

**NON-CHAPTER 343 DOCUMENT
PUBLICATION FORM
OFFICE OF ENVIRONMENTAL QUALITY CONTROL**

Project Name: Pua Force Main Installation and Rehabilitation

Applicable Law: 36 CFR Part 800

Type of Document: National Historic Preservation Act Section 106

Island: Hawai'i

District: Waiākea Ahupua'a, South Hilo District

TMK: (POR.): (3) 2-1-011: 004 & 010 (State of Hawai'i); (3) 2-1-013: 002, 143, & 145 (State of Hawai'i), and 146 & 147 (Bishop Estates); and County of Hawai'i Nahale-A Avenue, Pua Avenue, and Kalaniana Ole Avenue right-of-way (No TMK)

Permits Required: N/A

Applicant or Proposing Agency:

(Address, Contact Person, Telephone, E-mail)

State of Hawaii, Department of Health, Environmental Management Division, Wastewater Branch
2827 Waimano Home Road, Rm. 207

Pearl City, HI 96782

Contact and Phone: Chane Hayashida, (808) 586-4294, Chane.Hayashida@doh.hawaii.gov

Approving Agency or Accepting Authority:

(Address, Contact Person, Telephone, E-mail)

State of Hawaii, Department of Health, Environmental Management Division, Wastewater Branch
2827 Waimano Home Road, Rm. 207

Pearl City, HI 96782

Contact and Phone: Chane Hayashida, (808) 586-4294, Chane.Hayashida@doh.hawaii.gov

Consultant:

(Address, Contact Person, Telephone, E-mail)

R.M. Towill Corporation

2024 North King St., Suite 200

Honolulu, HI 96819

Contact and Phone: Jaime Nishikawa, (808) 842-1133, jaimen@rmtowill.com

Status: Comments due no later than July 8, 2024 to:

Attn: Chane Hayashida

Department of Health, Wastewater Branch

2827 Waimano Home Road, Rm. 207

Pearl City, HI 96782

Email: wwb@doh.hawaii.gov

Project Summary:

(Summarize proposed action and purpose/need in less than 200 words in the space below):

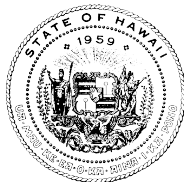
The Department of Health (DOH) initiated Section 106 of the NHPA consultation with the State Historic Preservation Division (SHPD) in accordance with 36 CFR Part 800. In 1990, the U.S. Environmental Protection Agency (EPA) designated the DOH to act on EPA's behalf, pursuant to 36 CFR §800.2 (c) (4), when initiating Section 106 of the NHPA process in connection with projects funded under the Hawai'i Clean Water

State Revolving Fund (CWSRF). The DOH is providing funding under the CWSRF to the County of Hawai'i for the Pua Force Main Installation and Rehabilitation. The proposed project will utilize federal funding and is considered an undertaking, as defined by Section 106 of the NHPA, 54 U.S.C. §306101 et seq., and 36 CFR Part 800.

The undertaking consists of the installation of a new 24-inch parallel Force Main 2 for connection to the existing dual 24-inch Force Main 2 along Nahale-A Avenue and Pua Avenue, accessory improvements, and rehabilitation of the existing 24-inch Force Main 1 to provide a dual force main system between the Hilo Wastewater Treatment Plant (WWTP) and the Pua Sewage Pump Station (SPS).located in Waiākea Ahupua'a, South Hilo District, Island of Hawai'i. The project, located at TMK Parcel (POR.): (3) 2-1-011: 004 & 010 (State of Hawai'i); (3) 2-1-013: 002, 143, & 145 (State of Hawai'i), and 146 & 147 (Bishop Estates); and County of Hawai'i Nahale-A Avenue, Pua Avenue, and Kalaniana Ole Avenue right-of-way (No TMK).

The DOH has engaged SHPD to determine the presence of potential sites of historic importance within the vicinity of the project area as well as the potential impact of the project on such sites, if present.

JOSH GREEN, M.D.
GOVERNOR OF HAWAII
KE KIA'AINA O KA MOKU'AINA 'O HAWAII



KENNETH S. FINK, MD, MGA, MPH
DIRECTOR OF HEALTH
KA LUNA HO'OKELE

STATE OF HAWAII
DEPARTMENT OF HEALTH
KA 'OIHANA OLAKINO
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

May 24, 2024

62-43 S106 ltr (initial) SHPD.docx

Alan S. Downer, PhD, Administrator
State of Hawai'i, Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Rm. 555
Kapolei, HI 96707
Submitted via: SHPD HICRIS

Dear Dr. Downer:

Subject: National Historic Preservation Act (NHPA)
Request to Initiate Section 106 Consultation
Pua Force Main Installation and Rehabilitation
Clean Water State Revolving Fund (CWSRF) Project No. C150062-43
Waiākea Ahupua'a, South Hilo District, Hawai'i Island
TMK: (POR.): (3) 2-1-011: 004 & 010 (State of Hawai'i); (3) 2-1-013: 002, 143, & 145
(State of Hawai'i), and 146 & 147 (Bishop Estates); and County of Hawai'i Nahale-A
Avenue, Pua Avenue, and Kalaniana Ole Avenue right-of-way (No TMK)
State Historic Preservation Division (SHPD) Project No. 2024PR00241

On behalf of the Environmental Protection Agency (EPA), the State of Hawai'i Department of Health (DOH) requests to initiate Section 106 consultation with the State Historic Preservation Officer (SHPO) for the proposed Pua Force Main Installation and Rehabilitation project located in Waiākea Ahupua'a, South Hilo District, Hawai'i Island.

The proposed project may be eligible to utilize federal funding that is administered by the DOH through the CWSRF and will be considered a federal action and undertaking, as defined by Section 106 of the NHPA of 1966 (as amended 2014), Title 54 of the United States Code (54 USC) Section 306108, and Title 36 of the Code of Federal Regulations (36 CFR) Part 800.

The EPA has authorized the DOH to act on behalf of the EPA regarding NHPA Section 106 notification and consultation. This letter is to request to initiate the Section 106 consultation process with the SHPO and SHPD in accordance with 36 CFR, Section 800.3.

The DOH may provide funding under the CWSRF to the County of Hawai'i, Department of Environmental Management (DEM) for the Pua Force Main Installation and Rehabilitation project.

Project Description

The project involves the installation of a new 24-inch parallel Force Main 2 (yellow dashed line in *Attachment A*) for connection to the existing dual 24-inch Force Main 2 (yellow solid line in *Attachment A*) along Nahale-A Avenue and Pua Avenue, accessory improvements, and rehabilitation of the existing 24-inch Force Main 1 (red solid line in *Attachment A*) to provide a dual force main system between the Hilo Wastewater Treatment Plant (WWTP) and the Pua Sewage Pump Station (SPS).

The County will install a second (dual) below-grade 24-inch sewer force main (yellow dashed line in *Attachment A*) (approximately 13,000 linear feet [ft]) via trenching. The new force main will be installed parallel to the existing (original) 24-inch force main (red solid line in *Attachment A*) that was installed back in the early 90s. The new Force Main 2 will tie into the existing dual 24-inch Force Main 2 (yellow solid line in *Attachment A*) in Nahale-A Avenue and Pua Avenue. The new 24-inch force main will provide the County with the capability to switch service usage between the two force mains when one of the force mains is taken out of service for maintenance. The dual force main will also allow the County to flow the two force mains simultaneously during extreme flow conditions. A below-grade bypass valve box and above-grade surge protection system will be constructed along with the new Force Main 2 connection at the Pua SPS site. A temporary above-grade sewer bypass system will also be required during construction for the connection of the bypass valve box to the existing force main at the Pua SPS. At the Hilo WWTP, the new Force Main 2 will connect to the existing 24-inch stub headworks. The new force main will be designed to convey the same flows as the existing force main. Overall, this will provide necessary redundancy to the system in the event the active force main needs to be taken offline for emergency repairs or rehabilitation. The prior easements established are sufficient for the two parallel force mains and one 42-inch effluent outfall pipeline to serve the Hilo WWTP.

Upon completion of the new Force Main 2 (yellow dashed line in *Attachment A*), the existing 16,600 linear foot 24-inch Force Main 1 (red solid line in *Attachment A*) located between the Pua SPS and Hilo WWTP will be rehabilitated via cured-in-place pipe (CIPP), a trenchless rehabilitation method used to repair existing pipelines. The CIPP will be installed using temporary access pits spaced approximately every 350 to 600 ft along the existing 24-inch force main alignment. The estimated access pit size is approximately 10x10x10 ft, however, the actual pit size will be based on the contractor's means and methods. Approximately half of the access pits will be repurposed into new access sewer manholes (SMHs) along the force main alignment within the undeveloped areas. The existing Force Main 1 (red solid line in *Attachment A*) will serve as a backup to the new Force Main 2 (yellow solid and dashed lines in *Attachment A*) and provide redundancy for the sewer system during emergency repairs and routine maintenance.

Generally, the ground disturbance will include grubbing, grading, and excavation associated with the installation of the new force main and SMHs. Approximate depths for project-related ground disturbance will include the following:

- 5 to 18 ft below the existing grade at the Pua SPS (24-inch Force Main 2 will be constructed at a depth of approximately 5 to 15 ft; valve boxes at a depth of approximately 13 ft below the existing grade; foundation of the surge tank will be constructed at a depth of approximately 18 ft below the existing grade; connection of the

16-inch force main from the surge tank to the Pua SPS building will be constructed at a depth of approximately 13 ft below the existing grade);

- 12 ft below the existing grade for rehabilitation of the existing 24-inch Force Main 1 and installation of SMHs;
- 6 to 14 ft below the existing grade for installation of new Force Main 2 and sewer manholes along the alignment; and
- 7 to 10 ft below the existing grade at the Hilo WWTP.

Area of Potential Effect (APE)

The APE for the Pua FM Installation and Rehabilitation project is approximately 34.95 acres (14.14 hectares), however, the actual area of ground disturbance is less. The project area is depicted in *Attachment B*. The APE includes work within TMKs: (por.): (3) 2-1-011: 004 & 010 (State of Hawai'i); (3) 2-1-013: 002, 143, & 145 (State of Hawai'i), and 146 & 147 (Bishop Estates); and County of Hawai'i Nahale-A Avenue, Pua Avenue, and Kalanianā'ole Avenue right-of-way (no TMK). All project staging will be confined within the APE limits shown in *Attachment B*.

Identification and Inventory of Historic Properties

Numerous past archaeological studies have been conducted in the vicinity of the APE; however, only one of these prior studies overlaps the APE (Rosendahl 1988; *Attachment C*). Paul H. Rosendahl, Inc. (PHRI) in 1988 conducted an archaeological reconnaissance survey for an environmental impact statement (EIS) for a proposed Hilo WWTP project (Rosendahl 1988). The study area included the majority of what is now the current WWTP site located southeast of Hilo International Airport, and an associated sewer line corridor extending 3,810 meters to the old plant site at Puhī Bay (currently the site of the Pua SPS). The sewer line corridor examined during the 1988 study extended further west along the airport property boundary than the current alignment, crossing through the center of the Keaukaha Hawaiian Homestead neighborhood to reach the coast. No archaeological features were identified during the archaeological reconnaissance and no additional archaeological work was recommended.

Cultural Surveys Hawai'i, Inc. (CSH) completed a literature review and field inspection (LRFI) for the current undertakings (Bautista et al. 2023; *Attachment D*). The LRFI was designed to determine the likelihood that historic properties may be affected by the Pua FM Installation and Rehabilitation project, and based on findings, consider cultural resource management recommendations to facilitate project planning and support the project's historic preservation and environmental review compliance.

The Bautista et al. (2023) literature review component identified 13 previously identified historic properties situated within approximately 500 meters of the APE (*Attachment E*). Of these, only two (State Inventory of Historic Places [SIHP] #s 50-10-35-30696, disturbed wall segments; and 50-10-35-30697, modified lava tube) are in relative proximity to a portion of the pipeline corridor located north of the airport runway, though they were indicated to lie outside the APE corridor.

No known or potential archaeological historic properties were identified within the APE during the Bautista et al. (2023) field inspection. SIHP # -30696 was relocated over 20 meters outside the APE limits. SIHP # -30697 was not encountered in or along the bounds of the APE. Several architectural buildings and structures are present in the Pua SPS parcel and adjacent

force main parcel at the coast; these features may have been constructed in the late 1960s or 1970s in association with the former wastewater treatment plant and therefore may be considered historic in age; however, the project will not impact these buildings and structures. Based on the findings of the LRFI, an archaeological inventory survey was not recommended.

Consultations

Section 106 consultation letters have also been sent to Native Hawaiian organizations, consulting parties, and/or interested persons that might attach significance to this area and have invited them to participate in the process. The mailing list is provided in *Attachment F*.

We welcome any comments that you may have on this project's proposed improvements.

We are particularly interested in any information you may have on the historic and cultural sites that have been recorded in the area. In addition, if you are acquainted with any persons or organizations that are knowledgeable about the proposed project area or any descendants with ancestral, lineal, or cultural ties to, cultural knowledge or concerns for, and/or cultural or religious attachment to the proposed project area, then we would appreciate receiving their names and contact information.

We would appreciate a written response within thirty (30) calendar days from receipt of this letter. Please address any written comments to email: Chane.Hayashida@doh.hawaii.gov or the following address:

Attn: Chane Hayashida
Department of Health, Wastewater Branch
2827 Waimano Home Road, Room 207
Pearl City, HI 96782

Should you have any questions, please contact Chane Hayashida at (808) 586-4294.

