawaiian Islands are roughly in the middle of the Ring and accordingly have experienced tsunamis originating from different locations. In the past 60 years, six tsunamis originating from the Ring were particularly destructive. Barrier and fringe reefs tend to absorb the energy of the waves and protect the shoreline.

High Waves. In Hawai'i, waves are caused by: (1) a north Pacific swell; (2) a northeast trade wind swell; (3) a south swell; and (4) Kona storm swells. The north Pacific swell is generated by storms in the Aleutian Island area, and it can produce wave heights 8 to 30 feet on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast trades produce wave heights 4 to 12 feet on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range one to four feet. Kona storm (see above) waves average 10 to 15 feet and can occur at any time of the year.



Sandwich Isles Communications, Inc.

Marine Survey of Proposed Exit Point at Po'olenalena Park Landing Site
Submarine Fiber-Optic Cable Project
Figure 8.7-1

8.7.2 Construction or Short-Term Impacts

A sandy-vegetative area located about 1,900 feet from the drill location at a depth of 58 feet is suitable as a HDD EP. The directional finding capabilities of HDD technology are more than adequate in targeting this location, especially since the margin of error is a radius of 100 feet (50 feet to the north).

As stated in Sections1.2.1 and 8.6.2, the bentonite and water mixture used for drilling slurry would be replaced by water prior to the drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP (also see Section 8.6.2).

8.7.3 Long-Term Impacts

The USGS has provided ratings regarding various coastal hazards along the entire shoreline of Hawai'i, including overall hazard assessments. For the Po'olenalena Park landing site parcel, the USGS provided an overall hazard assessment of moderate (level 4 in a scale from 1 to 7) due to potential hazards from tsunami and stream flooding.

It is highly unlikely that a tsunami would damage the landing site infrastructure of Po'olenalena Park parcel because the fiber-optic cable would be underground and wave action caused by the tsunami would not have much effect at a depth of 58 feet, the depth of the proposed breakout location. However, a tsunami may cause landside debris to flow into the ocean as the water recedes from the shore. This debris could damage or break a cable. Therefore, the underwater cable would have double armor protection at depths shallower than about 350 feet.

8.7.4 Mitigation Measures

Mitigation is not necessary.

8.8 TERRESTRIAL AND AQUATIC BIOLOGY

8.8.1 Existing Conditions

Terrestrial

A terrestrial flora survey was conducted for the project on the Po'olenalena Park landing site parcel (see Appendix 4). A few large kiawe trees, 25 to 30 feet tall, border the seaward (makai) side of the parcel parking area. Ground cover in this area consists of low clumps of Guinea grass (*Panicum maximum*) and buffelgrass (*Cenchrus ciliaris*) near the parking area, and small patches of golden crown-beard (*Verbesina encelioides*) and Australian saltbush (*Atriplex semibaccata*) closer to the beach. On the north side of the property adjacent to the tall wall are a few small trees of milo (*Thespesia populnea*) among one- to two-foot-tall weedy species of Swollen fingergrass (*Chloris barbata*), spiny amaranth (*Amaranthus spinosus*), and *Boerhavia coccinea*, which are abundant to common throughout the islands, and other common species in smaller numbers scattered about. A small 'a'a lava outcrop on the northeast corner of the property bordering Mākena Alanui Road supports native species consisting of seven wiliwili trees (*Erythrina sandwicensis*) approximately 15 to 18 feet tall, a few small shrubs of 'ilie'e (*Plumbago zeylanica*) and koali 'awa (*Ipomoea indica*), a native morning glory.

No flora species found on the Po'olenalena Park site are listed as a threatened or endangered species or a species of concern by the U.S. Fish and Wildlife Service (USFWS).

Since the landing site parcel supports a high degree of human activity (see Section 8.4.1), terrestrial faunal species likely to be using the site would be introduced species that are common throughout the Hawaiian islands, such as rats, mice, mongooses, cats, and dogs. Avifauna common to the area include the common mynah, golden plover, Japanese white-eye, northern cardinal, sparrow, spotted dove and zebra dove.

Aquatic

The ocean bottom at the EP of the Po'olenalena Park landing site is a mix of flat and relatively featureless limestone with sand and *Halimeda incrassata* (a green algal species) beds. This zone extends uninterrupted over a hundred feet. The sizes of the limestone features range from 15 to 80 square feet, with sand and Halimeda beds in between. These features appear to extend beyond 100 feet seaward of the breakout location. The *Halimeda* and two other algal species (*Larencia nidifica* and *Sphacelaria furcigera*) have mean coverage of 8.9 percent, with most being the *Halimeda*. Some limestone has coral coverage (*Portites lobata* and *Montipora verrucosa*) of one percent or less.

The microinvertebrate census conducted for the project noted six species, including leopard cone shell (*Conus leopardus*), the boring divalve (*Arca ventricosa*), Christmas tree worm (*Spirobranchus gigantea*), wana (*Echinothrix diadema*), urcin (urchin?) (*Eucidaris metularia*) and the short-spined urchin (*Tripneustes gratilla*) (see Appendix 5). The fish survey conducted for the project encountered eleven species of fish (16 individuals), and the estimated standing crop of fish was 7 g/m^2 (grams per square meter) (see Appendix 5). The species contributing most to this biomass was a single cornet fish (*Fistularia commersoni*) making up 47 percent, and a single 'o'ili (*Cantherhines dumerili*) making up 46 percent.

8.8.2 Construction or Short-Term Impacts

Although the Po'olenalena landing site parcel is dominated primarily by introduced plants, HDD staging would be conducted from the gravel-covered parking lot, and would not require the clearing of vegetation. Trenching may be conducted to the south side of the parcel's driveway off of Mākena Alanui Road to avoid access impacts. Affected vegetation, if any, would be weedy patches.

Using the limestone/sandy/vegetative area as the EP at the 58-foot isobath, as proposed in Section 1.2.3 for the Po'olenalena Park landing site, would avoid potential adverse impacts to the aquatic biological environment.

The proposed deployment of directional drilling avoids problems with deploying cables on the surface of the seafloor and possibly impacting sessile species (permanently attached or fixed) such as corals. An added benefit to the use of directional drilling is the protection afforded to the cable in the shallow water where storm surf could result in cable failure. The proposed alignment will utilize directional drilling thereby avoiding marine communities and any impacts in coastal waters. The bentonite and water mixture used for drilling slurry would be replaced by water immediately prior to the HDD drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP. In the event of an accidental discharge of slurry during drilling or at the EP (see Section 8.6.2), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidy relatively quickly. Also, slurry is not toxic or hazardous to marine life.

When laying cable, caution must be taken to avoid adverse interactions with protected species of marine mammals that occur in Hawai'i's waters. Although humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying operations within these months. If a whale or other protected species is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation would also be halted until the animal moves away of its own volition. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

Some of the faunal species using the site may avoid the parcel due to construction activities. It is anticipated that they would return to the site following the cessation of construction.

8.8.3 Long-Term Impacts

No long-term impacts on terrestrial botanical resources are anticipated as all construction equipment and machinery will be removed from the landing site once construction and installation is completed. The site and connecting route will be restored to existing conditions following removal of construction equipment.

No long-term impacts on marine communities are anticipated, particularly since the cable will be laid on sand substratum and will "sink" into the sand. The shifting nature of sand and its continual movement will usually bury any deployed cable with time. Marine species found in sand habitats have evolved to live in this continually moving substratum thus placing a cable on this substratum which will become buried will not materially hinder any of these species.

8.8.4 Mitigation Measures

Because the proposed action would have no short- or long-term adverse impacts on any flora or terrestrial fauna, threatened and endangered species, or their critical habitat, no mitigation measures are required. After construction is completed, the contractor will return the site to its pre-construction condition.

The mitigation measures below are proposed to avoid adverse interactions with marine animals during construction.

Immediately before and during the pop-out event, an underwater diver shall observe the environment before attaching the cable. If a protected animal is observed in the immediate vicinity of the EP, the pop-out event shall be delayed until the animal moves away from the project area of its own volition.

If any protected species is detected during construction, including marine mammals and sea turtles, cable deployment shall be halted until they move away from the vessel or the cable deployment area.

The bentonite and water mixture used for drilling slurry will be replaced by water immediately prior to the HDD drill head emerging from the EP preventing bentonite from releasing into the ocean.

8.9 AIR QUALITY

8.9.1 Existing Conditions

Data collected by the State Department of Health (SDOH) indicate that the State has some of the best air quality conditions in the nation. To monitor air quality, the SDOH operates a network of stations at various locations throughout the islands. In Kihei-Mākena, the major sources of air quality pollutants are from traffic and fugitive dust generated from active and fallow agricultural lands. Cane burning used to cause air quality problems, but sugar cane is no longer cultivated in West Maui. In general, regional air quality conditions of the region are good, similar to all other places in the State; however, there may be problems at spot locations such as at busy intersections. Such spot locations do not appear to be at or near the landing site.

8.9.2 Construction or Short-Term Impacts

Some excavation work would be required to set up the drilling operation, but more importantly, excavation would be required to install the beach manhole within the Mākena Alanui Road right-of-way and for trenching between the drill spot and the beach manhole. Noticeable dust emissions may occur from the trenching and beach manhole excavations, especially if the excavated soil is dry and weather conditions are windy. Soil sampling on the parcel (see Section 8.1.1) did not encounter groundwater. Therefore, the expectation is that much of the soil from the trenching and beach manhole excavations would be dry.

The HDD drill rig, compressor and other construction-related vehicles emit engine exhaust, which would temporarily contribute to air pollutants in the vicinity of the work area. Most of the equipment and vehicles, including the drill rig and compressor, are diesel-powered, which emit relatively high levels of nitrogen oxide (NO_X) in comparison to gasoline-powered equipment. However, standards for such pollutants are set on a regional basis, and would therefore not be violated by short-term construction equipment emissions.

8.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality is anticipated because the work site will be restored to its original condition after the cable-laying process is completed and construction equipment is removed. After construction is completed the Po'olenalena Park landing site would experience no further activity that could potentially degrade air quality.

8.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality, such as no visible dust emissions outside the affected parcel. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses

Upon completion of work the project site shall be re-vegetated as appropriate.

8.10 NOISE

8.10.1 Existing Conditions

Ambient noise levels in the project area are predominantly from local vehicular traffic, wind, ocean surf, occasional stereos from cars and park users.

8.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of noise is expected to come from use of heavy machinery, such as bulldozers, directional boring rig, and trucks entering and leaving the site during the drilling period, expected to last up to three months. Noise produced by this operation may occasionally be as high as 90 to 94 decibels at 50 feet away, which is comparable to the noise from a lawnmower. HDD operations and other construction activities will be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would more than likely violate Community Noise Control Standards; therefore, the SIC contractor would require a noise permit from the SDOH. Overall construction, which

The noise generated by HDD operations and other construction activities at the Po'olenalena Park landing site may disturb residents of the large ocean-front house on the adjacent north side parcel (see Section 8.2.1). However, the actual noise impact at the residence may be somewhat mitigated by the wall separating the properties. Also, the house appears to have good noise attenuation. In addition, the beach fronting the parcel is used for recreational purposes and is popular (see Section 8.4.1). HDD drilling could disturb people sunbathing or socializing on areas of the beach near the parking lot. However, Po'olenalena Beach is large, and there other sections of the beach likely to be less affected by noise emissions from HDD drilling. The beach does not appear to be crowded. Therefore, all users would have the option of not using the beach fronting the parking lot. The duration of overall construction, which includes HDD staging and breakdown, drilling operations, and trenching, would be about three months.

8.10.3 Long-Term Impacts

There would be no project-related noise once construction is completed. No long-term impacts are expected as there will be no operational requirements for the manhole site except for an occasional maintenance repair technician visiting the site on an as-needed basis.

8.10.4 Mitigation Measures

HDD operations and other construction activities shall be conducted within the hours allowed for construction under State law, i.e, 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would likely violate Community Noise Control Standards; therefore the SIC contractor would require a noise permit from the SDOH.

Prior to the start of construction, SIC or its contractor shall inform all nearby residences about the proposed construction schedule and anticipated noise impact. SIC shall provide contact information where residents may call to ask questions or report problems. In general, the contractor shall be the point of contact to the community during construction. However, members of the community shall be able to contact SIC if they are dissatisfied with how the contractor resolves noise or other problems, or have complaints about the contractor.

The SIC contractor shall be required to maintain his or her HDD drilling equipment in proper working order, especially all noise suppression systems, such as the rig's muffler.

8.11 PUBLIC FACILITIES

8.11.1 Existing Conditions

Mākena Alanui Road, a two-lane County facility, provides the only surface transportation access to the project site. The road does not have curbs, gutters, or curb inlets, but does contain culvert crossings to accommodate stormwater flows. Traffic counts are not available for Mākena Alanui Road. However, the road does not appear to be heavily used.

County water and sewer lines are located within the Mākena Alanui Road right-of-way. Detailed descriptions and locations of utilities located with the right-of-way will be analyzed during final design.

The Po'olenalena Park landing site parcel is publicly owned, and use of the site for beach parking is available at no cost to the public.

8.11.2 Construction or Short-Term Impacts

SIC is planning installation of its terrestrial fiber-optic lines within the Mākena Alanui Road right-of-way, and is currently coordinating with County and utility owners to ensure that the underground conduit does not interfere or damage their facilities. The landing site beach manhole would be placed within the road right-of-way to be easily accessible to SIC personnel. The Po'olenalena Park landing site beach manhole, to be also placed within the roadway right-of-way, would provide a direct connection to the terrestrial system.

During construction there may be restricted traffic flow, including the temporary closure of one lane along Mākena Alanui Road. This is not expected to cause substantial delays to vehicles using the road because the road is not heavily used. There is no anticipated impact on emergency vehicle access, as traffic coordinators would allow vehicles to pass in the case of emergencies.

8.11.3 Long-Term Impacts

After construction, the SIC contractor would be required to return the project site to pre-construction conditions. Therefore, landing site infrastructure, which includes a beach manhole, would not affect maintenance of Mākena Alanui Road or its other infrastructure, nor would it prevent expanding existing or installing new infrastructure within the roadway right-of-way.

8.11.4 Mitigation Measures

SIC shall coordinate work on Mākena Alanui Road with the County Department of Public Works (DPW), including ensuring that design specifications meet DPW standards. Design plans shall be reviewed by DPW.

During construction work on Mākena Alanui Road, flagmen and/or police officers shall be posted to direct traffic safely around the construction of the proposed manhole.

SIC shall coordinate with the County of Maui to ensure that the landing site connection to the terrestrial duct line and placement of the beach manhole would not damage existing water and sewer lines or interfere with future utility plans.

Chapter 9

Kawaihae, Hawai'i Landing Site : Environmental Setting, Impacts, and Proposed Mitigation

CHAPTER NINE: KAWAIHAE, HAWAI'I LANDING SITE: ENVIRONMENTAL SETTING, IMPACTS AND PROPOSED MITIGATION

9.1 TOPOGRAPHY AND GEOLOGIC CONDITIONS

9.1.1 Existing Conditions

The island of Hawai'i consists of approximately 4,000 square miles of land formed by volcanic activity. The five volcanoes comprising the Big Island are Kohala (long extinct), Mauna Kea (dormant, with some activity during recent geologic time), Hualālai (considered dormant, with last eruption in 1801), and the active volcanoes Mauna Loa and Kīlauea. Because the Big Island is made up of dormant and active volcanoes, earthquakes frequently occur on this island. The majority of volcanic activity in historical times occured around Kīlauea Volcano on the eastern portion of the island; the Kailua-Kona area has experienced some earthquakes with magnitude of 6 or greater. By comparison, the northern portion of the island, of which Kawaihae is a part, has experienced smaller earthquakes within the range of 3.5 to 4.9 since 1929 (Juvik and Juvik, 1998). Similarly, the project site is located in the area with the lowest probability of coverage by lava flows on the island. *(See Figure 9.1-1.)*

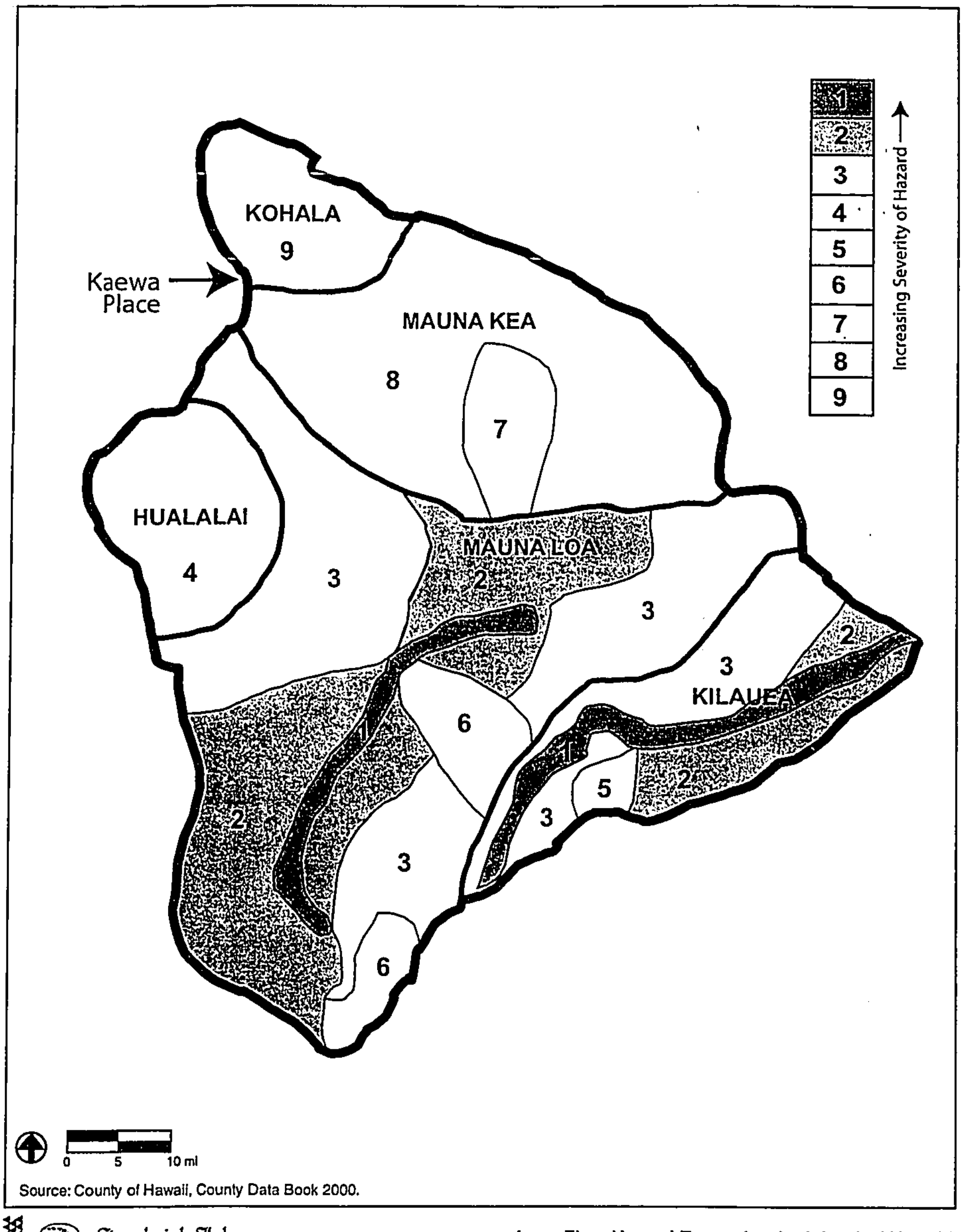
The Kawaihae landing site lies on the coastline at the western base of the Kohala Mountains. The arèa is defined by the geographic formations of the dormant Mauna Kea volcano, as well as the extinct Kohala volcano. The area is known for its dry, windy conditions.

The name Kawaihae means "Water of Wrath" in Hawaiian, referring to the fact that people fought for water from a naturally occurring pool in this arid area. However, it is said that this pool was destroyed by recent harbor developments (Kelly, 1974, as cited in Orr, 2003).

The Kaewa Place landing site parcel is flat and is about ten feet above msl. The soil in this region is characterized as Kawaihae very rocky, very fine sandy loam (6 to 12 percent slopes), which is characterized by a thin surface layer of reddish brown extremely stony sandy loam, below which are silt loam and loam. They are gently to moderately sloping soils on coastal plains and contain rock outcrops. This dark reddish-brown, extremely stony soil type is somewhat excessively drained and is found on coastal plains. Kawaihae type soils are used mainly for pasture, recreation areas, wildlife habitat, and homesites (Soil Conservation Service, 1973). However, such activities are not currently conducted on the project site. See Section 9.2 for a discussion of important farmland categories.

A subsurface soil sampling test conducted at the landing site revealed sandy gravel and cobbles, interspersed by layers of very hard basalt formations. Soil sampling consisted of drilling two small holes in the road on the project property, which were 20 and 40 feet deep, respectively. The topmost soil layer of medium-dense sandy gravel and cobbles is fill material approximately five feet deep. The fill layer was underlain by a layer of hard to very hard basalt rock formation to the maximum drill depth of 40.5 feet. Clinker layers were encountered in the basalt formation, as well as a void within the basalt formation in one of the borings (Geolabs, 2003).

Soil sampling and geological survey of the project site conducted in February 2003 revealed that groundwater levels at the site ranged from about 11.6 to 11.8 feet below the existing ground surface.



Source: County of Hawaii, County Data Book 2000.

Sandwich Isles Communications, Inc.

Lava Flow Hazard Zones for the Island of Hawai'i
Submarine Fiber-Optic Cable Project
Figure 9.1-1

Hazardous Materials

Since present and historic land uses in the project area could have produced site contamination, a database search was conducted to investigate the potential that the site contains hazardous materials (see Appendix 6). According to a search of commercially available federal, State, and local databases, there are no known hazardous waste sites within a mile of the project site (EDR, 2003). The database search does not cover off-shore sites.

The marine portion of the project site (around the EP) is covered by dredged spoils associated with past dredging activities at Kawaihae Harbor. (See Figure 9.1-2.) Spoils are not anticipated to be contaminated with hazardous materials. Site-specific testing and additional research would be necessary to determine with certainty if dredged spoils are contaminated by hazardous materials. The original harbor dredging was conducted in the 1950s, and additional material may have come from maintenance dredging that was subsequently conducted in the 1970s. See Section 9.7 for additional discussion of the marine "spoils area."

9.1.2 Construction or Short-Term Impacts

Construction activities at Kaewa Place landing site are expected to last approximately three months. Construction would temporarily affect the surface appearance at the project site. This is because limited earthmoving may be involved to grade the area for construction vehicle access, as well as construction of the drill pit and placement of associated drilling mud extricated from the HDD bore. See Section 1.4.4 for a detailed description of the construction process. At the Kaewa Place site, a soil berm placed across the entrance road would have to be removed temporarily, because it currently blocks access to the parcel.

Some localized geologic voids could be encountered during HDD operations. Bentonite drilling slurry could escape through these geologic voids, and some slurry could be lost in filling small voids. But once voids are filled, the return of the slurry would be as constant as it was prior to encountering the void. If the slurry does not return or does not return with sufficient quantity, the contractor would either thicken the slurry mix or grout the void.

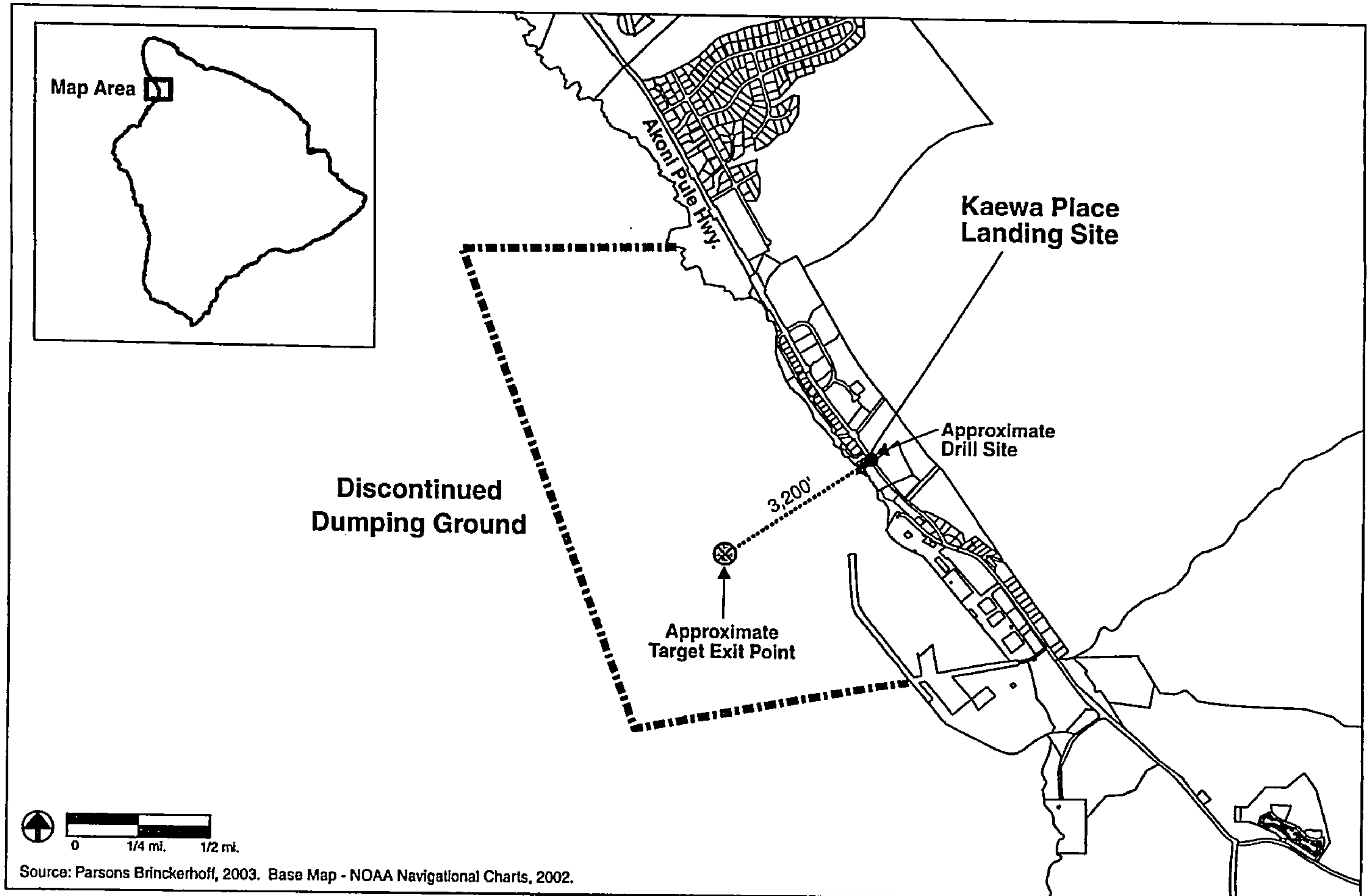
A database search identified no potentially problematic sites either on the project site or in its vicinity (EDR, 2003). No interaction with known hazardous waste sites is anticipated. An underwater survey has identified the best placement of the EP to avoid dredged spoils, live coral, and/or other sensitive areas. Prior to the HDD drill head exiting into the ocean, the drill head will be navigated to that location.

Relative to other types of construction such as trenching, the construction duration is short and the proposed construction method is non-invasive. Moreover, the project does not propose to alter the property's topography, soil characteristics, or other geologic and natural conditions, so there would be no change from existing natural hazard risks such as earthquakes, hurricanes, floods or tsunami. The County's Department of Public Works would be consulted during the design phase about any potential hazard issues.

9.1.3 Long-Term Impacts

After construction is completed, the project site would be returned as much as possible to its pre-construction condition. Therefore, no long-term impacts on the region's geology, topography, or soils are anticipated.

Construction impacts disturbing dredged spoil would be temporary. Therefore, no long-term impacts are anticipated.



Sandwich Isles Communications, Inc.

Marine Dumping Ground at Kaewa Place, Kawaihae, Hawai'i
Submarine Fiber-Optic Cable Project
Figure 9.1-2

The proposed landing site and resulting cable manhole would be adjacent to the narrow strip of the 100-year flood zone along the coastline. However, the SIC fiber-optic cable, while beneficial for the nearby Department of Hawaiian Home Lands (DHHL) community, is not considered a "critical facility" requiring special consideration under floodplain regulations. See Section 11.1.7 for a complete discussion of floodplain management issues.

9.1.4 Mitigation Measures

Because the EP is within a dredged spoil disposal area, testing shall be conducted to determine if the substrate at the EP is contaminated with hazardous substances. As the HDD drill head cuts through the dredged spoils and brings the slurry back to the drill site, the material shall be tested prior to disposal at a landfill. If dredged spoils' materials are contaminated, the contractor shall determine the best method of disposing of the contaminated materials in accordance with all applicable laws and regulations.

9.2 LAND USE

9.2.1 Existing Conditions

The project site is undeveloped and is currently unused. In the early to middle part of the 1900s, this location was the site of a pier and cattle holding area used to ship cattle from ranch lands in Waimea to other markets. This pier was destroyed by a 1946 tsunami. For additional information on the pier and other historic sites in the project area, see Section 9.3 of this EA. Figure 9.2-1 shows land uses in the area, and Figure 9.2-2 shows representative photogaphs of the proposed Kaewa Place landing site.

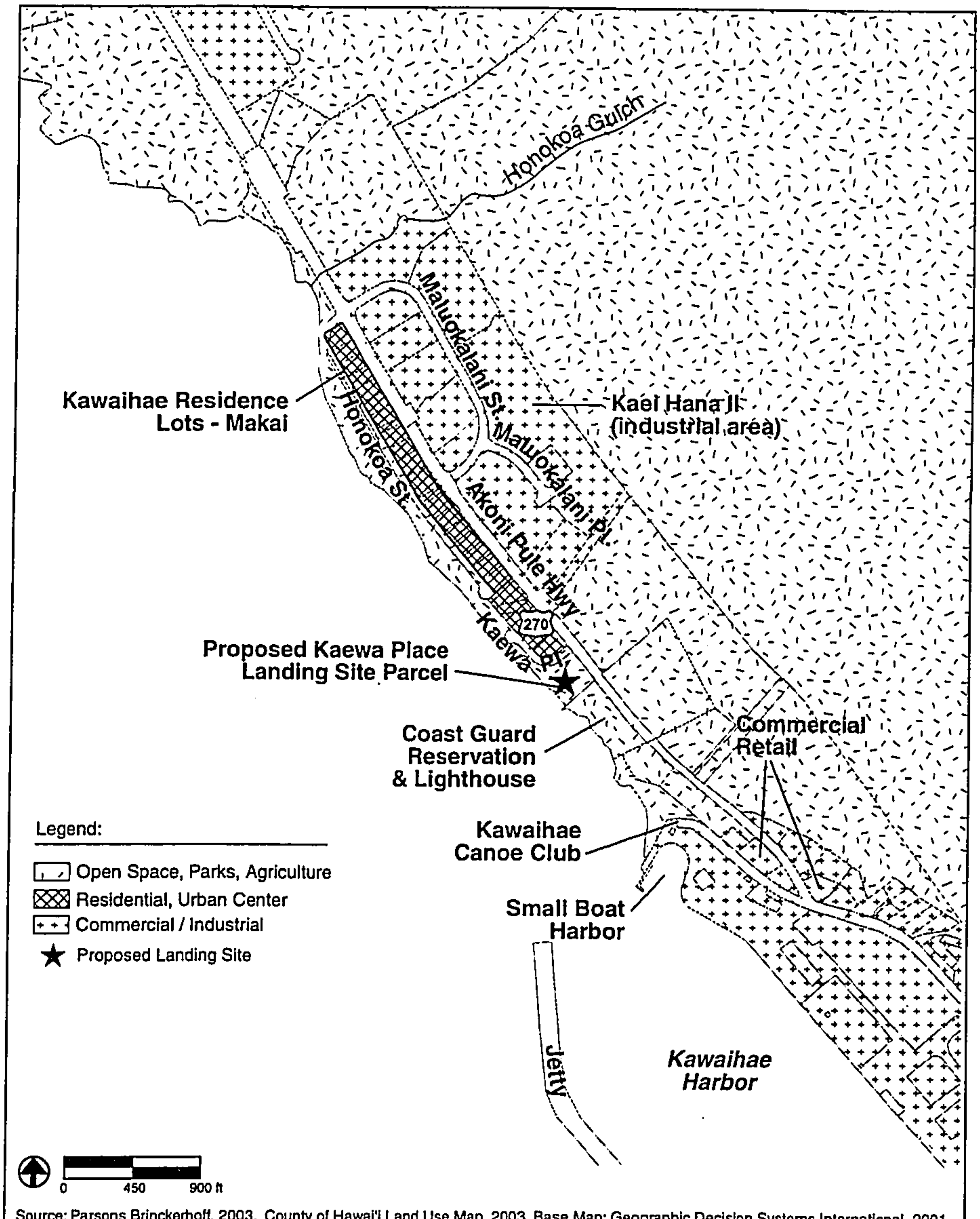
The proposed project site is classified as State Land Use Urban District. Maps of State land use classifications near landing sites are provided in Chapter 11. The proposed project is located in the Special Management Area (SMA), which is discussed in Chapter 11.

The County has zoned a narrow coastal strip including this project site as "Open." The project site is intended for use as open area and low density development. Areas north of the project site along the highway are intended for low- or medium-density development and industrial development.

Approximately 20 DHHL house lots are in the Kawaihae Residence Lots – Makai subdivision, located along the coast immediately north of the proposed project area on the makai side of Akoni Pule Highway. Many of these lots are developed and occupied, though several have not yet been developed. The closest of these homes is approximately 500 feet from the proposed construction site and is buffered from the project site by an area covered with large and ample vegetation.

The closest businesses to the project site are located in an industrial area roughly a quarter-mile northwest of the project site. There is a small strip mall at the corner of Akoni Pule Highway and an unnamed street leading to the Kawaihae Small Boat Harbor, roughly a half-mile southeast of the project site. Industrial activities related to harbor operations are performed at Kawaihae Harbor.

Directly south of the proposed project site is a federally owned lighthouse facility. The 6.6-acre lot is undeveloped with the exception of the lighthouse, and is covered with vegetation. No other activity takes place on this parcel. State-owned and operated Kawaihae Harbor is located just south of the lighthouse. The proposed project would not affect the harbor. The harbor was at one time considered as a potential HDD drilling site, but was eliminated because of concerns about adverse interactions with shipping activities. Attached to the main Kawaihae Harbor is the Kawaihae Small Boat Harbor, operated by the Department of Land and Natural Resources, Division of Boating and Ocean Recreation. The small boat harbor has eleven moorings, a launch ramp, pier, and a comfort station. There are no residences in the



Source: Parsons Brinckerhoff, 2003. County of Hawai'i Land Use Map, 2003. Base Map: Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

Existing Land Uses - Kaewa Place Landing Site
Submarine Fiber-Optic Cable Project
Figure 9.2-1

View of proposed HDD construction site, looking makai
from Akoni Pule Highway.

View of proposed HDD construction staging area, looking north
from asphalt road.

Source: Parsons Brinckerhoff, 2002.

Sandwich Isles
Communications, Inc.

Photos of Kaewa Place Landing Site Parcel
Submarine Fiber-Optic Cable Project

Figure 9.2-2

harbor and no live-aboard boats are allowed in the small boat harbor. A second small boat harbor has been created farther south at Kawaihae Harbor, but the newer facility is not yet fully operational.

The construction site is located within the coastal zone and the SMA. See Chapter 11 for discussions about consistency with the Coastal Zone Management Act and activities within the SMA.

As discussed in Chapter 11, important agricultural areas are protected by the federal Farmland Protection Policy Act (FPPA). Under the FPPA, federal agencies must formally assess a project's impact on agriculture. The Kaewa Place landing site is not located on agricultural land. Under Agricultural Lands of Importance to the State of Hawai'i (ALISH) system, the nearest prime, unique, or other important farmland is approximately five miles away.

9.2.2 Construction or Short-Term Impacts

Construction activities would affect less than one acre on the southern most portion of the 6.6-acre coastal lot. Construction would be restricted to the immediate vicinity of the HDD drilling site, staging area, and the offshore EP. The project site is not currently in use, and no significant impact on land use is anticipated in the general vicinity, both during and after construction. Therefore, no adverse impacts on land use would occur at the project site. HDD activities are temporary and relatively non-invasive in nature compared to trenching. Construction of the landing site is expected to last approximately three months. Moreover, the project would not affect future development by DHHL on the property, because the site would be returned to its pre-construction condition as much as possible. The easement for the landing site would be under an existing driveway. The manhole for accessing the fiber-optic cable system at this landing site would be constructed in the road right-of-way on Akoni Pule Highway.