Sincerely,



JONATHAN NAGATO, P.E., ACTING CHIEF
Wastewater Branch

Attachments

CH:jn

C: Ramzi Mansour (via email at Ramzi.Mansour@hawaiicounty.gov)
Chris Sparber (via email at Chris.Sparber@hawaiicounty.gov)
Mark Grant (via email at MarkJ.Grant@hawaiicounty.gov)

References Cited

Bautista, Olivier M., Sarah Wilkinson, and Hallett H. Hammatt

2023 *Archaeological Literature Review and Field Inspection for the Pua Sewage Pump Station Force Main Projects, Waiākea Ahupua‘a, South Hilo District, Hawai‘i Island, TMKs: (3) 2-1-011:004 and 010 por.; (3) 2-1-013:002, 143, 145, 146, and 147 por.* Cultural Surveys Hawai‘i, Inc., Kailua, Hawai‘i.

ESRI

2020, 2021 World Imagery. Esri, Redlands, California. Available online at www.arcgisonline.com/maps/World_Imagery.

Hawai‘i TMK Service

2010 Tax Map Keys [3] 2-1-011 and 2-1-013. Hawai‘i TMK Service, Honolulu

Rosendahl, Margaret L.K.

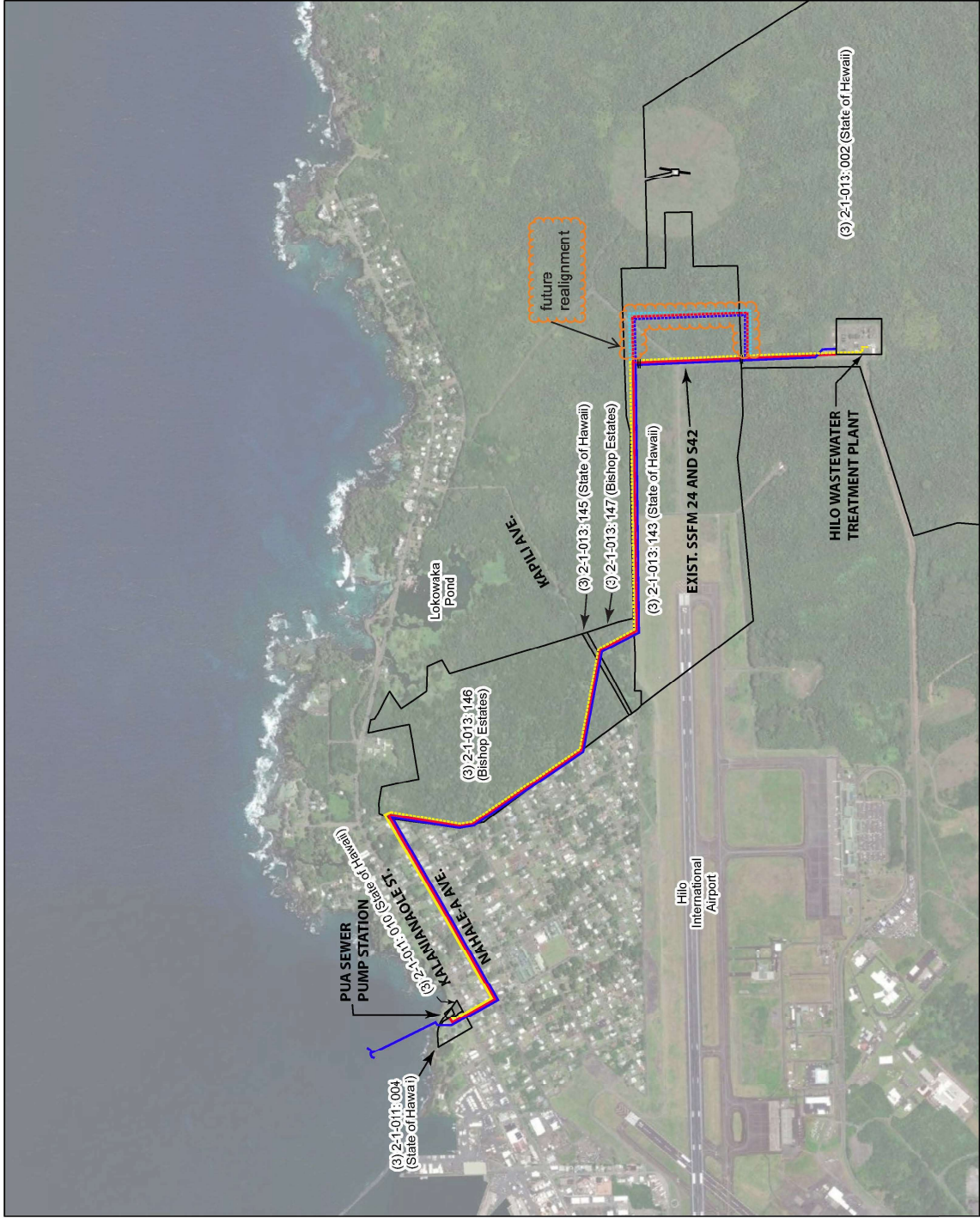
1988 *Archaeological Reconnaissance Survey for Environmental Impact Statement (EIS) Hilo Wastewater Treatment Facility Site, Land of Waiakea, District of South Hilo, Island of Hawaii (TMK:2-1-13:Por.12,13,20,22)*. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai‘i.

USGS (U.S. Geological Survey)

1995 Hilo USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado

Attachment A

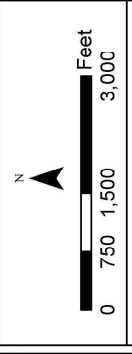
Attachment A. Pua FM Installation and Rehabilitation Project Overview and Location



Legend

- EXISTING 24" FORCE MAIN 1 REHAB
- EXISTING 24" FORCE MAIN 2
- EXISTING 42" SEWER EFFLUENT
- NEW 24" FORCE MAIN 2
- FUTURE 24" FORCE MAINS
- FUTURE 42" SEWER EFFLUENT
- TAX MAP KEY

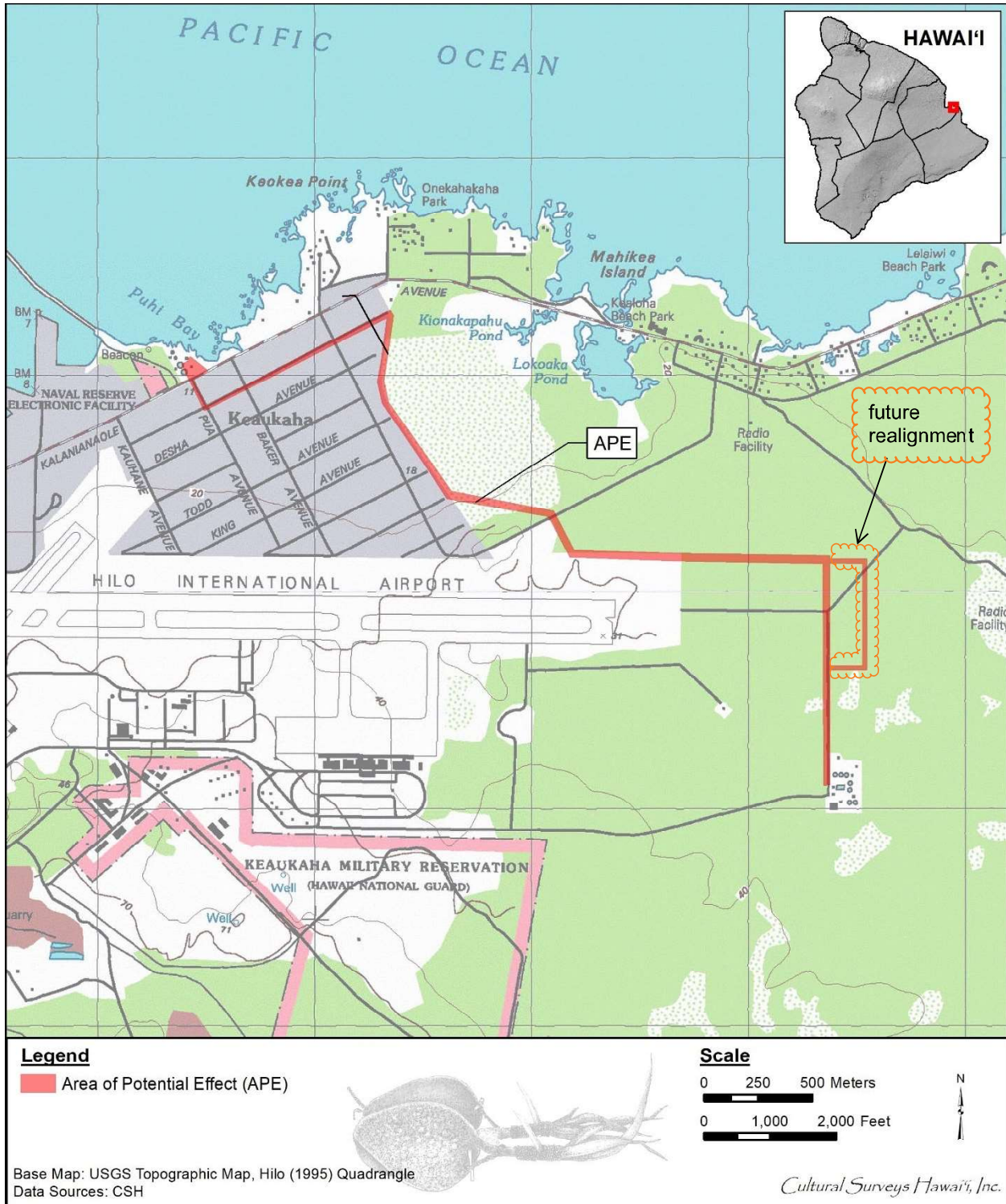
Notes:
 Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Tax Map Key
 Pua Force Main Installation and Rehab
 Hilo, Island of Hawaii, Hawaii
 R. M. Towill Corporation

Attachment B

Attachment B. Pua FM Installation and Rehabilitation Project APE

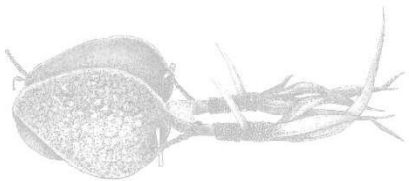


Attachment B. Aerial imagery showing the location of the Pua FM Installation and Rehabilitation Project APE



Legend

 Area of Potential Effect (APE)



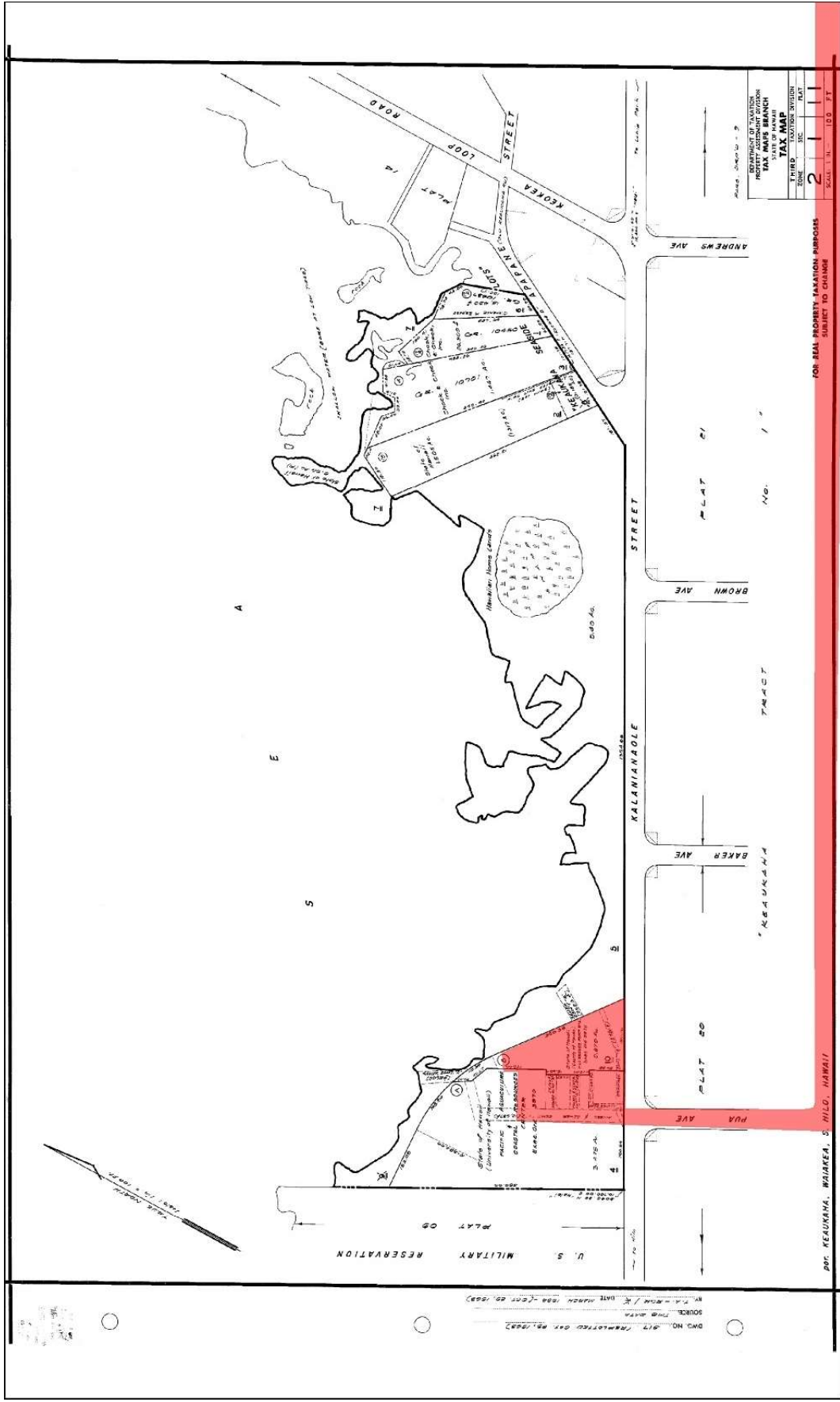
Scale



Base Map: ESRI Aerial Imagery 2020 & 2021
Data Sources: CSH

Cultural Surveys / Hawai'i, Inc.