There would be no displacement impacts as a result of the construction and operation of the landing site at Kaewa Place. The proposed project site is undeveloped. Residences adjacent to the property would not be affected by the drilling activities, and would not require relocation assistance. With the exception of potential noise impacts, no homes and businesses in the surrounding neighborhood would be directly affected by construction activities, due to the site-specific nature of the proposed work. A noise impact analysis is presented in Section 9.10.

The construction site is located within the coastal zone and the SMA. See Chapter 11 for discussions about consistency with the Coastal Zone Management Act and activities within the SMA.

The landing site at Kaewa Place would not affect any lands classified, zoned, or actively used for agriculture. The nearest prime, unique, or other important farmland identified under the ALISH system is roughly five miles away, and would not be affected by construction and/or operation of the submarine cable system. Therefore, FPPA does not apply to this site. The project is also not anticipated to affect soil erosion.

9.2.3 Long-Term Impacts

No adverse long-term impacts on land use are anticipated. After construction is completed, the landside construction area would be returned as much as possible to its pre-construction condition and the easement for the cable conduit would be under an existing driveway. Therefore, the development potential of this property would remain unchanged. A cable manhole would be in the road right-of-way, and occasional access to the manhole by SIC staff may be required for maintenance.

For the same reason, no lasting adverse impacts are anticipated, particularly on coastal uses. Additional discussion on use of coastal resources is provided in the cultural resources discussion in Section 9.4.

Moreover, installation of fiber-optic cable is anticipated to improve quality of life of the residents on DHHL properties in the Kawaihae area, as well as at other DHHL sites on Big Island.

9.2.4 Mitigation Measures

Because no adverse impact on formally classified lands or displacement of residences, farms, or businesses are anticipated, no mitigation measures are necessary.

9.3 ARCHAEOLOGICAL AND HISTORIC RESOURCES

9.3.1 Existing Conditions

The parcel was initially inspected by archaeological subconsultants on December 18, 2002. The project site is currently unused, but it has been previously disturbed. The project site and surrounding area are characterized by exposed bedrock with areas of shallow soil. Remnants of an old pier destroyed by a 1946 tsunami are visible on the coastline at this site. Anecdotal information indicates that the pier was used to ship cattle from the ranch lands in Waimea to other markets, and infrastructure associated with pier operations used to exist on site. See Section 9.1 and 9.2 for additional details on physical site *conditions and uses.*

The proposed landing site is located on an asphalt road that ends at the shoreline where a boulder beach and the remains of the historic pier are present. The remains consist of formed concrete and stone foundation remnants on the shoreline and concrete piers in the water. A formed concrete building foundation is present on the south side of the road. A stone and concrete retaining wall borders the south side of the road next to the foundation. An area immediately north of the road next to the shoreline has been modified by earthmoving activity evidenced by scarred bedrock and piles of stone and earth. The archaeological inventory survey in Appendix 3 contains additional information about these sites.

The National Historic Preservation Act of 1966 (NHPA), as amended, and Advisory Council on Historic Preservation's implementing regulations, 36CFR Part 800, require Federal agencies to take into account the effect their actions may have on historic properties prior to carrying out such actions. Accordingly, statewide coordination with State Historic Preservation Division (SHPD) on the SIC submarine cable project has been initiated. Full documentation of coordination activities is included in Chapter 12 of this EA.

During a meeting with the SHPD on February 5, 2003 concerning a definition for the area of potential effects (APE), an agreement was reached with SHPD staff. The resulting APE for Kaewa Place is shown in Figure 11.1-1G in Chapter 11. SHPD also indicated that it should be consulted prior to any subsurface testing at proposed landing sites. An archaeologist visited the site prior to soil sampling and deemed it unlikely that the sampling in the road would encounter subsurface deposits because the roadbed was probably graded prior to paving.

In a letter dated February 11, 2003, SHPD was asked to comment on soil sampling to be conducted at Kaewa Place on February 24 to 25, 2003. No written or verbal response to this letter was received prior to conducting the soil sampling. However, in a subsequent letter dated February 26, 2003, SHPD replied that it believed no significant historic properties would be affected by the soil sampling.

Figure 9.3-1 shows locations of four historic sites within the APE, as identified by the archaeological inventory survey. The sites are historic structural remains that primarily date to the late 1930s. According to a Kawaihae resident, the pier (State Site number 50-10-05-23860) and associated comfort station (Site 50-10-05-23859) were constructed in 1937. The pier was used until it was destroyed by the 1946 tsunami. Site 50-10-05-23858, a wall, was probably constructed around the same time as the pier and restroom because it lies along a road connected to the road leading to the pier. Site 50-10-05-23857 appears to be a bridge abutment probably predating the other sites, because the condition of the concrete is more deteriorated than in the other structures (Haun & Associates, 2003).

Records at the Bureau of Conveyances indicate that the project area was Territory of Hawai'i property controlled by the Board of Harbor Commission under Executive Order 737. The order was cancelled in 1957 and the land was transferred to the Department of Hawaiian Home Lands in 1967. In addition, property records indicate that there was a "Cattle Pen Site" during the 1930s, consistent with anecdotal information about the use of the pier for shipping cattle.

Examination of the current tax map indicates that there are no Land Commission Awards in the subject parcel. (Haun & Associates, 2003).

Pursuant to State Department of Land and Natural Resources (DLNR) Chapter 275-5(d), the sites identified and relocated during the survey are assessed for significance based on criteria outlined in the Rules Governing Procedures for Historic Preservation Review (DLNR 2002: Chapter 275). Similar federal guidelines exist for significance assessments under Section 106 of the National Historic Preservation Act (36 CFR 800). See Chapter 11 for discussions of federal and state significance criteria. Based on those criteria, all four sites are considered to be significant under Criterion "D", because the sites have yielded information important for understanding historic land use in the project area.

The mapping, written descriptions, photography, and test excavations conducted at the four sites adequately document them, and no further work or preservation is recommended.

9.3.2 Construction or Short-Term Impacts

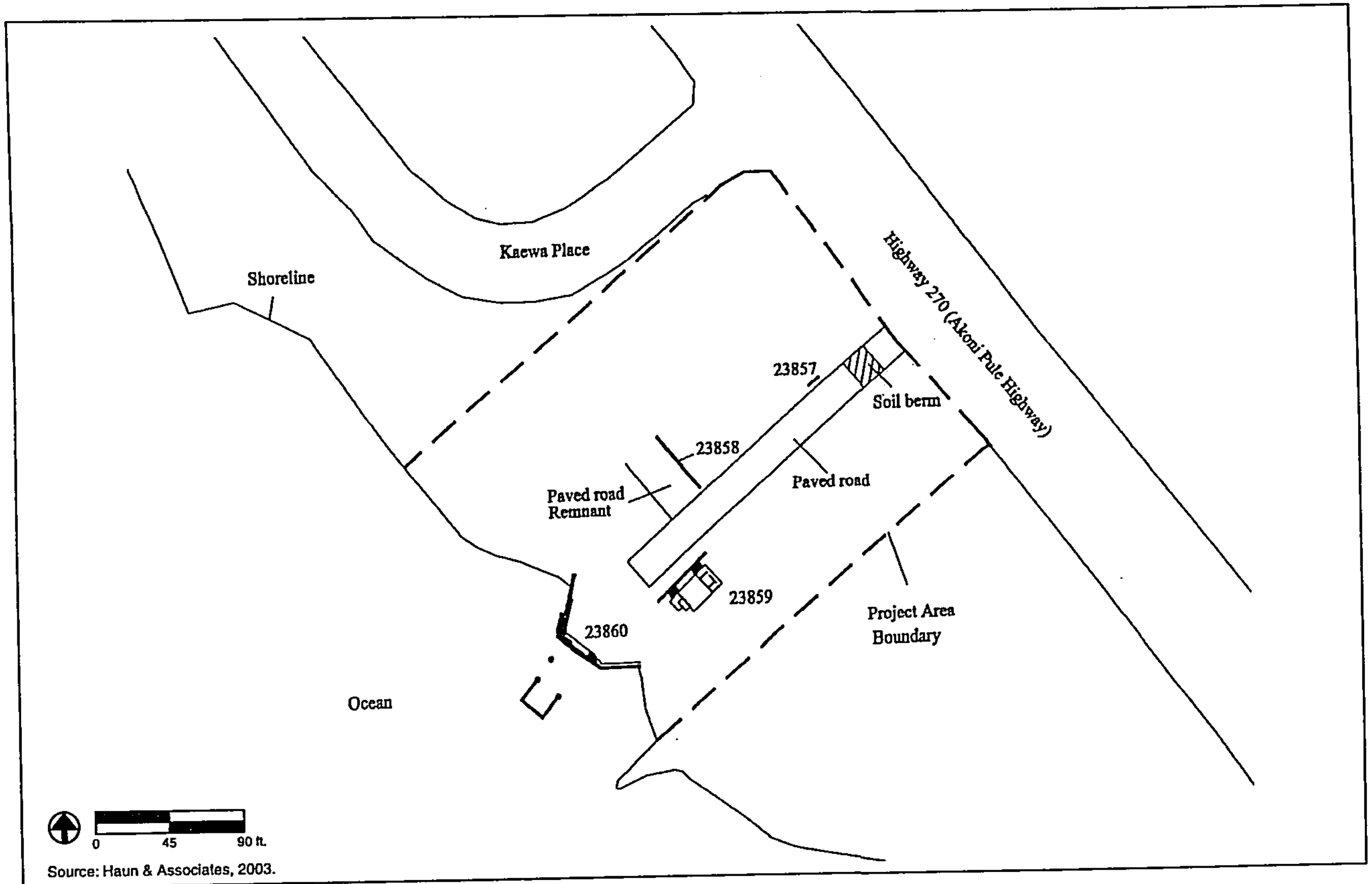
The mapping, written description, photography, and results of test excavations provided in this inventory survey adequately document the four historic sites identified in the APE. As a result, the sites are not recommended for preservation, and no further archaeological work at this project area is deemed necessary. Therefore, proposed construction activities are not anticipated to have adverse impacts on historic properties, even if these sites were to be disturbed. However, the contractor would be directed to avoid these identified sites as much as possible.

9.3.3 Long-Term Impacts

No long-term impacts on archaeological and historical resources are anticipated, for the same reasons that there would be no construction impacts. No further work or preservation is deemed necessary for the historical sites that have been identified.

9.3.4 Mitigation Measures

Because construction is not anticipated to have adverse impacts on historic properties, and preservation of the sites identified is not recommended, no mitigation is proposed. However, the contractor shall be directed to avoid disturbing sites identified in the inventory survey, if possible.



Sandwich Isles Communications, Inc.

Historic Sites at Kaewa Place Landing Site
Submarine Fiber-Optic Cable Project
Figure 9.3-1

9.4 CULTURAL, SOCIAL, AND ECONOMIC ACTIVITIES

9.4.1 Existing Conditions

The total population of the island of Hawai'i as of April 2000 was 148,677, up 9.3 percent from 1990. The project site is located in the South Kohala district, which has 13,131 people or 8.8 percent of the island's total, up 43.7 percent since 1990. The project site borders the North Kohala district, which is relatively unpopulated at only 6,038 residents or 4.1 percent of the islandwide total. That district's population also grew 40.7 percent over the 10-year period since 1990. Of the 4,084 families on the island in 2000, 11.0 percent were below national poverty level thresholds in 1999. (State of Hawai'i Data Book 2001; County of Hawai'i's County Data Book 2000)

A Cultural Impact Study & Assessment (CIS) prepared for this project is included as Appendix 3 of this EA. The CIS describes the project site and the culture and history of the Kawaihae region. The CIS includes a cultural and historical background review and interviews with three cultural consultants in the area. Concerns of importance to the community expressed by these cultural consultants are listed below:

- That the project would be done safely and without risk to the Hawaiian people and with care for the land;
- That the project would not desecrate the land;
- That the ocean as well as the land would not be further destroyed;
- That SIC would be mindful of high surf-related problems;
- That something be done about the lack of ocean flow within Kawaihae Harbor proper; and
- That SIC respect the land and the ocean.

Fishing activities and their relationship to marine resources and places are particularly important to the area's cultural heritage and is a subsistence-level activity for many families. According to anecdotal information provided by one cultural consultant, even though many people typically reside along shorelines because of the relative availability of food resources, it appears that the project site has generally been an unpopulated area. The site has been used mostly for shoreline fishing and gathering despite limited access to the property. There may have been some temporary dwellings, but they were mostly associated with the "'come and go kind" of fishing activities. Construction of the pier in the late 1930s may have brought additional activity to that part of the coastline, but fishing remains the predominant cultural activity in that area (Akau, as cited in Orr, 2003).

The following are prominent public facilities and recreational areas located around Kawaihae. However, none is directly adjacent to the project site: Kawaihae Harbor; Kawaihae Small Boat Harbor (including Kawaihae Canoe Club, located at the small boat harbor); Spencer Beach Park (south of Kawaihae Harbor); and Pu'ukoholā Heiau National Historic Site (off Akoni Pule Highway, between Spencer Beach Park and the highway). (See Section 9.11 for discussion of additional public facilities.)

9.4.2 Construction or Short-Term Impacts

Shoreline fishing and gathering access at the Kaewa Place site would be temporarily restricted during construction. However, such a limitation on access would last only for the duration of construction. Construction activities at this site are expected to last roughly three months. Access would be restored to existing levels after the work is completed and the site is returned to pre-construction conditions. There may also be some restrictions on boat fishermen when the cable-laying ship is active in the area. Again, such an impact would be brief, and would be much shorter than the construction period on land.

No impact on recreational resources is anticipated as a result of construction activities. Most recreational facilities such as parks are not near the project site. The Kawaihae Canoe Club has expressed concern about offshore construction work because the club's practice path takes paddlers hard by the project site at about ten feet offshore during mauka winds (Orr, 2003). However, offshore work would be conducted about 3,200 feet offshore and is not anticipated to affect the canoe club's practices during the brief duration that the cable laying ship will be near Kawaihae.

This project would temporarily create short-term construction and engineering jobs associated with the design, construction and initial operation of the project.

9.4.3 Long-Term Impacts

Installation of a fiber-optic cable is anticipated to help improve the quality of life of DHHL residents in Kawaihae, as well as elsewhere on the Big Island. This project would generate limited full-time employment for operation of the SIC fiber-optic telecommunications cable system. However, it is not anticipated to be a deciding factor in changing housing, demographic, or economic characteristics in the region.

Maintenance and servicing of the telecommunications lines are expected to support some new permanent jobs including field and office positions. SIC is committed to providing training and educational opportunities, as required by its license agreement with DHHL. However, the number of long-term jobs created by the proposed project is expected to be low.

Fiscal impacts associated with this project are expected to primarily result from additional tax revenues to the State due to spending of construction workers' earnings. However, given the low number of employees anticipated, the fiscal impact would be minimal. Since County revenues are primarily limited to property taxes, there should be minimal change to County revenues.

No adverse impacts on resident and worker populations in the project area are expected. The project will be beneficial to those residing on Department of Hawaiian Home Lands by providing broadband services to the telecommunications users.

No significant impacts to the island's housing or resident population are expected as the project does not propose to add any housing units.

The CIS concluded that the cultural consultants generally approve of the proposed telecommunications project because of expected benefits to residents of Hawaiian Home lands. No long-term adverse impacts were identified in the CIS.

While some of the concerns expressed by the consultants are not necessarily specific to the project, and SIC does not have control over all of these concerns (such as water flow in the harbor), SIC intends to construct and operate its cable system in a manner consistent with responsible land stewardship.

9.4.4 Mitigation Measures

Impacts on shoreline fishing and gathering activities shall be minimized as much as possible. Restrictions on shoreline access shall last only for the duration of construction, and access shall be restored after work is completed and the site is returned to pre-construction conditions.

9.5 VISUAL AND AESTHETIC RESOURCES

9.5.1 Existing Conditions

The proposed landing site would be located on part of an elongated property along the coastline. While coastlines are generally visually sensitive areas, this particular portion of the coastline is unremarkable in comparison to other coastlines on the island. The coastline and the ocean are not visible from the road. In addition, the bulk of the property is hidden from view from the highway by foliage and gently downward-sloping topography. The coastline can be viewed from areas mauka of the highway; however, most of the project site would be hidden by tall vegetation, most of which would not be disturbed during construction. There is one coastal residential subdivision immediately north of the proposed landing site; however, the project site cannot be seen from the subdivision due to obstructions.

The landing site is probably visible from parts of Kawaihae Harbor, a short distance to the south. The harbor's breakwater is roughly one-third of a mile from the site; the closest part of the harbor to the landing site is the Kawaihae small boat harbor, about a quarter of a mile away. Although a lighthouse is located on the Coast Guard reservation between the proposed landing site and the harbor, no public access to this federally owned property is provided, so no impacts on view from this sight are anticipated.

Views from the project site look directly out to the open ocean, with Kawaihae Harbor and its breakwater visible as prominent landmarks to the south. There are no mauka views in this area, since the topography slopes gently upward on the mauka side of Akoni Pule Highway, and even the highway is not readily visible from the project site.

9.5.2 Construction and Short-Term Impacts

A large drilling rig and other construction-related equipment would temporarily occupy the Kaewa Place landing site during construction. Moreover, the distance between the harbor and the Kaewa Place landing site is sufficient such that equipment would hardly be visible from the harbor. Due to distance, ample vegetation, and other obstructions, no short-term impacts on views from other points on the coastline or from mauka areas are anticipated.

Drilling would be far enough away (about 250 feet) from the lighthouse to not impede view of the lighthouse, affect the functionality of the lighthouse, or adversely affect cohesion of the coastal landscape from any coastal or mauka vantage point.

9.5.3 Long-Term Impacts

Based on the relatively small scale and nature of proposed construction, no long-term impacts are anticipated. After construction is completed, the property would be returned to its pre-construction condition. The only visible evidence of the SIC fiber-optic cable would be a telecommunications manhole placed at-grade in the roadway right-of-way. No protrusions or above-ground structures would remain.

9.5.4 Mitigation Measures

No permanent visual impacts would occur, as a result of the proposed project; therefore no mitigation measures are necessary.

9.6 WATER RESOURCES

9.6.1 Existing Conditions

The land-based portion of construction would occur adjacent to the ocean. The marine waters all along the North Kohala coastline (out to the 100-fathom contour) are categorized as Class A Waters by the Department of Health. Class AA waters are located approximately two miles south of the project site, just south of Spencer Beach Park. According to the Hawai'i Department of Health (DOH) administrative rules, marine waters are categorized as Class AA and Class A. Class AA waters are to "remain in the natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-cause source or actions." Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters. (Hawai'i Administrative Rules (HAR), Chapter 11-54, Water Quality Standards.)

Based on harbor activity to the south and the dredged spoil disposal surrounding the harbor and the nearshore area fronting the project site, existing marine conditions can be characterized as less than pristine. No water quality data were collected at this site.

Most of the project site is located beyond the floodplain, although a narrow stretch of coastline approximately 50 feet from the water line is within the 100-year flood zone.

The absence of wetlands was verified through a field check of the proposed landing site, conducted on December 18, 2002. According to both the Soil Conservation Service (SCS - now known as Natural Resources Conservation Service, NRCS) soil maps and observations in the field, there are no hydric soils in the area. Section 9.1 contains a more detail description of soil conditions. The U.S. Fish and Wildlife Service's National Wetlands Inventory classifies a narrow strip of the tidally influenced portion of the shoreline as a wetland, including the property on which the landing site is located (EDR, 2003).

The Kawaihae area is predominantly arid, and no pockets of water currently exist in the vicinity. As discussed in previous sections, historical information obtained from archival research and cultural consultants indicate that at one time there may have been a naturally occurring pool at or near the site of Kawaihae Harbor.

There are no perennial streams in the area. The nearest surface waters are intermittent streams – an unnamed gulch lies about a half-mile to the north, just before Honokoa Gulch, and Makahuna Gulch is about one mile to the south of the project site. These areas were dry during the field visit conducted in December 2002.

Soil sampling and geological survey of the project site conducted in February 2003 revealed that groundwater levels at the site ranged from about 11.6 to 11.8 feet below the existing ground surface. Due to the proximity of the project site to the coastline, water levels at the landing site may vary with tidal fluctuations, seasonal precipitation, and other factors. Groundwater in the area is brackish, and a database search did not identify any potable water wells within a one-mile radius of the project site.

9.6.2 Construction or Short-Term Impacts

HDD allows the underground bore to be placed below the environmentally sensitive surface resources such as beaches and streams. Unlike trenching, the equipment is confined to the entrance pit work area, and the majority of construction work occurs underground. The only onshore surface disturbance occurs at the entrance pit. Some localized grading may be required to accommodate the construction equipment, but the proposed work will not alter existing drainage patterns or have any water requirements. Once on-site work is completed, the ground is returned to its previous condition, and there will be no additional disturbance at the landing site aside from access to the manhole for periodic maintenance. The duration of construction activities at the Kaewa Place landing site is estimated to be roughly three months.

The primary water quality concern during construction is the potential for sediments entering the ocean in the form of runoff from the project site. Construction activities could expose more soil and runoff from the project site, which could increase turbidity in the ocean, particularly if a heavy rain were to occur. Installation of the fiber-optic cable conduit using HDD would not affect surface waters, such as the ocean, because HDD operations produce no surface discharges of pollutants, and the contractor would be instructed to implement best management practices (BMPs) to prevent soil erosion and sedimentation at the construction site. They will also have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Contractors would be required to handle oils and mechanical fluids with caution in order to prevent spills.

Excavation work for trenching and to install the beach manhole on Akoni Pule Highway is not anticipated to generate sedimentary runoff because the contractor would probably not conduct excavation work during a storm or heavy rain. The entire construction site would probably be less than one acre. Therefore, a National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Associated with Construction Activity would probably not be needed. However, BMP measures developed for other landing sites would be applied at all landing sites, including at Kaewa Place.

The use of slurry, the lubricant made from a mixture of bentonite and water, is highly controlled and monitored throughout the drilling process (see Section 1.4.4). The bentonite slurry used for the HDD process would be confined to the drill pit and construction site. It should be noted that bentonite is a naturally occurring clay. Therefore, impacts to the quality of nearby waters are not anticipated because slurry is not expected to leak from the drill bore and be discharged into the environment. As noted in Section 1.4.4, bentonite is a naturally occurring clay material, which is not toxic nor harmful to the ocean environment.

Immediately prior to the drill head emerging into the ocean water from the exit point, the slurry would be flushed and replaced by water. Therefore, negligible amounts of slurry or drilling mud would be released into the ocean at the exit point. However, it is possible that the contractor could miscalculate the timing of the slurry to water exchange, and slurry could be inadvertently released into ocean water. In addition, ocean currents and/or wave action would dissipate the slurry relatively quickly, depending on the amount of slurry released, such that turbidity effects would be limited. Nevertheless, divers shall be stationed at the exit point during this activity (see Section 1.4.4).

If there were an accidental release of slurry into the ocean (e.g., the drill head encounters a void that is accessible to the ocean water or land surface where the slurry can migrate to the ocean), the slurry would temporarily affect water turbidity. The contractor would immediately be aware of the loss of slurry because pressure within the drill hole, which is monitored, would drop as the slurry escapes from the drill hole. The contractor would stop drilling if the discharge cannot immediately be stopped. Although the discharge of slurry into the environment would be an inadvertent incident, this release could still be considered a violation under State law and the contractor could be subject to fines. However, as stated in Section 9.6.4, the contractor shall be required to take proper precautions, many of which are standard in the industry, to prevent inadvertent discharges of slurry.

Because the HDD pit and bore would be at the coastline, it is down gradient from any potential potable water source that may exist. As discussed above, there are no known potable water wells within a one-mile radius of the project site. Therefore, no impact to groundwater resources -- particularly potable water sources – is anticipated. However, the brackish water table in this area is close to the maximum depth that would need to be excavated to install the manhole, or roughly 10 feet. If construction of the manhole or any portion of the project reaches the water table, dewatering would be conducted.

9.6.3 Long-Term Impacts

Once construction is completed, no long-term marine or surface water impact is anticipated. Any flooding occurring on the property would not damage or affect the fiber-optic cable landing site because all infrastructure would be underground or waterproofed.

The sides of the HDD bore would be lined by the drill casing, which becomes the conduit. That conduit is anticipated to prevent interaction with groundwater after construction is completed.

9.6.4 Mitigation Measures

The SIC contractor shall be required to conduct best management practices (BMPs), to prevent erosion and sedimentation, and have plans for spill prevention and response, proper disposal of solid and liquid wastes, and proper operation and maintenance of equipment and vehicles. Contractors would be required to be cautious when using oils and other fluids that could leach into groundwater through spills. Although the Kaewa Place landing site does not require an NPDES permit for stormwater discharges associated with construction, the same BMPs that would be used under NPDES permits for other sites (see Section 11.4) would also be used for this site.

During drilling, the contractor would constantly monitor the amount of returning slurry to check for unexpected loss. If slurry does not return or returns in insufficient quantities, the contractor would have several measures at his or her disposal. If slurry is observed on land or in the ocean and the problem cannot immediately be resolved, drilling and the introduction of additional slurry would immediately stop. Industry standards to prevent further release of slurry include modifying the slurry properties (e.g., making the slurry thicker); modifying the pressure or volume of the slurry; advancing or retreating the drill pipe or casings; or using other materials such as grout, to seal the source of the leakage or fill the void.

Divers stationed at the exit point when the drill head emerges from the exit point shall be equipped with specialized pumps and filter bags in case slurry is accidentally discharged. If a slurry discharge occurs, it shall be collected in bags and disposed of onshore. Similar procedures would be used if the contractor detects an inadvertent release from voids.

A slurry release on land shall be contained using silt fencing or sand bags. Slurry shall then be transferred or pumped to the drill site for reuse or disposed of properly.

All inadvertent discharges of slurry into State waters shall be reported to the SDOH Clean Water Branch. The contractor shall report the source of discharge, an estimate of the quantity of slurry released, and a description of how the discharge was stopped.

Releases of sediment and construction-related substances on site shall be minimized by implementing BMPs to be identified by the contractor. Although the Kaewa Place landing site does would not require a NPDES permit for stormwater associated with construction activity, the same BMP measures would be used as those landing sites requiring the permit because there would also be excavation at this site.

9.7 MARINE AND NEARSHORE CONDITIONS

The following discussion is based on a submarine engineering report (MOE, 2003) and a marine survey (Brock, 2003) prepared for this project.

9.7.1 Existing Conditions

The offshore area around Kawaihae Harbor is designated as a discontinued Dumping Ground, according to nautical charts (National Oceanographic and Atmospheric Administration [NOAA]). NOAA charts indicate a discontinued dumping ground approximately 3,500 feet west of the Kaewa Place landing site. Additionally, a smaller area within this dumping ground is also marked as "Spoil Area" approximately 2,000 feet to the southwest of Kaewa Place. The most likely source of the dredged materials is past dredging activity at Kawaihae Harbor. The harbor was constructed in the late 1950s, with dredging occurring for the basin and entrance channel between 1957 and 1959. Additional dredging to expand the harbor basin and widen the channel, as well as maintenance dredging, was conducted between 1971 and 1973 (Thompson, no date.). The proposed EP is near the designated "spoil area." Marine surveys confirmed that dredged materials appear to be discarded in this area.

Site selection in this area was limited by proximity of an active commercial harbor. A SCUBA survey targeted potential sites below the harbor channel to avoid adverse interactions with vessels dragging their *anchors in and out of the channel. The marine survey is described in detail in* Appendix 5. *The* SCUBA survey determined that the best location for the EP would be within a 46-foot-wide band of dredged spoils south of the marked Spoils Area, which is 77 to 95 feet in depth and devoid of live coral. The recommended EP is located inside this area at a depth of 81 feet, as shown in Figure 9.7-1. The ocean bottom at this location is flat, with the substrate consisting of fine coral sand and small coralline rubble.

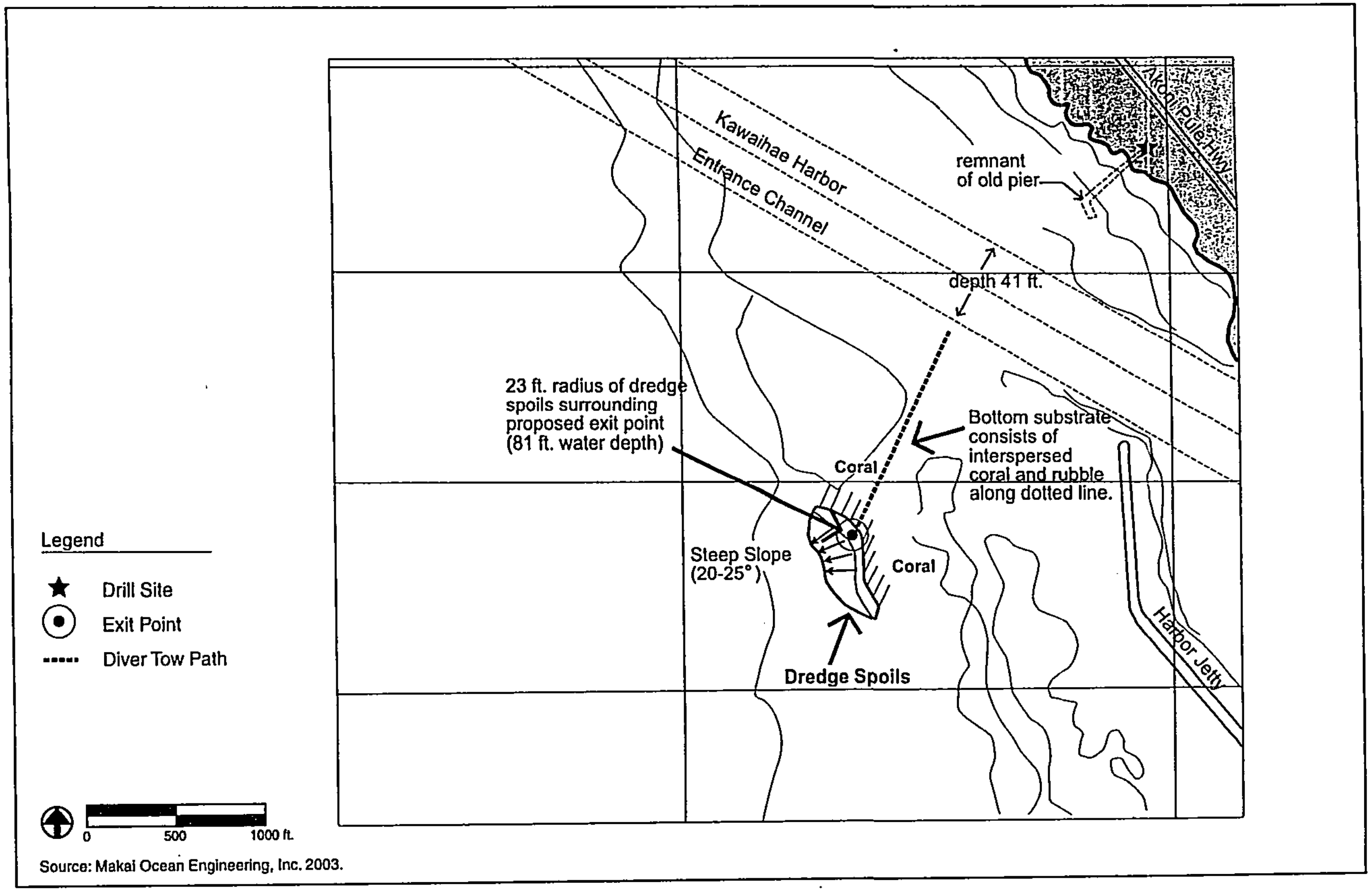
While the presence of dredged spoils is not ideal, the site is satisfactory because it is within the depth requirements for HDD, devoid of live coral cover, and at a safe distance from harbor traffic. HDD would bore under the 41-foot-deep harbor channel. No other submerged hazards or deep depressions were observed shoreward of the proposed EP.

Coastal or nearshore areas are vulnerable to a number of natural hazards, in particular storms, hurricanes, tsunamis, and high waves. These natural hazards are discussed below.

Storms and Hurricanes. The Hawaiian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward (north and northeast) sides of the islands in comparison to leeward areas (south and southwest).

During the past 30 years, over 130 storms have passed through or near one or more of the islands. Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, kona (Hawaiian word for leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused the most damage to Kaua'i. However, meteorologists warn that no island is safe from hurricanes.

Tsunamis. Tsunamis are a series of large waves caused by one of three geologic processes: (1) earthquakes (the most common); (2) landslides (either submarine or subaerial); and (3) explosive submarine volcanic events. The "Pacific Ring of Fire," which encircles the Pacific Basin reaching as far as Asia, North America, South America and Australia, is a zone of frequent earthquakes and volcanic



Sandwich Isles Communications, Inc.

Marine Survey of Proposed Exit Point at Kaewa Place Landing Site
Submarine Fiber-Optic Cable Project
Figure 9.7-1

activity. The Hawaiian Islands are roughly in the middle of the Ring, and therefore have experienced tsunamis originating from different locations. In the past 60 years, six tsunamis originating from the Ring were particularly destructive. Barrier and fringe reefs tend to absorb the energy of the waves and protect the shoreline.

High Waves. In Hawai'i, waves are caused by: (1) the north Pacific swell; (2) the northeast trade wind swell; (3) a south swell; and (4) kona storm swells. The north Pacific swell is generated by storms in the Aleutian Islands area, and it tends to produce wave heights 8 to 30 feet on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast trades produce wave heights 4 to 12 feet on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range one to four feet. Kona storm waves (see above) average 10 to 15 feet and can occur at any time of the year.

Taking into account the potential for natural hazards in the region, the Kawaihae Bay coastal zone was assigned an overall hazard assessment of 4 to 5 (moderate to high). The proposed Kaewa Place landing site and associated underwater EP is in a moderate zone with an ocean hazard assessment value of 4. The only hazard rated high in the area is related to seismic volcanic activity (Fletcher, 2002, as cited in Makai Ocean Engineering, 2003).

9.7.2 Construction or Short-Term Impacts

A small part of the ocean bottom would be disturbed when the drill head emerges from the bore hole into the ocean. However, the drill shaft is only six to eight inches in diameter, so the impact on the substratum would be limited both in size and in duration. After the drill head is detached, the submarine cable would be connected to the cable in the underground conduit, and the submarine cable would be laid on the ocean bottom seaward of the EP towards Maui. Only temporary disturbance to the ocean bottom is anticipated during cable-laying operations.

Though the drill head would exit in an area covered by dredged spoils, these spoils are not anticipated to be contaminated with hazardous materials. HDD is anticipated to disturb a minimal amount of dredge spoils from past harbor construction activities. The disturbance caused by the pop-out of the drill head would be temporary and minimal, with the impact footprint limited to the small circle roughly six to eight inches in diameter (see construction method description in Section 1.4.4). The disturbance would, at most, result in the resuspension of a negligible amount of dredge spoil sediment, followed by rapid settlement and/or dispersal of the suspended material. Site-specific testing of dredged spoils from the slurry would be needed to determine with certainty if dredged spoils are contaminated by hazardous materials. Testing would determine if the substrate at the EP is contaminated with hazardous substances. As the HDD drill head cuts through the dredged spoils and brings the slurry back to the drill site, the material can be tested prior to disposal at a landfill during construction.

9.7.3 Long-Term Impacts

Once the cable is laid, it should remain stable and/or settle into the substrate. No shifting of dredged spoils is anticipated because the materials have been there for decades. Seismic activity in the area could result in the cable being buried, but no environmental damage nor damage to the cable is anticipated.

Just as there would be no short-term construction-related impacts or risks associated with natural hazards, the project after construction would not create additional hazards or risks for the project site or the region. Other natural hazards such as tsunamis and hurricanes are possible anywhere in the

Hawaiian Island chain, and the island of Hawai'i is not any more or less vulnerable to such events than other islands in the State.

9.7.4 Mitigation Measures

As discussed in Section 9.1.4, site-specific testing of dredged spoils from the drilling slurry shall be conducted to determine if the dredged spoils are contaminated by hazardous materials, prior to disposal. If dredged spoils are found to be contaminated, federal and state regulations shall be followed for the handling and disposal of contaminated materials. No other mitigation measures are anticipated.

9.8 TERRESTRIAL AND AQUATIC BIOLOGY

9.8.1 Existing Conditions

Terrestrial

There is no designated critical habitat for federally listed endangered species in the vicinity of this project site. (USFWS, 2003)

None of the plants found during the site visit is a threatened or endangered species, or a species of concern. All native plants observed at the site can be found in similar dry, lowland habitats throughout the islands. The dominant species on the proposed cable landing site are buffelgrass (*Cenchrus ciliaris*) and kiawe trees (*Prosopis pallida*). Both are introduced species. Clumps of buffelgrass line the old roadway leading from Akoni Pule Highway onto the project parcel.