Attachment B. APE TMK [3] 2-1-011 Parcel 004 and 010



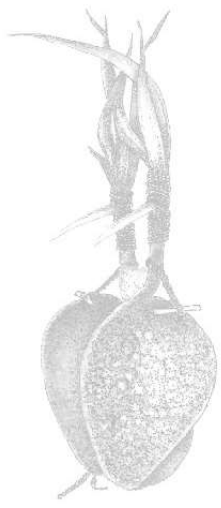
FOR REAL PROPERTY TAXATION PURPOSES
SUBJECT TO CHANGE

PROPERTY CLASSIFICATION	2
TAX MAP	2
SECTION	2
TOWNSHIP	2
RANGE	2
SCALE 1" = 100 FT	

Legend

Area of Potential Effect (APE)

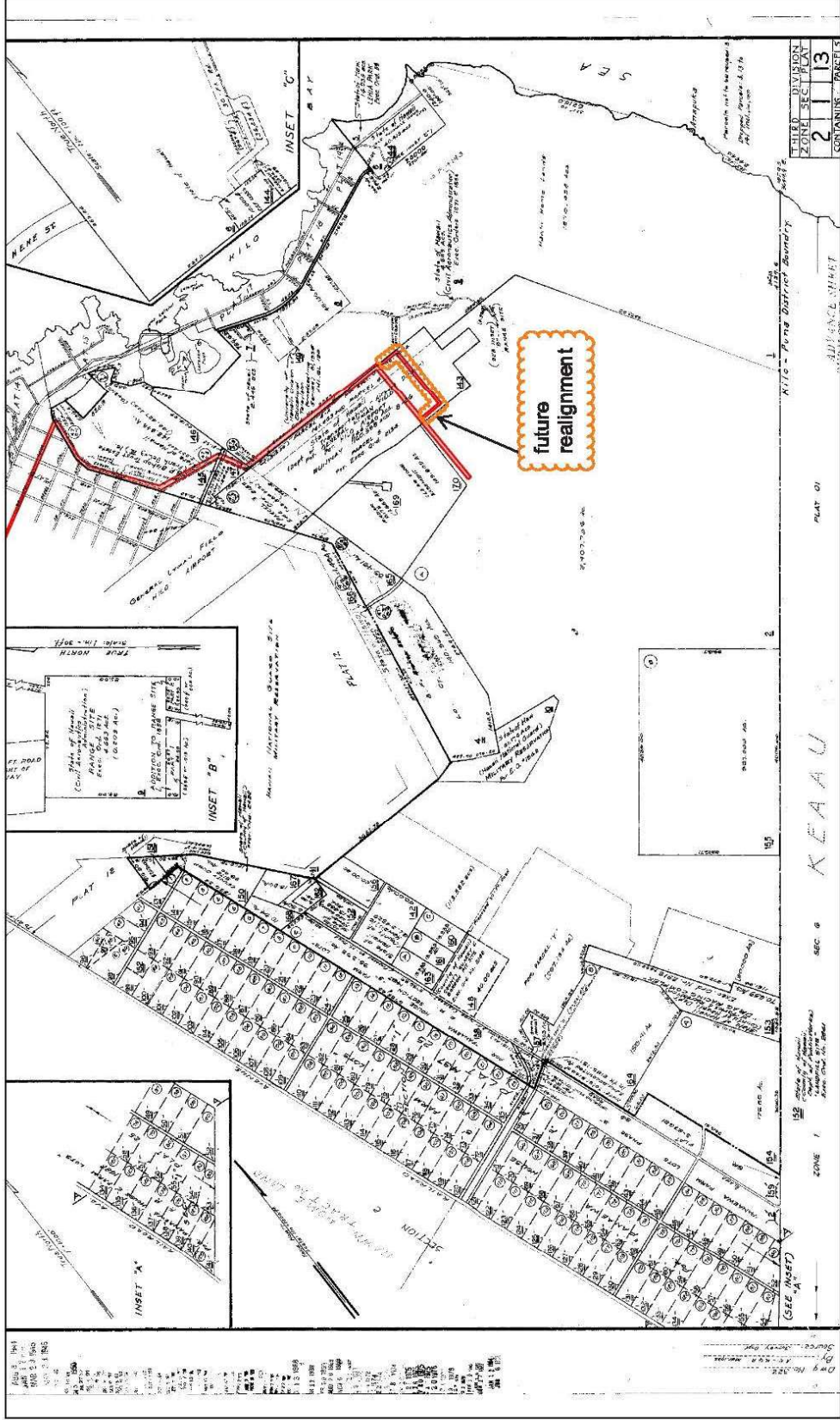
Scale



Base Map: Tax Map Key [3] 2-1-011
Data Sources: CSH

Cultural Surveys Hawaii, Inc.

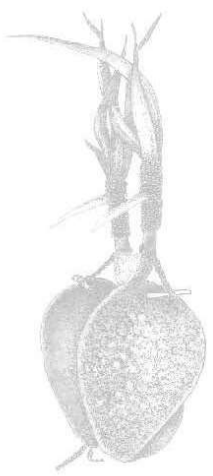
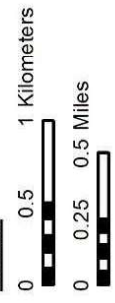
Attachment B. APE TMK: [3] 2-1-013 Parcel 002 and crossing through parcels 001, 143, 145, 146, and 147



Legend

 Project Area

Scale

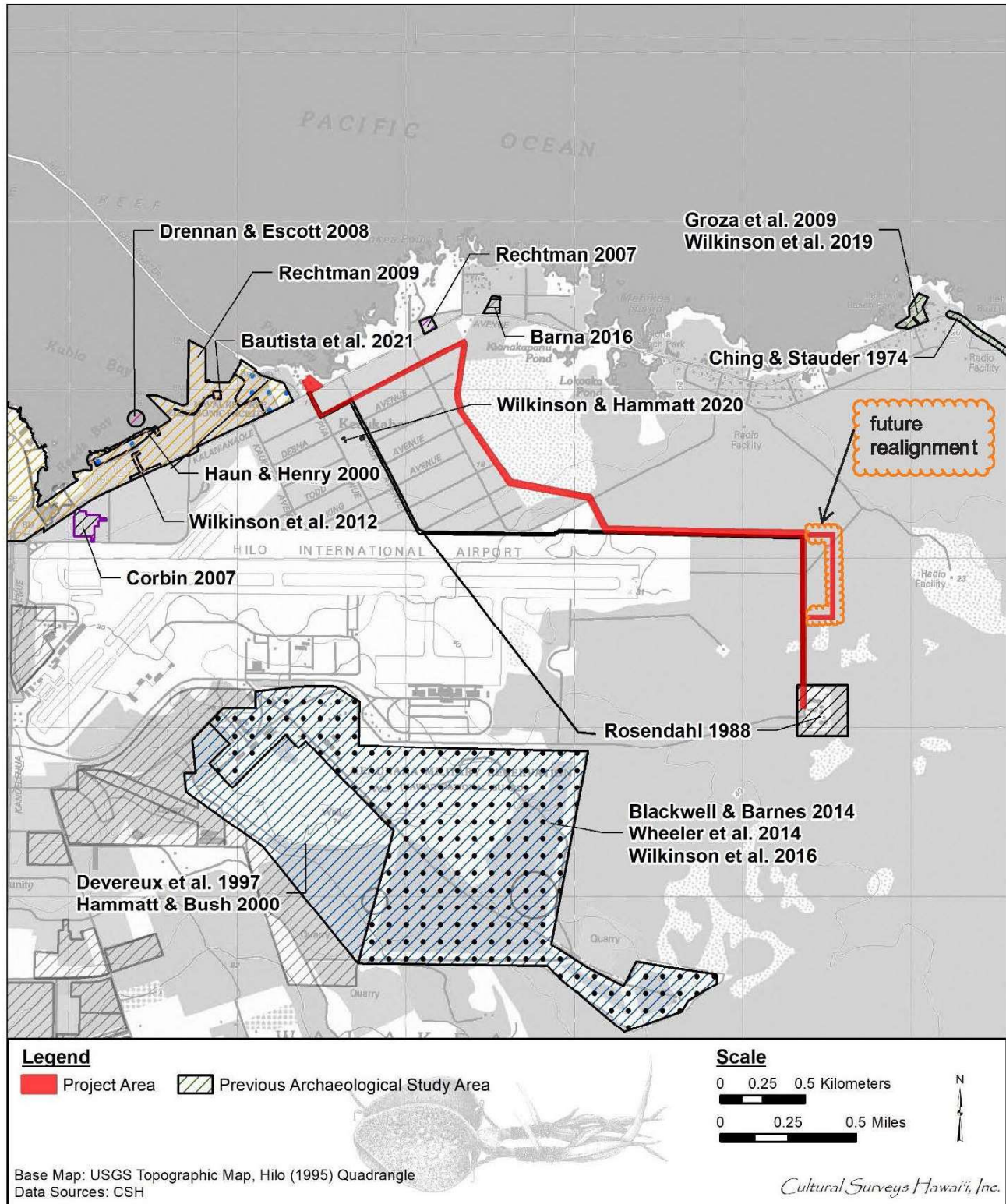


Base Map: Tax Map Key [3] 2-1-013
Data Sources: CSH

Cultural Surveys Hawaii, Inc.

Attachment C

Attachment C. Previous Archaeological Studies Within 1.5 km of APE



Drennan & Escott 2008

Rechtman 2009

Rechtman 2007

Groza et al. 2009
 Wilkinson et al. 2019

Bautista et al. 2021

Barna 2016

Ching & Stauder 1974

Haun & Henry 2000

Wilkinson & Hammatt 2020

future
 realignment

Wilkinson et al. 2012

Corbin 2007

Rosendahl 1988

Blackwell & Barnes 2014
 Wheeler et al. 2014
 Wilkinson et al. 2016

Devereux et al. 1997
 Hammatt & Bush 2000

Attachment D

Draft
Archaeological Literature Review and
Field Inspection for the
Pua Sewage Pump Station Force Main Projects,
Waiākea Ahupua‘a, South Hilo District,
Hawai‘i Island

TMKs: (3) 2-1-011:004 and 010 por.;
(3) 2-1-013:002, 143, 145, 146, and 147 por.

Prepared for
R. M. Towill Corporation
on behalf of the
County of Hawai‘i, Department of Environmental Management (DEM)

Prepared by
Olivier M. Bautista, B.A.,
Sarah Wilkinson, B.A.,
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: WAIAKEA 27)

December 2023

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Hawai‘i Office
399 Hualani St. #124
Hilo, Hawai‘i 96720
Ph.: (808) 965-6478
Fax: (808) 965-6582

Reference	Archaeological Literature Review and Field Inspection for the Pua Sewage Pump Station Force Main Projects, Waiākea Ahupua'a, South Hilo District, Hawai'i Island, TMKs: (3) 2-1-011:004 and 010 por.; (3) 2-1-013:002, 143, 145, 146, and 147 por. (Bautista et al. 2023)
Date	December 2023
Project Numbers	Cultural Surveys Hawai'i, Inc. (CSH) Job Code: WAIAKEA 27 Clean Water State Revolving Fund (CWSRF) Project Priority List (PPL) Numbers: <ul style="list-style-type: none"> • The Pua FM Installation and Rehabilitation Phase 1 – Force Main 2 Installation Project has been assigned CWSRF PPL No. C150062-43. • The Pua FM Installation and Rehabilitation Phase 2 – Force Main 1 Rehabilitation Project has been assigned CWSRF PPL No. C150062-58. • The Pua SPS Renovation Project has been assigned CWSRF PPL No. C150062-57.
Investigation Permit Number	CSH completed the field inspection under archaeological fieldwork permit numbers 22-02 and 23-30, issued by the Hawai'i State Historic Preservation Division (SHPD) per Hawai'i Administrative Rules (HAR) §13-282.
Land Jurisdiction	State; Private
Agencies	Hawai'i State Department of Health (DOH); SHPD; County of Hawai'i, Department of Environmental Management (DEM)
Project Funding	State of Hawai'i (revolving fund); County of Hawai'i
Project Proponent and Contact	County of Hawai'i DEM Chris Laude, P.E., Acting WWD Chief 345 Kekuanaoa Street, Suite 41 Hilo, HI 96720 Attention: Chris Laude Email: Christopher.Laude@hawaiicounty.gov
Planning Consultant for the Project	Brian Takeda Planning Project Manager R. M. Towill Corporation 2024 North King Street, Suite 200 Honolulu, HI 96819 Office: (808) 842-1133 Fax: (808) 842-1937 Email: BrianT@rmtowill.com
Project Location	The project area is in the town of Hilo on the windward side of Hawai'i Island. The project area comprises new and existing pipeline corridors extending from the county's Hilo Wastewater Treatment Plant (WWTP) to the existing Pua Sewage Pump Station (SPS) located just west of Puhi Bay on the <i>makai</i> (seaward) side of Kalaniana'ole Street.