Immediately north of the old road is an open area would be used as a staging area for construction activities. This area is also characterized by scattered patches of buffelgrass and barren patches of soil and rubble. Besides buffelgrass, other plants observed at this open area in smaller numbers include 'aheahea (*Chenopodium murale*), 'uhaloa (*Waltheria indica*), and sixweeks threeawn grass (*Aristida adscensionis*). This area appears to have been previously disturbed, as evidenced by the pile of boulders and broken concrete slabs on the makai end. Immediately mauka of the pier is an open area with bare soil and rocks and a few patches of buffelgrass, 'aheahea, swollen fingergrass (*Chloris barbata*), 'uahloa, and Australian saltbush (*Atriplex semibaccata*).

The rest of the parcel is covered by a closed-canopy kiawe forest that is 20 to 30 feet tall. Ground cover in the kiawe forest consists of scattered patches of buffelgrass, with prominent areas of bare soil and leaf litter. Small shrubs or subshrubs of 'ilima (*Sida fallax*) and 'uhaloa are occasionally observed. Most of these plants occur along the margins of the forest where there is more light available.

Two indigenous species (native to the Hawaiian Islands and elsewhere) were observed on the site - 'ilima and 'uhaloa. A few plants of the endemic pa'uohi'iaka (*Jacquemontia ovalifolia* subspecies *sandwicensis*), a member of the morning glory family with pale blue flowers, were found on the Coast Guard reservation to the south of the subject property.

Few rare or endangered terrestrial wildlife are known to inhabit the area. The 'ope'ape'a (*Lasiurus cinereus semotus*), the native Hawaiian hoary bat, was sighted once in 1960 at Spencer Beach Park about 1.5 miles away, but no sightings have been recorded since then. Other terrestrial animals that frequent the site are probably limited to introduced and common species.

Aquatic

A biological survey was conducted around the underwater EP using SCUBA. The survey noted three coral species having a mean coverage of 0.4 percent. The species are *Porites compressa, Montipora verrucosa, and Montipora patula.* All corals were small, suggesting that none was more than a few years of age. Macroinvertebrate species observed in the transect area included a pair of octopus or he'e (*Octopus cyanea*) the boring bivalve (*Arca ventricosa*), two sea urchin species (*Tripneustes graillа* and *Echinothrix diadema*), and two sea cucumber species (*Holothuria atra* and *Bodadschia vitiensis*). Five species of fish were recorded, the most common being the sleek unicornfish or kala holo (*Naso hexacanthus*) and the orangebar surgeonfish or na'ena'e (*Acanthurus olivaceus*). Only 23 individual fish were counted during the survey.

By comparison, a relatively large coral ridge roughly 80 feet north of the proposed cable EP had higher coral cover of 75.3 percent and richer species diversity, exhibited by the 21 fish species (333 individuals) counted in this area. The dominant coral type in this area is the finger coral (*Porites compressa*).

This area would not be affected by the proposed EP placement. The placement of the proposed EP completely avoids problems that may be encountered if surface-deployed cables were to cross over coral reef areas.

During the marine survey, a small pod of spinner porpoises (also commonly referred to as spinner dolphins) (*Stenella longirostris*) was observed more than 330 feet seaward of the proposed Kaewa Place EP.

The area shoreward of the proposed EP is used by shore fishermen, snorkelers and spear fishermen. Fishing boats moored at Kawaihae small boat harbor regularly transit the proposed EP conducting routine fishing activities. For a discussion of potential impacts on fishing and gathering activities, see Section 9.4.

9.8.2 Construction or Short-Term Impacts

Vegetation along the old road on the project site and in the proposed construction staging area would be cleared as necessary by the contractor. The entire construction site would be less than one acre. The contractor would determine the minimum amount of clearing required at the site.

After construction is completed, the contractor would return the site as much as possible to its pre-construction condition. The exposed areas within the cable easement will be replanted as needed to ensure stability of the site. The area is expected to revegetate quickly. The dominant plant species found on the project site are common, introduced species that grow quickly. Therefore, no adverse short-term impact on flora is anticipated.

No adverse impact on terrestrial faunal resources is anticipated, because of the temporary and benign nature of the proposed HDD construction method, and because few wildlife inhabit the area. No threatened or endangered animals are known to inhabit or utilize the area.

Deployment of fiber-optic cables across hard ocean bottom surfaces could affect species that are covered by the cable. However, the Kaewa Place landing site and EP has been selected in an area devoid of live coral, so no adverse impacts on sessile (permanently attached or fixed) marine species is expected. No impact is expected on other motile species, including fish and turtles, which would most likely avoid the area during construction activity.

During drilling, no adverse interaction with listed marine species is anticipated, because of the temporary and benign nature of the proposed HDD method. HDD minimally disturbs the marine environment, limited to the pop-out of the drill head and the underwater attachment of the cable line to be pulled back to the manhole location. As described in Chapter 1, the drill head pop-out would be a controlled event. An underwater diver would observe the environment before attaching the cable. If an endangered animal is observed in the immediate vicinity of the EP, the pop-out event may be delayed until the animal moves away from the project area of its own volition. The bentonite and water mixture used for drilling slurry would be replaced by water immediately prior to the HDD drill head emerging from the EP. Therefore, no bentonite would be released into the ocean at the EP. In the event of an accidental discharge of slurry during drilling or at the EP (see Section 8.6.2), such a release would not be harmful to marine life, including marine mammals, because ocean currents or wave action would dissipate the turbidy relatively quickly. Also, slurry is not toxic or hazardous to marine life.

When laying cable, caution must be taken to avoid adverse interactions with protected species of marine mammals that occur in Hawai'i's waters. Although humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying operations within these months. If a whale or other protected species is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation would also be halted until the animal moves away of its own volition. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

9.8.3 Long-Term Impacts

Once construction is completed and the cable installed, the project site would be returned as much as possible to its pre-construction condition, and there would be no further disturbance to the marine or terrestrial environment.

The only evidence of construction that would remain is the manhole on the terrestrial side, the small pop-out-point, and cable lying underwater. The cable would be laid at a depth of 60 feet or greater, which is designed to avoid sensitive coral reefs and be deep enough to avoid damage from storms. Over time it is expected that the cable would become buried in the substratum.

The presence of the cable or manhole is not anticipated to cause any long-term adverse interaction with protected species. There is no evidence to suggest that impact occurs with cable operation. There are a number of fiber-optic cables operating on the leeward coast of O'ahu, where marine mammals are present, with no known adverse impacts on those animals.

9.8.4 Mitigation Measures

Because the proposed action would have no short- or long-term adverse impacts on any flora or terrestrial fauna, threatened and endangered species, or their critical habitat, no mitigation measures are required. After construction is completed, the contractor will return the site to its pre-construction condition.

The following mitigation measures are proposed to avoid adverse interactions with marine animals during construction.

Immediately before and during the pop-out event, an underwater diver shall observe the environment before attaching the cable. If a protected animal is observed in the immediate vicinity of the EP, the pop-out event shall be delayed until the animal moves away from the project area of its own volition.

If any protected species is detected during construction, including marine mammals and sea turtles, cable deployment shall be halted until they move away from the vessel or the cable deployment area.

The bentonite and water mixture used for drilling slurry will be replaced by water immediately prior to the HDD drill head emerging from the EP preventing bentonite from releasing into the ocean.

9.9 AIR QUALITY

9.9.1 Existing Conditions

Air quality in the State of Hawai'i is typically excellent, due to offshore trade winds that help disperse most urban air pollutants. On Hawai'i island, sulfur dioxide emissions from volcanic activity on the island can sometimes compromise air quality. In the Kawaihae area in particular, low population density and lack of development, combined with the characteristic windy conditions help to keep the area virtually free of air pollutants.

9.9.2 Construction or Short-Term Impacts

Some excavation work would be required to set up the drilling operation, but more importantly, excavation would be required to install the beach manhole within the Akoni Pule Highway right-of-way and trenching between the drill site and the beach manhole. Construction vehicles emit air pollutants, typically in the form of fugitive dust and diesel fumes associated with site clearing and heavy vehicle traffic. Dust emissions may occur during trenching and excavation if the soil is dry and conditions are windy. The HDD rig and compressor are diesel-powered, and would emit relatively high levels of nitrogen oxide (NO_x) in comparison to gasoline-powered equipment. However, the effects of NO_x are evaluated on a regional basis and are not likely to be violated by short-term construction emissions at isolated locations, such as at a landing site.

Moreover, the Kaewa Place landing site benefits from strong coastal winds that would result in rapid dispersal of most air pollutants. Therefore, the amount of temporary emissions caused by routine construction activities is anticipated not to exceed State or federal air quality standards, and no noticeable adverse air quality conditions should extend outside of the immediate area of construction.

9.9.3 Long-Term Impacts

Construction activity would be short-lived, and the prevailing winds in the area would help to disperse air pollutants, such that there would be no lingering effects on air quality. After construction is completed and the manhole installed, the landing site would experience no further activity that could potentially degrade air quality.

9.9.4 Mitigation Measures

The contractor shall adhere to State rules and regulations governing air quality, such as ensuring there are no visible dust emissions outside the affected parcel. BMPs shall also be implemented to minimize unnecessary air quality impacts. Dust emissions shall be prevented by requiring the contractor to periodically wet down the work area, stabilization of surfaces of stockpiled materials, and treatment of unpaved routes with dust suppressants. This will help control escape of fugitive dust beyond the construction site.

The SIC contractor shall also be required to maintain his or her equipment and vehicles in proper working order, including exhaust systems. Although a faulty exhaust system on the drill rig, as an example, would not cause regional air quality problems, it could be a nuisance or health hazard to nearby uses

As required by State regulations, upon completion of work the project site shall be revegetated as appropriate to control erosion and release of dust by the wind.

9.10 NOISE

9.10.1 Existing Conditions

Since there are no developments or activities on the project site currently, ambient noise levels are limited to passby traffic on Akoni Pule Highway, as well as wind and wave sounds.

9.10.2 Construction or Short-Term Impacts

During the construction phase, excavation, boring, and cable laying equipment that will be used will be sources of increased noise. However, because of the temporary nature of construction, it is not generally considered a significant impact. The majority of noise is expected to come from use of heavy machinery, such as bulldozers, directional boring rig, and trucks entering and leaving the site during the drilling period, expected to last approximately three months. Noise produced by this operation may occasionally be as high as 90 to 94 decibels at 50 feet away, which is comparable to the noise from a lawnmower. HDD operations and other construction activities will be conducted within the hours allowed for construction under State law, i.e., 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would more than likely violate Community Noise Control Standards; therefore, the SIC contractor would require a noise permit from the SDOH.

It is anticipated that the residence located closest to the project area (about 400 feet from the project site) would be affected by construction noise for the duration of drilling. It is anticipated that residents in the house located in the Kawaihae Residential Lots–Makai subdivision may be able to hear the drilling noise.

9.10.3 Long-Term Impacts

There would be no project-related noise once construction is completed. No long-term impacts are expected as there will be no operational requirements for the manhole site except for an occasional maintenance repair technician visiting the site on an as-needed basis.

9.10.4 Mitigation Measures

HDD operations and other construction activities shall be conducted within the hours allowed for construction under State law, i.e, 7:00 a.m. to 6:00 p.m. Monday through Friday, and Saturdays from 9:00 a.m. to 6:00 p.m. HDD operations would likely violate Community Noise Control Standards; therefore the SIC contractor would require a noise permit from the SDOH.

Prior to the start of construction, SIC or its contractor shall inform the nearby community about the proposed construction schedule and anticipated noise impact. SIC shall provide contact information where residents may call to ask questions or report problems. In general, the contractor shall be the point of contact to the community during construction. However, members of the community shall be able to contact SIC if they are dissatisfied with how the contractor resolves noise or other problems, or have complaints about the contractor.

The SIC contractor shall be required to maintain his or her HDD drilling equipment in proper working order, especially all noise suppression systems, such as the rig's muffler. Noise generated from machinery shall be mitigated by requiring contractors to adhere to State noise regulations.

9.11 PUBLIC FACILITIES AND SAFETY

9.11.1 Existing Conditions

The project site is located directly off of Akoni Pule Highway (Highway 270), which is the main two-lane route connecting the northern end of Queen Ka'ahumanu Highway (Highway 19) with the northern tip of the island at 'Upolu Point. The terrestrial portion of the SIC fiber-optic cable lines would be laid within the Akoni Pule Highway right-of-way.

Public utilities such as water, electrical, and telecommunications systems tend to be located within State and County road rights-of-way. Potable water is generally provided by the County's Department of Water Supply, though some private water systems do exist, and some areas rely on water tanks fed by catchment systems. Electricity is provided by Hawaii Electric Light Company (HELCO); and existing telephone and cable services are provided where available by Verizon Hawaii (formerly GTE Hawaiian Tel) and Sun *Cablevision, which serves West Hawai'i.* Electricity and telephone lines are provided by overhead lines.

9.11.2 Construction or Short-Term Impacts

The contractor would be responsible for maintaining traffic flow as much as possible on Akoni Pule Highway. During construction there may be restricted traffic flow, including closure of one traffic lane along the highway. There is no impact on emergency vehicle access is anticipated, as traffic coordinators would allow vehicles to pass in the case of emergencies.

All applicable approvals and permits related to construction affecting the roadway would be obtained from the County Department of Public Works and the State DOT prior to construction.

Construction of the manhole and hookup to the terrestrial portion of the SIC cable system would avoid all public utilities located underground or overhead within the road right-of-way. If it is not possible to avoid such utilities, SIC would coordinate with the public utility provider(s) to relocate conflicting lines.

9.11.3 Long-Term Impacts

After construction, contractors would be required to return the project site to pre-construction conditions. Therefore, no adverse long-term impacts to any public utilities, facilities, or services are anticipated after the fiber-optic cable installation is completed. The project would not affect expansion of existing infrastructure or installation of new infrastructure.

Once construction of the manhole has been completed, there would be no long-term traffic impacts on public roadway facilities.

9.11.4 Mitigation Measures

SIC shall coordinate work on Akoni Pule Highway with the State of Hawaii Department of Transportation to prevent conflicts in activities. SIC shall post appropriate public notice per County and State requirements for lane closures,as necessary.

During construction work on Akoni Pule Highway, flagmen and/or police officers shall be posted to direct traffic safely around the construction of the proposed manhole.

SIC shall coordinate with the County Department of Water Supply and the HELCO to ensure that the landing site construction activities will not damage existing utility lines or interfere with future plans.

Chapter 10
Secondary and Cumulative Impacts

Final Environmental Assessment/
Finding of No Significant Impact
Submarine Fiber-Optic Cable Project

CHAPTER TEN: SECONDARY AND CUMULATIVE IMPACTS

The purpose of this chapter is to discuss secondary and cumulative impacts that could potentially result from the proposed project.

Secondary impacts, also known as indirect effects, are those impacts that occur later in time or at a more distant location, but are reasonably foreseeable results of the original action. Examples of secondary impacts include changes in land use patterns, population density, or growth rate, and related impacts on the natural environment.

Cumulative impacts result from implementing several individual projects in the same geographic area and/or time frame, even though each may have limited impacts separately. Cumulative impacts of interlinking separate SIC projects are discussed below, as well as impacts potentially resulting from implementation of other unrelated projects.

10.1 SECONDARY IMPACTS

10.1.1 Potential Impacts of Submarine Cables

Cables would be installed underground using HDD from a terrestrial construction site, with the bulk of the cable length placed on the ocean floor. In the near shore environment, there would be little or no movement of the cable because underground cables would not be exposed to surface environmental conditions, such as wave action. In deeper waters, the cable would remain immobile under its own weight. Therefore, subsequent abrasion impacts from movement of the cable, once installed, are not expected. In the rare event of a tsunami, backwash from the tsunami could affect the cable. Should such an event occur, SIC and/or its contractor would inspect the cable and make the necessary repairs to the system.

The cable casing is made of non-toxic armoring materials and is not expected to have any adverse effect on water quality and/or marine biology. The SIC system would consist of relatively short cable routes, designed to avoid the use of submarine repeaters (equipment to maintain signal strength on long cable segments by periodically amplifying light traveling over long distances). Repeaters would have required installing high voltage wires within the fiber optic cable conduit. Because such elements would not be used, no harmful environmental impacts are anticipated from laying and operating cables on the ocean bottom.

Based on the considerations above, secondary impacts from installation and operation of the submarine cables themselves are not expected.

10.1.2 Potential Impacts at Landing Sites

The provision of telecommunications services would enhance the DHHL properties and facilitate development that is already planned and anticipated at each site. However, development of many properties that are not yet built is seriously constrained by the lack of utilities other than telecommunications, such as water supply. Other issues, including financial concerns, also constrain immediate development of many DHHL properties.

SIC has no plan to provide services to non-DHHL beneficiaries. SIC's Public Utilities Commission license allows it to provide services only to DHHL beneficiaries, or other lessees on DHHL properties. Therefore, provision of such services is not anticipated to spur any population growth, adverse social impacts, or overall development other than that which has already been anticipated.

Impacts associated with this project are primarily related to construction activities and would therefore be short-term. The project would generate temporary engineering and construction jobs, and permanent jobs for system operation and maintenance. SIC's preference is to use qualified local residents and contractors. Therefore, these temporary and permanent jobs are not of sufficient scale to generate substantial immigration to individual islands or to the State as a whole. Accordingly, the project would not create a significant increase in or impact upon resident population, housing, demand for public facilities and services, land use patterns, public infrastructure, and the natural environment.

The proposed project would be unlikely to induce secondary impacts such as unplanned emergence of high technology centers on or near DHHL properties. Previous installations of fiber optic cable systems elsewhere in the State do not appear to have induced such development, nor acted as a general economic stimulus. Development of high technology centers relies on many factors beyond the availability of a high-speed telecommunications system, such as economic health, local business climate, and availability of a qualified labor force.

Because no secondary impacts are anticipated, no mitigation measures are proposed.

10.2 CUMULATIVE IMPACTS

10.2.1 Potential Impacts of the Submarine Cables

The potential for incremental environmental impacts on the marine environment from this project is negligible. Given the existence of many other submarine cables already installed throughout the State, and the benign nature of these cables once installed, no cumulative impacts are anticipated to occur from the addition of the five SIC submarine routes.

10.2.2 Potential Landing Site Impacts and Interactions with Planned Projects

Impacts on the landing sites would be temporary, related to construction, and located on different islands. Therefore, cumulative impacts should be considered at the island or regional level, since impacts at one landing site would not cause nor increase impacts at another landing site.

The limited and temporary nature of construction-phase impacts from this project is not anticipated to combine with impacts generated by other projects, especially with the implementation of maintenance of traffic procedures, Best Management Practices and other committed mitigation measures contained in this document. At most landing sites, the proposed work would affect only a specific property and would terminate in the roadway beyond that property.

The operational aspect of the proposed project would not aggravate nor incrementally change existing and/or planned conditions. The submarine network would connect with SIC's terrestrial network, which has been planned and developed separately. There would be no adverse interaction with that project because both projects have been designed to complement each other.

Because no cumulative impacts are anticipated, no mitigation measures are proposed.

Chapter 11

Consistency and Compliance with Federal, State and Local Regulations, Plans and Policies

Final Environmental Assessment/ Finding of No Significant Impact

Submarine Fiber-Optic Cable Project

CHAPTER ELEVEN: CONSISTENCY AND COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS, PLANS, AND POLICIES

This document is an Environmental Assessment prepared to comply with the requirements of Chapter 343, Hawai'i Revised Statutes (HRS). The application of HRS Chapter 343 and the National Environmental Policy Act (NEPA) to this project is described in Chapter 1.

The purpose of this chapter is to describe the regulations applicable to the project. Federal, State and county requirements are described along with the activities accomplished to date to comply with those requirements. This chapter also discusses the project's conformance with relevant government master plans and adopted policies.

11.1 FEDERAL REGULATIONS

The project must comply with a series of federal requirements as described below.

11.1.1 National Historic Preservation Act Section 106

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies consider the effect of their actions on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register of Historic Places (NRHP). Such resources are called "historic properties." Under Section 106, a federal action (or undertaking) may involve federally funded projects, activities, or programs, including those carried out with federal financial assistance. Federal actions also include projects requiring a federal permit, license or approval, including those where federal authority has been delegated to a state or local agency.

This project must comply with Section 106 because a federal loan would be obtained from the Rural Utilities Service (RUS) of the U.S. Department of Agriculture, and a federal permit (from the Department of the Army; see Section 11.4) would be required.

Section 106 requires consultation with the State Historic Preservation Officer (SHPO) and other agencies and organizations that may have an interest in or are mandated to protect historic properties. In addition, the Advisory Council on Historic Preservation (ACHP) is afforded the opportunity to comment on actions that may potentially affect historic properties.

The Section 106 process follows these steps:

- Identification of historic properties in the project's "Area of Potential Effect" (APE);
- Assessment of potential project effects on historic properties in the APE, and
- If necessary, mitigation of adverse impacts.

11.1.1.1 Identification of Historic Properties

For a district, site, building, structure or object to be considered eligible for the NRHP (or be considered "historic" or a "historic property"), it must have "integrity of location, design, setting, materials, workmanship, feeling, and association," and meet any one of the following criteria:

(A) Be associated with events that have made a significant contribution to the broad patterns of history;
(B) Be associated with the lives of persons significant in the past;

(C) Embody the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
(D) Be an entity that yielded, or may likely yield, information important in prehistory or history.

The Hawai'i Register of Historic Places (HR) provides an additional criterion:
(E) Be a site that has cultural significance, such as religious structures (shrines, *heiau*), or human burial locations.

Identification of historic properties in the APE results in one of two findings:

- No historic properties affected; or
- Historic properties affected.

"No historic properties affected" means that either there are no historic properties present within the APE, or there are historic properties present in the APE, but the undertaking would have no harmful nor beneficial effect on them. "Historic properties affected" means that the APE contains historic properties that could be affected by the undertaking. This "effect" is then evaluated as to whether or not it is "adverse" (*see Section 11.1.1.2 for further information*).

Figures 11.1-1A through 11.1-1G show the APE for each proposed landing site. Staff of the Historic Preservation Division (SHPD) of the State of Hawai'i Department of Land and Natural Resources concurred with the boundaries of the APEs on February 5 and 13, 2003 (see Section 12.2).

Archaeological studies have been conducted by Cultural Surveys Hawaii, Haun & Associates, and Xamanek Researches within the APEs of all seven proposed landing sites. The level of study (assessment or inventory survey) was determined through coordination with the SHPD. Table 11.1-1 summarizes the results of the archaeological studies.

Based on the information contained in Table 11.1-1, the RUS is anticipated to render "no historic properties affected" determinations regarding the proposed 'Akialoa Road, Kili Drive, Sandy Beach Park, and Wahikuli landing sites. Historic properties would be affected by development of the proposed Oneali'i Homesteads, Po'olenalena Park, and Kaewa Place landing sites.

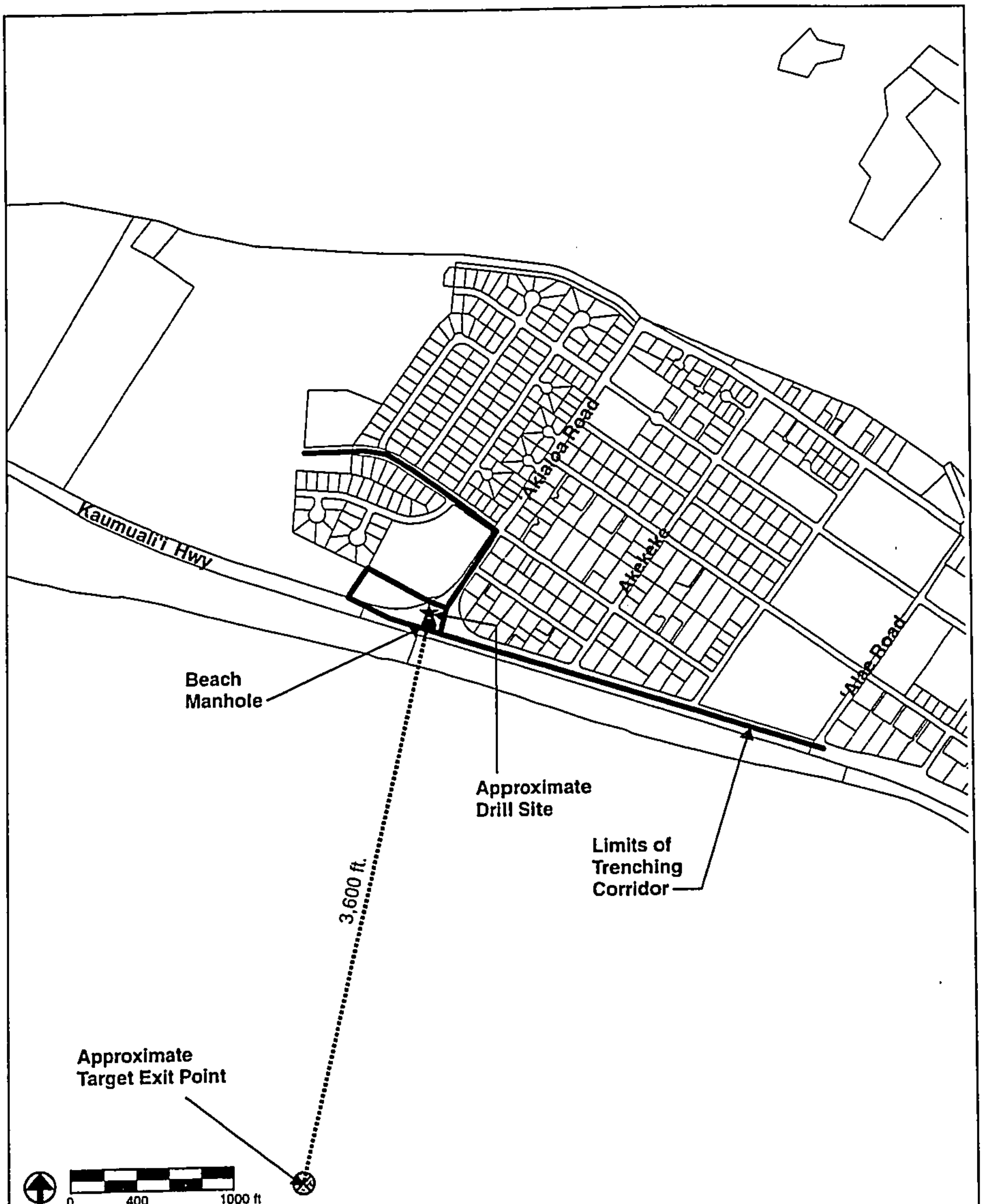
11.1.1.2 Adverse Effect Determinations

For those proposed landing site APEs containing historic properties, Section 106 defines two possible "effect" determinations:

- No adverse effect; or
- Adverse effect.

"No adverse effect" means that there could be an effect, but the effect would not be harmful to those characteristics that qualify the property for inclusion on the NRHP. An "adverse effect" means the undertaking may alter the characteristics of the historic property in a manner that would diminish its historic qualities. Consideration is given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP.

Table 11.1-2 summarizes a preliminary evaluation of whether those historic properties that have been identified within the APE of a landing site would be "adversely affected" by the project, as defined by the Section 106 requirements.

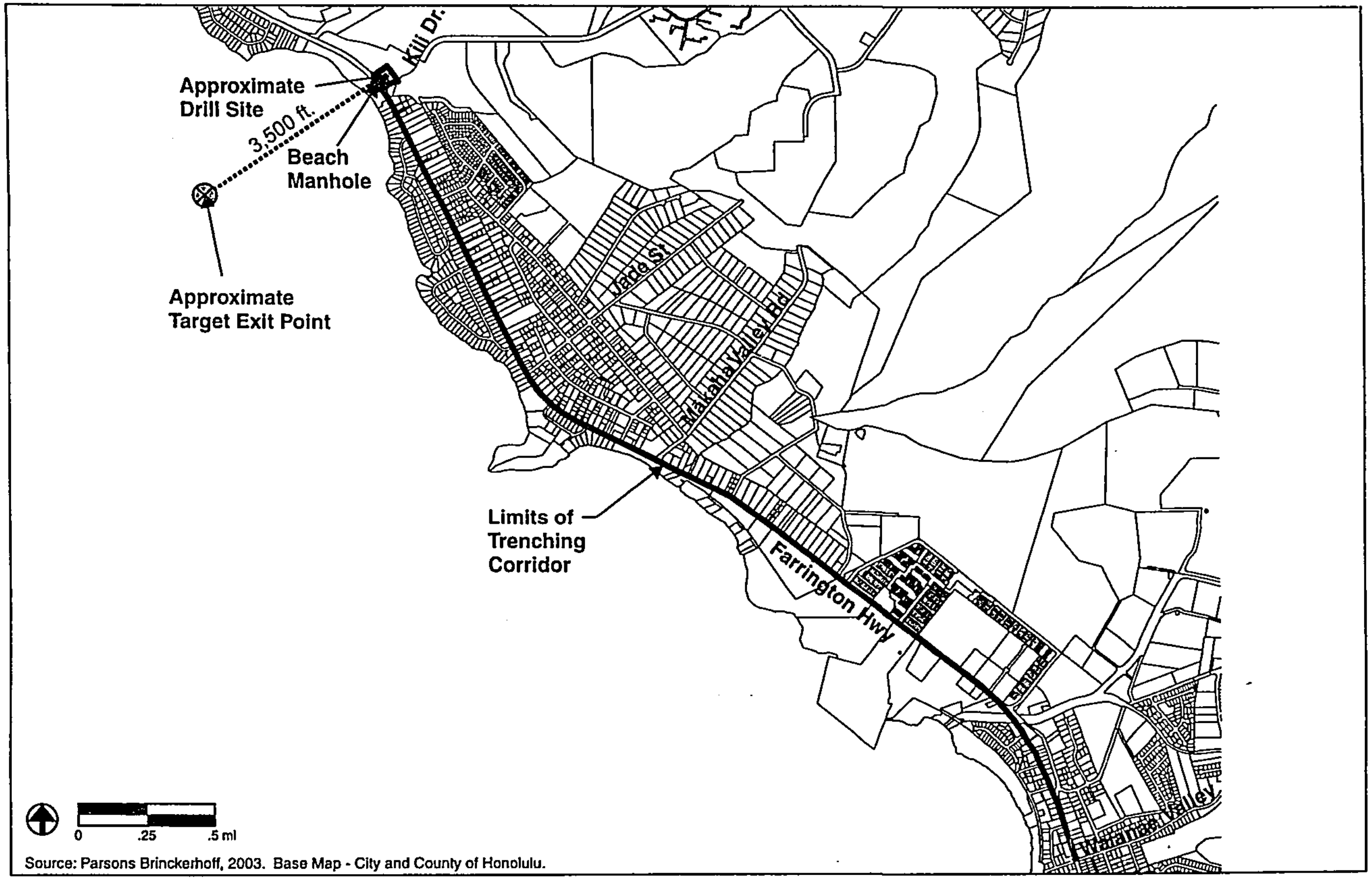


Source: Parsons Brinckerhoff, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

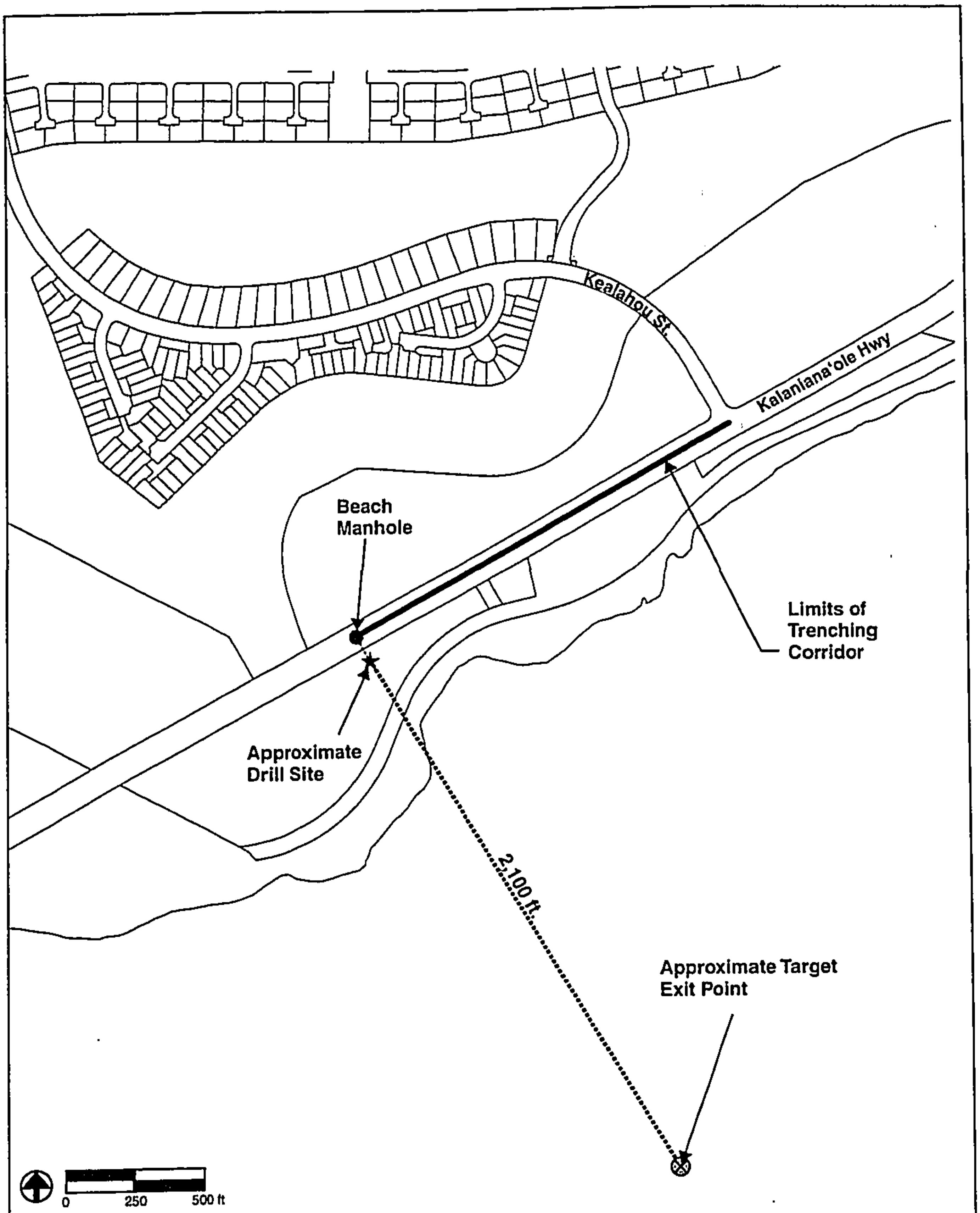
Area of Potential Effect - 'Akialoa Road Landing Site, Kekaha, Kaua'i
Submarine Fiber-Optic Cable Project

Figure 11.1-1A



Sandwich Isles Communications, Inc.

Area of Potential Effect - Kili Drive Landing Site, Mākaha, O'ahu
Submarine Fiber-Optic Cable Project
Figure 11.1-1B

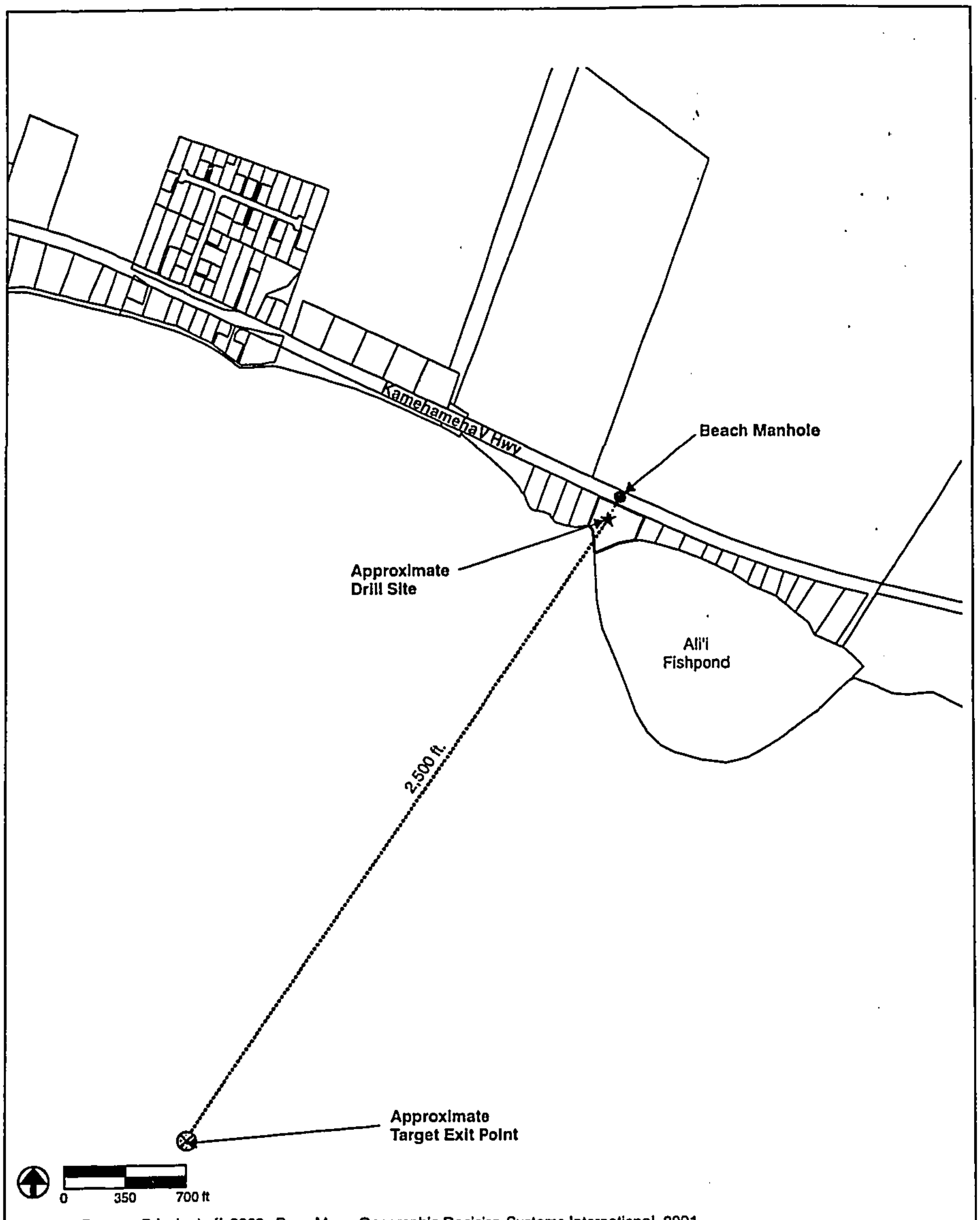


Source: Parsons Brinckerhoff, 2003. Base Map - City & County of Honolulu.

Sandwich Isles Communications, Inc.

Area of Potential Effect -
Sandy Beach Park Landing Site, Hawai'i Kai, O'ahu
Submarine Fiber-Optic Cable Project

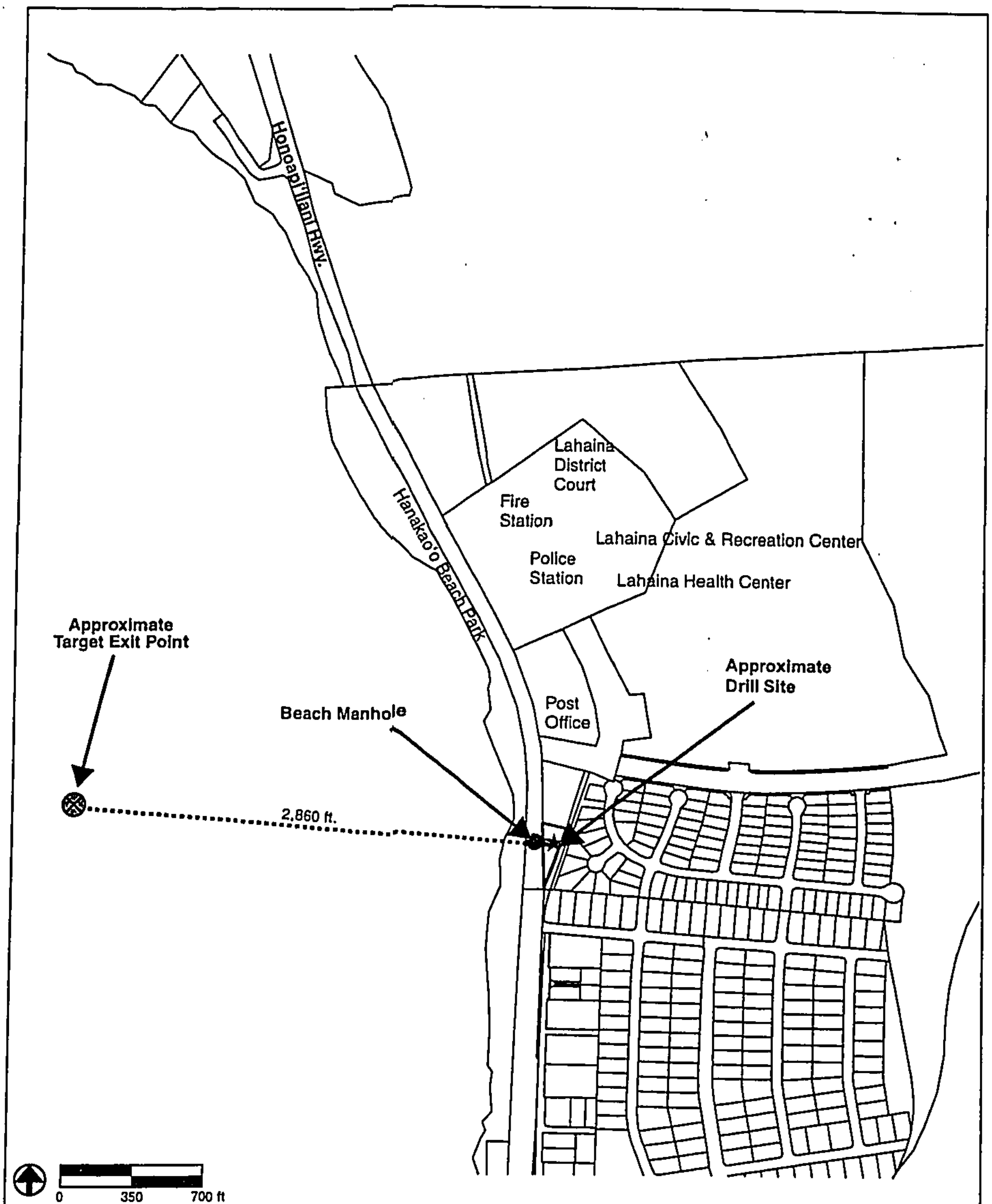
Figure 11.1-1C



Source: Parsons Brinckerhoff, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

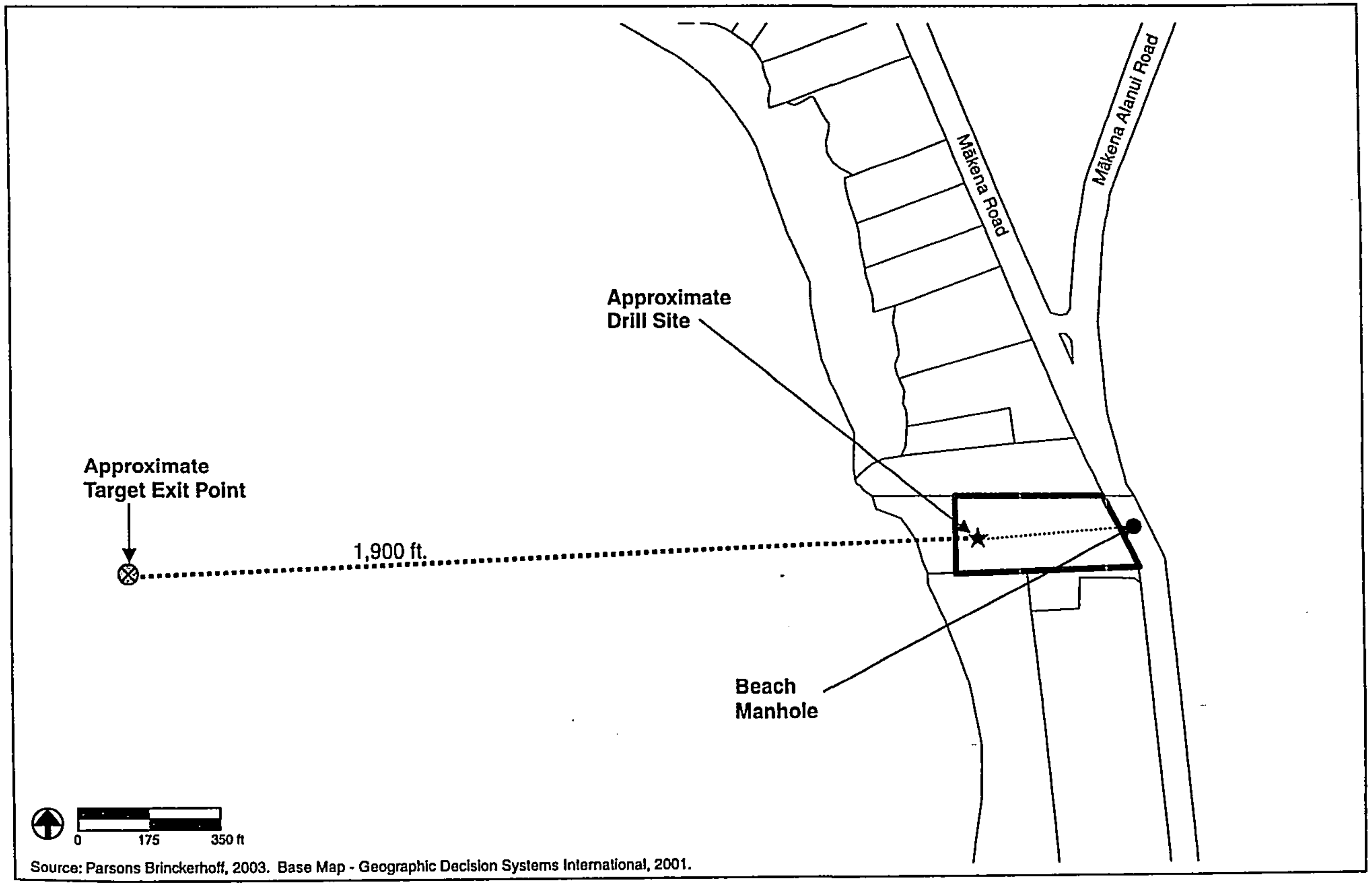
Area of Potential Effect -
Oneali'i Homesteads Landing Site, Kaunakakai, Moloka'i
Submarine Fiber-Optic Cable Project
Figure 11.1-1D



Source: Parsons Brinckerhoff, 2003, and Makai Ocean Engineering, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

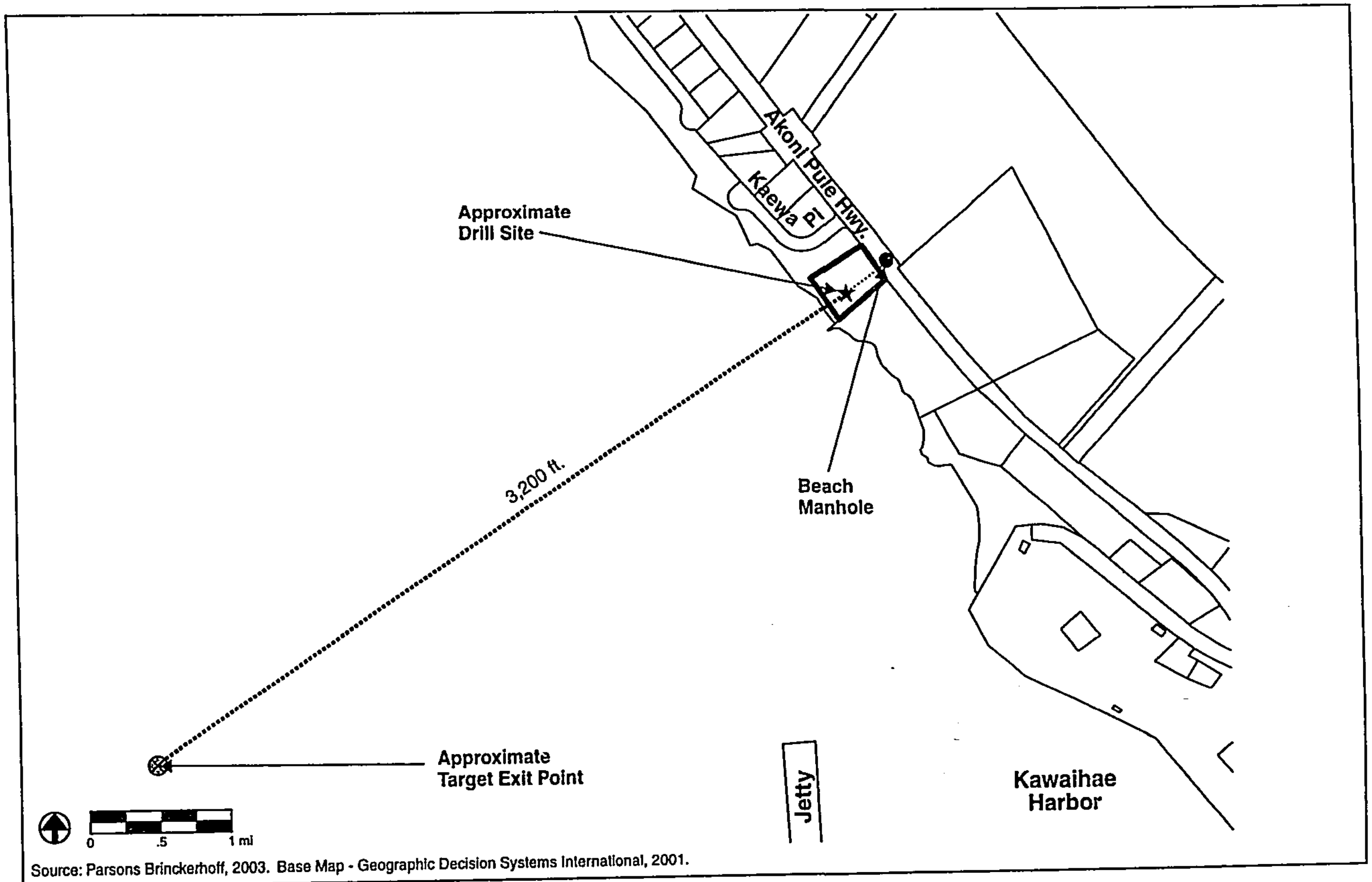
Area of Potential Effect - Wahikuli Landing Site, Lahaina, Maui
Submarine Fiber-Optic Cable Project
Figure 11.1-1E



Source: Parsons Brinckerhoff, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

Area of Potential Effect - Po'olenalena Landing Site, Mākena, Maui
Submarine Fiber-Optic Cable Project
Figure 11.1-1F



Sandwich Isles Communications, Inc.

Area of Potential Effect - Kaewa Place Landing Site, Kawaihae, Hawai'i
Submarine Fiber-Optic Cable Project
Figure 11.1-1G

TABLE 11.1-1
HISTORIC PROPERTIES WITHIN THE AREAS OF POTENTIAL EFFECT

Proposed Landing Site	Historic Properties	
	State Site No.	Description
'Akialoa Road, Kaua'i	Not Applicable	None
Kili Drive, O'ahu	Not Applicable	None
Sandy Beach Park, O'ahu	Not Applicable	None
Oneali'i Homesteads, Moloka'i	50-60-03-135	Ali'i Fishpond
Wahikuli, Maui	Not Applicable	None
Po'olenalena Park, Maui	50-50-14-5486	Coastal habitation site (three subsurface cultural layers)
Kaewa Place, Hawai'i	50-10-05-23857	Bridge abutment
	50-10-05-23858	Wall
	50-10-05-23859	Comfort station (associated with pier)
	50-10-05-23860	Pier

Sources: Cultural Surveys Hawaii, Archaeological Inventory Survey in Support of the Proposed Sandwich Isles Fiber-Optic Cable Landing at 'Akialoa Road, Kekaha, Waimea Ahupua'a, Kona District, Island of Kaua'i (TMK 1-2-02:*por.) (August 2003), Archaeological Inventory Survey in Support of the Proposed Sandwich Isles Fiber-Optic Cable Landing at Kili Drive, Mākaha Ahupua'a, Wai'anae District, Island of O'ahu (TMK 8-4-02:47 por.) (August 2003), Archaeological Inventory Survey in Support of the Proposed Sandwich Isles Fiber-Optic Cable Landing within Sandy Beach Park, Ahupua'a of Maunalua, Island of O'ahu (TMK 3-9-12:02) (August 2003); and Xamanek Researches, An Archaeological Assessment of a Portion of a Parcel of Land in Makakupa'ia Ahupua'a, Island of Moloka'i (TMK: 5-4-06:19) (October 8, 2003), An Archaeological Inventory Survey of the Proposed Sandwich Isles Communications, Inc. Fiber-Optics Landing Location Near the Lahaina Post Office, Wahikuli Ahupua'a, Lahaina District, Island of Maui (TMK: 4-5-21:15) (July 18, 2003), and An Archaeological Inventory Survey of the Proposed Fiber Optics Landing Location at Po'olenalena Beach Park, Keahou ahuua'a, Honua'ula moku, Makawao District, Island of Maui (TMK: 2-1-07:por. 72) (December 2, 2003); Haun & Associates, Archaeological Inventory Survey, TMK: 6-1-04: Por. 20, Land of Kawaihae 1, South Kohala District, Island of Hawai'i (June 2003);

TABLE 11.1-2
PRELIMINARY ADVERSE EFFECT EVALUATIONS

Proposed Landing Site	Historic Property	Evaluation
Oneali'i Homesteads, Moloka'i	Ali'i Fishpond	No Adverse Effect
Po'olenalena Park, Maui	Coastal habitation site	Adverse Effect
Kaewa Place, Hawai'i	Bridge abutment	No Adverse Effect
	Wall	No Adverse Effect
	Comfort station	No Adverse Effect
	Pier	No Adverse Effect

Source: Parsons Brinckerhoff Quade & Douglas, Inc., October 2003.

Discussion of why five of the six historic properties listed on Table 11.1-2 would not be adversely affected by the proposed project is provided below:

Ali'i Fishpond. The fiber-optic cable alignment of the Oneali'i Homesteads landing site would be on the west side of the fishpond wall. Since the western wall of the fishpond does not extend to the western end of the landing site parcel, it is possible to establish an easement beyond the fishpond boundary.

Bridge Abutment, Wall, Comfort Station, and Pier. These four historic properties within the Kaewa Place landing site parcel do not require preservation. Furthermore, all four sites have been fully documented in an archaeological inventory survey conducted for the project. No further archaeological work is required.

An "adverse effect" determination was rendered on the coastal habitation site, which is evident by the uncovering of three layers of subsurface cultural deposits during an inventory survey at the Po'olenalena Park landing site parcel. The area surveyed extended from the drill site seaward for approximately 140 feet. The habitation site likely extends mauka within the coastal sand formation. Therefore, excavation for the slurry pit and/or drilling would likely penetrate through one or more cultural layers. In addition, trenching to install fiber-optic cable between the drill site and manhole on Mākena Alanui Road may also cut through one or more cultural layers. See Section 8.3.2 for further information.

11.1.1.3 Resolution of Adverse Effects

Section 106 requires that a Memorandum of Agreement (MOA) between the federal agency and the State Historic Preservation Officer (SHPO) be prepared for all "adverse effect" determinations. The Advisory Council on Historic Preservation (ACHP) is sometimes a third party to the MOA, and other organizations may also be signatories to the MOA. The MOA addresses a range of concerns, including measures to be taken to mitigate the project's adverse effects on the historic resource.

Section 8.3.4 describes proposed mitigation measures that would probably be specified in the upcoming MOA. Briefly, the measures would include an additional subsurface inventory survey covering the HDD staging area and the trench alignment to obtain more information about the habitation site. Following the inventory survey, a preservation plan would be prepared. If burial remains are uncovered during the supplemental inventory survey, the conduit alignment would be adjusted to avoid the site and the modified alignment would undergo a subsurface inventory survey.

Since SIC already has a MOA addressing the construction of its terrestrial system on Maui, the current intent is for the signatories of the existing MOA on Maui to amend the MOA to address the new submarine cable landings.

11.1.1.4 Consultation

Section 106 requires consultation with the SHPO and agencies, organizations and individuals with expertise and interest in historic, archeological and cultural resources, which is to occur throughout the process, such as within each of the steps described above. Section 106 consultation activities conducted to date are summarized in Section 12.2.

In a letter providing comments on the Draft EA, the SHPD communicated agreement that an "adverse effect" determination would be appropriate for the Po'olenalena Park landing site, and that the existing Memorandum of Agreement (MOA) for undertakings on the Island of Maui should be amended (also see Section 12.2).

11.1.2 Endangered Species Act and Other Laws Protecting Biological Resources

Section 7 of the Endangered Species Act (ESA) requires that federal agencies consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any federally listed threatened or endangered species, or result in the destruction or adverse modification of a critical habitat.

In addition, the stakeholders involved in the Section 7 process are the same stakeholders involved in other federal processes established to protect biological resources. Other applicable federal laws include the following:

- Magnuson-Stevens Fishery Conservation and Management Act, reauthorized as the Sustainable Fisheries Act (SFA);
- Marine Mammal Protection Act (MMPA);
- Fish and Wildlife Coordination Act (FWCA); and
- Migratory Bird Treaty Act (MBTA).

In addition, the presidential Executive Order on Coral Reef Protection (E.O. 13089) requires all federal agencies to ensure that any actions they authorize, fund, or carry out would not degrade the conditions of coral reef ecosystems. The proposed project will be implemented in accordance with this Executive Order. In June 1998, E.O. 13089 established the U.S. Coral Reef Task Force, consisting of representatives of several federal agencies and states working together to determine the best course of action for protecting the nation's coral reef ecosystems. E.O. 13089 states that "all Federal agencies...shall...utilize their programs and authorities to protect and enhance the conditions of such ecosystems...and... to the extent permitted by law, ensure that any actions they authorize, fund, or carry out would not degrade conditions of such ecosystems." The Hawaiian Islands Humpback Whale National Marine Sanctuary is a part of the national system of marine sanctuaries. While humpback whales can appear anywhere in Hawai'i's coastal waters, the sanctuary was established to protect humpback whales and their habitat within the sanctuary boundaries, among other purposes. Figure 11.1-2 shows proposed cable routes and landing sites in relation to the boundaries of the sanctuary.

The ESA Section 7 Consultation process provides a useful framework to evaluate the project's impacts on protected species within the context of the multiple applicable federal requirements. Therefore, the discussion below focuses on the Section 7 process.

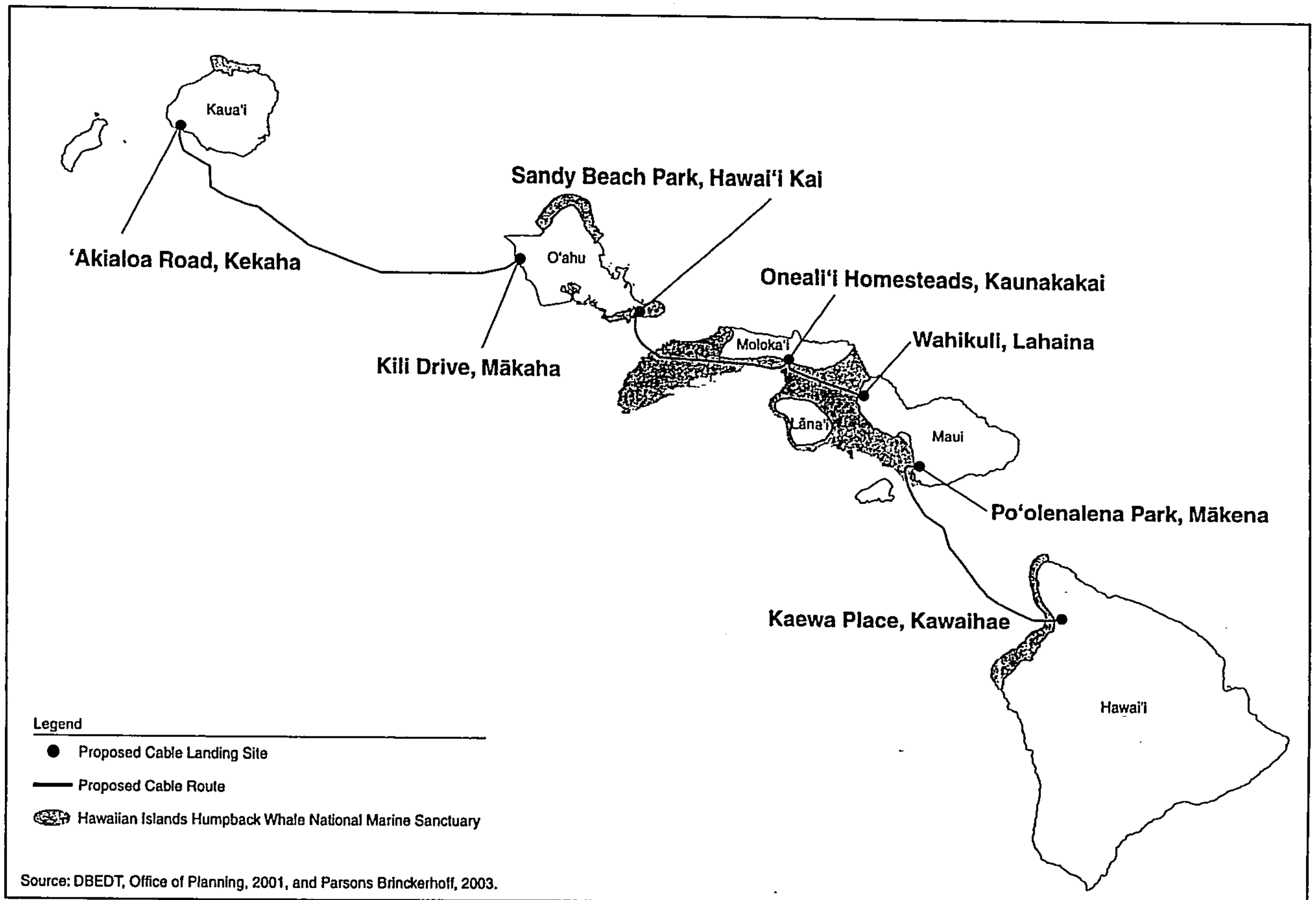
The following discussion briefly outlines the Section 7 consultation process:

1. Identify the potential presence of federally protected species and their critical habitat in the project area.
2. Determine if the project may generate potential adverse effects on the identified species.
3. If adverse effects on the identified species are not anticipated, "Informal" Section 7 consultation with the USFWS and/or NMFS is initiated. USFWS and/or NMFS concurrence that the project would not adversely affect the protected species in the project area concludes "Informal" Section 7 consultation.
4. If adverse effects on the protected species could occur, "Formal" Section 7 consultation with USFWS and/or NMFS is initiated through preparation and submission of a "biological assessment" (BA) addressing all potentially affected species.
5. Subsequent to agency review of the BA, USFWS and/or NMFS prepares a "biological opinion" (BO) that includes recommended mitigation measures to minimize potential adverse impacts on the protected species. Issuance of the BO concludes "Formal" Section 7 consultation.

11.1.2.1 Identification of Protected Species

The USFWS and NMFS were contacted in letters dated February 26, 2003 (two letters), and April 22, 2003 (see Appendix 2) by RUS and Parsons Brinckerhoff. Coordination meetings were also held with both agencies on May 31, 2002. Since the project involves both land and ocean resources, both USFWS and NMFS have jurisdiction. Both agencies were asked to identify those species that may be affected by the project pursuant to ESA, SFA, MMPA, MBTA, and FWCA. In addition, the State Department of Land and Natural Resources (DLNR), Divisions of Forestry and Wildlife (DOFAW) and of Aquatic Resources (DAR) were also asked in letters dated May 7, 2003 (see Appendix 2) to identify protected species that could be affected by the project.

In a letter dated April 14, 2003, the NMFS identified the following protected species that may be affected by the project. The first five species listed are endangered and are therefore, protected under both ESA and MMPA. The rest of the species listed below are protected under MMPA.



Sandwich Isles Communications, Inc.

Boundary of Hawaiian Islands Humpback Whale National Marine Sanctuary
Submarine Fiber-Optic Cable Project
Figure 11.1-2

- Green turtle (*Chelonia mydas*) - Threatened
- Hawksbill turtle (*Eretmochelys imbricata*) - Endangered
- Humpback whale (*Megaptera novaeangliae*) - Endangered
- Sperm whale (*Physeter macrocephalus*) - Endangered
- Hawaiian monk seal or 'Ilio-holo-i-ka-uaua (*Monachus shauinslandi*) - Endangered
- Bryde's whale (*Balaenoptera edeni*)
- Cuvier's beaked whale (*Ziphius cavirostris*)
- Pygmy sperm whale (*Kogia breviceps*)
- Dwarf sperm whale (*Kogia simus*)
- Melon-headed whale (*Peponocephala electra*)
- Pygmy killer whale (*Feresa attenuate*)
- False killer whale (*Pseudorca crassidens*)
- Killer whale (*Orcinus orca*)
- Short finned pilot whale (*Globicephala macrorhynchus*)
- Spinner dolphin (*Stenella longirostris*)
- Striped dolphin (*Stenella coeruleoalba*)
- Pantropical spotted dolphin (*Stenella attenuata*)
- Common dolphin (*Delphinus delphis*)
- Risso's dolphin (*Grampus griseus*)

In a letter dated June 19, 2003, the USFWS identified the following species that may be affected by the project pursuant to ESA Section 7, MBTA, and FWCA. The list is categorized by landing site.

<u>'Akialoa Road, Kaua'i</u>

- Hawaiian hoary bat or 'ope'ape'a (*Lasiurus cinereus semotus*) - Endangered

<u>Sandy Beach Park, O'ahu</u>

- Hawaiian monk seal or 'Ilio-holo-i-ka-uaua (*Monachus shauinslandi*) - Endangered

<u>Oneali'i Homesteads, Moloka'i</u>

- 'Ohai plant (*Sesbania tomentosa*) - Endangered

<u>Wahikuli, Maui</u>

- Hawaiian hoary bat or 'ope'ape'a (*Lasiurus cinereus semotus*) - Endangered
- Hawaiian monk seal or 'Ilio-holo-i-ka-uaua (*Monachus shauinslandi*) - Endangered

<u>Po'olenalena Park, Maui</u>

- Hawaiian monk seal or 'Ilio-holo-i-ka-uaua (*Monachus shauinslandi*) – Endangered
- 'Awikiwiki plant (*Canavalia Pubescens*) - Candidate
- Blackburn's sphinx moth (*Manduca blackburni*) - Endangered

<u>Kaewa Place, Hawai'i</u>

- Hawaiian hoary bat or 'ope'ape'a (*Lasiurus cinereus semotus*) – Endangered
- 'Ihi Plant (*Portulaca Villosa*) – Species of Concern

DOFAW and DAR did not respond to requests for information identifying protected species.

In addition to agency coordination activities, surveys of terrestrial flora and marine biology were conducted at each landing site (see Sections 3.8, 4.8, 5.8, 6.8, 7.8, 8.8, and 9.8). Floral surveys covered the maximum areas that may be affected by construction. At the smaller landing site parcels, the entire parcel was surveyed. The marine biological surveys focused on the area surrounding the proposed undersea exit points (EPs) of the horizontal directional drilling (HDD) bore. The marine biological surveys focused on the EPs because elsewhere within the landing site, the submarine cable would be installed in a bore hole drilled below the ocean floor.

Of the listed ESA species only green sea turtles were observed at two of the seven landing sites during the on-site biological surveys. During the marine survey at the Kawaihae landing site, a small pod of roughly 20 spinner dolphins (*Stenella longirostris*) was observed during the marine biological survey. At least one humpback whale was also sighted during a separate site visit at the proposed Lahaina landing site in January 2003. While no other listed species were noted at any of the landing sites, they may occur in the general vicinity. Therefore, the following discussion addresses potential interactions between protected species and construction/operation activities.

11.1.2.2 Potential Effects on Protected Species

11.1.2.2.1 Marine

Marine biology surveys were conducted at each landing site (see Appendix 5). Marine biological surveys focused on the area surrounding the proposed undersea exit points (EP) of the horizontal directional drilling (HDD) bore.

Although no individuals belonging to protected species were observed during on-site biological surveys, protected marine species are known to occur in the waters where SIC plans to install fiber-optic cables. However, laying cable is not expected to adversely affect the protected species. HDD and submarine cable laying activities would be benign and temporary, causing a low level of disturbance to the marine environment. Section 1.4 contains a detailed description of fiber-optic cable installation activities.

Marine disturbance caused by HDD would be limited to the area of the EP. As described in Section 1.4, the drill head exit would be a controlled event, observed by divers who would cap the bore when finished to await later hook-up with the submarine cable. This would also be a controlled activity conducted by divers. If a protected animal such as the Hawaiian monk seal or green sea turtle is observed in the immediate vicinity of the EP or the cable hook-up, the activity would be delayed until the animal moves away of its own volition.

Exit points have been located in areas where there are no live coral communities, and the cable seaward of the EP would not be laid on live coral. Therefore, no adverse impacts are anticipated on coral habitat that may be of direct importance to some listed species, such as sea turtles. Moreover, water quality would also be protected by replacing drilling slurry with water just prior to the pop-out event. Slurry, it should be noted, is not toxic or hazardous to marine life. Section 1.4 contains a detailed description of the construction method.

Submarine cable laying activities (see Section 1.4) would avoid interactions with protected marine mammal species that frequent Hawaiian waters. Although Humpback whales are in Hawaiian waters from December through April, interactions can be avoided during cable-laying within these months. If a whale(s) is spotted in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, the operation would be halted until the whale(s) moves away from the vessel or cable deployment area of its own volition. During the operation to connect the submarine fiber-optic cable to the landing site, care would be taken to avoid excess slack, which could entangle a humpback. The presence of spinner dolphins can generally be detected by their obvious activity in the water. If they are present in the area, cable deployment would be halted until they have left the area.

There is no evidence to suggest that the presence of submarine fiber-optic cables on the ocean floor would cause adverse impacts to species protected under ESA and MMPA. As an example, there are numerous cables on the leeward coast of O'ahu, where marine mammals continue to be present.

11.1.2.2.2 Landside

Surveys of terrestrial flora were conducted at each landing site (see Appendix 4). The botanical surveys covered the maximum areas on a given property that may be affected by construction, including connecting routes at applicable sites. For smaller landing sites the entire parcel was surveyed.

Terrestrial flora surveys conducted at all landing sites found no protected plant species, including the plant species listed in Section 11.1.2.1. Vegetative communities potentially affected by proposed construction activities are common throughout the Hawaiian Islands, and many of them are considered weedy.

According to the USFWS website, the Hawaiian hoary bat is a solitary bat that roosts among trees in areas near forests and feeds at night. The 'Akialoa Road and Wahikuli landing site parcels, two of the sites that the USFWS stated are in areas where Hawaiian hoary bats were observed in the past, do not provide the type of habitat favored by the bat. The 'Akialoa Road landing site is next to a residential community and the Wahikuli site is in Lahaina adjacent to Honoapi'ilani Highway and the Lahaina civic center. The other landing site parcel identified by USFWS as being in an area of Hawaiian hoary bat sightings, Kaewa Place, contains a closed-canopy kiawe forest. Therefore, it is possible that Hawaiian hoary bats roost in the parcel, but there are nearby residences and the site is near Kawaihae Harbor. The Hawaiian hoary bat sighting was in 1960 at Spencer Beach Park, located one and a half miles from the landing site. No sightings have been recorded since then.

According to the USFWS website, the Blackburn's Sphinx Moth was believed extinct until 1984 when a small population was rediscovered on the south coast of East Maui in a dry undeveloped area. The sighting near the Po'olenalena Park landing site was in 1940 at a location one mile to the south. The Po'olenalena Park parcel does not appear to provide the type of habitat that Blackburn's Sphinx Moth would favor, according to the USFWS website.

11.1.2.3 Informal Consultation

The information provided above indicate that cable installation activities on the landside, which involve HDD staging and trenching, are unlikely to adversely affect species identified pursuant to ESA, MBTA, and FWCA. Marine submarine cable deployment and hook-up with landing site infrastructure are also unlikely to adversely affect species identified pursuant to ESA and MMPA. Nevertheless, operations would be halted if any protected species is observed near or within the deployment area. Therefore, RUS has found that the species listed in the April 14, 2003 NMFS letter and the June 19, 2003 USFWS letter would not likely be adversely affected by the proposed Submarine Fiber-Optic Cable project. In letters dated March 4, 2004 (see Appendix 2), the RUS requested that NMFS and USFWS concur with these determinations. It is expected that NMFS and USFWS would agree with an "Informal" Section 7 consultation, and concur with the RUS findings.

11.1.3 Safe Drinking Water Act Section 1424(e)

The 1974 Safe Drinking Water Act (SDWA) manages and protects the quality of drinking water in the U.S. by instituting regulatory programs that:

- Establish standards and treatment requirements for drinking water;
- Control underground injections of wastes that might contaminate water supplies; and
- Protect groundwater resources.