	<p>For the purpose of this study, the pipeline corridors are generally 50 feet (ft) wide; along Nahale-A Avenue and Pua Avenue the corridor is the width of the roadway rights-of-way. The Hilo WWTP is located at the eastern end of Kekuanaoa Place, approximately 900 m southeast of the Hilo International Airport runway. The project area is shown on a portion of the 1995 Hilo U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle on Hawai'i Island (Figure 1), tax map plats (Figure 2 and Figure 3), and a 2020 aerial photograph (Figure 4).</p>
<p>Project Description and Related Ground Disturbance</p>	<p>The County of Hawai'i, DEM, proposes the Pua Force Main (FM) Installation and Rehabilitation Phase 1 and Phase 2 Projects and Pua Sewage Pump Station (SPS) Renovation Project located in Hilo, Island of Hawai'i, Hawai'i. The proposed Pua FM Installation and Rehabilitation Phase 1 Project involves the installation of a new dual 24-inch Force Main 2 (yellow dashed line in Figure 5) for connection to the existing dual 24-inch Force Main 2 (yellow solid line in Figure 5) along Nahale-A Avenue and Pua Avenue and accessory improvements. The proposed Pua FM Installation and Rehabilitation Phase 2 Project involves the rehabilitation of the existing 24-inch Force Main 1 (red solid line in Figure 5). Once constructed, the projects will provide a dual force main system between the Hilo WWTP and the Pua SPS. The proposed Pua SPS Renovation Project involves the renovation of the existing Pua SPS facility.</p> <p>Previously, the Pua FM Installation and Rehabilitation Phase 1 and Phase 2 Projects involved a much larger scope of work to reroute the primary sewer utility lines slightly eastward based on future plans by the Hawai'i Department of Transportation, Airports Division (HDOT-A) to shift the Hilo International Airport's (ITO) main Runway 8-26. This plan, however, is in an early conceptual stage and without sufficient detail for the COH to design and locate the position of the Pua FMs and sewer effluent line to meet the Federal Aviation Administration's (FAA) required airfield clearances. The COH DEM, therefore, will maintain the current position of the Pua FMs and sewer effluent line and will revisit this issue at such time when plans to shift Runway 8-26 are finalized. While there is no present need to relocate or extend the Pua sewer utility lines, the DEM will maintain coordination with HDOT-A and the Hilo International Airport for future planning purposes, and to ensure that the airport's restrictive zone remains safe and clear. See the orange bubble in Figure 5 and the diagram in Figure 6 for the location of the anticipated future realignment of the Pua FMs and sewer effluent line.</p> <p><u>Pua FM Installation and Rehabilitation Phase 1 – Force Main 2 Installation Project and Phase 2 – Force Main 1 Rehabilitation Project Description</u></p>

	<p>The project involves the installation of a new 24-inch parallel Force Main 2 (yellow dashed line in Figure 5) for connection to the existing dual 24-inch Force Main 2 (yellow solid line in Figure 5) along Nahale-A Avenue and Pua Avenue, accessory improvements, and rehabilitation of the existing 24-inch Force Main 1 (red solid line in Figure 5) to provide a dual force main system between the Hilo WWTP and the Pua SPS.</p> <p>The County will install a second (dual) below-grade 24-inch sewer force main (yellow dashed line in Figure 5) (approximately 13,000 linear feet [ft]) via trenching. The new force main will be installed parallel to the existing (original) 24-inch force main (red solid line in Figure 5) that was installed back in the early 90s. The new Force Main 2 will tie into the existing dual 24-inch Force Main 2 (yellow solid line in Figure 5) in Nahale-A Avenue and Pua Avenue. The new 24-inch force main will provide the County with the capability to switch service usage between the two force mains when one of the force mains is taken out of service for maintenance. The dual force main will also allow the County to flow the two force mains simultaneously during extreme flow conditions. A below-grade bypass valve box and above-grade surge protection system will be constructed along with the new Force Main 2 connection at the Pua SPS site. A temporary above-grade sewer bypass system will also be required during construction for the connection of the bypass valve box to the existing force main at the Pua SPS. At the Hilo WWTP, the new Force Main 2 will connect to the existing 24-inch stub headworks. The new force main will be designed to convey the same flows as the existing force main. Overall, this will provide necessary redundancy to the system in the event the active force main needs to be taken offline for emergency repairs or rehabilitation. The prior easements established are sufficient for the two parallel force mains and one 42-inch effluent outfall pipeline to serve the Hilo WWTP.</p> <p>Upon completion of the new Force Main 2 (yellow dashed line in Figure 5), the existing 16,600 linear foot 24-inch Force Main 1 (red solid line in Figure 5) located between the Pua SPS and Hilo WWTP will be rehabilitated via cured-in-place pipe (CIPP), a trenchless rehabilitation method used to repair existing pipelines (Figure 7). The CIPP will be installed using temporary access pits spaced approximately every 350 to 600 ft along the existing 24-inch force main alignment. The estimated access pit size is approximately 10x10x10 ft, however, the actual pit size will be based on the contractor's means and methods (Figure 7). Approximately half of the access pits will be repurposed into new access sewer manholes (SMHs) along the force main alignment within the undeveloped areas. The existing Force Main 1 (red solid line in Figure 5) will serve as a backup to the new Force</p>
--	--

<p>Main 2 (yellow solid and dashed lines in Figure 5) and provide redundancy for the sewer system during emergency repairs and routine maintenance.</p> <p>Generally, ground disturbance will include grubbing, grading, and excavation associated with the installation of the new force main, SMHs, and Pua SPS improvements. Approximate depths for project-related ground disturbance will include the following:</p> <ul style="list-style-type: none"> • 5 to 18 ft below the existing grade at the Pua SPS (24-inch Force Main 2 will be constructed at a depth of approximately 5 to 15 ft; valve boxes at a depth of approximately 13 ft below the existing grade; foundation of the surge tank will be constructed at a depth of approximately 18 ft below the existing grade; connection of the 16-inch force main from the surge tank to the Pua SPS building will be constructed at a depth of approximately 13 ft below the existing grade); • 12 ft below the existing grade for rehabilitation of the existing 24-inch Force Main 1 and installation of SMHs; • 6 to 14 ft below the existing grade for installation of new Force Main 2 and sewer manholes along the alignment; and • 7 to 10 ft below the existing grade at the Hilo WWTP. <p><u>Pua SPS Renovation Project Description</u></p> <p>The DEM proposes to renovate the Pua SPS to bring it up to current design standards. Improvements will include the replacement of various old and/or defunct equipment at the SPS site. The proposed project will include but not be limited to:</p> <ul style="list-style-type: none"> • Interior improvements within the existing Pua SPS building to replace various old and/or defunct equipment. • Below-grade improvements at the Pua SPS site for the replacement of an existing below-grade fuel tank, approximately 9 ft below the existing grade. • Above-grade improvements at the Pua SPS site for the installation of an exterior stairwell providing access to the SPS building and the replacement of an existing wet well hatch. Installation of the stairwell will require excavation to a depth of approximately 10 ft below the existing grade. <p>Work within the existing SPS building will include but is not limited to, replacing one of the pumps and associated electrical appurtenances, replacement of the odor control system, installing air conditioning in the motor control center, replacing existing ductwork, replacing an existing wet well chart recorder, upgrading the pump and well system design control systems, modifying the non-compliant wet well access</p>
--

	<p>area, removing equipment no longer in operation, and associated accessory improvements. Improvements to various facilities around the perimeter of the existing SPS building include the replacement of an existing below-grade fuel tank, the replacement of an existing wet well hatch, and the installation of an exterior above-grade stairwell. Additionally, temporary project laydown areas, staging areas, and erosion control devices will be required to support the construction of the proposed improvements. The new facilities will have substantially the same purpose, capacity, and dimensions as those existing. The Pua SPS will continue to be used for the collection, storage, and conveyance of wastewater.</p>
Project Area Acreage	<p>The project area of potential effect (APE) for the Pua FM Installation and Rehabilitation Phase 1 and Phase 2 Projects and Pua SPS Renovation Project is approximately 38.67 acres (15.65 hectares), however, the actual area of ground disturbance is less. The APE includes work within TMKs: (por.) (3) 2-1-011:004 & 010 (State of Hawai'i); (3) 2-1-013: 002, 143, & 145 (State of Hawai'i), and 146 & 147 (Bishop Estates); and County of Hawai'i Nahale-A Avenue, Pua Avenue, and Kalanianā'ole Avenue right-of-way (no TMK). All project staging will be confined within the APE limits.</p>
Document Purpose and Historic Preservation Regulatory Context	<p>This investigation was conducted—through historical, cultural, and archaeological background research and a field inspection of the project area—to determine the likelihood that archaeological historic properties may be affected by the project. This document is intended to facilitate the projects' planning and support the projects' historic preservation review compliance. This investigation does not fulfill the requirements of an archaeological inventory survey (AIS) investigation, per HAR §13-276.</p> <p>This information may also be used to support the DEM's consultation with the SHPD regarding the projects' necessary historic preservation review steps pursuant to HAR §13-275.</p> <p>The Pua FM Installation and Rehabilitation Phase 1 – Force Main 2 Installation Project (CWSRF PPL No. C150062-43), Pua FM Installation and Rehabilitation Phase 2 – Force Main 1 Rehabilitation Project (CWSRF PPL No. C150062-58), and Pua SPS Renovation Project (CWSRF PPL No. C150062-57) involve funding from the CWSRF and are therefore an undertaking requiring compliance with Section 106 of the National Historic Preservation Act (NHPA) and the Archaeological and Historic Preservation Act (AHPA). The EPA administers the CWSRF program, which authorizes capitalization grants to state agencies in Region 9, including the Hawai'i State DOH. In turn, the DOH Wastewater Branch provides assistance to county and state agencies for water pollution control projects. In October 2015 the EPA authorized the DOH to undertake consultation with the State</p>

	<p>Historic Preservation Officer (SHPO), Native Hawaiian organizations (NHOs), and interested parties for projects funded under the CWSRF. NHPA Section 106 and AHPA consultation has not yet been initiated for these projects.</p>
<p>Natural Environment</p>	<p>The project area is situated on the windward side of Hawai'i Island, on the lower eastern slope of Mauna Loa in the <i>ahupua'a</i> (traditional land division) of Waiākea. The project area is on the eastern outskirts of Hilo Town and is partially within the coastal neighborhood of Keaukaha.</p> <p>The project area generally comprises corridors situated along either existing, previously developed pipeline alignments or within undeveloped forest. Elevations within the study area range from approximately 3 m (10 ft) above mean sea level (amsl) at the Pua SPS along the coast to 24 m (80 ft) amsl at the Hilo WWTP. Rainfall in the vicinity of the project area averages 130 inches per year (Giambelluca et al. 2013). While brackish water ponds are common along the Keaukaha coastline, none are in proximity to the current project area.</p> <p>The natural topography in this area is mildly sloping toward the coast, which is to the north. Except for the proposed new force main alignment located east of the airport runway, the project area has been subjected to extensive prior disturbance associated with development of the existing pipeline infrastructure, sewage facilities, and travel ways. These developments have significantly impacted the natural terrain.</p> <p>According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic (SSURGO) database (2001) and soil survey data gathered by Sato et al. (1973), the project area overlies four distinct soil and land types (Figure 8). Most of the project area comprises <i>pāhoehoe</i> (smooth, unbroken) lava flows (rLW; see Figure 8). The westernmost portions of the project area overlie Keaukaha extremely rocky muck, 0–20% slopes (rKFD; see Figure 8), characterized as “well-drained, thin organic soils overlying pahoehoe lava bedrock” that are mostly in native forest, with some cleared areas used for pasture (Sato et al. 1973:27). Portions of the new and existing pipeline alignments located north of the Hilo WWTP overlie Olaa extremely stony clay loam, 0–20% slopes (OID; see Figure 8), described as “well-drained silty clay loams that formed in volcanic ash” and commonly used for sugarcane (Sato et al. 1973:42). The southern extremity of the project area near the Hilo WWTP overlies an area of Papai extremely stony muck 3–25% slopes (rPAE; see Figure 8); this soil type is characterized as “well-drained, thin, extremely stony organic soils over fragmental Aa [rough, broken] lava [...] used mostly for woodland” (Sato et al. 1973:46).</p> <p>Vegetation within the project area is dependent on the nature and extent of any prior disturbance. The northwestern portions of the project area</p>