In the interest of groundwater resource protection, SDWA Section 1424(e) authorizes the U.S. Environmental Protection Agency (EPA) to designate an aquifer for special protection if it is the sole or principal drinking water resource for an area and if its contamination would create a significant hazard to public health. Federally funded or financially supported projects located on EPA-designated sole source aquifers are required to complete a Section 1424(e) Review or Groundwater Impact Assessment.

The Southern O'ahu Basal Aquifer (SOBA) and the Moloka'i Aquifer are the only designated sole source aquifers in the State of Hawai'i. The two proposed landing sites on O'ahu are not located within the SOBA. However, since the entire island of Moloka'i is within the boundary of the designated sole source aquifer, the proposed Oneali'i Homesteads landing site overlies the aquifer.

As required by Section 1424(e), an assessment of the project's potential impact on the Moloka'i Sole Source Aquifer was completed (see Appendix 7) and submitted to EPA on December 22, 2003. The assessment found that HDD would not adversely affect the aquifer because the drill site would be located near the shoreline, recharge of the aquifer occurs at upland locations, and the aquifer gradient flows seaward. The Section 1424(e) process would have been completed if the EPA provided written concurrence with the assessment that the project would not adversely affect the Moloka'i Sole Source Aquifer. However, the EPA informed the project sponsors on February 24, 2004 that they have only 30 days to review the impact assessment, and failure to do so would result in an automatic approval of the assessment pursuant to Section 1424(e).

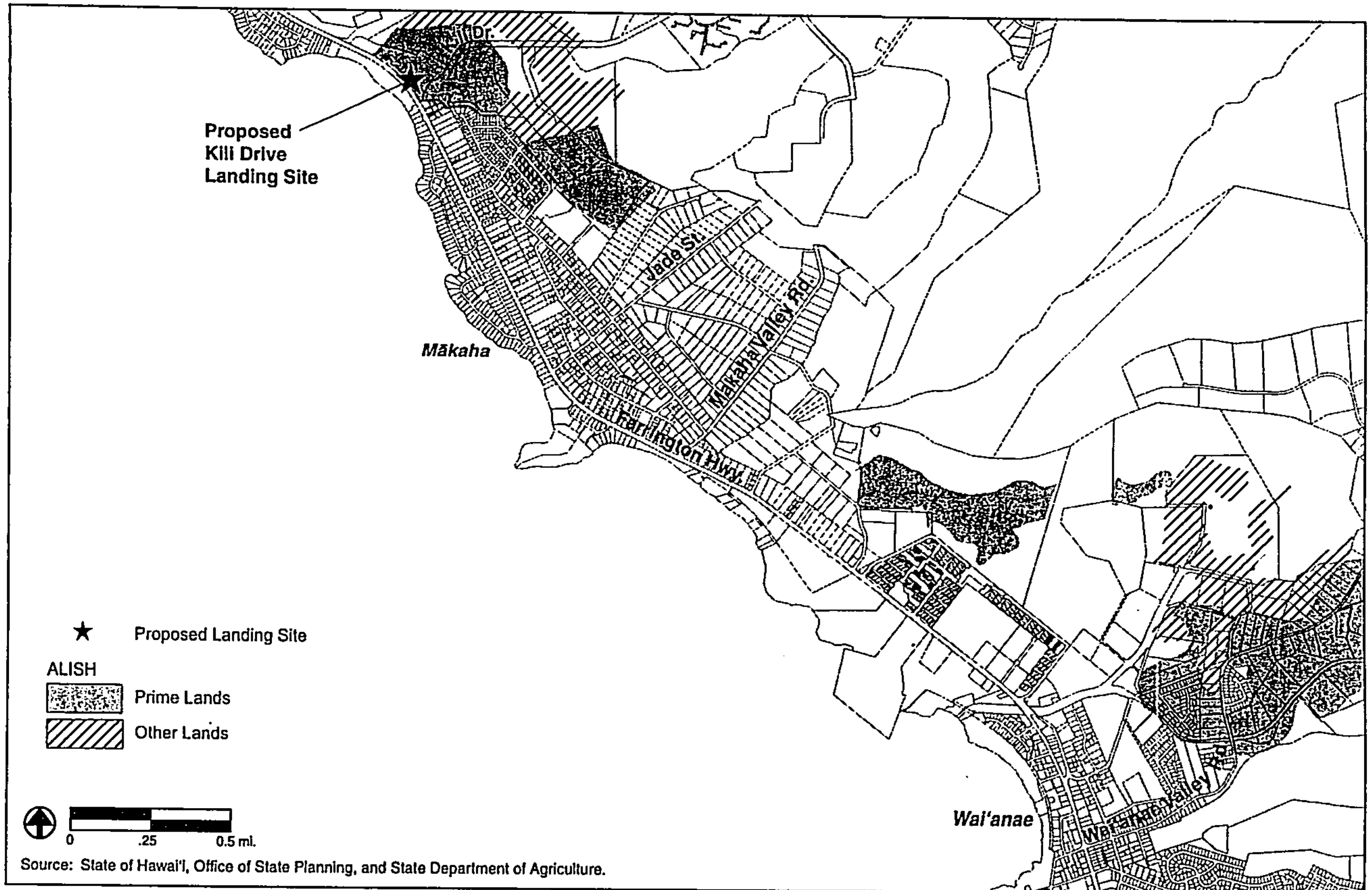
11.1.4 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) is administered by the U.S. Department of Agriculture, Natural Resource Conservation Service (NRCS). The FFPA requires that projects with federal involvement identify and consider the effects of their actions on the preservation of farmland. The FPPA applies only when agriculturally important lands may be affected. Therefore, proposed federal projects on urban designated land do not require FPPA review. The Kili Drive landing site is the only proposed landing site on agriculturally important land. The parcel is designated as "prime" under the State classification system, "Agricultural Lands of Importance to the State of Hawai'i" (see Figure 11.1-3). Typically, Form AD-1006, "Farmland Conversion Impact Rating," would be submitted to NRCS. However, in a letter dated June 24, 2003, the NRCS stated that completion of this form would not be necessary because the landing site parcel would be returned to its pre-construction state, resulting in no impact to farming.

11.1.5 Environmental Justice

Executive Order (E.O.) 12898 regarding Environmental Justice requires federal agencies to identify and avoid disproportionately high and/or adverse effects of federal projects on minority and low-income populations' health or environment. Because of the RUS construction loan, this project must comply with E.O. 12898.

All proposed landing site parcels are unoccupied. Therefore, no person or group would experience disproportionately high and/or adverse effects from the project, such as displacement or relocation. Impacts of the project would be limited to the construction phase. After construction, the only evidence of the project would be the beach manhole cover within a road right-of-way. Furthermore, SIC has conducted a comprehensive and far-reaching public involvement process with those communities and others where the landing sites are located. See Section 12.3 for information regarding SIC's public involvement activities.



Sandwich Isles Communications, Inc.

Agricultural Lands of Importance to the State of Hawai'i Near Kili Drive, Mākaha, O'ahu
Submarine Fiber-Optic Cable Project
Figure 11.1-3

11.1.6 Rivers and Harbors Act Section 10

Based on early coordination with the U.S. Army Corps of Engineers (USACE), a Department of the Army (DA) permit would be required pursuant to Section 10 of the Rivers and Harbors Act, 33 United States Code (USC) 403. Section 10 regulates work proposed in "waters of the U.S." Recently, USACE, in a letter providing comments on the project's Draft EA, confirmed this assessment (also see Section 12.2).

11.1.7 Floodplain Management

E.O. 11988, Floodplain Management, requires federal agencies to avoid actions that would place facilities in floodplains and/or affect floodplain values. Facilities in a floodplain may be damaged by a flood, or may change the flood-handling capability of the floodplain or the pattern or magnitude of flood flows. Coastal areas subject to storm surge or tsunami are often considered floodplain areas.

Once completed, all landing site infrastructure would be underground. The beach manhole cover within a road right-of-way would be the only visible element of the landing site infrastructure. The project would not cause changes to existing floodplains, nor would they likely be damaged should a flood occur, including tsunamis or storm surges. Therefore, the project appears to comply with the requirements of E.O. 11988.

11.2 STATE PLANS, POLICIES AND REGULATIONS

State plans and requirements applicable to this project are described below.

11.2.1 Hawai'i State Plan

The Hawai'i State Plan, Chapter 226 of the Hawai'i Revised Statutes (HRS), serves as a guide for future long-range development of the State. It consists of comprehensive goals, objectives, policies and priorities for all areas of government functions. These functions include the protection of the physical environment, the provision of public facilities systems, and the promotion and assistance of socio-cultural advancement. Policies applicable to the proposed project are listed below followed by brief discussion of how the project is consistent with these policies.

<u>Objectives and policies for the economy—information industry (226-10.5)</u>

- Encourage development and expansion of the telecommunications infrastructure serving Hawai'i to accommodate future growth in the information industry; and
- Provide opportunities for Hawai'i's people to obtain job training and education that would allow for upward mobility within the information industry.

<u>Consistency</u>. SIC is providing additional telecommunications infrastructure that would directly serve Hawaiian Home Lands, providing homesteaders with state-of-the-art, competitively priced, broadband telecommunications services. Homesteaders would have access to educational programming, Internet services, video teleconferencing, and other fiber-optic-based services. In addition, telecommunication services allow for employment training, business development, and educational opportunities.

<u>Objective and policies for facility systems—in general (226-14)</u>

- Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in congruence with State and county plans; and
- Ensure that required facility systems can be supported within resource capacities at reasonable cost to the user.

Objectives and policies for facility systems—telecommunications (226-18.5)

- To ensure provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.

Consistency. It is State policy to provide native Hawaiians with at least 50 percent blood quantum, with lands to live on and improve their quality of life. SIC is providing telecommunication services on Hawaiian Home Lands at no cost to the State Department of Hawaiian Home Lands (DHHL). The State Public Utilities Commission would regulate the cost to homesteaders. Therefore, services would be competitive with the cost of telecommunication services provided elsewhere in the State.

The proposed fiber-optic network, including the landing site infrastructure and the submarine cables, would be less susceptible to natural hazards, such as hurricanes, than overhead communication systems. Landing site infrastructure would be placed underground. Submarine alignments have been located to avoid hazardous areas. The submarine cables would be armored to minimize the potential of cable damage. Therefore, the system would be highly reliable.

11.2.2 Hawai'i State Land Use Controls

Lands in the State are divided into four classifications: Urban, Agriculture, Rural, and Conservation. As shown on Figures 11.2-1A through 11.2-1G, all proposed landing site parcels are classified Urban except the proposed Sandy Beach landing site parcel on O'ahu, which is in the Conservation District. Regulatory oversight regarding land use within the Urban District resides with county planning departments (Department of Planning and Permitting for the City and County of Honolulu). See Section 11.3 for further information regarding County zoning. The proposed Sandy Beach landing site would require a State Conservation District Use Permit (CDUP) for its landside and seaside portions (see Section 11.2.3).

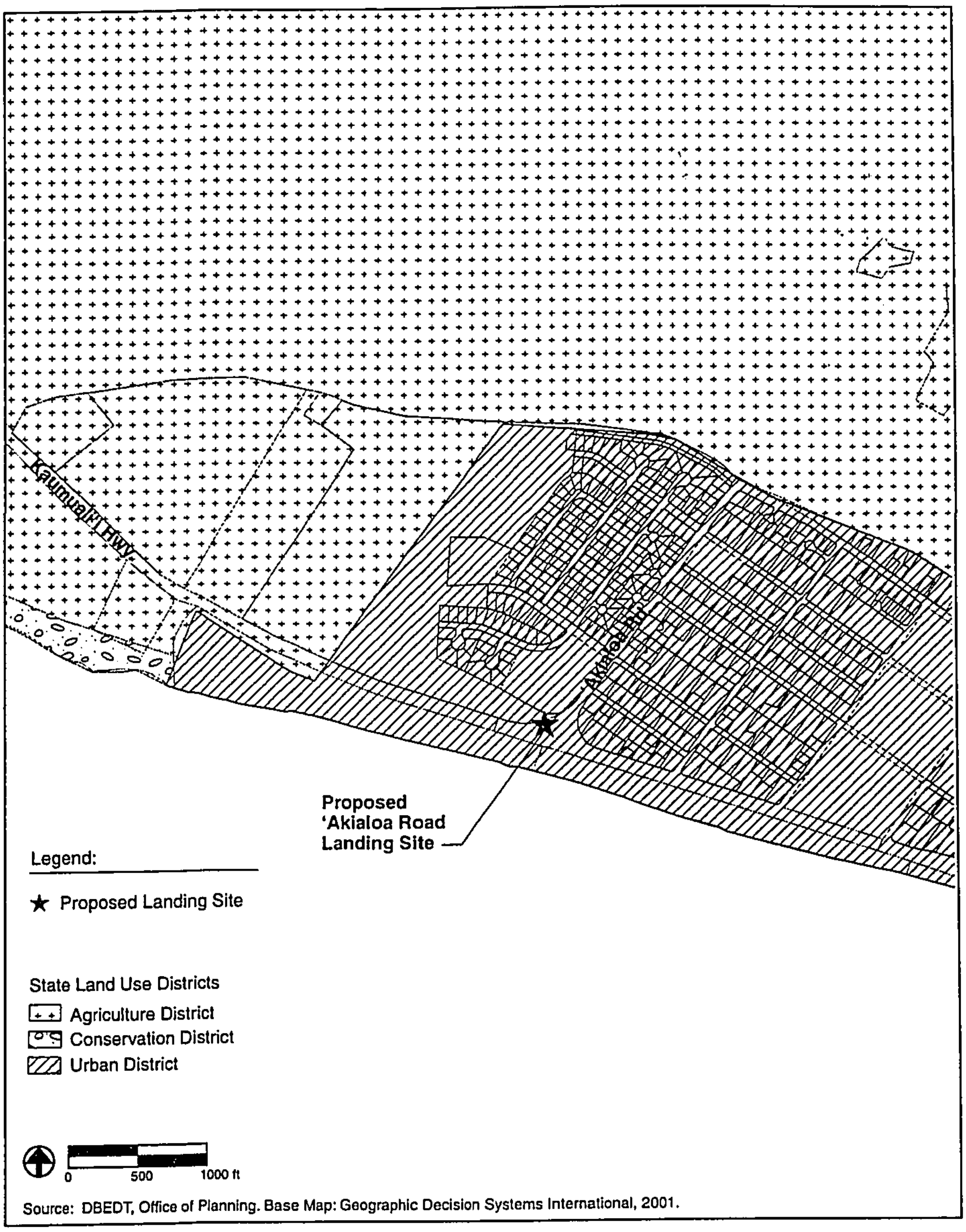
11.2.3 Conservation District Use Permit

HRS Chapter 183C, Conservation Districts, directed the DLNR and the Board of Land and Natural Resources (BLNR) to manage and regulate the Conservation District, including:

- Maintaining an accurate inventory of lands classified within the state Conservation District;
- Appropriately zoning lands within the Conservation District;
- Establishing appropriate uses or activities on conservation lands, including uses or activities for which no permit would be required; and
- Establishing and enforcing land use regulations including the collection of fines for violations of land use and terms and conditions of issued permits or approvals.

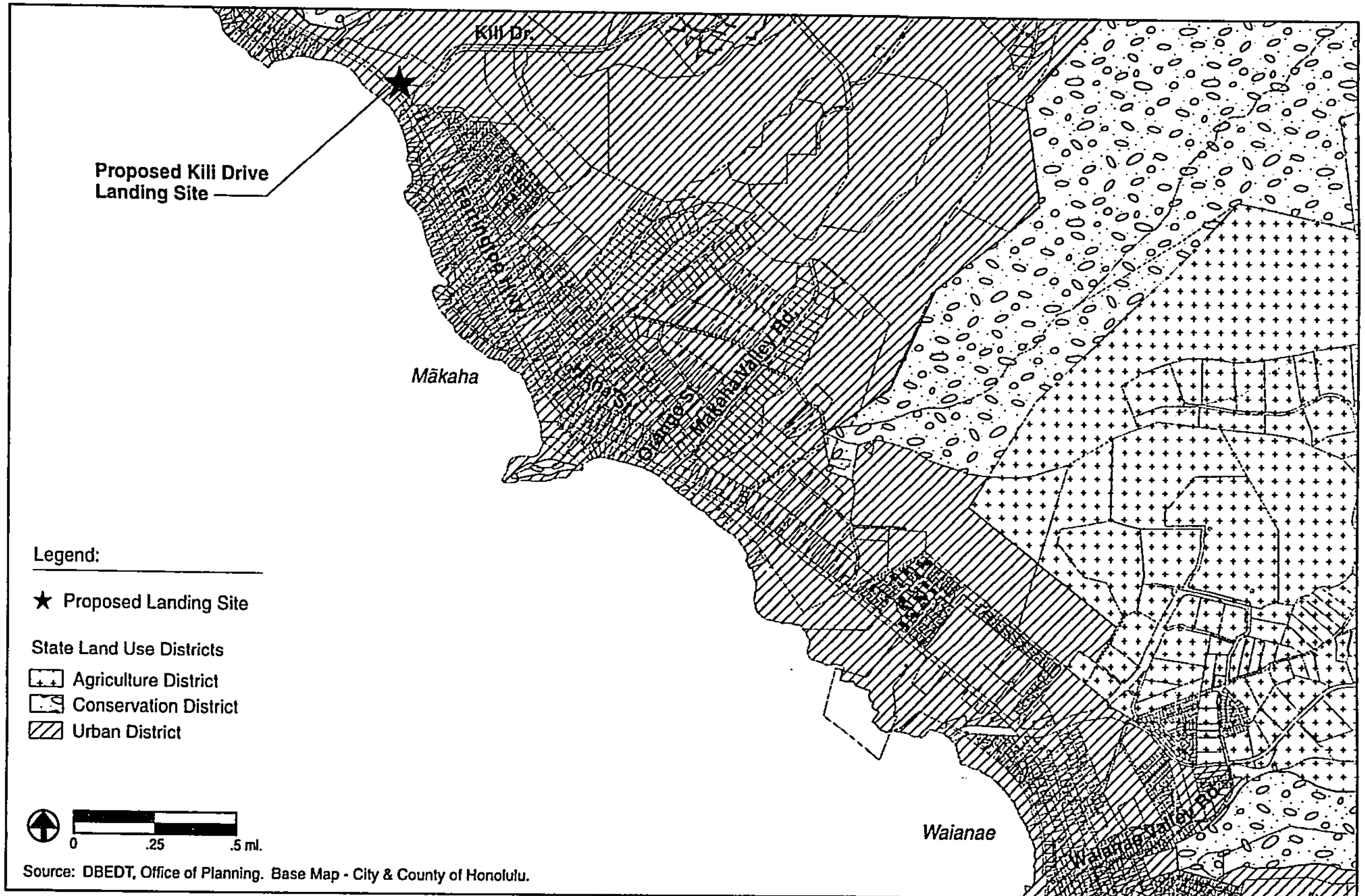
The Conservation District includes all submerged lands from the shoreline to a distance of 12 miles offshore. Therefore, all landing site infrastructure seaward of the shoreline would be within the Conservation District, Resource subzone, and subject to the CDUP requirements of the DLNR. In addition, part or possibly all Sandy Beach Park landside fiber-optic cable infrastructure would be within the Conservation District, Limited subzone (see Figure 11.2-1C). Also, a portion of the Wahikuli landside easement within Wahikuli Wayside Park, which is located makai of the drill site across Honoapi'ilani Highway, would be within the Conservation District, Resource subzone (see Figure 11.2-1E). Therefore, certain elements of these landing sites would require a CDUP. The entire onshore areas where fiber-optic cable infrastructure would be installed for the other five proposed landing sites are within Urban Districts, and are not subject to CDUP requirements.

According to Section 13-5-22 of the Hawai'i Administrative Rules (HAR), Identified Land Uses in the Protective Subzone, P-6, Public Purpose Uses, (D-2), "communications systems and other such land uses which are undertaken by non-governmental entities which benefit the public" are allowed with a CDUP. HAR Section 13-5-23, Identified Land Uses in the Limited Subzone, states that "all identified land



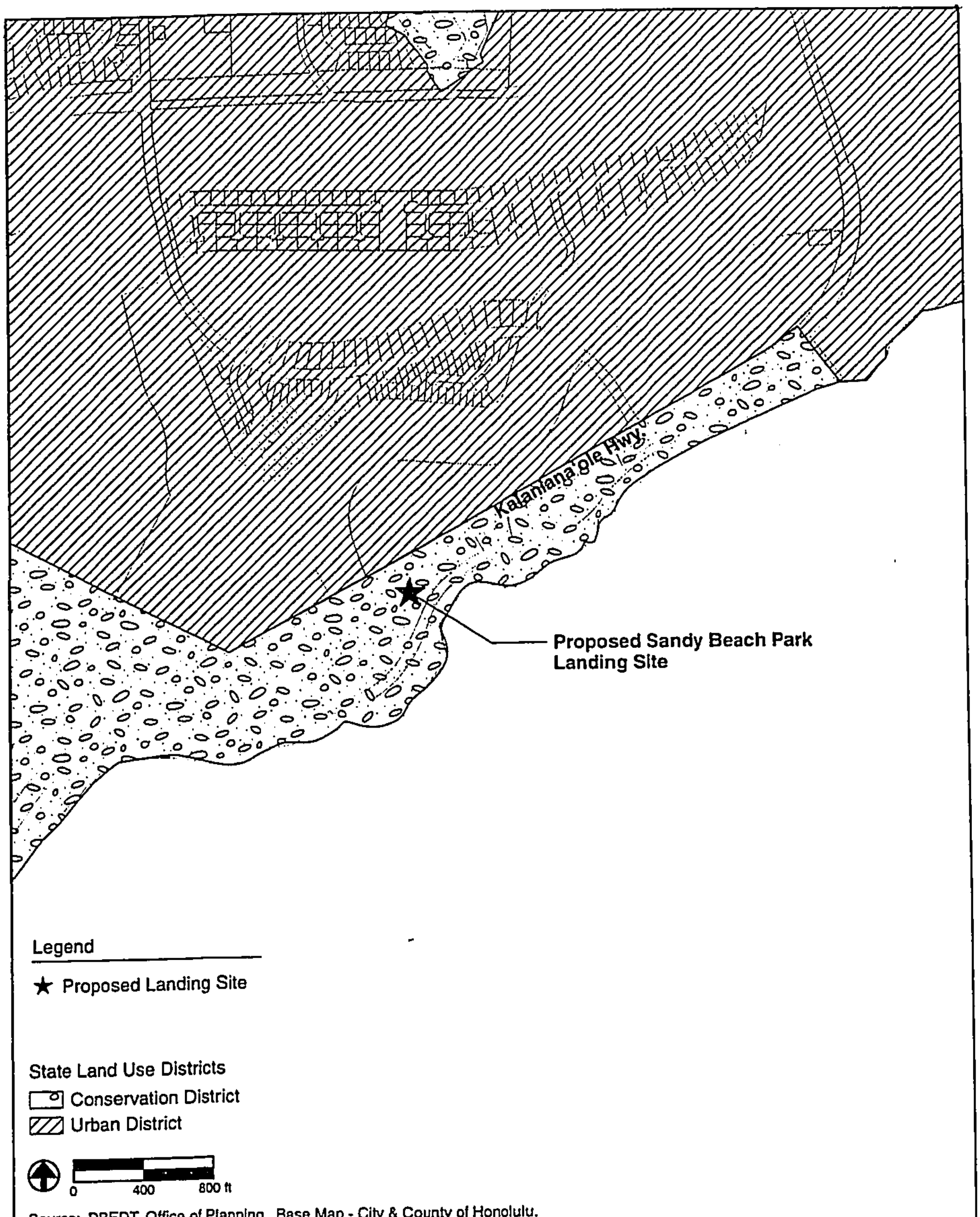
Sandwich Isles Communications, Inc.

State Land Use Districts - 'Akialoa Road, Kekaha, Kaua'i
Submarine Fiber-Optic Cable Project
Figure 11.2-1A



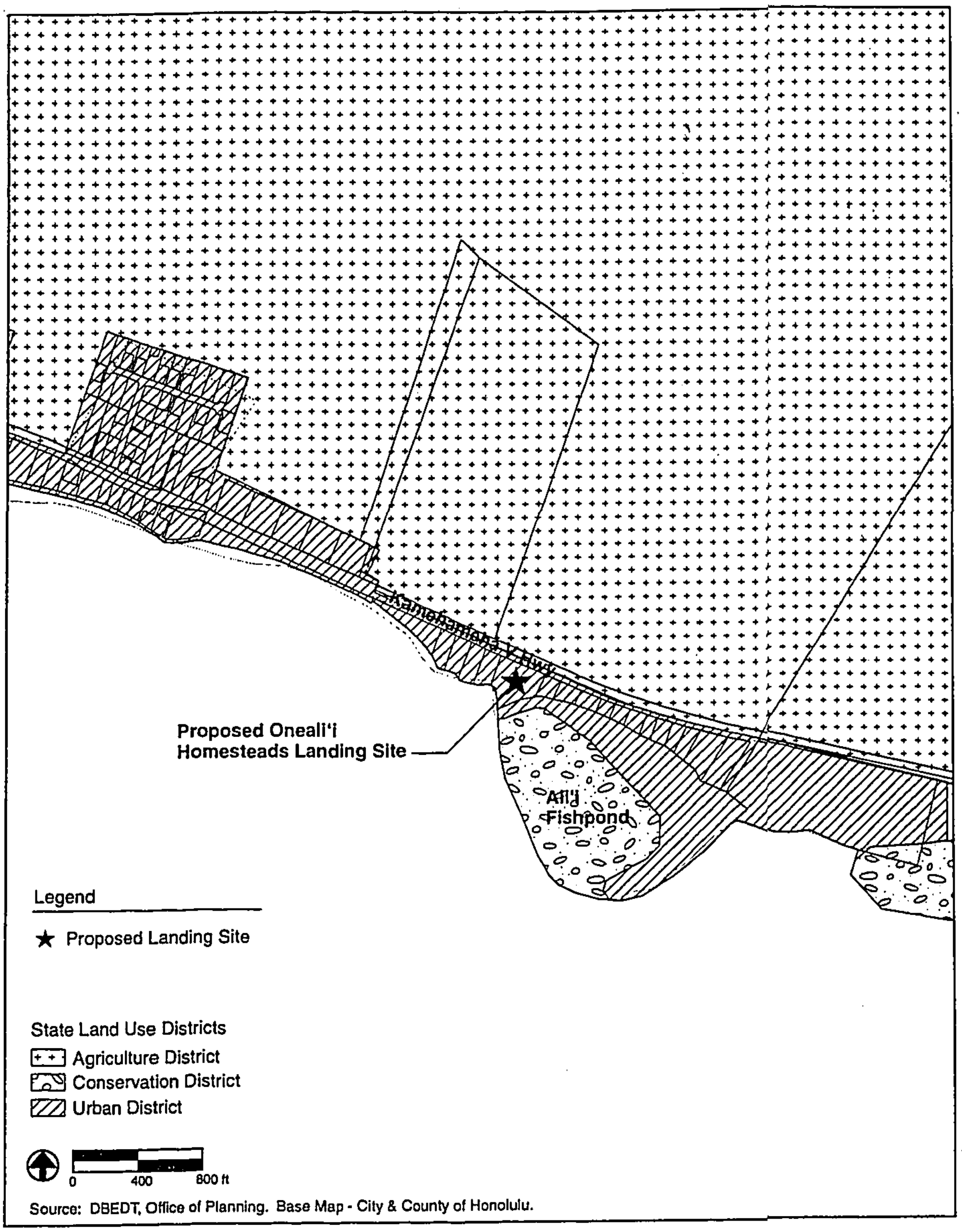
Sandwich Isles Communications, Inc.

State Land Use Districts - Kili Drive, Mākaha, O'ahu
Submarine Fiber-Optic Cable Project
Figure 11.2-1B



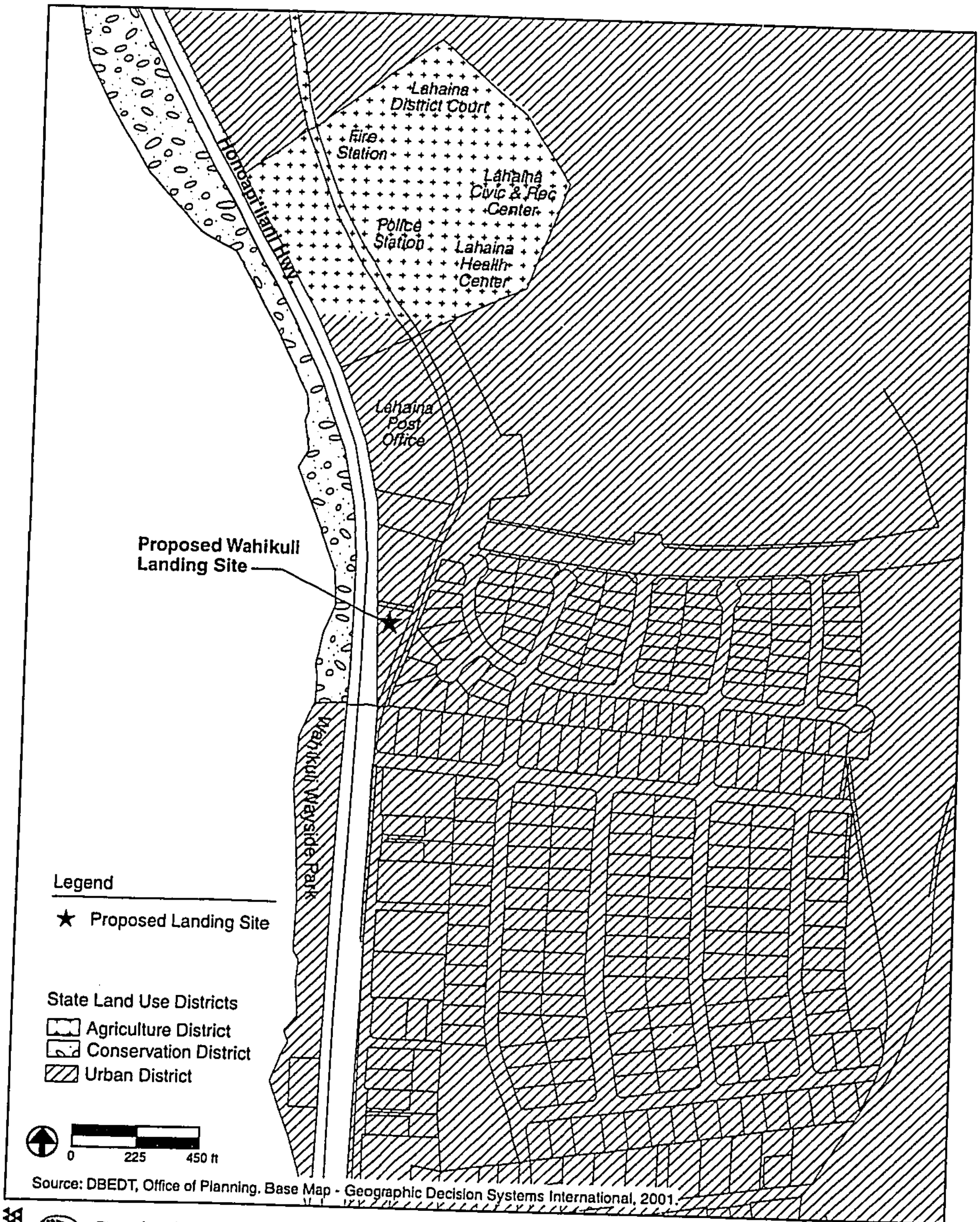
Sandwich Isles Communications, Inc.

State Land Use Districts - Sandy Beach Park, Hawai'i Kai, O'ahu
Submarine Fiber-Optic Cable Project
Figure 11.2-1C



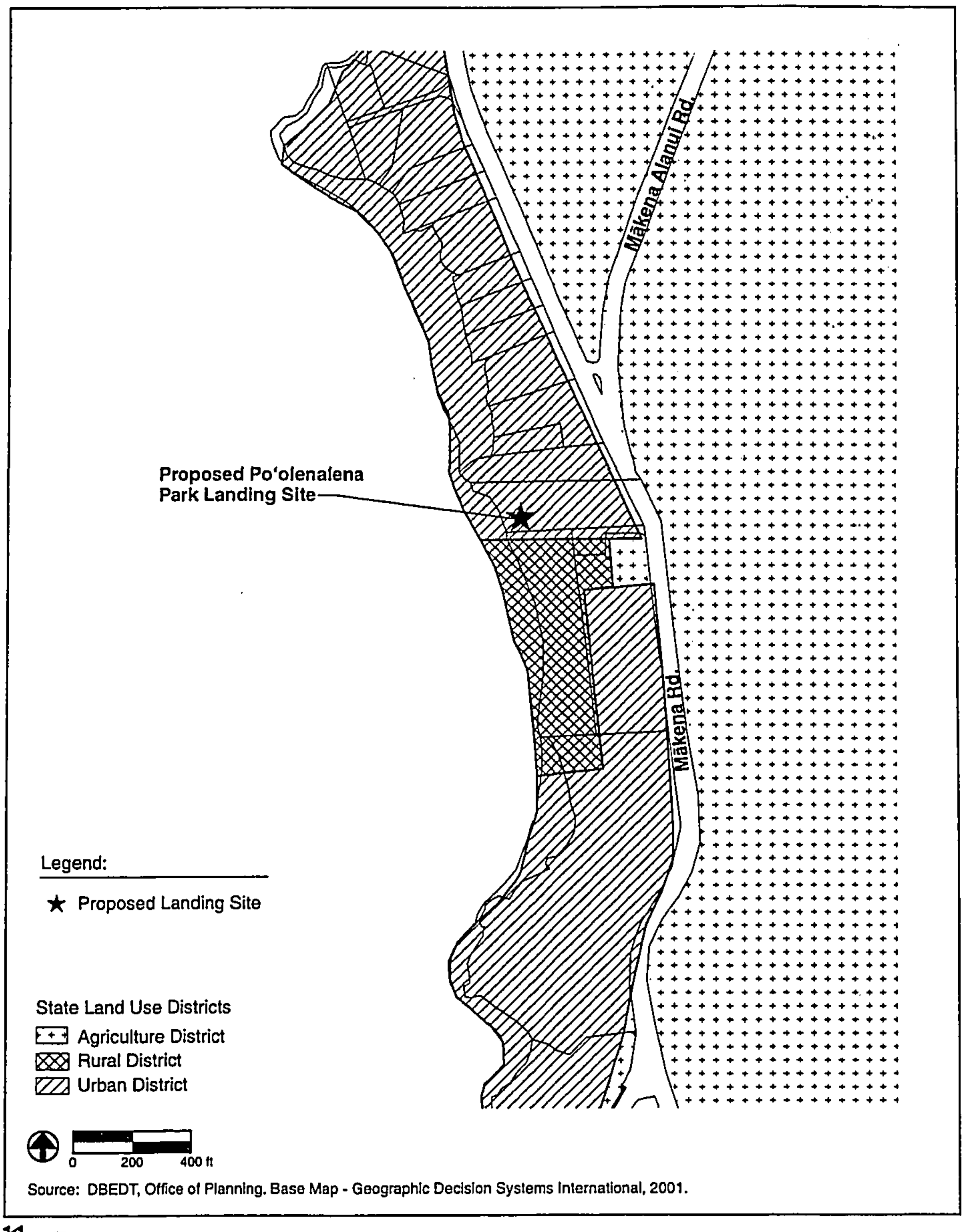
Sandwich Isles Communications, Inc.