	<p>at and adjacent to the Pua SPS are within a fenced and fully developed portions of coastal lot containing maintained lawn areas and ornamental landscaping. A large monkeypod tree (<i>Pithecellobium saman</i>) is located in the southeastern corner of the SPS parcel. The portion of the project area along Nahale-A Avenue and Pua Avenue comprises improved roadways and shoulder areas devoid of vegetation. The existing pipeline alignment located between Nahale-A Avenue to the north and the Hilo WWTP to the south is within an approximately 75–80-ft-wide easement that was previously grubbed and graded. Invasive vegetation has grown back along the perimeters of this existing alignment. The new proposed alignment is within undeveloped forest north of the Hilo WWTP. Within this area, mobility and ground surface visibility is generally poor due to the uneven lava terrain and dense vegetation. Vegetation in this area consists of a mix of native and introduced species, particularly Shoebutton Ardisia (<i>Ardisia elliptica</i>), Palm fern (<i>Blechnum appendiculatum</i>), <i>hapu'u</i> (<i>Cibotium</i> spp.), <i>uluhe</i> (<i>Dicranopteris linearis</i>), <i>lama</i> (<i>Diospyros sandwicensis</i>), <i>'ie 'ie</i> (<i>Freycinetia arborea</i>), Bing-a-bing (<i>Macaranga mappia</i>), various melastomes (<i>Melastoma</i> spp.), melochia (<i>Melochia umbellata</i>), <i>'ōhi'a</i> (<i>Metrosideros polymorpha</i>), <i>kōlea lau nui</i> (<i>Myrsine lessertiana</i>), <i>hala</i> (<i>Pandanus tectorius</i>), strawberry guava (<i>Psidium cattleianum</i>), and <i>kōpiko</i> (<i>Psychotria</i> spp.).</p>
<p>Built Environment</p>	<p>The southern terminus of the project area corridor is at the existing Hilo WWTP (see Figure 5). The fenced plant facility, which is accessed from Kekuaanoa Place, is surrounded by undeveloped forest. An existing force main alignment extends north from the plant for approximately 0.5 miles within an easement containing a gravel road. The gravel road terminates at a paved access road running along the northern boundary of the Hilo airport property. The existing force main easement follows this paved road for approximately 0.7 miles, at which point the easement turns to the northwest toward the Keaukaha Hawaiian Homestead neighborhood, crossing over a gravel extension of Kaupili Avenue. The easement abuts the eastern side of the neighborhood in the vicinity of Krauss Avenue, and then follows the western edge of the neighborhood to the northern terminus of the corridor at Nahale-A Avenue. This portion of the project area corridor located along the Keaukaha Hawaiian Homesteads is characterized by a cleared swath through the forest containing an existing subsurface pipeline. Though the pipeline is buried, its route is visible as a linear, slightly raised alignment within the center of the easement. The new force main will be installed within the previously cleared easement along the eastern, <i>makai</i> side of the existing pipeline.</p> <p>The proposed new sewage force main alignment located north of the plant and east of the airport runway is within undeveloped forest. This</p>

	<p>new alignment is accessed from the gravel roadway extending north from the plant (Figure 6).</p> <p>A series of CIPPs is proposed along existing dual force main and gravity sewer lines located beneath portions of Nahale-A Avenue and Pua Avenue (Figure 7), which are asphalt roadways with improved (paved or graded) shoulders. Overhead utility transmission lines are present along both of these roadways.</p> <p>A small portion of the project area is located at the existing Pua SPS facility at the coast near Puhi Bay and an adjacent parcel where a new force main will be installed (Figure 5). The SPS facility is on a fenced and fully developed lot including operations buildings and associated structures, driveways, a parking area, and maintained grassy lawns. The parcel immediately to the west, where the new force main will be installed within an existing sewer easement, is similarly developed and currently part of the University of Hawai'i at Hilo Pacific Agriculture and Coastal Resources Center.</p>
<p>Background Research Methods</p>	<p>Background research included a review of previous archaeological studies on file at the SHPD; review of documents at Hamilton Library of the University of Hawai'i, the Hawai'i State Archives, the Hawaiian Mission Children's Society Library and Archives, the Hawai'i Public Library, and the Bishop Museum Archives; study of historic photographs at the Hawai'i State Archives and the Bishop Museum Archives; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH library were also consulted. In addition, Māhele records were examined from the Waihona 'Aina database (Waihona 'Aina 2022). This research provided the environmental, cultural, historic, and archaeological background for the project area.</p>
<p>Background Research Summary</p>	<p>Waiākea is a large <i>ahupua'a</i> (traditional land division), encompassing some 95,000 acres. The rich upland resources of taro and sweet potato and abundant marine resources, particularly shrimp and fish, made Waiākea very valuable to the Hawaiian people (Fornander 1916-1919; Kelly et al. 1981). According to Hawaiian folklore and legends, gods and goddesses including Pele, Hi'iaka and Pana'ewa frequented Waiākea. Many legends have associated Waiākea with Hawaiian <i>ali'i</i> (chiefs) since the sixteenth century and describe it as a gathering place for ceremonies (Emerson 1915; Fornander 1916-1919; Kamakau 1961; Noglemeier 2006; Thrum 1923).</p> <p>In 1979 Holly McEldowney prepared an archaeological and historical literature search and research design as part of a lava flow control study for Hilo (McEldowney 1979). In her report, McEldowney describes five zones of land use and associated resources as observed during the early historic period. The project area, situated at 10–80 ft amsl, falls</p>

	<p>within two of these zones (Zone I and Zone II; Figure 9). The northern portion of the project area is within Zone I, defined as the coastal settlement zone and characterized as “a nearly continuous complex of native huts and garden plots interspersed with shady groves of trees” (McEldowney 1979:16). The southern portion of the project area is shown to overlap the <i>makai</i> limits of Zone II, the Upland Agricultural Zone, which was generally characterized by open grassland used for planting (McEldowney 1979:19–20). To some degree these grasslands in Hilo were likely formed by human activity such as swidden agriculture, which would have reduced over time the lowland ‘<i>ōhi‘a</i> forest like that still present today in portions of Pana‘ewa (McEldowney 1979:21–24). According to Handy and Handy (1972:131–132), the Pana‘ewa forest did also contain house sites with associated planting areas. An 1851 Government Survey map (Figure 10) shows most of the project area located within a broad, coastal “Hala Woods” situated <i>makai</i> of the “Panaewa Woods.” Thus, the portion of the project area in Zone II was likely used for collection and management of natural resources, such as the prevalent <i>lauhala</i> (leaves of the <i>hala</i> plant) used for weaving, and for intermittent, small-scale agriculture, with the natural depressions in lava flows used for mulch-type agriculture.</p> <p>The shift from a subsistence-based to a market-based economy began in the early 1800s following Western Contact with the Hawaiian Islands. This shift was precipitated by the sandalwood trade, arrival of whalers, introduction of imported food crops (Kelly et al. 1981). During this time Hilo was becoming an important port town. The establishment of the American Board of Commissioners for Foreign Missions (ABCFM) station in Hilo during this time also resulted in significant cultural changes (Kelly et al. 1981).</p> <p>In the Māhele of 1848 Waiākea Ahupua‘a was held as Crown Land. When Kamehameha I died in 1819, his son Liholiho had received the lands. Two ‘<i>ili kū</i> (subdivisions of an <i>ahupua‘a</i> which pay tribute to the district chief) were awarded to Victoria Kamāmalu, granddaughter of Kamehameha I and heir to Ka‘ahumanu, as part of Land Commission Award 7713. These ‘<i>ili kū</i> included Pi‘oipi‘o near Hilo Bay, and Honohononui, a long strip of land in Keaukaha containing some or all of the northern half of the proposed pipeline corridor (Figure 10). Honohononui is indicated to have extended <i>mauka</i> (inland) to the vicinity of the road to Puna (Figure 10). Hudson (1932:246) documented a portion of this trail in the vicinity of the present Keaukaha Military Reservation, calling it the “Puna-Kau Trail.”</p> <p>According to the Māhele database (Waihona ‘Aina 2022), 28 Land Commission Award (LCA) parcels were granted within Waiākea, most of which were focused around the edges of the large coastal fishponds</p>
--	---

	<p>to the west near Hilo Bay. Land use information from the <i>kuleana</i> or commoner awards generally refer to cultivated fields with house lots, indicating habitation and agricultural production within the same zone. No LCA are indicated in proximity to the project area.</p> <p>During the mid-nineteenth century, sugarcane plantation agriculture and ranching came to prominence in Waiākea Ahupua‘a. The Waiakea Sugar Plantation comprised large tracts of land in Hilo, west of Keaukaha, and other plantations and mills cropped up around the district. The Waiakea Plantation and Mill, as well as the road to Puna, are shown on an 1886 map of Hawai‘i Island (Figure 11). By the 1870s, the road to Puna was a functioning horse trail, likely fitting Apple’s (1965:65) Type C classification. Hudson (1932:246) described it as “about 4 feet wide, paved with bits of aa lava and flat stones, banked on the sides, and built up in crossing gullies.”</p> <p>In 1879, a 3-mile railroad was constructed from Waiakea Mill to the cane fields, “the first in the ‘Sandwich Islands’ to haul sugar with a steam locomotive” (Condé and Best 1973:117). This railroad would be expanded substantially over the coming decades. Portions of the railroad and various plantation mills are illustrated on a 1901 map (Figure 12), which indicates little development in Keaukaha and the vicinity of the project area. Ranching was also primarily focused west of Keaukaha, in the portions of upland Waiākea too rocky for sugarcane. Land use in the project area vicinity likely continued to be focused on marine resource collection and habitation with small agricultural plots along the coast, and procurement of forest resources and intermittent, small-scale agriculture further upslope.</p> <p>The 1900s brought the onset of urban development to the district of South Hilo. Several major construction projects were undertaken between 1900–1930, including new wharves and boat landings, bridges, the Hilo breakwater, and the Waiolama dredge-and-fill project near the bay (Kelly et al. 1981:287–291). A 1914 map (Figure 13) shows an expansion of the railroad to the new wharf at the coast (completed in 1913), located approximately 500 m west of the project area at Pua SPS. Figure 13 also depicts a settlement at “Keokaha” north and east of the project area. The road to Puna, labeled as “Puna Trail”, is shown passing south of the project area, with an unlabeled trail extending <i>makai</i> from the Puna Trail west of the existing Hilo WWTP location; this unlabeled <i>mauka-makai</i> trail terminates at another unlabeled trail indicated to overlap the project area corridor in three separate locations (Figure 13).</p> <p>In 1914 the Governor of the Territory of Hawaii set aside 216.43 acres of land in Waiākea for a National Guard of Hawaii rifle range. A 1915 map (Figure 14) depicts the new rifle range in the vicinity of the present</p>
--	---

	<p>Keaukaha Military Reservation west of the project area. By 1927, the military reservation had expanded to nearly 1,000 acres (Wheeler et al. 2014:37). Figure 14 also shows other recent developments including the Hilo Breakwater, wharves, expanded Hilo Railroad, and Waiākea House Lots in relation to the project area and the <i>'ili kū</i> of Honohononui.</p> <p>The Keaukaha Hawaiian Homestead settlement, along which the northern portion of the project area is situated, was also developed in the 1920s. The settlement, illustrated on Figure 15, was the second established in the state under the Hawaiian Homes Commission Act and was described as “an unqualified success” (Kelly et al. 1981:229). By 1931 more than 200 house lots were occupied by a population of over 1,200 (Kelly et al. 1981:233). Development of the Hilo Airfield, adjacent to the Keaukaha Homestead, also began in the 1920s (Kelly et al. 1981:230).</p> <p>The onset of World War II resulted in expansion and designation of Hilo airport as General Lyman Field by the U.S. military. This and subsequent airport expansions adversely affected the adjacent Keaukaha homestead community, displacing many lessees (Kelly et al. 1981:234–235). Also during this time period, the April 1946 tsunami caused extensive damage and loss of life in Hilo (Kelly et al. 1981:291). The road into Keaukaha was washed out, and the breakwater and piers at the Kūhiʻō wharf were also damaged.</p> <p>Following statehood in 1959 and the decline of the sugar industry, tourism became an economic mainstay for the Hilo area. Another tsunami in 1960 caused great damage throughout Hilo, and subsequently portions of the town were reorganized to minimize devastation from future tsunami (Clark 1985:16). A 1963 topographic map (Figure 16) depicts the continued development in the vicinity of the project area. In 1967 a sewage treatment plant was constructed at Puhi Bay, at the coast fronting the Keaukaha homesteads (Kelly et al. 1981:248, 292). This treatment plant is visible on a 1977 orthophoto (Figure 17) in the vicinity of the current Pua SPS and force main parcel at the coast. Portions of the Puhi Bay treatment plant have since been repurposed as an aquaculture research and training center.</p> <p>In 1989, General Lyman Field was renamed as Hilo International Airport. The airport is in the process of being modernized through a variety of projects. In 1994 a new Hilo WWTP (also called the Hilo WWTP) was completed southeast of the airport at its current location. The treated effluent is gravity fed to the ocean outfall located at Puhi Bay. The old sewage plant site at Puhi Bay contains a wastewater pump station and an aquaculture research and training center. The Keaukaha</p>
--	---

	Military Reservation continues to be utilized by the Hawaii National Guard.
Prior Archaeological Studies Summary	<p>Nineteen previous archaeological studies have been identified within 1.5 km of the project area. These studies are depicted in relation to the project area in Figure 18 and summarized in Table 1. Of these studies, only one (Rosendahl 1988) overlaps the current project area. Historic properties previously documented within 500 m of the current project area are shown in Figure 19 and summarized in Table 2; of these, two (State Inventory of Historic Places [SIHP] #s 50-10-35-30696, disturbed wall segments; and 50-10-35-30697, modified lava tube) are in relative proximity to a portion of the pipeline corridor located north of the airport runway, though they are indicated to lie outside the corridor.</p> <p>Paul H. Rosendahl, Inc. (PHRI) in 1988 conducted an archaeological reconnaissance survey for an environmental impact statement (EIS) for a proposed Hilo Wastewater Treatment Plant project (Rosendahl 1988; Figure 18). The project area included what is now the current wastewater treatment plant site located southeast of Hilo International Airport, and an associated sewer line corridor extending 3,810 m to the old plant site at Puihi Bay (currently the site of the Pua SPS). The sewer line corridor examined during the 1988 study extended further west along the airport property boundary than the current alignment, crossing through the center of the Keaukaha Hawaiian Homestead neighborhood to reach the coast. No archaeological features were identified during the archaeological reconnaissance and no additional archaeological work was recommended.</p>
Fieldwork Effort and Findings	<p>The field inspection was conducted on six separate days following completion of R.M. Towill's topographic surveys of the proposed pipeline corridors and subsequent additions to the project area: 14 April 2022, 16 August 2022, 23 August 2022, 18 November 2022, 28 December 2022, and 9 February 2023. Fieldwork was conducted by CSH Project Director Olivier M. Bautista, B.A., and Archaeologist Samantha Purdy, B.A., under the general supervision of Principal Investigator Hallett Hammatt, Ph.D. The field inspection generally consisted of a thorough pedestrian coverage of the project area, accomplished by sweeps spaced 3–6 m apart depending on the density of the vegetation.</p> <p>The fieldwork involved inspection of the existing and proposed pipeline easements and the Pua SPS and force main parcels at the coast in Keaukaha. The portion of the existing pipeline easement that will contain the new sewage force main pipes was cleared of invasive vegetation regrowth prior to R.M. Towill's topographic survey. Therefore, vegetation was mostly absent along these portions of the existing pipeline corridor during CSH's inspection, providing good</p>

ground visibility (Figure 20 through Figure 23). An unnamed trail depicted on a portion of the 1914 Waiakea USGS map was indicated to cross the existing pipeline corridor in three locations (Figure 13); the CSH crew was unable to relocate any portion of this trail within or near the boundaries of the project corridor. No trail markers (*ahu*), kerbstones, or other signs of a trail were observed upon the land surface in these areas. Background research also indicated the existence of two known historic properties located on either side of the existing pipeline corridor just north of the airport runway: SHIP #s -30696 (three wall segments) and -30697 (lava tube) (Figure 19). CSH sought to confirm SIHP # -30696 as the site is indicated in close proximity to the project corridor. Two of the three SIHP # -30696 wall segments were confirmed and observed as described in the HICIRS resource notes. The identified segments are characterized as relatively short, 2–3 m-long segments of rock walls heavily impacted by bulldozing activity (Figure 24, Figure 25, and Figure 26; Table 2). The third wall segment may have been obscured in a dense cluster of vegetation further east. At its nearest point SIHP # -30696 is situated approximately 22.5 m from the project corridor (Figure 24). No archaeological features were observed within the existing pipeline corridor in this area.

The proposed new force main corridor located north of the Hilo WWTP is within largely undisturbed forest. The R.M. Towill crew hand cleared the northern and southern legs of the new alignment during the topographic survey, but not the longer eastern portion of the alignment, so the CSH crew utilized a handheld GPS device to stay on course in this area. The forest in this part of the project area is moderately dense (Figure 27 and Figure 28) and infested with tiny red fire ants. Ground visibility was fair to good. The R.M. Towill surveyors had encountered three features during their survey along the southern leg of the new alignment that were assessed as potential archaeological features. Photographs of these features were provided to CSH, and the features were marked with orange flagging tape so CSH could examine them during the field inspection. The features included a roughly square-shaped rock feature, lava tube, and lava blister (Figure 24). CSH inspected these features and determined they are natural geological features lacking any archaeological characteristics. The square-shaped rock feature was determined to be a natural depression with exposed rocky edges (Figure 29). The lava tube and lava overhang are common natural features throughout this forested area and did not contain any cultural materials or modifications (Figure 30 through Figure 31). CSH also encountered an abandoned, clandestine marijuana grow site within the northern leg of the new alignment (Figure 24). The site contains a variety of black plastic grow bags and numerous glass bottles (Figure 33 and Figure 34). Based on the vegetation growth on the bags and bottles, glass bottle types, and decomposition rate of the plastic grow

bags, it appears this site was active in the 1990s. Aside from this modern grow site, no cultural features were observed within this new force main corridor.

The project corridor along Nahale-A Avenue and Pua Avenue was found to consist of active and maintained asphalt roadways within a fully developed residential neighborhood (Figure 35 and Figure 36). Sewer manholes denote the presence of the existing sewer lines beneath these sections of roadway. No archaeological features were observed within this portion of the project area.

The portion of the project area within the existing Pua SPS parcel has been completely altered by development of the former wastewater treatment plant and the current pump station facility. This portion of the project area contains a central pump station and operations building surrounded by maintained grassy lawns and a driveway and parking area (Figure 37 through Figure 40). No information about the construction of the building was available on the County's tax office website; a building with a somewhat different configuration appears in this location on the 1977 aerial photo (see Figure 17). In the space west of the building is a concrete structure (Figure 41). The parking lot area to the southeast of the building contains a storage container and a portable office building (Figure 42). No archaeological features were observed within the Pua SPS parcel.

The parcel immediately west of the Pua SPS, in which a new force main will be installed within an existing sewer easement, has also been completely altered by prior development. Like the Pua SPS parcel, this parcel was once part of the former wastewater treatment plant. It is currently the site of the UH Hilo Pacific Agriculture and Coastal Resources Center. The portion of the parcel within the project area includes a gated and paved driveway accessing a small parking lot, office building, storage structures, and a rectangular, concrete pond-type structure enclosed by a chain link fence (Figure 43 through Figure 46). Other buildings and structures (including several large, circular tanks) are present within the greater parcel but outside the project area limits. With the exception of some modern plastic storage sheds, all of these features are visible on the 1977 aerial photo (see Figure 17) and were therefore likely constructed in association with the former wastewater treatment plant. No archaeological features were observed in this portion of the project area.

In summary, no known or potential archaeological historic properties were identified within the project area during the course of the field inspection. Several architectural buildings and structures are present in the Pua SPS parcel and adjacent force main parcel at the coast; these features may have been constructed in the late 1960s or 1970s in

	association with the former wastewater treatment plant and therefore may be considered historic in age; however, the project would not impact these buildings and structures.
Potential for Project Effect on Historic Properties	Background research and the results of the field inspection indicate an absence of known or potential archaeological historic properties within the project area.
Recommendations	<p>The potential for development of the Pua Sewage Pump Station Force Main Project to impact archaeological historic properties is low. This assessment is based on the following:</p> <ul style="list-style-type: none"> • Extent of prior ground disturbance within the majority of the project area (along existing force main alignments and/or active roadways, and within the Pua SPS/former wastewater facility at the coast); • No surface remnants of the unnamed trail depicted in the 1914 Waiakea USGS map (Figure 13) observed during the field inspection within or immediately adjacent to the project area; any portions of this trail that once existed within the project area would have been obliterated by development of the existing force main and associated roadways, and these sections of the trail are adequately documented by depiction of their locations on the 1914 map; • Absence of any other previously documented historic properties within the project area; and • Absence of archaeological features identified during the field inspection of the proposed new force main alignment in the undeveloped forest north of the Hilo WWTP. <p>Given the absence of surface archaeological features in the project area and characteristics of the natural environment, an archaeological inventory survey is not recommended. The undeveloped portion of the project area is in areas of exposed <i>pāhoehoe</i> lava flow and relatively shallow, very stony soil that would not be conducive to subsurface testing. As observed during the field inspection, lava tubes and blisters are common throughout the area. There is some potential for discovery of subsurface lava tubes containing cultural modifications during trenching for development of the new force main alignment. Should a lava tube be encountered during project construction, work should be halted immediately and SHPD should be contacted.</p> <p>Consultation with the SHPD should be sought for concurrence with these recommendations, and to obtain any further determinations of historic preservation requirements for the project.</p>

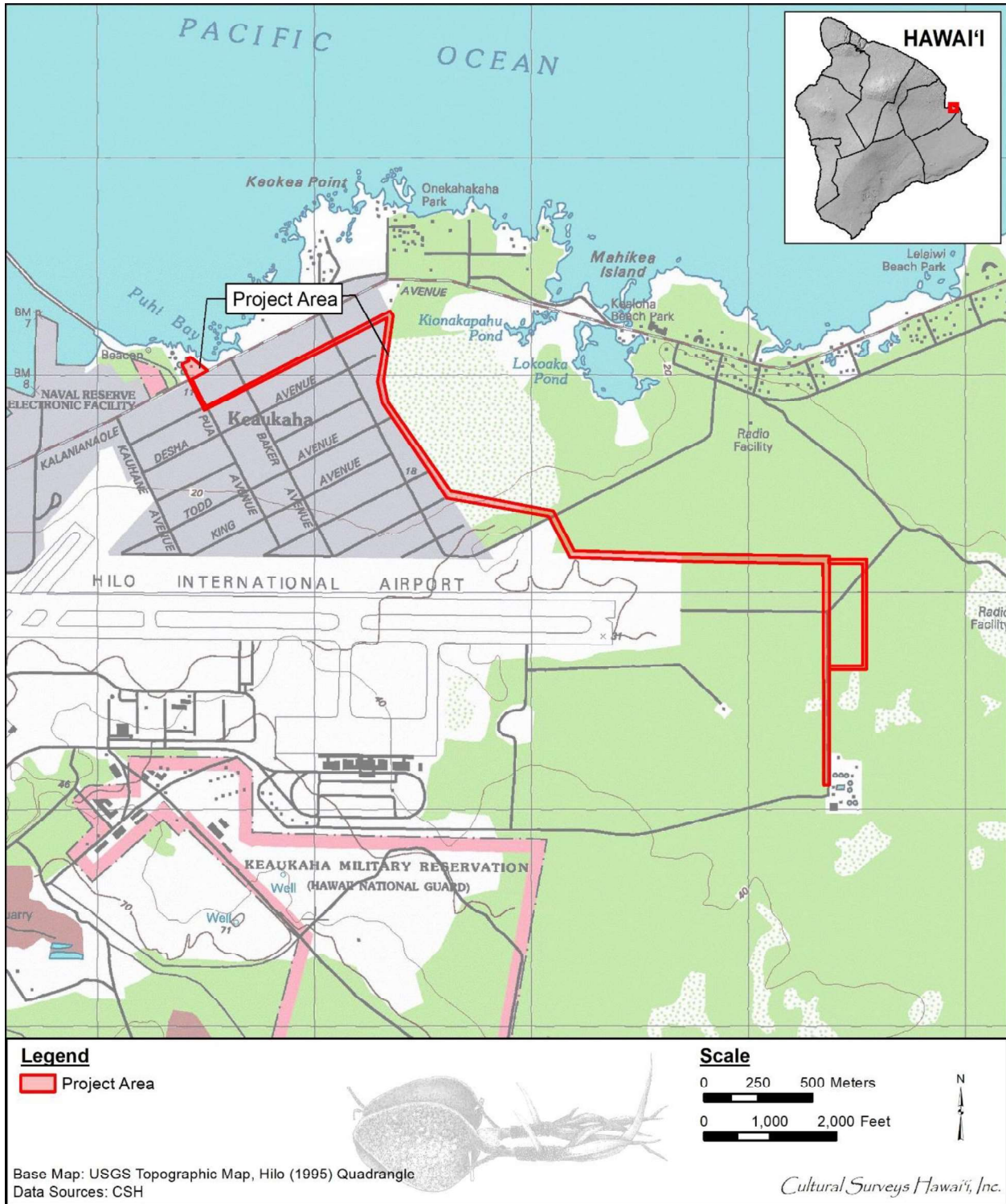


Figure 1. Portion of the 1995 Hilo USGS 7.5-minute topographic quadrangle showing the location of the project area