State Land Use Districts - Oneali'i Homesteads, Kaunakakai, Moloka'i
Submarine Fiber-Optic Cable Project
Figure 11.2-1D



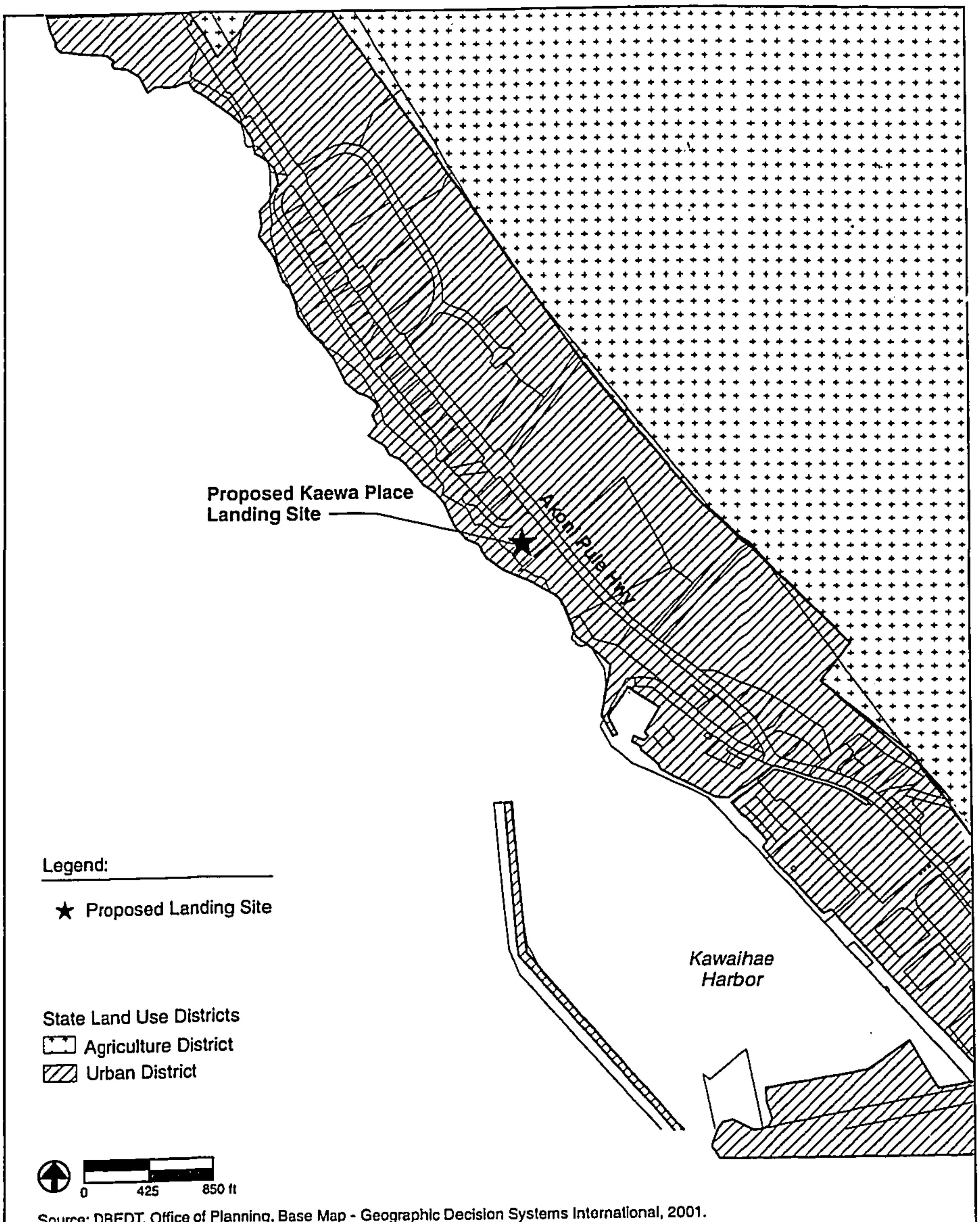
Sandwich Isles Communications, Inc.

State Land Use Districts at Wahikuli, Lahaina, Maui
Submarine Fiber-Optic Cable Project
Figure 11.2-1E



Sandwich Isles Communications, Inc.

State Land Use Districts at Po'olenalena Park, Mākena, Maui
Submarine Fiber-Optic Cable Project
Figure 11.2-1F



Sandwich Isles Communications, Inc.

State Land Use Districts - Kaewa Place, Kawaihae, Hawai'i
Submarine Fiber-Optic Cable Project
Figure 11.2-1G

uses and their associated permit or site plan approval requirements listed for the protective subzone also apply to the limited subzone, unless otherwise noted." HAR Section 13-5-24, Identified Land Uses in the Resource Subzone, states that "all identified land uses and their associated permit or site plan approval requirements listed for the protective and limited subzones also apply to the resource subzone, unless otherwise noted."

A Conservation District Use Application (CDUA) for the project was submitted to the DLNR on December 17, 2003, along with the project's Draft EA (see Appendix 2). The DLNR Chairperson accepted the CDUA in a letter dated February 12, 2004, effective February 16, 2004. DLNR is planning to hold public hearings in each island affected by the project for the CDUA.

Utility easements (granted by the BLNR) that would approve the use of State lands for the submarine cable system may be granted shortly after the CDUPs.

11.2.4 Hawai'i Revised Statutes, Chapter 6E

HRS Chapter 6E, the State counterpart law to the NHPA (see Section 11.1.1), places similar responsibilities on State agencies as NHPA Section 106 places on federal agencies. HRS Section 6E-8 states that before any agency or officer of the State or its political subdivisions (i.e., counties) commences *or permits any project which may affect historic property, aviation artifact, or a burial site, it must provide* the SHPD an opportunity for review. SHPD has generally accepted the Section 106 process (see Section 11.1.1) as being sufficient to meet the requirements of HRS Chapter 6E. In a letter providing comments on the Draft EA, the SHPD stated that they have completed review of the archaeological reports and noted that the Draft EA "accurately represents the nature and extent of historic preservation compliance." Also see Section 11.1.1.

11.2.5 State Endangered Species Law, HRS Chapter 195D

HRS Chapter 195D is the State counterpart law to the ESA (see Section 11.1.2). Similar to ESA Section 7, HRS Chapter 195D, which is administered by the DLNR Division of Forestry and Wildlife (DOFAW), requires evaluation of the project's potential impacts on threatened and endangered species. DOFAW has generally accepted the ESA Section 7 process as satisfying the requirements of HRS Chapter 195D, except under certain circumstances. Also see Section 11.1.2.

11.2.6 Coastal Zone Management

The Coastal Zone Management (CZM) Act was passed to encourage states to preserve, protect, develop, and, where possible, restore or enhance valuable natural coastal resources. The State of Hawai'i CZM program was established through passage of HRS Chapter 205A in 1977. All federally proposed activities or activities that require a federal permit or license are required to be consistent to the maximum extent practicable with the Hawai'i CZM program. Administration of the Hawai'i CZM program is in the process of transferring from the State Department of Business, Economic Development and Tourism to DLNR.

In a letter dated January 24, 2003 (see Appendix 2), the CZM Program stated that loans and grants authorized under the Rural Electrification Act of 1936 do not require a Hawai'i CZM Program consistency review. However, in a letter dated May 15, 2003, the State's Office of Planning (OP), of which the CZM Program is a part, stated that the project must still undergo a consistency review because a Department of the Army (DA) permit is required for the project (see Section 11.1.6).

The following summarizes the project's consistency evaluation with the objectives and policies of the Hawai'i CZM Program. Hawai'i CZM Program personnel would review this assessment.

Recreation Resources

Two proposed landing sites, Po'olenalena Park and Sandy Beach Park, are within existing parks. As described in Section 8.4.2, construction of the Po'olenalena Park landing site would temporarily displace a portion of the beach park parking lot, but access to the beach through the parcel would be maintained. As described in Section 5.4.2, construction of the Sandy Beach Park landing site would use a portion of Sandy Beach, a large beach park on the eastern side of the island. However, the construction site is located away from the park proper (the area where most people congregate), and there would still be ample space for the public to use and enjoy the park during construction. Once completed, the infrastructure of these two landing sites would be underground and therefore would not affect the use or enjoyment of park resources. The other five proposed landing sites do not use park or recreational property, nor would they affect access to park or recreational resources during construction.

Historic Resources

As described in Section 11.1.1, three of the seven proposed landing site APEs contain historic properties. At the Oneali'i Homesteads landing site, the fiber-optic cable alignment would lie west of *Ali'i Fishpond*, thereby avoiding crossing or coming in contact with the fishpond wall (see Section 6.3.2). The four historic properties within the Kaewa Place landing site APE do not require preservation and do not need further documentation, as described in Section 9.3.2, per archaeologist's recommendations. At the Po'olenalena Park landing site, a supplemental subsurface inventory survey will be conducted of the HDD staging area and a portion of the fiber-optic cable conduit alignment between the drill site and the beach manhole on Mākena Alanui Road. An archaeologist would monitor trenching and other excavation activities at the 'Akialoa Road, Oneali'i Homesteads and Wahikuli landing sites. See Section 11.1.1 for further information.

Scenic And Open Space Resources

Once completed, all infrastructure associated with the seven proposed landing sites would be underground. The only evidence of the landing sites would be beach manhole covers in the nearest road. For more information, see Sections 3.5, 4.5, 5.5, 6.5, 7.5, 8.5, and 9.5. Therefore the project would not create any visual intrusions.

Coastal Ecosystems

HDD operations would be managed to prevent pollutant discharge. The contractor would practice good housekeeping and implement Best Management Practices (BMPs), as required by SDOH regulations. The bentonite (a natural clay material) and water mixture used for drilling slurry would be replaced by water prior to breakout into the ocean at the EP. There is a possibility that inadvertent release of bentonite could occur during drilling. Even though ocean currents would dissipate such slurry relatively quickly so there would be little to no turbidity, as a precautionary measure, divers would be stationed at each exit point during this activity. In addition, although not all proposed landing sites require a National Pollutant Discharge Elimination System (NPDES) permit for Stormwater Associated with Construction Activity, they would all institute the same BMPs because construction activities at each site would be quite similar. For more information, see Sections 1.4, as well as 3.6, 4.6, 5.6, 6.6, 7.6, 8.6, and 9.6.

Economic Uses

Once completed, future economic uses of the proposed landing site parcels would not be affected. All infrastructure associated with the seven proposed landing sites would be underground.

Coastal Hazards

Although coastal and nearshore areas are vulnerable to natural hazards, the landing site infrastructure would be protected beneath the ocean floor and underground on the landside. For more information, see Sections 3.7, 4.7, 5.7, 6.7, 7.7, 8.7, and 9.7.

Managing Development

The proposed project would require State and county permits, which also include provisions for public participation and the protection of coastal resources.

Public Participation

To date, SIC has conducted substantial public involvement. For more information, see Section 12.3.

Beach Protection

None of the proposed landing sites would cause coastal erosion because all infrastructure associated with the sites would be underground and beneath the ocean floor.

Marine Resources

None of the proposed landing sites or the laying of the submarine fiber-optic cable would affect marine or coastal resources. The use of HDD would avoid damage to live coral communities, and the deployment of submarine fiber-optic cables would not harm marine life. See Section 11.1.2 for further information.

11.3 COUNTY PLANS, POLICIES AND REGULATIONS

County plans and requirements applicable to this project are described below.

11.3.1 Special Management Area and Shoreline Setback

The Hawai'i CZM program (see Section 11.2.6) designated the areas along the shoreline for "special controls on developments to avoid permanent losses of valuable resources and the foreclosure of management options, and to ensure that adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided." [HRS Section 205A-21] To accomplish these objectives, HRS Chapter 205A established the Special Management Area (SMA) and shoreline setbacks, and authorized the counties to develop and administer permitting systems to control development within the SMA and the shoreline setback.

The SMA is a regulated zone extending inland from the shoreline to a landward boundary delineated by the counties. The landward boundary of the SMA can vary from a few dozen feet to more than a mile.

The shoreline area (for the shoreline setback program) is the land between the shoreline and an imaginary line running parallel to the shoreline established by each county. HRS Section 205A-43 states that setbacks along shorelines shall not be less than 20 feet, nor more than 40 feet.

County planning departments (Department of Planning and Permitting (DPP) for the City and County of Honolulu) administer SMA use permit and shoreline setback variance (SSV) programs. All underground infrastructure associated with the seven proposed landing sites, including connector routes, are within the SMA (see Figures 11.3-1A through 11.3-1G). Infrastructure near the shoreline is also within the shoreline setback. Since the project provides new infrastructure, the planning departments have determined that such infrastructure is a "development" subject to SMA use permitting, but may determine that elements of the project within existing road rights-of-way are not subject to SMA use permitting (DPP in a letter dated March 22, 2004 stated this assessment). The applicant will coordinate with each county planning department regarding their respective SMA permitting requirements.

Three of the counties have either stated or indicated that the landing sites require SSVs. Only the County of Hawai'i Planning Department has stated that the elements of the Kaewa Place landing site in the shoreline setback is a "minor activity", and therefore, not subject to a SSV (see Draft EA comment letter dated March 5, 2004).

In terms of addressing the environmental issues associated with the SMA and shoreline setback, the only evidence of landing site infrastructure would be beach manhole covers within the rights-of-way of the nearest roads. Therefore, landing sites would not adversely affect shoreline access, beach processes (e.g., sand replenishment), or coastal resources. In addition, the landing sites are part of a statewide system to provide telecommunications services to Hawaiian Home Lands via fiber-optic cable. Therefore, landing site infrastructure cannot be located in inland areas. For additional information, see Section 11.2.6 regarding project consistency with the Hawai'i CZM Program.

11.3.2 General Plans

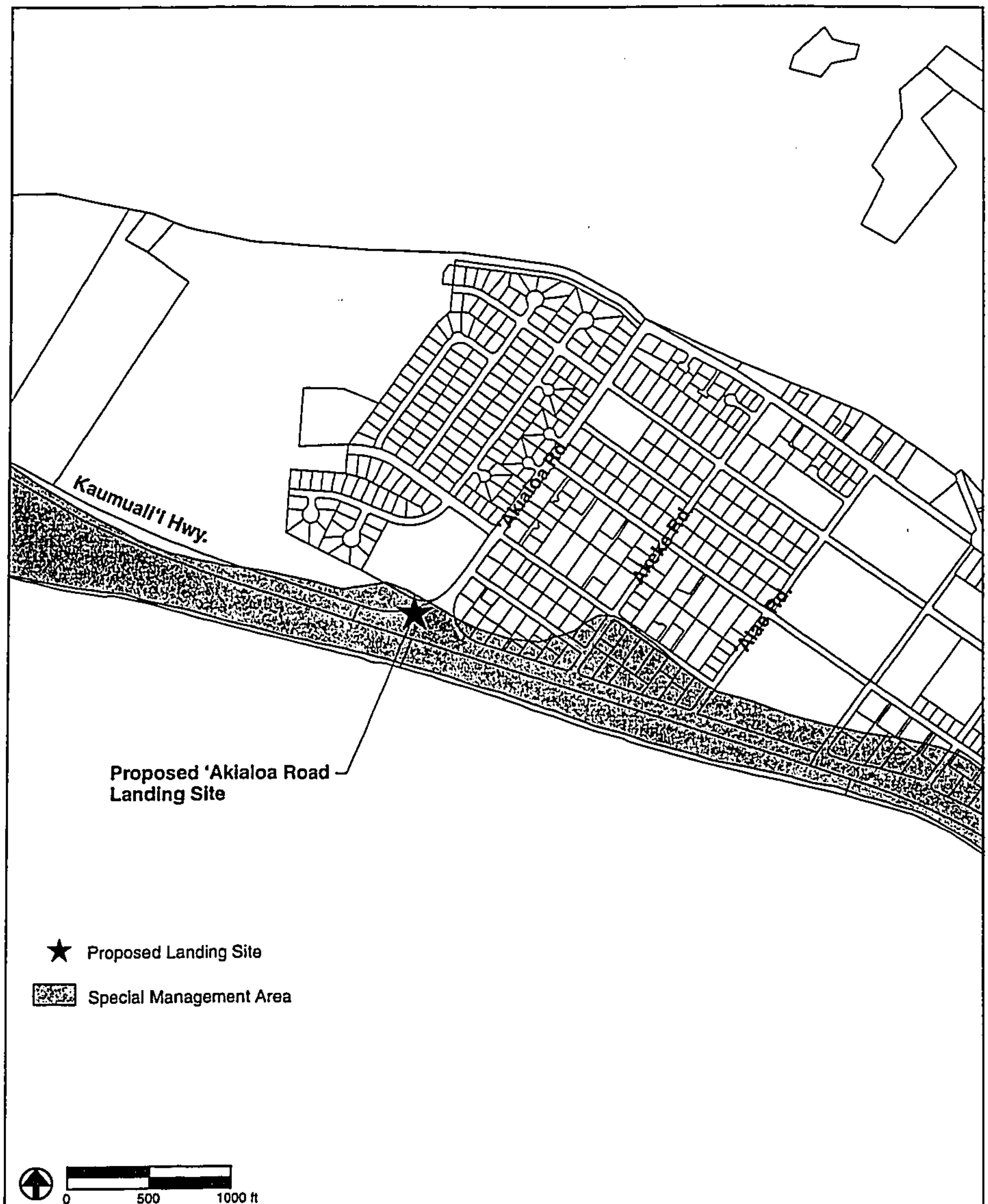
11.3.2.1 County of Kaua'i

The Kaua'i General Plan (November 2000) provides guidance for land use regulations, the location and character of new development and facilities, and planning for County and State facilities. Section 2.1 of the General Plan, "Community Values," relays the philosophical foundation of the community's goals and policies, including (1) diverse job and business opportunities; (2) recognition of the uniqueness of our communities, supporting people with roots and history in those communities to continue to live and raise their families; (3) safety for all citizens and visitors; and (4) support for our youth and educating them to succeed.

The proposed project, along with SIC's terrestrial network on Kaua'i, supports the General Plan's community values by providing residents of Kaua'i Hawaiian Home Lands with high quality reliable telecommunications services, which would allow homesteaders to have affordable telephone service, and access to the Internet, libraries, and other sources of current educational information.

11.3.2.2 City and County of Honolulu

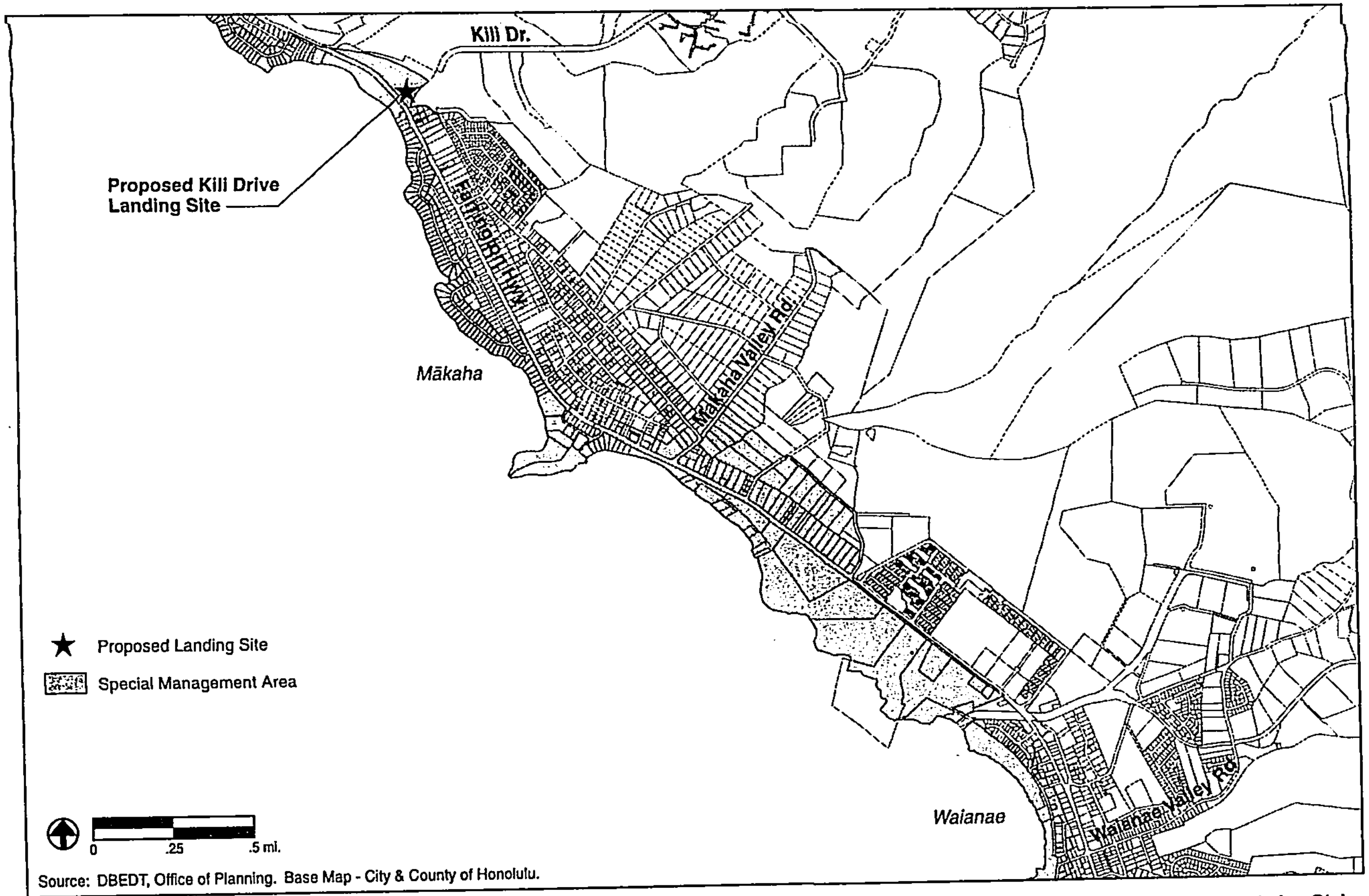
The General Plan of the City and County of Honolulu (DGP 1992) provides a statement of long-range social, economic, environmental, and design objectives for the Island of O'ahu and a statement of policies necessary to meet these objectives. The project is consistent with goals and policies with respect to:



Source: DBEDT, Office of Planning. Base Map - Geographic Decision Systems International, 2001.

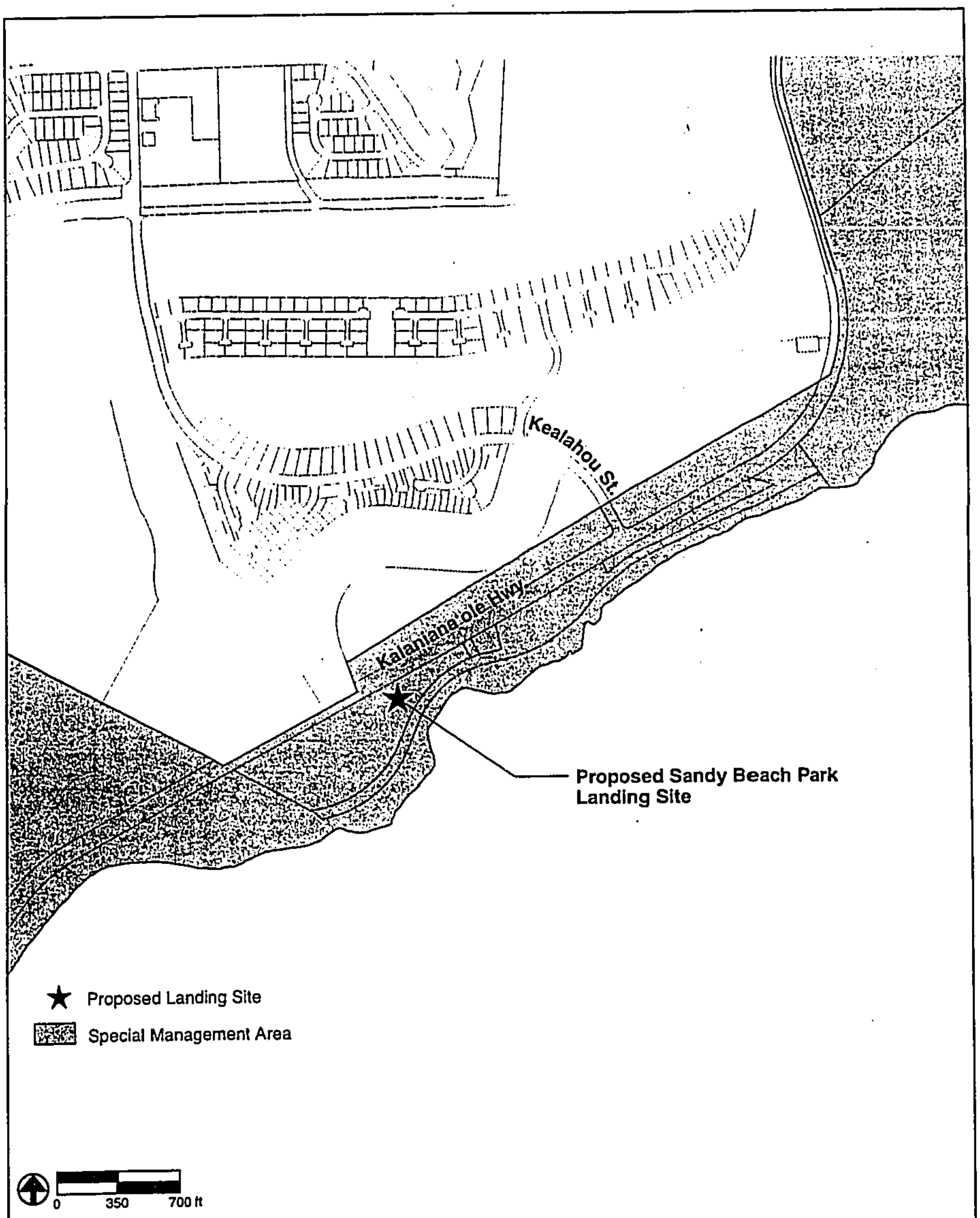
Sandwich Isles Communications, Inc.

Special Management Area at 'Akialoa Road, Kekaha, Kaua'i
Submarine Fiber-Optic Cable Project
Figure 11.3-1A



Sandwich Isles Communications, Inc.

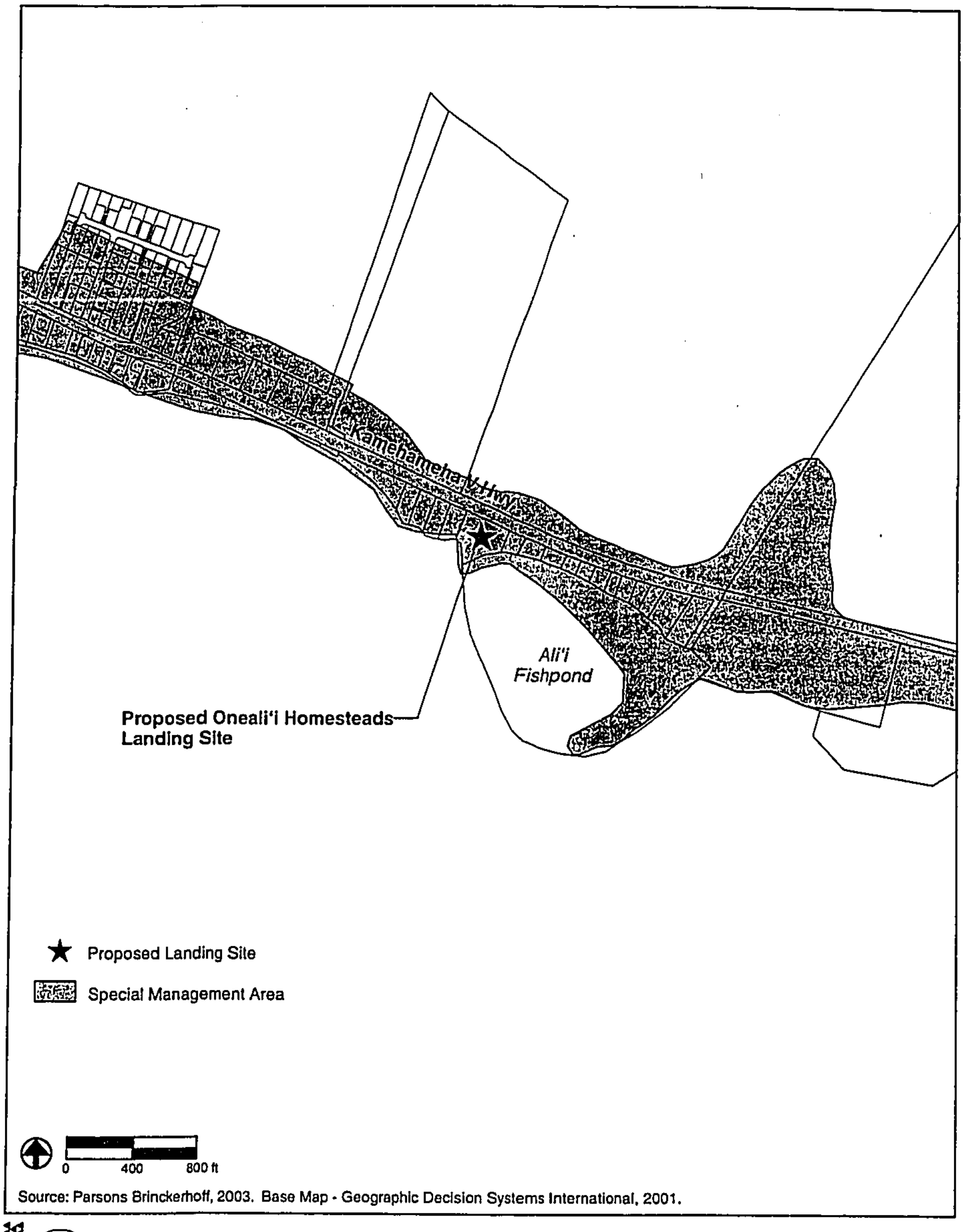
Special Management Area at Kili Drive, Mākaha, O'ahu
Submarine Fiber-Optic Cable Project
Figure 11.3-1B



Source: DBEDT, Office of Planning. Base Map - City & County of Honolulu.

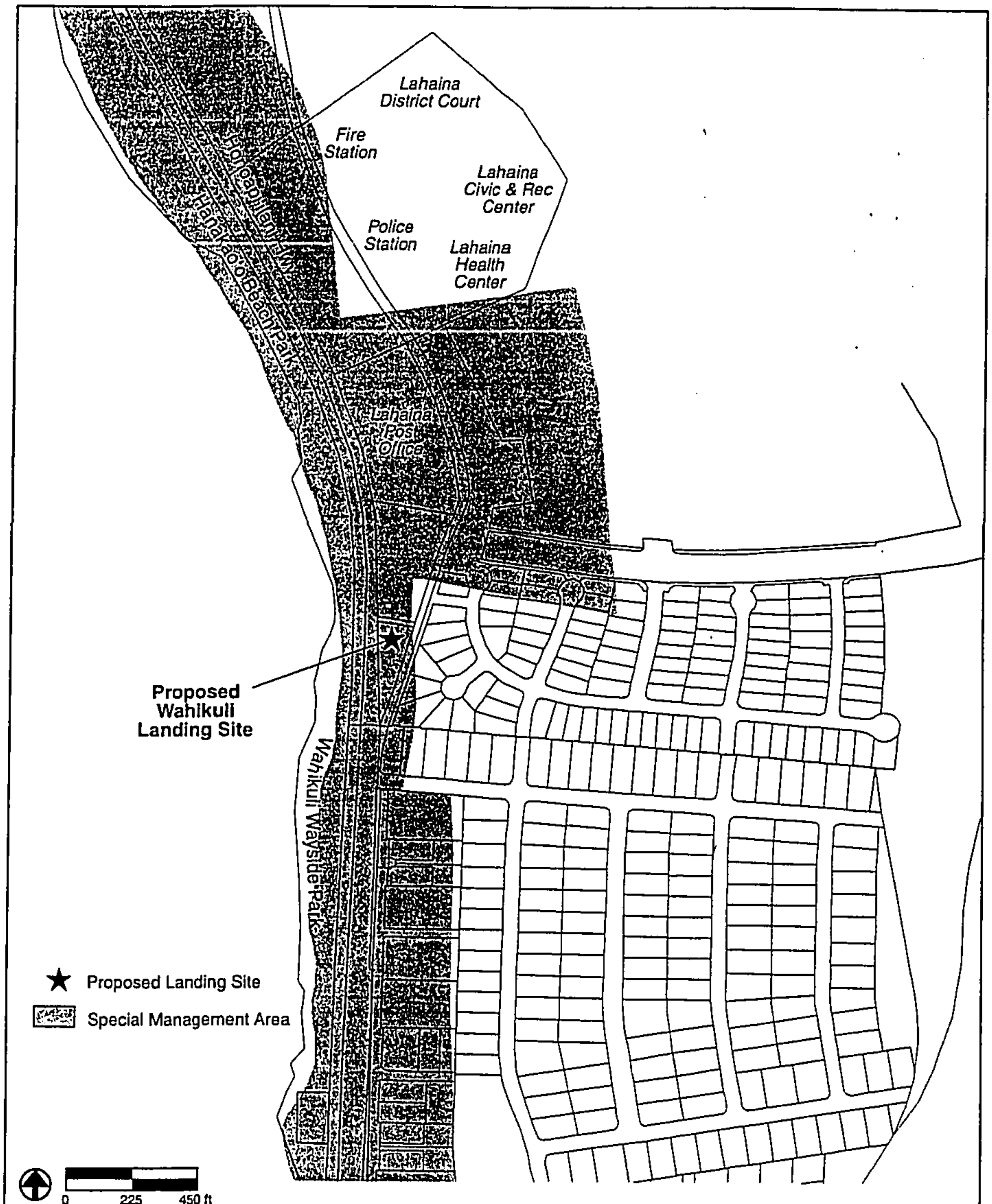
Sandwich Isles Communications, Inc.

Special Management Area at Sandy Beach Park, Hawaiʻi Kai, Oʻahu
Submarine Fiber-Optic Cable Project
Figure 11.3-1C



Sandwich Isles
Communications, Inc.