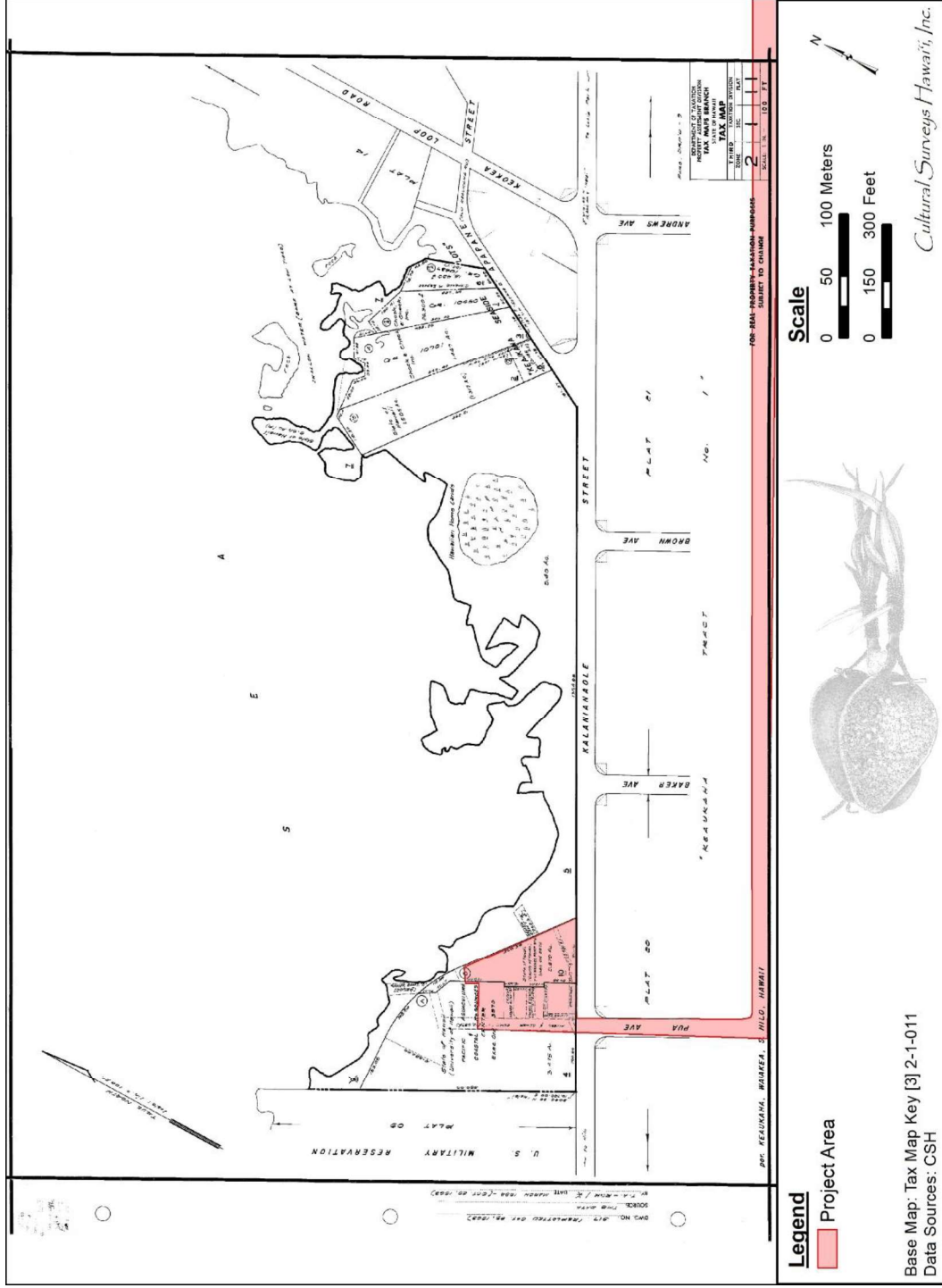


Figure 2. Tax Map Key (TMK) [3] 2-1-011 showing the portion of the project area at the Pua SPS in parcel 004, adjacent parcel 010 where a new force main will be installed, and along the Pua Avenue right-of-way where new CIPP pits will be installed (Hawai'i TMK Service 2010)

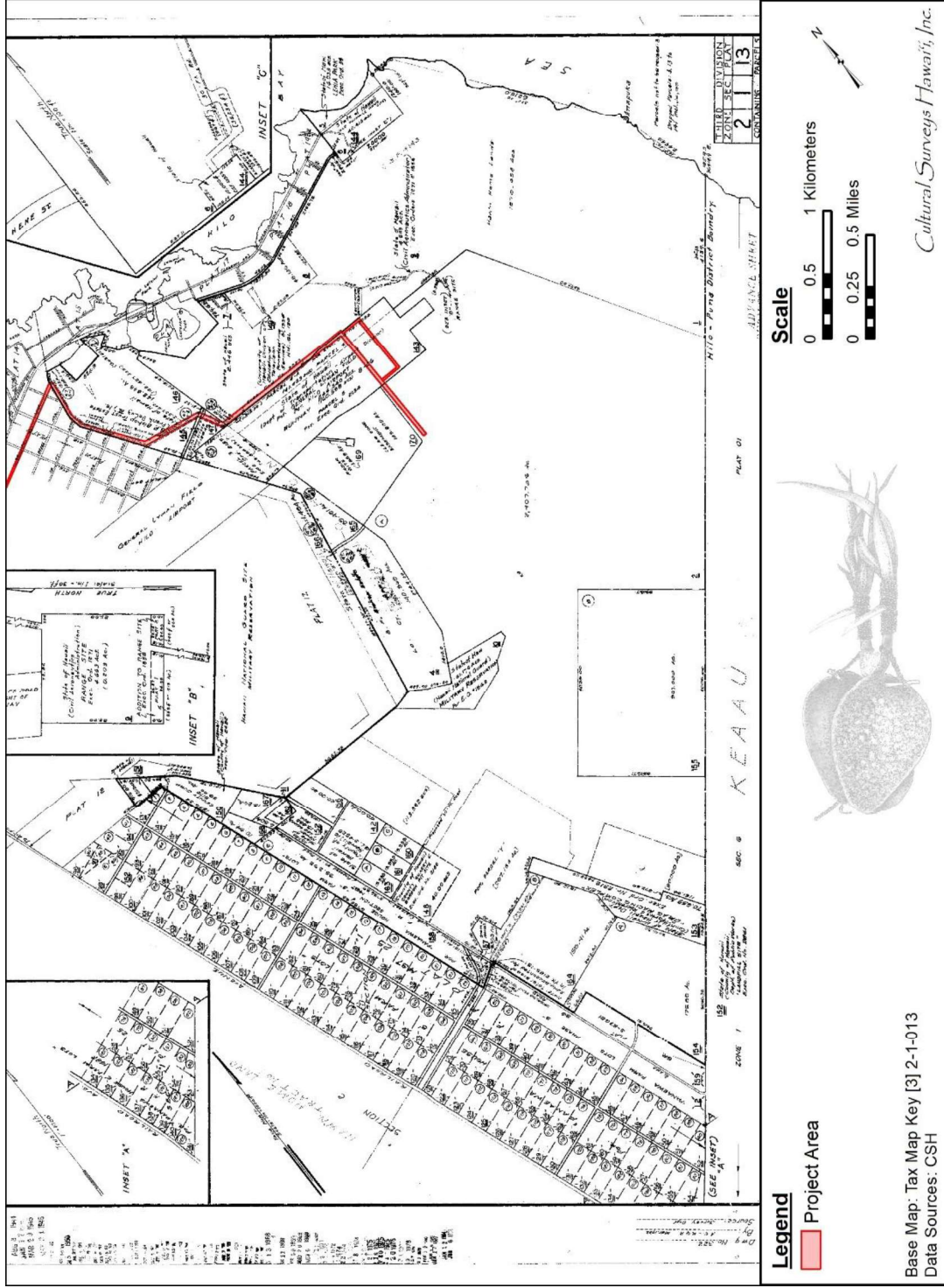


Figure 3. TMK: [3] 2-1-013 showing the project area corridors beginning at the existing WWTP at parcel 002; crossing through parcels 001, 143, 145, 146, and 147; and extending along the Nahale-A Avenue right-of-way (Hawai'i TMK Service 2010)

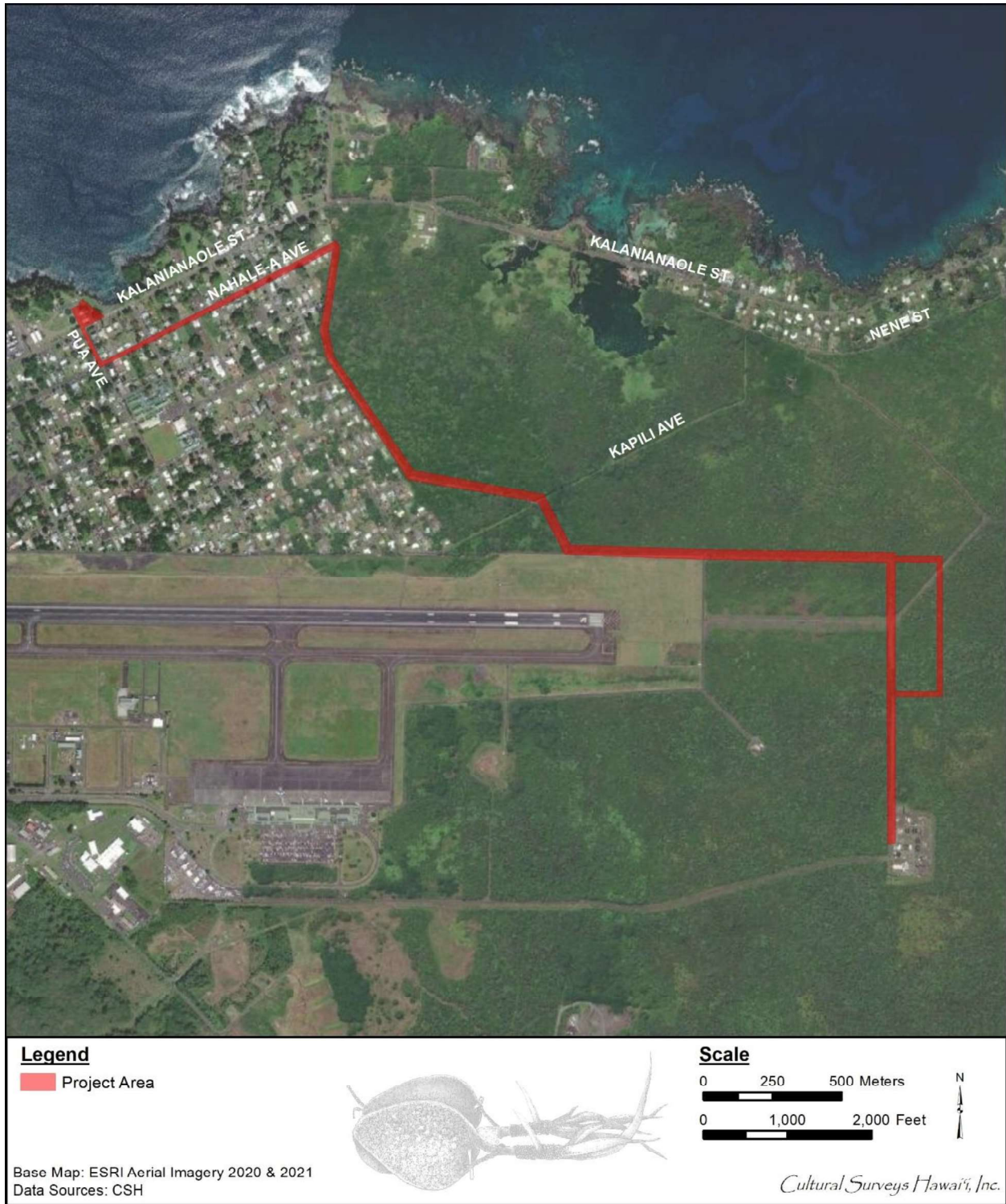


Figure 4. Aerial photograph (ESRI 2020) showing the project area

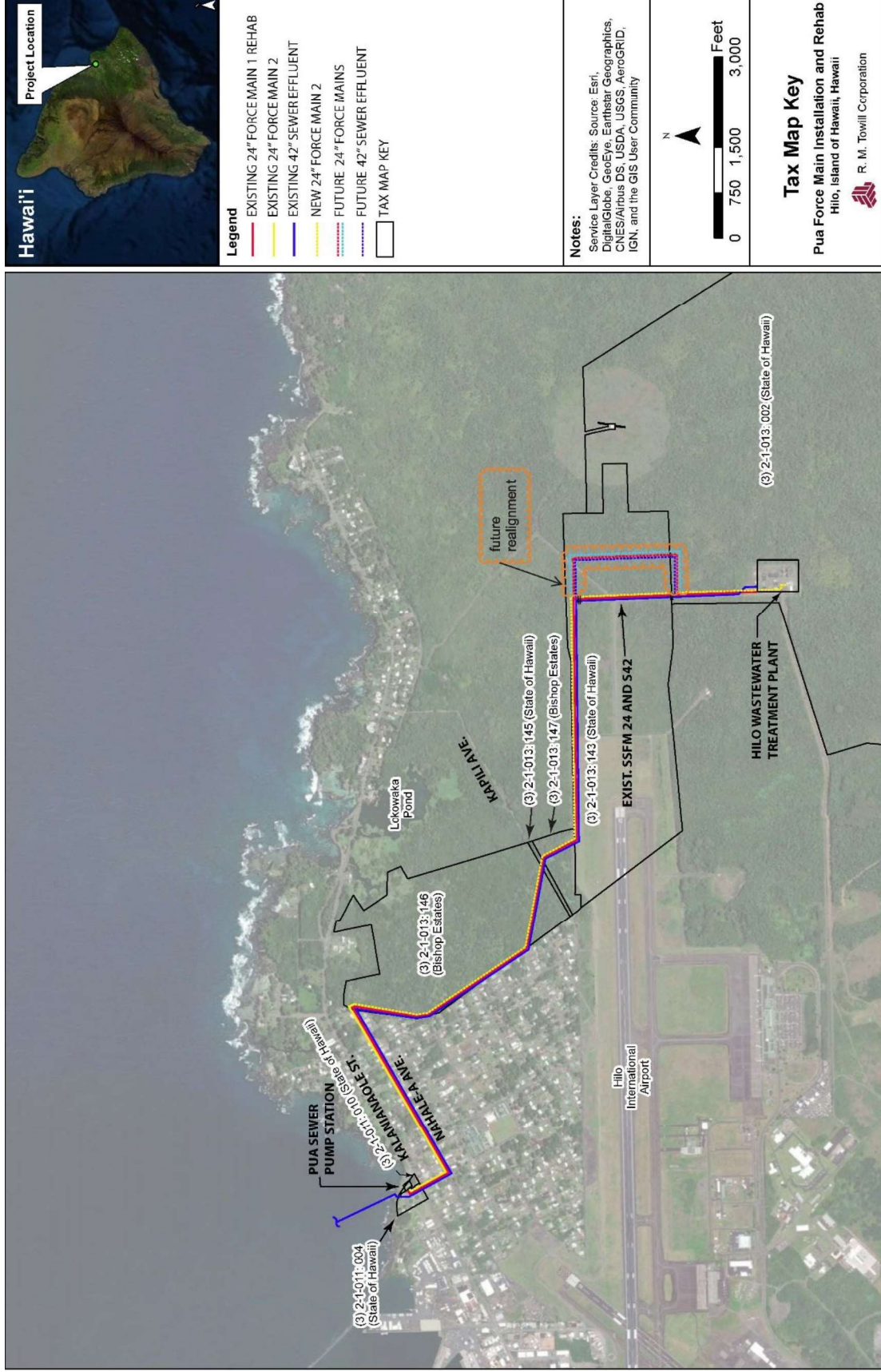


Figure 5. Project location map showing proposed new force main and sewer effluent lines (courtesy of client)

LRFI for the Pua Sewage Pump Station Force Main Project, Waiākea, South Hilo, Hawai'i Island

TMKs: (3) 2-1-011: 004 (State of Hawaii); (3) 2-1-013:002, 143, 145, 146, and 147 por.