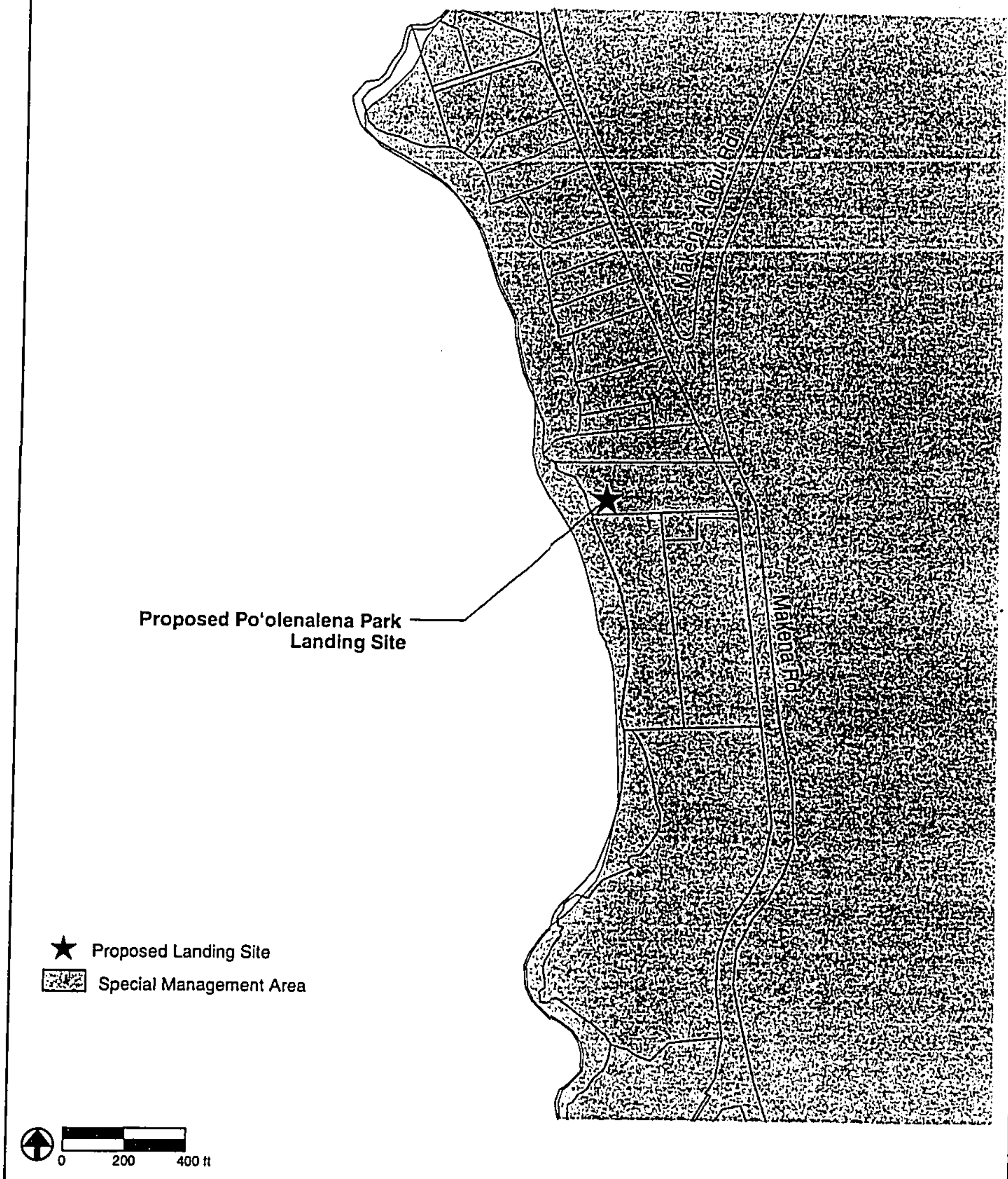
Special Management Area at
Oneali'i Homesteads, Kaunakakai, Moloka'i
Submarine Fiber-Optic Cable Project
Figure 11.3-1D



Source: Parsons Brinckerhoff, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

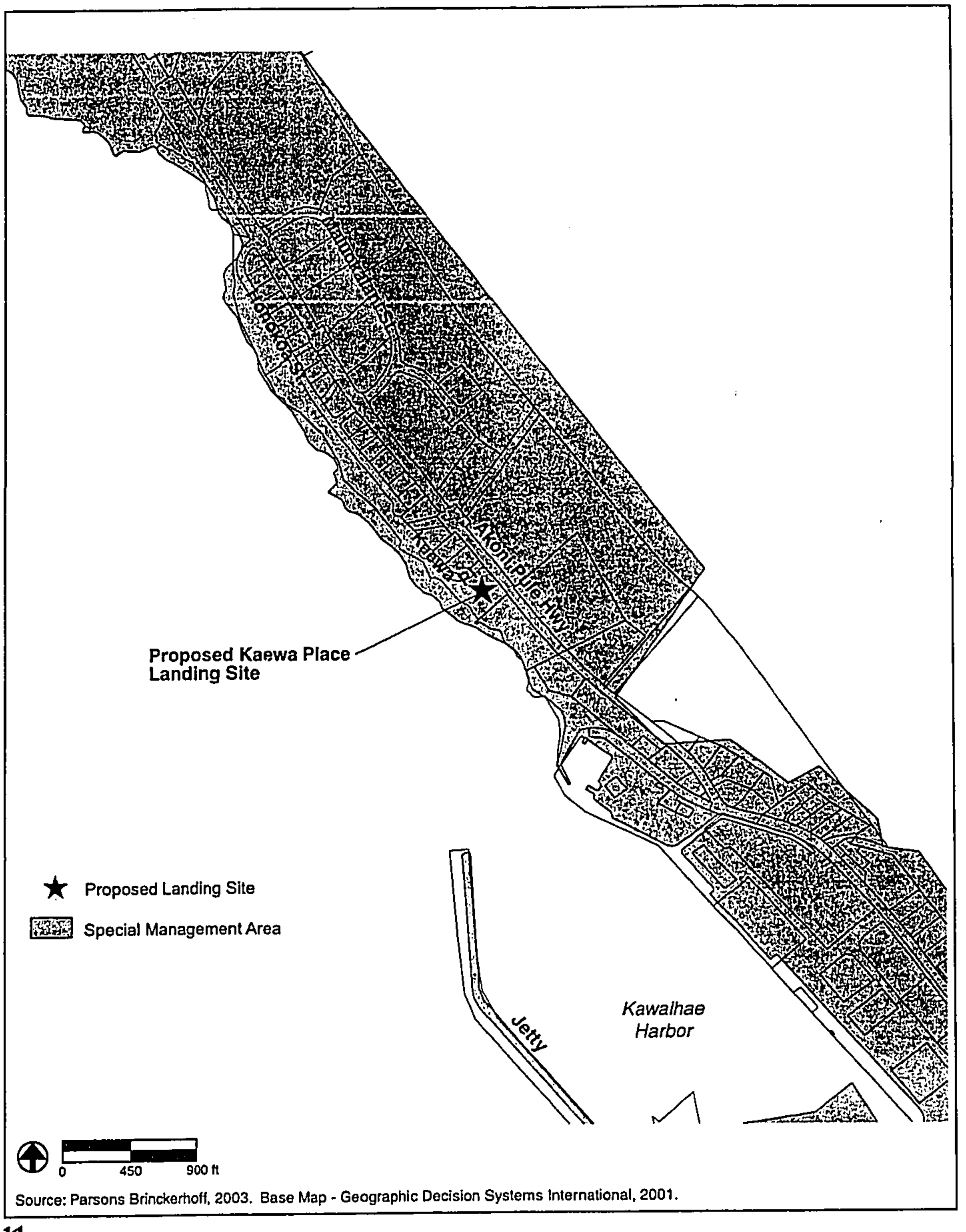
Special Management Area at Wahikuli, Lahaina, Mau'i
Submarine Fiber-Optic Cable Project
Figure 11.3-1E



Source: Parsons Brinckerhoff, 2003. Base Map - Geographic Decision Systems International, 2001.

Sandwich Isles Communications, Inc.

Special Management Area at Po'olenalena Park, Mākena, Maui
Submarine Fiber-Optic Cable Project
Figure 11.3-1F



Sandwich Isles Communications, Inc.

Special Management Area at Kaewa Place, Kawaihae, Hawai'i
Submarine Fiber-Optic Cable Project
Figure 11.3-1G

- Economy. The project as part of the larger SIC statewide fiber-optic network would generate employment opportunities in engineering, construction and technical support fields.
- Natural Environment. The fiber-optic cable connection between land and marine networks would be by horizontal directional drilling, as opposed to open trenching through potentially environmentally sensitive areas, such as beaches, shorelines, live coral communities and other coastal features.
- Transportation and Utilities. The project helps provide modern telecommunications services to Hawaiian Home Lands on O'ahu.

11.3.2.3 County of Maui

The County of Maui's General Plan 1990 was adopted by Ordinance No. 2039, which took effect on September 27, 1991. The General Plan consists of objectives and policies to meet Maui residents' needs and desires. The following major themes were incorporated in the General Plan: protect Maui County's agricultural land and rural identity; prepare a directed and managed growth plan; protect Maui County's shoreline and limit visitor industry growth; maintain a viable economy that offers diverse employment opportunities for residents; and provide for needed resident housing. With regard to infrastructure, the General Plan had the following objective: "To anticipate and provide public utilities that would meet community needs in a timely manner." One of the policies under this objective stated: "Support programs, services and institutions that provide economic diversification."

The SIC fiber-optic cable network is proposed to provide residents of DHHL homesteads with communications infrastructure, an important element in any economic development or diversification effort. The three landing sites in Maui County, which includes Moloka'i, are an integral element in the network. Therefore, the proposed Submarine Fiber Cable Project is consistent with the Maui General Plan.

11.3.2.4 County of Hawai'i

Among its goals, The General Plan, Hawai'i County lists the desire to provide residents with opportunities to improve their quality of life and to provide an environment to allow new, expanded, or improved economic opportunities that are compatible with the County's natural and social environment. Its goals pertaining to public utilities include the provision of adequate, efficient, and dependable public utility services, as well as designing public utilities to fit into their surroundings or to be concealed from public view.

The proposed project, along with SIC's terrestrial network on the Island of Hawai'i, supports public utility goals of the General Plan by providing residents living on Hawaiian Home Lands on the island with affordable telecommunications services.

11.3.3 Zoning Ordinances

11.3.3.1 County of Kaua'i

The purpose of the County of Kaua'i Comprehensive Zoning Ordinance (CZO) is to provide regulations and standards for development of land uses and the construction of structures. Section 8-1.4(d) of the County of Kaua'i CZO states that public utility transmission lines, when placed less than 20 feet above allowable structure heights, shall not be subject to regulation under the CZO. The landing site infrastructure, including the connecting route, would be underground and therefore is permitted by the CZO.

11.3.3.2 City and County of Honolulu

Under the Revised Charter (1992), the Department of Planning and Permitting administers the Land Use Ordinance (LUO) whose purpose is to regulate land use through its zoning powers. This is to be done in a manner that would encourage orderly development in accordance with adopted land use policies, including the O'ahu general plan and development plans, and to promote and protect the public health, safety and welfare. Utility systems are permitted in every zoning district and are classified as being either Type A or B. The proposed infrastructure, which includes underground fiber-optic cables and beach manholes, would be considered a Type A project because it would cause minor (in this case, no) impact on adjacent land uses. Type B projects, on the other hand, would cause impacts to neighboring land uses, and therefore, such projects require a Conditional Use Permit.

11.3.3.3 County of Maui

Permitted uses relating to zoning are codified in Title 19 of the Maui County Code. Utility systems such as the proposed fiber-optic cable landing sites are considered an incidental use permitted in all County zoning districts. There are no specific zoning standards or requirements that would require discretionary review by the Maui or Moloka'i Planning Commissions or the Maui County Council.

11.3.3.4 County of Hawai'i

No land use permit applications would need to be reviewed by the County to complete this project. The project site is part of a 6.633-acre parcel zoned Open (O). According to the County of Hawai'i zoning code, Chapter 25-4-11(a), communication, transmission, and power lines of public and private utilities are permitted uses within any district.

11.4 LIST OF PERMITS AND APPROVALS

The following permits or approvals may be required prior to the construction of the project. Application for most of these permits cannot be made until compliance with the environmental review process (NEPA and HRS Chapter 343) is completed.

<u>Federal</u>

- USFWS and NMFS – Section 7 Consultation
- USACE – DA permit pursuant to Section 10 of the Rivers and Harbors Act for all proposed landing sites
- Federal Communications Commission – Cable Landing License for all proposed landing sites

<u>State</u>

- Department of Business, Economic Development, and Tourism (DBEDT), Office of Planning - CZM federal consistency determination
- DLNR, Historic Preservation Division – Section 106 Coordination
- DLNR, Land Division – CDUP
  - Submerged land up to 12 miles from the shoreline at all proposed landing sites
  - Sandy Beach Park landing site and Connecting Route
  - Wahikuli Landing Site: easement within Wahikuli Wayside Park
- DLNR, Land Division – Utility easement on State submerged lands for all proposed landing sites
- DLNR, Land Division – Utility easement on State land
  - Wahikuli landing site
  - Po'olenalena Park landing site

- SDOH, Clean Water Branch – National Pollutant Discharge Elimination System Permit for stormwater discharges relating to construction activities
  - ʻAkialoa Road landing site and Connecting Route
  - Kili Drive landing site and Connecting Route
  - Sandy Beach Park landing site and Connecting Route
- SDOH, Noise, Radiation and Indoor Air Quality Branch – Noise Permit for all proposed landing sites
- State of Hawaiʻi Department of Hawaiian Home Lands – Utility easement
  - ʻAkialoa Road landing site
  - Onealiʻi Homesteads landing site
  - Kaewa Place landing site
- State of Hawaiʻi Department of Transportation – Permit to Perform Work Upon a State Highway
  - ʻAkialoa Road landing site and connecting route
  - Kili Drive landing site and connecting route
  - Sandy Beach Park landing site and connecting route
  - Onealiʻi Homesteads landing site
  - Wahikuli landing site
  - Kaewa Place landing site

<u>Counties</u>

- All counties' Departments of Public Works (Department of Planning and Permitting, or DPP, for the City and County of Honolulu) - building permits for all proposed landing sites and connecting routes
- City and County of Honolulu DPP - Street Usage Permit for the Kili Drive connecting route
- City and County of Honolulu - Utility easement
  - Kili Drive landing site
  - Sandy Beach Park landing site
- County of Maui Department of Pubic Works – Street Usage Permit for the Poʻolenalena Park landing site
- All counties' Planning Departments (and DPP) – SMA use permits and SSVs for all proposed landing sites (the County of Hawaiʻi Planning Department does not require a SSV)

Chapter 12
Comments and Coordination

CHAPTER TWELVE: COMMENTS AND COORDINATION

This chapter summarizes the public and agency consultation and coordination activities for the SIC Submarine Fiber Optic Cable Project that have been conducted to date. Project scoping and coordination activities have included correspondence with government agencies, landowners, environmental organizations; and meetings with government agencies and other interested parties.

12.1 PRE-CONSULTATION

Over 800 agencies, organizations and individuals, including residents living adjacent to one of the seven proposed landing sites, were sent a letter about the project in May, 2003 (see Appendix 1) asking if they were aware of any environmental or social issues associated with the proposed project. Letters were sent to individuals or organizations who might be affected by, or have an interest in the proposed action. Counties, organizations and individuals were sent description information on the landing sites proposed within their communities. State and federal agencies were sent Statewide project information (see Appendix 1).

Issuance of these letters was intended as partial compliance with Office of Environmental Quality Control OEQC's guidance on conducting pre-consultation activities prior to issuing a Draft EA. In addition, some of the letters had the purpose of initiating or advancing agency coordination for certain laws and regulations (see Section 12.2).

A total of 115 scoping comments were received from agency groups and individuals, 8 of which requested a copy of the EA upon availability. Those responding to the pre-consultation letters are listed below:

Federal Agencies

- Department of Defense, Navy
- U.S. Coast Guard
- U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Pacific Islands Area Office (NMFS)
- U.S. Department of the Interior, U.S. Fish and Wildlife Service, Pacific Islands Office
- U.S. Geological Survey, Pacific Island Ecosystems Research Center

State of Hawai'i Agencies

- Department of Accounting and General Services
- Department of Business and Economic Development
- Department of Defense, Office of the Director of Civil Defense
- Department of Education, Facilities and Support Services Branch
- Department of Hawaiian Home Lands, Land Management Division
- Department of Health, Clean Water Branch
- Department of Health, Hazard Evaluation and Emergency Response Office
- Department of Health, Noise, Radiation, & Indoor Air Quality Branch
- Department of Health, Solid and Hazardous Waste Branch
- Department of Health, Vector Control Branch
- Department of Health, Wastewater Branch
- Department of Land and Natural Resources, Division Forestry and Wildlife
- Department of Land and Natural Resources, Division of State Parks
- Department of Land and Natural Resources, Land Division
- Department of Land and Natural Resources, State Historic Preservation Division
- Department of Transportation, Harbors Division
- Department of Transportation, Highways Division,
- Department of Transportation, Highways Division, Right-of-Way Branch

City and County of Honolulu
- Board of Water Supply, City and County of Honolulu
- Department of Budget and Fiscal Services, City and County of Honolulu
- Department of the Corporation Counsel, City and County of Honolulu
- Department of Environmental Services, 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 Services, City and County of Honolulu
- Honolulu Fire Department, City and County of Honolulu
- Honolulu Police Department, City and County of Honolulu

County of Maui
- Department of Housing and Human Concerns, County of Maui
- Department of Water Supply, County of Maui
- Maui Police Department, County of Maui

County of Hawai'i
- Department of Environmental Management, County of Hawai'i
- Department of Planning, County of Hawai'i
- *Office of the Mayor, County of Hawai'i*
- Police Department, County of Hawai'i

County of Kaua'i
- Kaua'i Historic Preservation Review Commission

Utility Companies
- Maui Electric Company, Ltd.
- The Gas Company

Civic Groups
- Mākaha Shores Condominium Association
- Nānākuli Housing Corporation
- Wai'anae Hawaiian Civil Club
- Moloka'i Hawaiian Civic Club
- Healani's Hula Halau

12.2 REGULATORY CONSULTATION AND COORDINATION

Since the project requires compliance with multiple environmental laws and regulations, coordination and consultation targeted toward compliance with these specific requirements has been conducted as described below. Appendix 2 contains copies of relevant correspondence. Further information on these additional environmental requirements is provided in Chapter 11.

<u>Section 7 of the Endangered Species Act and Other Laws Protecting Biological Resources</u>

Section 7 of the Endangered Species Act (ESA) requires that federally-funded actions not jeopardize any species listed as threatened or endangered, or adversely modify designated critical habitat. The stakeholders involved in the Section 7 process are the same as those involved in other federal processes established to protect biological resources, which include:
- Magnuson-Stevens Fishery Conservation and Management Act;
- Marine Mammal Protection Act (MMPA);
- Fish and Wildlife Coordination Act (FWCA);

- Migratory Bird Treaty Act (MBTA);
- Executive Order on Coral Reef Protection (E.O. 13089); and
- Hawaiian Islands Humpback Whale National Marine Sanctuary.

Chapter 195D of the Hawai'i Revised Statutes (HRS), the State counterpart law to the ESA, requires evaluation of the potential impact of State projects on threatened and endangered species.

The following consultation and coordination activities have been conducted to date (see Appendix 2):

- U.S. Department of the Interior, Fish and Wildlife Service (USFWS)
  - May 31, 2002 joint agency meeting involving the U.S. Environmental Protection Agency (EPA), USFWS, NMFS, Ho'ākea, Environmental Planning Solutions and Parsons Brinckerhoff (PB), to discuss the environmental aspects of the marine cable component of the project.
  - February 26, 2003 letter from the U.S. Department of Agriculture, Rural Utility Service (RUS) to the USFWS requesting list of Federal Trust Species that could be affected by the proposed project
  - April 22, 2003 letter from PB to the USFWS providing supplemental updated information about the project (also pre-consultation letter)
  - June 19, 2003 letter from the USFWS to the RUS providing list of Federal Trust Species that could be affected by the proposed project
  - March 4, 2004 letter from RUS to USFWS requesting concurrence on the finding that the proposed project is not likely to cause an adverse effect on federal trust species identified by the USFWS.

- U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)
  - May 31, 2002 joint agency meeting involving the EPA, USFWS, NMFS, Ho'ākea, Environmental Planning Solutions and PB, to discuss the environmental aspects of the marine cable component of the project.
  - February 26, 2003 letter from the RUS to NMFS requesting a list of Federal Trust Species that could be affected by the proposed project, and to initiate coordination regarding the Sustainable Fisheries Act and the Marine Mammal Protection Act.
  - April 14, 2003 letter from NMFS to RUS providing a list of protected species pursuant to Section 7 and the Marine Mammal Protection Act.
  - March 4, 2004 letter from RUS to NMFS requesting concurrence on the finding that the proposed project is not likely to cause an adverse effect on federal trust species identified by the NMFS.

- U.S. Department of Commerce, Natural Oceanic and Atmospheric Administration, Humpback Whale National Marine Sanctuary. The Sanctuary is co-managed by NOAA and the State Department of Land and Natural Resources (DLNR).
  - October 28, 2002 meeting involving PB and NOAA and DLNR Sanctuary Co-Managers to discuss the environmental aspects of the marine cable component of the project.
  - May 8, 2003 letter to federal and State Sanctuary Co-Managers providing information on the project and requesting input on environmental issues.

- Department of Land and Natural Resources (DLNR)
  - May 7, 2003 letter from PB to the Division of Aquatics, DLNR initiating coordination per the State of Hawai'i Endangered Species Act and providing information about the project.
  - May 7, 2003 letter from PB to the Division of Forestry and Wildlife, DLNR initiating coordination per the State of Hawai'i Endangered Species Act and providing information about the project.

Section 106 of the National Historic Preservation Act and Chapter 6E of the Hawai'i Revised Statutes

Section 106 of the National Historic Preservation Act (NHPA)requires that actions that are federally funded, authorized or carried out take into account the effect of such actions on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register of Historic Places. Hawai'i Revised Statutes (HRS) Chapter 6E places similar responsibilities on State agencies. SIC project archaeologists consulted with SHPD staff regarding technical issues regarding the proposed landing sites. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2).

- DLNR State Historic Preservation Division (SHPD) and State Historic Preservation Officer (SHPO)
  - February 5, 2003 meeting involving the SHPD, Ho'ākea, Environmental Planning Solutions, and PB to discuss the project including definition of Area of Potential Effect and potential landing sites.
  - February 11, 2003 letter from PB to the SHPD providing additional information on the two proposed landing sites on the island of Hawai'i: Keokea and Kawaihae. SHPD was requested to provide comments on the sites prior to soil sampling.
  - February 13, 2003 meeting involving the SHPD Maui archaeologist to discuss the potential Maui landing sites.
  - February 26, 2003 letter from SHPD to PB in response to PB's February 11, 2003 letter. SHPD indicated that no significant historic properties are anticipated to be affected by the soil sampling at the proposed Keokea and Kawaihae landing sites.
  - May 7, 2003 letter from PB to SHPD to request additional comments on the project pursuant to Section 106 and providing supplemental information about the project.
  - May 12, 2003 letter from SHPD to PB providing SHPD's comments on soil sampling activities at the Kili Drive, Mākaha, O'ahu landing site.
  - October 22, 2003 meeting involving the SHPD Maui archaeologist to discuss the Po'olenalena Park landing sites.
  - November 26, 2003 letter from DLNR to Xamenek Researches regarding SHPD comments on the field work for an archaeological inventory survey for Po'olenalena Beach Park Landing Site.
  - December 10, 2003 letter from PB to SHPD requesting comments on archaeological survey reports prepared for the project.
  - January 12, 2004 letter from the SHPO to PB providing comments on the Oneali'i Homesteads Landing Site archaeological assessment report.
  - January 13, 2004 letter from the SHPO to PB providing comments on the 'Akialoa Road Landing Site inventory survey report.
  - February 6, 2004 letter from the SHPD to Xamenek Researches providing comments on the Wahikuli Landing Site inventory survey report
  - February 19, 2004 letter from the SHPO to PB providing comments on the Sandy Beach Park Landing Site inventory survey report.
  - February 20, 2004 letter from the SHPO to PB providing comments on the Kili Drive Landing Site inventory survey report.
  - March 4, 2004 letter from the SHPO to PB providing comments on the Kaewa Place Landing Site inventory survey report.
  - March 17, 2004 letter from the SHPO to PB providing comments on Cultural Surveys Hawaii accepting the 'Akialoa Road Landing Site inventory survey report.
  - April 5, 2004 letter from the SHPD to DLNR Office of Conservation and Coastal Lands stating that the Draft EA "accurately represents the nature and extent of historic preservation compliance." (letter provided in response to distribution of Draft EA).
  - April 21, 2004 letter from the SHPO to Xamanek Researches providing comments on the Po'olenalena Beach Park Landing Site inventory survey report.

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

- Migratory Bird Treaty Act (MBTA);
- Executive Order on Coral Reef Protection (E.O. 13089); and
- Hawaiian Islands Humpback Whale National Marine Sanctuary.

Chapter 195D of the Hawai'i Revised Statutes (HRS), the State counterpart law to the ESA, requires evaluation of the potential impact of State projects on threatened and endangered species.

The following consultation and coordination activities have been conducted to date (see Appendix 2):

- U.S. Department of the Interior, Fish and Wildlife Service (USFWS)
  - May 31, 2002 joint agency meeting involving the U.S. Environmental Protection Agency (EPA), USFWS, NMFS, Ho'ākea, Environmental Planning Solutions and Parsons Brinckerhoff (PB), to discuss the environmental aspects of the marine cable component of the project.
  - February 26, 2003 letter from the U.S. Department of Agriculture, Rural Utility Service (RUS) to the USFWS requesting list of Federal Trust Species that could be affected by the proposed project
  - April 22, 2003 letter from PB to the USFWS providing supplemental updated information about the project (also pre-consultation letter)
  - June 19, 2003 letter from the USFWS to the RUS providing list of Federal Trust Species that could be affected by the proposed project
  - March 4, 2004 letter from RUS to USFWS requesting concurrence on the finding that the proposed project is not likely to cause an adverse effect on federal trust species identified by the USFWS.

- U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS)
  - May 31, 2002 joint agency meeting involving the EPA, USFWS, NMFS, Ho'ākea, Environmental Planning Solutions and PB, to discuss the environmental aspects of the marine cable component of the project.
  - February 26, 2003 letter from the RUS to NMFS requesting a list of Federal Trust Species that could be affected by the proposed project, and to initiate coordination regarding the Sustainable Fisheries Act and the Marine Mammal Protection Act.
  - April 14, 2003 letter from NMFS to RUS providing a list of protected species pursuant to Section 7 and the Marine Mammal Protection Act.
  - March 4, 2004 letter from RUS to NMFS requesting concurrence on the finding that the proposed project is not likely to cause an adverse effect on federal trust species identified by the NMFS.

- U.S. Department of Commerce, Natural Oceanic and Atmospheric Administration, Humpback Whale National Marine Sanctuary. The Sanctuary is co-managed by NOAA and the State Department of Land and Natural Resources (DLNR).
  - October 28, 2002 meeting involving PB and NOAA and DLNR Sanctuary Co-Managers to discuss the environmental aspects of the marine cable component of the project.
  - May 8, 2003 letter to federal and State Sanctuary Co-Managers providing information on the project and requesting input on environmental issues.

- Department of Land and Natural Resources (DLNR)
  - May 7, 2003 letter from PB to the Division of Aquatics, DLNR initiating coordination per the State of Hawai'i Endangered Species Act and providing information about the project.
  - May 7, 2003 letter from PB to the Division of Forestry and Wildlife, DLNR initiating coordination per the State of Hawai'i Endangered Species Act and providing information about the project.

Section 106 of the National Historic Preservation Act and Chapter 6E of the Hawai'i Revised Statutes

Section 106 of the National Historic Preservation Act (NHPA)requires that actions that are federally funded, authorized or carried out take into account the effect of such actions on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register of Historic Places. Hawai'i Revised Statutes (HRS) Chapter 6E places similar responsibilities on State agencies. SIC project archaeologists consulted with SHPD staff regarding technical issues regarding the proposed landing sites. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2).

- DLNR State Historic Preservation Division (SHPD) and State Historic Preservation Officer (SHPO)
  - February 5, 2003 meeting involving the SHPD, Ho'ākea, Environmental Planning Solutions, and PB to discuss the project including definition of Area of Potential Effect and potential landing sites.
  - February 11, 2003 letter from PB to the SHPD providing additional information on the two proposed landing sites on the island of Hawai'i: Keokea and Kawaihae. SHPD was requested to provide comments on the sites prior to soil sampling.
  - February 13, 2003 meeting involving the SHPD Maui archaeologist to discuss the potential Maui landing sites.
  - February 26, 2003 letter from SHPD to PB in response to PB's February 11, 2003 letter. SHPD indicated that no significant historic properties are anticipated to be affected by the soil sampling at the proposed Keokea and Kawaihae landing sites.
  - May 7, 2003 letter from PB to SHPD to request additional comments on the project pursuant to Section 106 and providing supplemental information about the project.
  - May 12, 2003 letter from SHPD to PB providing SHPD's comments on soil sampling activities at the Kili Drive, Mākaha, O'ahu landing site.
  - October 22, 2003 meeting involving the SHPD Maui archaeologist to discuss the Po'olenalena Park landing sites.
  - November 26, 2003 letter from DLNR to Xamenek Researches regarding SHPD comments on the field work for an archaeological inventory survey for Po'olenalena Beach Park Landing Site.
  - December 10, 2003 letter from PB to SHPD requesting comments on archaeological survey reports prepared for the project.
  - January 12, 2004 letter from the SHPO to PB providing comments on the Oneali'i Homesteads Landing Site archaeological assessment report.
  - January 13, 2004 letter from the SHPO to PB providing comments on the 'Akialoa Road Landing Site inventory survey report.
  - February 6, 2004 letter from the SHPD to Xamenek Researches providing comments on the Wahikuli Landing Site inventory survey report
  - February 19, 2004 letter from the SHPO to PB providing comments on the Sandy Beach Park Landing Site inventory survey report.
  - February 20, 2004 letter from the SHPO to PB providing comments on the Kili Drive Landing Site inventory survey report.
  - March 4, 2004 letter from the SHPO to PB providing comments on the Kaewa Place Landing Site inventory survey report.
  - March 17, 2004 letter from the SHPO to PB providing comments on Cultural Surveys Hawaii accepting the 'Akialoa Road Landing Site inventory survey report.
  - April 5, 2004 letter from the SHPD to DLNR Office of Conservation and Coastal Lands stating that the Draft EA "accurately represents the nature and extent of historic preservation compliance." (letter provided in response to distribution of Draft EA).
  - April 21, 2004 letter from the SHPO to Xamanek Researches providing comments on the Po'olenalena Beach Park Landing Site inventory survey report.

- Other agencies and organizations (also see Table 12.3-1)
  - May 8, 2003 letter from PB to Kaua'i Historic Preservation Review Commission
  - June 13, 2003 letter from the Kaua'i Historic Preservation Review Commission
  - Also see Section 12.4.2.

<u>Section 1424(e) of the Safe Drinking Water Act</u>

Section 1424(e) of the Safe Drinking Water Act (SDWA) of 1974 requires that federally funded or financially supported projects located on EPA designated sole source aquifers are required to complete a Groundwater Impact Assessment. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2).

Meetings were held with the Commission on Water Resource Management (CWRM) on March 17, 2003, and April 11, 2003, to discuss the groundwater impact assessment and to obtain data. CWRM is not mandated to regulate Section 1424 (e) SDWA, but was consulted with since it is the local authority on water resource management.

- U.S. Environmental Protection Agency (EPA)
  - May 7, 2003 meeting with the EPA
  - May 31, 2002 joint agency meeting involving the EPA, USFWS, NMFS, Ho'ākea, Environmental Planning Solutions and PB, to discuss the environmental aspects of the marine cable component of the project.
  - October 27, 2002 teleconference with EPA San Francisco to discuss project compliance with Section 1424 (e) and the scope of the Groundwater Impact Assessment.
  - December 22, 2003 letter from PB to EPA submitting the groundwater impact assessment on the Moloka'i Sole Source Aquifer pursuant to Section 1424(e) review.
  - February 24, 2004 PB telephone conversation with EPA who provided information that EPA has 30 days to review the impact assessment, and failure to do so would result in an automatic approval of the assessment per SDWA Section 1424(e).

- DLNR Commission on Water Resource Management (CWRM)
  - April 16, 2003 letter from PB to CWRM requesting a written determination on whether the project requires any permits by the CWRM.
  - May 6, 2003 letter from CWRM to PB indicating that CWRM issued permits are not required.

<u>Farmland Protection Policy Act</u>

The Farmland Protection Policy Act (FPPA) requires that federal agencies identify and consider the adverse effects of their actions on the preservation of farmland. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2).

- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)
  - May 23, 2003 letter from PB to NRCS initiating consultation regarding the FPPA and providing information on the project.
  - June 12, 2003 teleconference between PB and Saku Nakamura regarding requirements of the FPPA.
  - June 24, 2003 letter from NRCS to PB in response to PB's letter of May 23, 2003. NRCS indicated that the Farmland Protection Policy Act does not apply.

Section 10 of the Rivers and Harbors Appropriations Act

Section 10 of the Rivers and Harbors Act regulates work proposed in "waters of the U.S." that may affect navigation. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2)

- U.S. Army Corps of Engineers (USACE)
  - May 22, 2001 meeting between PB and USACE reagrding the Department of Army regulatory process.
  - September 1, 2001 meeting between Ho'ākea and USACE regarding the applicablity of the USACE permit for the marine fiber optic cables.
  - May 29, 2002 meeting involving USACE, Ho'ākea, and PB to discuss the environmental aspects of the marine cable component of the project.
  - May 7, 2003 Letter from PB to USACE requesting additional comments on the project and providing supplemental project information.
  - May 21, 2003 letter from PB to USACE requesting USACE's assistance in identifying existing submarine cables, wastewater outfalls, and other undersea utilities.
  - May 30, 2003 letter from USACE to PB in response to PB's May 21, 2003 letter regrding submarine cables, and other marine utilities.
  - February 25, 2004 letter from USACE to DLNR Office of Conservation and Coastal Lands providing an assessment that the project will require Department of Army authorization pursuant to Section 10 (letter provided in response to distribution of Draft EA).

Conservation District Use Permit

The Conservation District includes all submerged lands from the shoreline to a distance of three miles. Therefore, all landing site infrastructure seaward of the shoreline would be within the Conservation District and would require Conservation District Use Permits (CDUPs) granted by the Board of Land and Natural Resources. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2)

- DLNR Land Division (also Office of Conservation and Coastal Lands)
  - September 27, 2001 meeting between Ho'ākea and DLNR to discuss potential landing sites on the island of Maui.
  - August 27,2002 meeting involving DLNR, Ho'ākea and PB to introduce the marine part of SIC project and establish protocol for further coordination. DLNR agreed to be the accepting authority for the project's Chapter 343 document.
  - May 8, 2003 letter from PB to DLNR requesting comments on the project and providing information on the project.
  - May 15, 2003 meeting between Ho'ākea and DLNR to discuss the right-of-entry for the Poolenalena landing site.
  - May 15, 2003 letter from DLNR to PB regarding DHHL Parcels 32 and 7
  - May 22, 2003 letter from DLNR Land Division to PB in response to PB's letter dated May 8, 2003. DLNR provided comments on the project.
  - May 23, 2003 letter from PB to DLNR Land Division requesting confirmation that the Board of Land and Natural Resources will be the accepting agency for the project's Environmental Assessment and CDUP application. The letter also provided additional information on the project.
  - December 17, 2003 letter from PB to DLNR Chairperson submitting the Conservation District Use Application (CDUA) on behalf of SIC.
  - February 12, 2004 letter from DLNR Chairperson to PB announcing acceptance of the CDUA effective date, February 16, 2004.

Hawai'i Coastal Zone Management Program

As required by the Coastal Zone Management (CZM) Act HRS Chapter 205A, all federally proposed activities or activities that require a federal permit or license are required to be consistent to the maximum extent practicable with the Hawai'i CZM Program. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2)

- Office of Planning (OP) of the State Department of Business, Economic Development and Tourism
  - January 8, 2003 letter from PB to OP regarding the applicability of Hawai'i Coastal Zone Management Federal Consistency to the USDA Rural Utility Service Loan.
  - January 24, 2003 letter from OP to PB in response to PB's January 8, 2003 letter. OP indicated that CZM federal consistency reviews are not required by the Hawai'i CZM Program for loans and grants authorized under the Rural Electrification Act of 1936.
  - May 7, 2003 letter from PB to OP requesting comments on the project and initiating coordination pursuant to CZM provisions.
  - May 15, 2003 letter from OP to PB acknowledging that requirements for the Hawai'i CZM Program Federal Consistency review in conjunction with the U.S. Army Corps of Engineers permit were correctly identified.

Special Management Area Use Permit

HRS Chapter 205A authorized counties to develop and administer permitting systems to control development within areas along the shoreline, which are called Special Management Area(s) (SMA). In addition, counties administer use within shoreline setback areas. The following consultation and coordination activities were conducted on behalf of the project (see Appendix 2)

- County of Kaua'i Planning Department (Kaua'i Planning)
  - August 30, 2002 meeting involving Kaua'i Planning, Environmental Planning Solutions and PB. The Planning Department was briefed on the marine component of the project and the applicability of the SMA Permit and Shoreline Setback Variance (SSV) was discussed.
  - May 7, 2003 letter from PB to Kaua'i Planning requesting additional comments on the project and providing supplemental project information.

- City and County of Honolulu Department of Planning and Permitting (Honolulu Planning)
  - September 4, 2002 meeting involving the DPP, Environmental Planning Solutions and PB. The Honolulu Planning was briefed on the marine component of the project and the applicability of the SMA Permit, SSV, Conditional Use Permit (CUP), and State Special Use Permit (SUP).
  - May 7, 2003 letter from PB to Honolulu Planning requesting additional comments on the project and coordination pursuant to the SMA Permit.
  - July 18, 2003 letter from Honolulu Planning to PB in response to PB's May 7, 2003 letter. DPP indicated that the proposed landing sites appear to be within Special Management Area and shoreline setback. Both parcels are owned by the City and County of Honolulu.
  - March 22, 2004 letter from Honolulu Planning to PB providing notification that both O'ahu landing sites would qualify for minor SMA permits, and would require shoreline setback variances.

- County of Maui Planning Department (Maui Planning)
  - October 15, 2002 meeting between PB and the Maui Planning regarding the SMA Use Permit application process.
  - May 7, 2003 letter from PB to the Maui Planning requesting additional comments on the project and coordination pursuant to the SMA Permit.

- January 13, 2004 letter from PB to Maui Planning requesting assesment on whether the Maui county landing sites would qualify for minor SMA use permits and exemption from SSV requirements.
- February 12, 2004 letter from Maui Planning to PB informing PB that an SMA assessment application needs to be prepared before Maui Planning can make an assessment regarding the minor permits and SSVs.
- April 20, 2004 letter from PB to Maui Planning transmitting SMA assessment applications for the Wahikuli and Oneali'i Landing Sites.

- County of Hawai'i Planning Department (Hawai'i Planning)
  - December 11, 2001 meeting between Ho'ākea and the Hawai'i Planning to discuss the project and the SMA Use Permit.
  - October 16, 2002 meeting between PB and Hawai'i Planning regarding the SMA Permit application process.
  - February 24, 2003 meeting between PB and the Hawai'i Planning regarding the applicability of CZM laws,SMA Use Permit and Shoreline Setback Variance.
  - May 7, 2003 letter from PB to the Hawai'i Planning requesting additional comments on the project and coordination pursuant to the SMA Permit.
  - June 10, 2003 letter from the Hawai'i Planning to PB in reponse to PB's May 7, 2003 letter. The Planning Department provided comments on the applicability of the SMA Use Permit and the SSV.
  - March 5, 2004 (typo 3004) from Hawai'i Planning to DLNR providing a regulatory assessment regarding SMA and SSV permitting (letter provided in response to distribution of Draft EA)
  - March 19, 2004 letter from PB to Hawai'i Planning transmitting an SMA assessment application for the Kaewa Place landing site.
  - April 13, 2004 letter from Hawai'i Planning to PB providing an SMA minor permit for the Kaewa Place landing site.

12.3 PUBLIC INVOLVEMENT

Over 100 informal meetings have been held with various individuals, community groups and businesses from 2001 to present. Native Hawaiian individuals and organizations were contacted especially as a part of the cultural resource investigations. These meetings provided project information and gathered concerns on project issues, including valuable input on the siting of the landing sites. Table 12.3-1 lists the meetings that have been held.

TABLE 12.3-1
INFORMAL PUBLIC SCOPING AND COORDINATION MEETINGS

Meeting Date	Organization or Agency
7/14/2001	Colin Kippin, Office of Hawaiian Affairs, Deputy Director*
7/16/2001	Pua Aiu, Office of Hawaiian Affairs*
7/31/2001	Sol Ka'opuiki, Lāna'i Kupuna*
8/2/2001	Ray Soon, Director, Dept of Hawaiian Homelands*
8/3/2001	Charles Rose, Pres., Hawaiian Civic Club Association*

Meeting Date	Organization or Agency
8/3/2001	Don Hibbard, Department of Land and Natural Resources, State Historic Preservation Division*
8/13/2001	Ross Cordy, Archaeologist State Historic Preservation Division*
8/23/2001	David Scott, Historic Hawai'i Foundation, Director*
8/24/2001	Brian Keaulana, Ocean Expert*

TABLE 12.3-1
INFORMAL PUBLIC SCOPING AND COORDINATION MEETINGS
(CONTINUED)

Meeting Date	Organization or Agency
8/25/2001	Lurline Salvador, Oahu Island Burial Council*
9/1/2001	Harold Bronstein, Esq.
9/1/2001	John Nakagawa, Coastal Zone Management Office, Office of State Planning
9/1/2001	Pat Billington, U. S. Army Corps of Engineers, Regulatory Branch, Senior General Counsel
9/6/2001	Judy Stewart, Kekaha Hawaiian Homestead Association*
9/13/2001	Jim Muratsuchi, The Oceanic Institute
9/13/2001	Mina Morita, Kaua'i Representative
9/14/2001	Dennis (Bumpy) Kanahele*
9/14/2001	Jim Tollefson, Chamber of Commerce of Hawaii
9/21/2001	Anders Lyons, Director of Maui Programs, The Nature Conservancy
9/21/2001	Michael H. Lyons, II, Sr. Vice-President (Retired) of Bank of Hawaii
9/25/2001	Paula Helfrich, Hawai'i Island Economic Development Board
9/25/2001	Mel Hewett, Parker Ranch
9/26/2001	Iwalani Arakaki, Moloka'i Kupuna*
9/28/2001	Ann Nathaniel, Hawaiian Civic Club Association*
10/2001	Kathleen Pahinui, North Shore Neighborhood Board
10/1/2001	Antya Miller, Chair, Haleiwa Main Street
10/1/2001	Keola Hanoa, Hawai'i Island Burial Council*
10/2/2001	Peter Baldwin, CEO, Haleakala Ranch
10/2/2001	Robert Carroll, Maui County Council
10/3/2001	Maryanne Kusaka, Mayor, Kauai County
10/3/2001	Mark Marshall, Administrator, Kauai Civil Defense

Meeting Date	Organization or Agency
10/3/2001	Clifford Ikeda, Plans & Operations Officer, Kauai Civil Defense
10/4/2001	Van Diamond, Oahu Resident*
10/4/2001	John Ford, Geo InSight International Inc., Vice President, Operations
10/5/2001	Mike Kahikina, Representative House of Representatives, 43rd District
10/8/2001	Mike Kahikina, Representative House of Representatives, 43rd District
10/10/2001	Emily J. Auwae, House of Representatives, 44th District - Wai'anae/Mākaha
10/12/2001	Chuck Penque, Department of Land and Natural Resources, Division of Boating and Recreation, Maui Harbor Master
10/21/2001	Marie Solomon, Kupuna*
10/23/2001	Charlie Maxwell, Maui and Lana'i Island Burial Council, c/o State Historic Preservation Division*
10/24/2001	Ruby McDonald, Office of Hawaiian Affairs - Kona
10/31/2001	Ed Wendt, Na Moku Aupuni O Ko'olau*
10/31/2001	Ben Kama, Honolulu Neighborhood Comission
11/2001	Tom Shirai, O'ahu Island Burial Council*
11/1/2001	Gary Baldwin, Kaua'i Economic Development Board, Executive Director
11/7/2001	Ann Ogata-Deal, Coastal Erosion Program, Office of Planning
11/7/2001	Mike Molina, Maui County Council
11/8/2001	Mel Kalahiki, Na Koa*
11/15/2001	Hannah Springer, Cultural Specialist*
11/9/2001	Pua Kanahele, Hui Malama I Na Kupuna*

TABLE 12.3-1
INFORMAL PUBLIC SCOPING AND COORDINATION MEETINGS
(CONTINUED)

Meeting Date	Organization or Agency
11/21/2001	Dickie Nelson
12/7/2001	Gerald Takase, Office of The Corporation Counsel, County of Hawai'i
2/12/2002	Robin Danner, Council of Native Hawaiian Advancement*
2/18/2002	Carl Lindquist, Hana Business Council
2/20/2002	Hokulani Holt Padilla, Maui Cultural & Arts Center, Cultural Specialist*
4/16/2002	Ben Henderson, Deputy Director, Dept of Hawaiian Homelands*
5/1/2002	George Maioho, Dept of Hawaiian Homelands – Molokai*
5/29/2002	Lolly Silva, U. S. Army Corps of Engineers, Regulatory Branch
6/12/2002	Moloka'i Native Hawaiian Education Island Council
6/17/2002	Bertha Kawakami, Kaua'i State Representative
6/17/2002	John Ray, Hawai'i Leeward Planning Conference
6/24/2002	Peter Young, Deputy Managing Director, County of Hawai'i
6/27/2002	Patti Cook, Businesswoman
8/8/2002	Neil Hannahs, Kamehameha Schools*
10/1/2002	Bobby Luuwai, Cultural Expert
10/10/2002	Barbara Haliniak, Moloka'i Chamber of Commerce, President
10/10/2002	Ed Pedro, Billy Akutagawa, Sherman Napolean, Myron Akutagawa, Colette Machado, Stacy Helm Crivelho and Walter Ritte, Moloka'i Fishpond Group
10/15/2002	Kekaha Hawaiian Homestead Association*
10/16/2002	Jeanne Skog, Maui Economic Development Board
10/16/2002	Moloka'i Island Burial Council*
11/8/2002	Ulu Sherlock, Office of Hawaiian Affairs*
12/2/2002	Blossom Feteira, Hui Kako'o Aina Hoopulapula*
12/11/2002	Dixie Kaaetsu, County of Hawai'i, Managing Director
12/11/2002	Al Konishi, Hawai'i Resident
12/11/2002	Harry Kim, County of Hawai'i, Mayor
12/23/2002	Dana Hall, Maui and Lana'i Island Burial Council, Vice-Chair, c/o State Historic Preservation Division
1/21/2003	Stan Roehrig, Esq.
1/21/2003	Pat Tummons, Environment Hawai'i
1/22/2003	Ginger Fuata, Valley of the Rainbows (Wai'anae)
1/23/2003	Leilani Collins, Queen Lili'uokalani Children's Center - Wai'anae*
1/28/2003	Gail Gomes, Westside Stories (Wai'anae Coast)
1/28/2003	Carole Jackson, Hawaii Omori Corporation
1/28/2003	Kia'i Lee, Queen Lili"okalani Children's Center - Wai'anae, Facilities Manager
1/28/2003	Cynthia Rezentes, Wai'anae Neighborhood Board
1/29/2003	Mahealani Kamau'u, Native Hawaiian Legal Corporation*
2/2003	Brian Baptiste, Mayor, Kauai County
2/1/2003	John Clark, Writer/Author*
2/8/2003	Willie Kennison, ILWU Local 142
2/13/2003	Charley Pili Keau, Maui Kupuna*
2/13/2003	Betty Waller, Mākaha Ahupua'a Council, Chair
2/18/2003	John Knox
2/18/2003	Raelene Lancaster, Na Huapala O Hawai'i Halau*

TABLE 12.3-1
INFORMAL PUBLIC SCOPING AND COORDINATION MEETINGS
(CONTINUED)

Meeting Date	Organization or Agency
2/19/2003	Vince Bagoyo, Castle & Cooke Resorts, Vice President of Government Affairs
2/20/2003	Roy Figueiroa, General Manager, Makena Resort Corp.
2/20/2003	Diane Ho, Hawaiian Canoe Club, President*
2/20/2003	Kalani Flores, Cultural Specialist*
2/20/2003	Kiki Mo'okini, Hawaiian Language Instructor
2/20/2003	Kalani English, 5th Senatorial District
2/20/2003	Nathan Napoka, Department of Land and Natural Resources, State Historic Preservation Division*
2/21/2003	Sparky Rodrigues, O'ahu resident
2/25/2003	William Aila, Lualualei Ahupua'a Council Chair
2/27/2003	Perry Artates, Kula Homestead Association
2/27/2003	Lynn Araki-Regan, Office of Economic Development, Office of the Mayor, County of Maui, Economic Development Coordinator
3/2/2003	Wade Lee, Alu Like - Moloka'i Island Center*
3/2/2003	Karen Holt, Moloka'i Community Services Council
3/2/2003	Barbara Kalipi, Queen Lili'uokalani Children's Center - Moloka'i
3/12/2003	Dain Kane, Maui County Council, County of Maui, Chair
3/16/2003	Laki Sagiao, Wai'anae Boat Fishing Club
3/18/2003	Sunday Paris, Wai'anae Coast Neighborhood Board
3/24/2003	Sam Slom, State Senate
3/24/2003	William Holi, Hui Malama I Na Kupuna
3/25/2003	Al Pelayo, Kaanapali Developer

Meeting Date	Organization or Agency
3/27/2003	Charles Djou, City and County of Honolulu, Councilmember
4/2003	Carol Lovell, Kaua'i Resident*
4/1/2003	James Manaku, Wai'anae Coast Neighborhood Board
4/1/2003	Danette Ruyford, Honolulu Community Action Program, Wai'anae District Office
4/3/2003	Lea Perreira and Marlene Kali, Kekaha Hawaiian Homestead Association
4/4/2003	Pat Nishiyama, Na Kupuna O Maui, Lahaina*
4/5/2003	La France Kapaka-Arboleta, Kaua'i Island Burial Council*
4/5/2003	Roland Sagum, Kaua'i Resident
4/5/2003	Scott Sagum, Kaua'i Resident
4/9/2003	Sam Garcia, Mākena Community Association, President
4/10/2003	Aulani Ahmad, Princess Kahanu Estates Hawaiian Homestead Community Association
4/12/2003	Akoni Akana, Friends of Moku'ula, Director
4/16/2003	Carl Lindquist, Hana Business Council
4/16/2003	Ross Fernandez, Kekaha Resident
4/16/2003	Maui Chamber of Commerce
4/16/2003	Moloka'i Island Burial Council*
4/16/2003	Jim Muratsuchi, Oceanic Institute
4/25/2003	Greg Henigan, Napili Canoe Club
4/29/2003	Cindy Evans, Representative, House of Representatives, 7th District
5/1/2003	Theo Purdy, Moloka'i Kupuna
5/2/2003	Kaipo Asing, Councilmember, Kaua'i County Council
5/2/2003	Jay Furfaro, Councilmember, Kaua'i County Council

TABLE 12.3-1
INFORMAL PUBLIC SCOPING AND COORDINATION MEETINGS
(CONTINUED)

Meeting Date	Organization or Agency
5/6/2003	Wai'anae Coast Neighborhood Board No. 24
5/8/2003	Kamaki Kanahele, President, Nanakuli Hawaiian Homestead Association*
5/9/2003	Ivan Laikupu, Wai'anae Valley Hawaiian Homestead Association*
5/14/2003	Kalani Fronda, Kamehameha Schools*
5/15/2003	Alex & Anna Bishaw, Moloka'i Kupuna*
5/15/2003	Kaui Kapuni, Alu Like
5/15/2003	Jason Koga, Department of Land and Natural Resources, Land Division
5/15/2003	Randy Awo, Department of Land and Natural Resources, Division of Conservation & Resources
5/19/2003	Kaipo Akana, West Kaua'i Resident*
5/20/2003	Teruo Oshiro, Kekaha Resident*
5/21/2003	Aletha Kaohi, West Kaua'i Technology and Visitor Information Center
5/22/2003	Lynne Woods, Maui Chamber of Commerce, Ex-Director
5/27/2003	Nalani Flynn, Wai'anae Coast Rotary Club
5/28/2003	David Parsons, Department of Land and Natural Resources, Division of Boating and Ocean Recreation
5/29/2003	Maui and Lana'i Island Burial Council, c/o State Historic Preservation Division*
5/30/2003	Na Kupuna O Ka Moku O Wai'anae*
5/30/2003	Nettie Armitage-Lapilio, Wai'anae Coast Coalition
5/31/2003	Bill Akau, Kupuna*
5/31/2003	Donald Tolentino, Hawai'i Island Resident*
6/2/2003	Kaui Castillo, Queen Lili'uokalani Children's Center Kaua'i*
6/2/2003	Mabel Tolentino, Waimea Hawaiian Civic Club, President
6/2/2003	Gail Souza, Queen Lili'uokalani Children's Center - Kona Unit
6/3/2003	Gail Souza-Save, Queen Lili'uokalani Children's Center
6/5/2003	Edwina Caucolidis, Moloka'i Hawaiian Civic Club
6/12/2003	Charmaine Tavares, Maui County Council
6/12/2003	Millie Carroll, Office of the Mayor, Maui County
6/16/2003	Howard Kihune, Landtec
6/17/2003	Mike Kitamura, Office of Daniel K. Akaka, U.S. Senator
6/17/2003	Cynthia Bond
6/24/2003	Charlie Rodgers, Hawai'i Kai Neighborhood Board No. 1, Chair
7/2003	Gary Gill, Sierra Club
7/10/2003	Joe Ryan, Waimānalo Neighborhood Board, Vice-Chair
7/15/2003	Wilson Ho, Waimānalo Neighborhood Board, Chairperson
7/16/2003	Lucienne de Naie and Diane Shepard, Maui Chapter Sierra Club
7/24/2003	Curtis Tyler, Councilmember, Hawai'i County Council
7/28/2003	James Nakatani, Office of Ed Case, U.S. Representative
7/30/2003	Gil Agaran, Director of Public Works, Maui County
7/30/2003	Rob Parsons, Assistant to the Mayor, Maui County
8/2003	Nani Lee, Office of Hawaiian Affairs, Deputy Director*
8/20/2003	Doreen Lindsey, Nanaikapono Hawaiian Civic Clubs*

TABLE 12.3-1
INFORMAL PUBLIC SCOPING AND COORDINATION MEETINGS
(CONTINUED)

Meeting Date	Organization or Agency
9/16/2003	Colleen Hanabusa, Senator, State Senate, 21st District
9/27/2003	Lynn McCory, Pahio Resort
11/12/2003	The State Council of Hawaiian Homestead Association*
11/12/2003	Micah Kane, Director, Dept of Hawaiian Homelands*

*Meeting also served as Section 106 consultation.

12.4 DRAFT ENVIRONMENTAL ASSESSMENT

12.4.1 Availability of Draft Environmental Assessment

The project's Draft EA was announced in the February 23, 2004 edition of the State of Hawai'i Office of Environmental Quality Control's The Environmental Notice, initiating a 30-day public comment period that ended on March 23, 2004. DLNR, the accepting agency, provided copies of the Draft EA to various divisions within DLNR, and other federal, State and county agencies.

In addition to the distribution conducted by DLNR, the following agencies, and organization were provided copies of the Draft EA by SIC through PB. Some of the recipient organizations listed below have members who are knowledge about historic and cultural resources, which may be valuable in regards to NHPA Section 106 (see Section 12.2 under Section 106)

Federal, State and County Agencies

- U.S. Department of the Navy
- U.S. Geological Survey, Pacific Island Ecosystems Research Center
- State of Hawai'i Office of Hawaiian Affairs
- DLNR, Division of State Parks
- State of Hawai'i Department of Business, Economic Development and Tourism (DBEDT), Office of Planning
- State of Hawai'i Department of Hawaiian Home Lands (DHHL), Land Management Division
- City and County of Honolulu Department of Budget and Fiscal Services
- City and County of Honolulu Department of Parks and Recreation
- County of Maui Department of Parks and Recreation

Libraries

- Hawaii State Library
- Hanapepe Public Library
- Hawaii Kai Public Library
- Kailua-Kona Public Library
- Kealakekua Public Library
- Kihei Public Library
- Lahaina Public Library
- Lanai Public & School Library
- Molokai Public Library
- Thelma Parker Memorial Public & School Library
- Waianae Public Library
- Waimanalo Public Library
- Waimea Public Library

Neighborhood Boards
- Hawaii Kai
- Waianae
- Waimanalo

Island Burial Councils
- Hawaii Island
- Kauai/Niihau Island
- Maui/Lanai Island
- Molokai Island
- Oahu Island

Ahupua'a Councils
- Honouliuli – Lanikuhonua Ahupua'a Council
- Lualualei Ahupua'a Council
- Makaha Ahupua'a Council
- Waianae Ahupua'a Council

Other Organizations
- Association of Hawaiian Civic Clubs
- Historic Hawaii Foundation
- Hui Kako'o 'Aina Ho'opulapula
- Hui Malama I Na Kupuna
- Kaua'i County Historic Preservation Review Commission
- Maui Chamber of Commerce
- Maui Cultural Resources Commission
- Moloka'i Community Services Council
- Moloka'i Chamber of Commerce
- Nanakuli Hawaiian Homestead Assoc.
- Queen Lili'uokalani Children's Center – Kauai, Kona, Moloka'i, and Nanakuli Units
- State Council of Hawaiian Homestead Associations
- West Kaua'i Technology and Visitor Information Center

12.4.2 Comments

The following agencies provided comments during the Draft EA comment period:

Federal Agencies
- Department of the Army

State of Hawai'i Agencies
- Department of Business, Economic Development and Tourism
- Department of Hawaiian Home Lands
- Department of Health
- Department of Land and Natural Resources (DLNR) Division of Aquatic Resources
- DLNR Commission on Water Resource Management
- DLNR Historic Preservation Division (2 letters)
- Office of Environmental Quality Control

County of Kaua'i Agencies
- Planning Department
- Department of Public Works

- Kaua'i Historic Preservation Review Commission

City and County of Honolulu Agencies
- Department of Planning and Permitting
- Department of Parks and Recreation

County of Maui Agencies
- Department of Planning
- Department of Parks and Recreation
- Department of Public Works and Environmental Management

County of Hawai'i Agencies
- Planning Department

Copies of these comment letters are provided in Appendix 2, which are immediately followed by response letters dated April 12, 13 and 16, 2004 sent by PB on behalf of SIC.

DLNR considered all comments received and responses as they made their determination of whether or not the project will have a "significant impact" (see Chapter 13).

Chapter 13
Finding of No Significant Impact

Final Environmental Assessment/
Finding of No Significant Impact
Submarine Fiber-Optic Cable Project

CHAPTER THIRTEEN:
FINDING OF NO SIGNIFICANT IMPACT

13.1 DETERMINATION

The proposed project will not significantly alter the environment in either the long or short term. Short-term construction-related impacts will be minimal and will be mitigated in accordance with the committed mitigation measures described previously. Therefore, the State of Hawai'i Department of Land and Natural Resources (DLNR) has rendered a Finding of No Significant Impact (FONSI) for the submarine fiber-optic cable project proposed by Sandwich Isles Communications, Inc. (SIC).

13.2 FINDINGS AND REASONS

In accordance with the Hawai'i Revised Statutes (HRS) Chapter 343 HRS and Hawai'i Administrative Rules (HAR), Sections 11-200-9 and 11-200-11.2, DLNR, as the approving agency, has issued a FONSI for the proposed project. This finding was made after reviewing and considering comments received on the project's Draft EA, and SIC's responses to those comments.

This FONSI will be announced in the State's Environmental Notice along with an announcement of the availability of this Final Environmental Assessment (EA). The assessment provided below is based on an evaluation of project impacts in relation to the "Significance Criteria" specified in HAR 11-200-12 (b). The definition of "significant effect" in Chapter 343 was amended by the 2000 State Legislature to include ". . . or adversely affect the economic [or] welfare, social welfare [.], or cultural practices of the community and State." The Significance Criteria appear below in italics, and each criterion is followed by a brief discussion of the project in relation to that criterion. The nature of the project's potential impacts, and the committed mitigation measures to minimize adverse impacts, is discussed in detail in Chapters Three through Ten.

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource* – The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources. Although the cable conduits for the Po'olenalena Park landing site might go through parts of a archaeological coastal habitation site, SIC will arrange to have a second inventory survey conducted at the parcel to better define the resource, and will later work with the State Historic Preservation Division to develop a preservation plan for the site. None of the other landing sites involve impacts to valuable natural or cultural resources. Where fiber optic duct facilities will be installed outside of road rights-of-way, the property and the marine environment will be returned to pre-construction conditions.

2. *Curtails the beneficial uses of the environment* – The proposed project will not curtail the range of beneficial uses of the environment. No restriction of the beneficial uses will occur beyond the construction period, when access may be temporarily restricted to coastal segments directly affected by construction work, for a period of approximately three months.

3. *Conflicts with the State's long-term environmental policies or goals and guidelines expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders* - The proposed project will not conflict with the State's long-term environmental policies. The State's long term environmental policies are set forth in Chapter 344, HRS. The broad goals are to conserve natural resources and enhance the quality of life. The project is a relatively minor action, and is consistent with the State's long-term environmental policies.

4. *Substantially affects the economic or social welfare of the community or State* – The proposed project will not substantially affect the economic or social welfare of the community or State. The

project will have a positive effect on the economic and social welfare of residents of Hawaiian Home Lands by providing high-quality, essential telecommunications services. It will also generate short-term construction jobs and some long-term operational jobs, thereby enhancing the economy.

5. *Substantially affects public health* - The proposed project, with the implementation of the committed mitigation measures, will not substantially affect public health or safety in a detrimental way. As required by State law, construction will only be conducted from 7:00 a.m. to 6:00 p.m. Mondays through Fridays and 9:00 a.m. to 6:00 p.m. Saturdays. Maintenance of traffic plans will be developed and implemented so the impact on traffic during construction will be minimized.

6. *Involves substantial secondary impacts* - The proposed project will not involve substantial secondary impacts, such as population changes or creating additional demands on public facilities. While the project will help DHHL beneficiaries, the project is not anticipated to cause unforeseen social or economic growth. The project does not involve an increase in housing units that could increase the existing resident population. Although the project will provide a number of short-term construction jobs and some long-term operational jobs, these jobs are anticipated to be filled by local residents and will not induce in-migration.

7. *Involves substantial degradation of environmental quality* - The proposed project will not involve a substantial degradation of environmental quality. The project is a relatively minor and environmentally benign action, with limited environmental impacts during the construction phase. Committed mitigation measures to minimize for these construction-phase impacts will be implemented.

8. *Substantially affects a rare, threatened, or endangered species, or its habitat* - The proposed project is not anticipated to affect any rare, threatened, or endangered species or designated critical habitat. Occurrences of protected terrestrial species in the project areas are uncommon, and no direct adverse impact on these species is anticipated during HDD construction. Because protected species of marine animals occur in Hawai'i's waters, caution must be taken to avoid adverse interactions with these species. Immediately before and during HDD pop-out events, an underwater diver will observe the environment before pop-out. If a protected animal is observed in the immediate vicinity of the exit point, the pop-out event will be delayed until the animal moves away from the project area of its own volition. If a whale or other protected species, including spinner dolphins and sea turtles, is observed in the path of the cable vessel or in an area where they may interact with the vessel or deployment of the cable, this operation will be halted until the animal moves away of its own volition.

9. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions* - The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions. The project is not related to other activities in the region in such a way as to produce adverse cumulative effects or involve commitments for larger actions. The submarine portion of this cable project was designed to be built in conjunction with the independent terrestrial cable project addressed in previous EAs. The submarine portion of the project was disclosed in the previous EAs. The limited and temporary nature of construction-phase impacts are not anticipated to combine with those of any other planned projects, especially when mitigated through Best Management Practices and other measures as proposed in this EA. At most landing sites, the proposed work affects only a specific property and terminates in the roadway beyond the property.

10. *Detrimentally affects air or water quality or ambient noise levels* – The project will not substantially affect air or water quality or ambient noise levels beyond the construction phase. Brief, temporary, and unavoidable effects will occur during construction and will be mitigated to minimize the level of impact.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters* - The project is not likely to be damaged as a result of being located in the following environmentally-sensitive areas: Special Management Area, Shoreline Setback, flood plain, tsunami inundation area, geologically hazardous area, estuary, and coastal and submarine areas. Where the potential for damage is greatest, such as at the landing sites, the fiber optic cable will be buried, thereby protecting it. Because all construction sites will be returned to pre-construction conditions after initial installation work is completed, the project features will not present additional hazards to the public or the environment. The risks of being located in such sensitive areas are also acceptable and manageable.

12. *Substantially affects scenic vistas and viewplanes identified in county or state plans or studies* - The project will not substantially affect scenic vistas and viewplanes. Because the project involves installing underground cables, it will not impair any views.

13. *Requires substantial energy consumption* - The project will not require substantial energy consumption. Some energy input will be required for construction, but the establishment of high-speed telecommunications may foster telecommuting and other energy-conserving behaviors. In addition, modern telecommunications equipment is generally energy-efficient during normal operation.

Chapter 14
References

Final Environmental Assessment/
Finding of No Significant Impact
Submarine Fiber-Optic Cable Project

CHAPTER FOURTEEN: REFERENCES

American Council of Engineering Companies of Hawaii. 2000 Engineering Excellence Awards: "URS Corporation, Bilge and Oil Waste Water Pipelines Installation Using Horizontal Directional Drilling Method." http://www.cech.org/awards/2000/URS.html. Accessed November 10, 2003.

Brock, Richard. Marine Biological Assessment of Fiber Optic Cable Deployment at Seven Sites in the Hawaiian Islands in Support of the Sandwich Isles Communications, Inc. Network. July 2003.

Bueno, Sharon M. "Delicate Drilling under Pearl Harbor." In Trenchless Technology, December 2002. As reproduced on http://www.hmsconstructioninc.com/projects_drilling_pearl_article.html (HMS Construction Inc.) Accessed November 10, 2003.

Char & Associates. Botanical Survey for Proposed Queen's Beach Golf Course, Honolulu District, Island of Oahu," May 1995, for Helber Hastert & Fee.

Char & Associates. Botanical Resources Assessment Kekaha Cable Landing Site, Kekaha, Waimea District, Kaua'i. October 2002.

Char & Associates. Botanical Resources Assessment Kili Drive Cable Landing Site, Makaha, Wai'anae District, O'ahu. November 2002.

Char & Associates. Botanical Resources Assessment Sandy Beach Cable Landing Site, Honolulu District, O'ahu. November 2002.

Char & Associates. Botanical Resources Assessment Kalama'ula Cable Landing Site, Moloka'i District, Moloka'i. April 2003.

Char & Associates. Botanical Resources Assessment Wahikuli Cable Landing Site, Wahikuli, Lahaina, Maui. May 2003.

Char & Associates. Botanical Resources Assessment Po'olenalena Cable Landing Site, Makena, Makawao District, Maui. April 2003.

Char & Associates. Botanical Resources Assessment Kawaihae Cable Landing Site, South Kona District, Hawai'i. April 2003.

City and County of Honolulu, Department of Planning and Permitting. East Honolulu Sustainable Communities Plan. Ordinance 99-19. April 1999.

City and County of Honolulu, Department of Planning and Permitting. Waianae Sustainable Communities Plan. Ordinance 00-14. January 2000.

County of Hawai'i, Department of Research and Development. County of Hawai'i Data Book. Revised October 25, 2001. http://www.co.hawaii.hi.us/databook_current/dbooktoc.htm. April 11, 2003.

County of Hawai'i. 1983 Hawai'i County Code. Revised and Republished 1995. http://www.hawaii-county.com/countycode/haw-toc.html. Accessed April 11, 2003.

County of Hawai'i. County Data Book 2000. http://www.co.hawaii.hi.us/databook_current/dbooktoc.htm. Accessed July 21, 2003.

County of Kaua`i. Kaua`i Coastal View Study. 1989.

County of Kaua`i. Kaua`i General Plan. Ordinance No. 753. November 2000.

Cultural Surveys Hawai`i, Inc. Archaeological Inventory Survey in Support of the Proposed Sandwich Isles Fiber Optic Cable Landing at `Akialoa Road, Kekaha, Waimea Ahupua`a, Kona District, Island of Kaua`i, TMK (4) 1-3-01:999 (por). August 2003.

Cultural Surveys Hawai`i, Inc. Archaeological Inventory Survey in Support of Sandwich Isles Fiber Optic Cable Landing at Kili Drive, Makaha Ahupua`a, Waianae District, Island of Oahu, TMK 8-4-02:047 (por). August 2003.

Cultural Surveys Hawai`i, Inc. Archaeological Inventory Survey for the Proposed Sandwich Isles Fiber Optic Cable Landing within Sandy Beach Park, Ahupua`a of Maunalua, Island of Oahu, TMK 3-9-15:001 (por). August 2003.

Cultural Surveys Hawai`i, Inc. Cultural Impact Assessment in Support of the Proposed Sandwich Isles Fiber Optic Cable Landing at `Akialoa Road, Kekaha, Waimea Ahupua`a, Kona District, Island of Kaua`i, TMK (4) 1-3-01:999 (por). August 2003.

Cultural Surveys Hawai`i, Inc. Cultural Impact Assessment for the Proposed Sandwich Isles Fiber Optic Cable Landing at Kili Drive, Makaha Ahupua`a, Waianae District, Island of Oahu, TMK 8-4-02:047 (por). September 2003.

Cultural Surveys Hawai`i, Inc. Cultural Impact Assessment for the Proposed Sandwich Isles Fiber Optic Cable Landing within Sandy Beach Park, Ahupua`a of Maunalua, Island of Oahu, TMK 3-9-15:001 (por). October 2003.

Environmental Data Resources, Inc. (EDR). The EDR Radius Map with GeoCheck: `Akialoa Road, Kaumuali`i Hwy, Kekaha, HI 96752. Inquiry Number 1012891.1s. July 15, 2003

Environmental Data Resources, Inc. (EDR). The EDR Radius Map with GeoCheck: Kili Drive at Farrington Hwy, Makaha, HI. Inquiry Number 1012891.2s. July 15, 2003.

Environmental Data Resources, Inc. (EDR). The EDR Radius Map with GeoCheck: Sandy Beach Park, Hawaii Kai, Oahu, HI. Inquiry Number 1012891.3s. July 15, 2003.

Environmental Data Resources, Inc. (EDR). The EDR Radius Map with GeoCheck: Onealii Homesteads, Molokai, HI 96748. Inquiry Number 1012891.4s. July 16, 2003

Environmental Data Resources, Inc. (EDR). The EDR Radius Map with GeoCheck: Wahikuli, Lahaina, HI 96761. Inquiry Number 1012891.5a. July 17, 2003

Environmental Data Resources, Inc. (EDR). The EDR Radius Map with GeoCheck: Poolenalena Park, Makena, HI 96753. Inquiry Number 1012891.6s. July 17, 2003

Environmental Data Resources, Inc. (EDR). The EDR Radius Map with GeoCheck: Kaewa Place, Kawaihae, HI 96743. Inquiry Number 1012891.7s. July 17, 2003

Geolabs Inc. Boring information and boring location plan contained in facsimile to Parsons Brinckerhoff, June 2, 2003.

Geolabs Inc. Horizontal Directional Drilling Feasibility Report, Landing Sites for Rural Fiber Optic Lines – Phase II (RUS Landing Sites) State of Hawai'i (5 Islands). Prepared for Parsons Brinckerhoff Quade & Douglas. July 16, 2003.

Haun & Associates. Archaeological Inventory Survey, TMK: 6-1-04: Por. 20, Land of Kawaihae 1, South Kohala District, Island of Hawai'i. June, 2003.

Hawai'i Department of Health, Office of Environmental Planning. Water Quality Standards Map of the Island of Hawai'i. October 1987.

Juvik, Sonia P. and James O. Juvik, eds, and Chief Cartographer Thomas R. Paradise. Atlas of Hawai'i. Third Edition. 1998.

Kelly and Quintal. Cultural and Historical Report of Makua Military Reservation and Vicinity, Waianae, Oahu. TMK 8-4-02:047. 1996.

Makai Ocean Engineering. Sandwich Isles Communications Fiber Optic Network Desktop Study: Submarine Engineering Portion. July 1, 2003.

NKN Project Planning. Kekaha Residence Lots Final Environmental Assessment, Kekaha, Kaua'i, Hawaii. TMK (4) 1-2-002:044. April 2003.

NOAA Nautical charts. Published by Maptech, Inc. Edition 2001.

Orr, Maria E. Ka'imipono. Cultural Impact Study [CIS] & Assessment, SIC Submarine Fiber Optic Cable Project, Kawaihae 1 Ahupua'a, District of South Kohala, Hawai'i [TMK: 6-1-04: por 20]. Prepared for Haun & Associates, Parsons Brinckerhoff, and Sandwich Isles Communications, Inc. June 16, 2003.

Pacific Legacy. The Results of an Archaeological Inventory Survey in Coastal Makaha, Waianae, Oahu, Hawaii. TMK 8-4-02:047. 1996.

R.M. Towill Corporation. Final Environmental Assessment, Southern Cross Cable Network, Spencer Beach Park, Kawaihae, Hawai'i, TMK: 6-02-02: parcel 08. Prepared for GTE Hawaiian Tel International, Inc. March 11, 1999.

R.M. Towill Corporation, Final Environmental Assessment and Finding of No Significant Impact, Submarine Fiber Optic Cable Landing at Sandy Beach Park, Oahu for Hawaiian Island Fiber Network (HIFiberNet). August 1996.

SSFM International. Final Environmental Assessment for Sandwich Isles Communications, Inc. Kaua'i Rural Fiber Optic Duct Lines Project, Oahu, Hawaii. May 2001.

SSFM International. Final Environmental Assessment for Sandwich Isles Communications, Inc. Oahu Fiber Optic Duct Lines Project, Oahu, Hawaii. May 2001.

State of Hawai'i, Department of Land and Natural Resources, Division of Boating and Ocean Recreation. Kawaihae Facilities. <http://www.state.hi.us/dlnr/dbor/hawaiiharbors/kawaihae.htm>. April 11, 2003.

State of Hawai'i, Department of Health, Clean Air Branch. 2001 Annual Summary Hawai'i Air Quality Data. http://hawaii.gov/doh/eh/cab/cabmaps/ansum01.pdf. Accessed July 14, 2003.

State of Hawai'i, Department of Transportation, Harbors Division. Hawai'i Commercial Harbors 2020 Master Plan. 1998.

Terry, Ron. Final Environmental Assessment and Finding of No Significant Impact Sandwich Isles Communications,. Inc., County of Hawai'i, Rural Fiber Optic Duct Lines Project, TMK (3rd District): Various Sections, Zones, Plats, Parcels, Hawai'i Island, State of Hawai'i. Prepared for Sandwich Isles Communications, Inc. June 2001.

The State of Hawai'i Data Book 2001. http://www.state.hi.us/dbedt/db01/01/011001.pdf. Accessed July 21, 2003.

Thompson, Erwin N. *Pacific Ocean Engineers: History of the U.S Army Corps of Engineers in the Pacific, 1905-1980*. No Date. Prepared for the Army Corps of Engineers.

Tuggle, D. Makaha Bridge Phase II Archaeological Inventory Survey, IARII. 1994.

U.S. Department of Agriculture, Rural Utilities Service. "Rural Development Online" website. http://www.rurdev.usda.gov/recd_mission.html. Accessed October 30, 2003.

U.S. Fish and Wildlife Service. Critical Habitat for 47 Plant Species from the Island of Hawai'i. http://pacificislands.fws.gov/CHRules/bigislandch_fs.pdf. Accessed July 10, 2003.

Xamanek Researches. An Archaeological Assessment of a Portion of a Parcel of Land in Makakupa'ia Ahupua'a, Island of Moloka'i. October 8, 2003.

Xamanek Researches. An Archaeological Inventory Survey of the Proposed Sandwich Isles Communications, Inc. Fiber Optics Landing Location Near the Lahaina Post Office, Wahikuli Ahupua'a, Lahaina District, Island of Maui. July 18, 2003.

Xamanek Researches. An Archaeological Inventory Survey of the Proposed Sandwich Isles Communications, Inc. Fiber Optics Landing at Po'olenalena Beach Park, Keauhou, Honua'ula, Makawao District, Island of Maui. December, 2003.