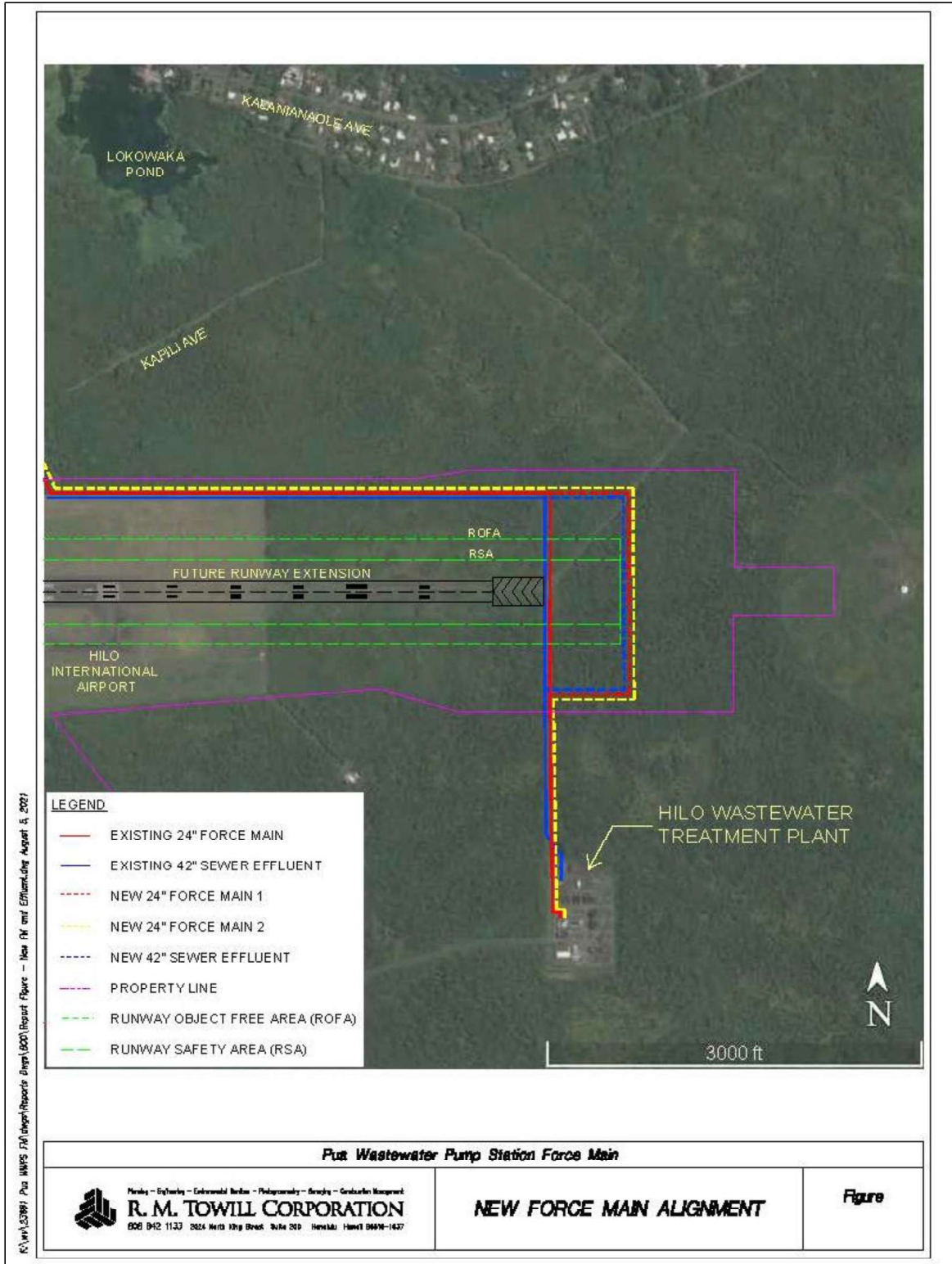


Figure 6. Detail of new force main alignment to avoid airport runway extension (courtesy of client)

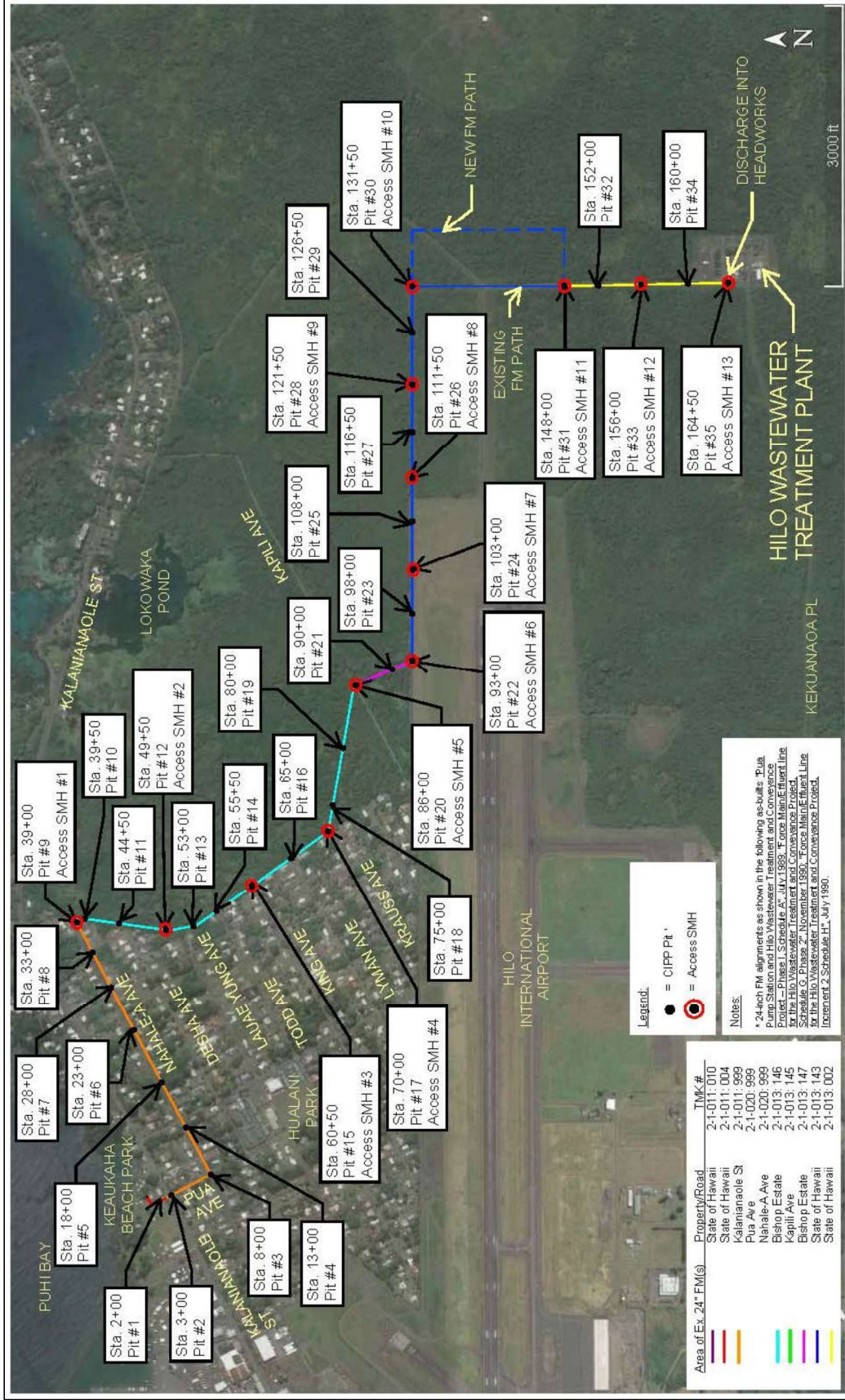


Figure 7. Detail of Proposed CIPP Pit and Access Sewer Manhole Locations (courtesy of client)

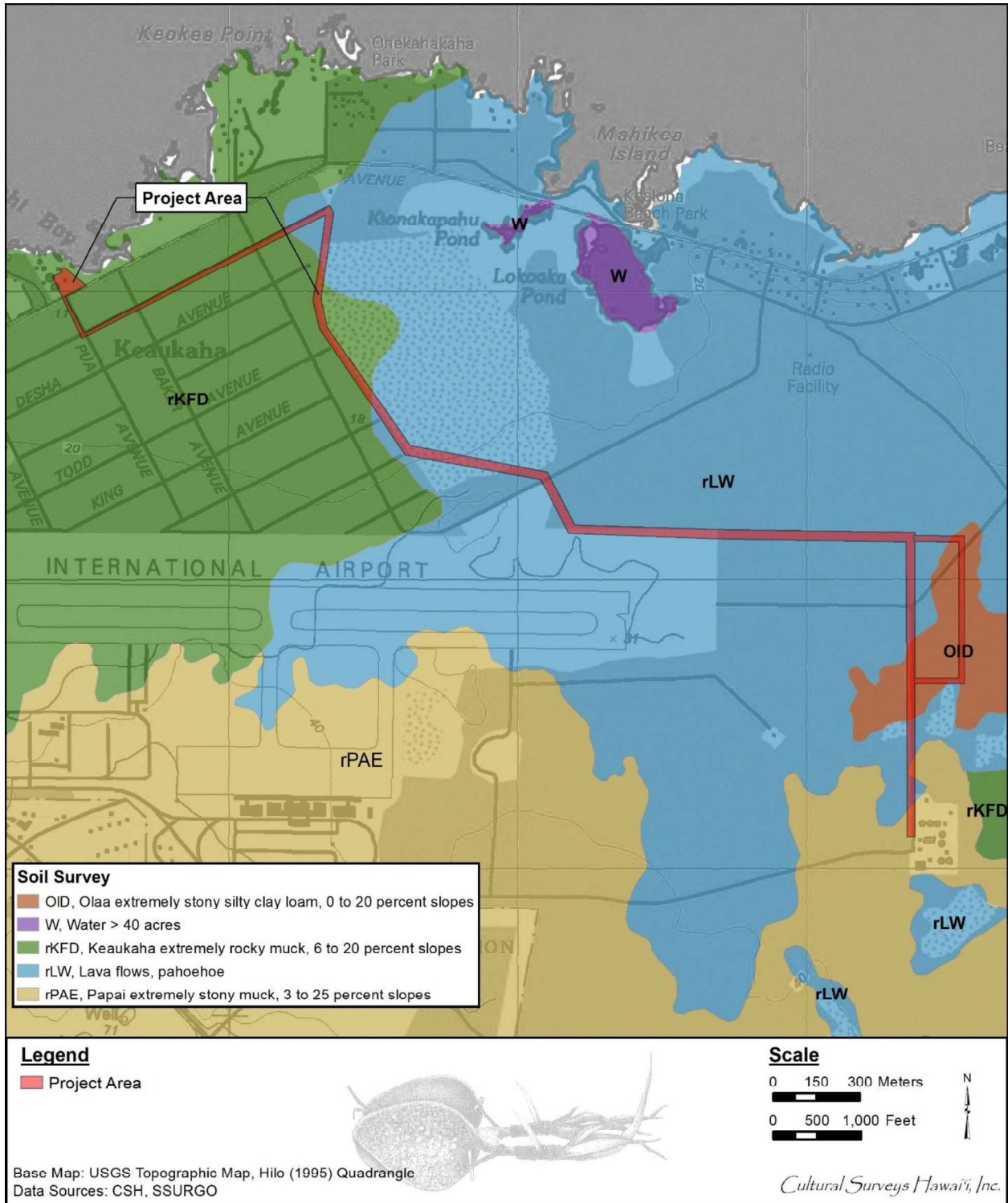


Figure 8. Overlay of *Soil Survey of the Island of Hawaii* (Sato et al. 1973), indicating soil and land types within project area (USDA SSURGO 2001)

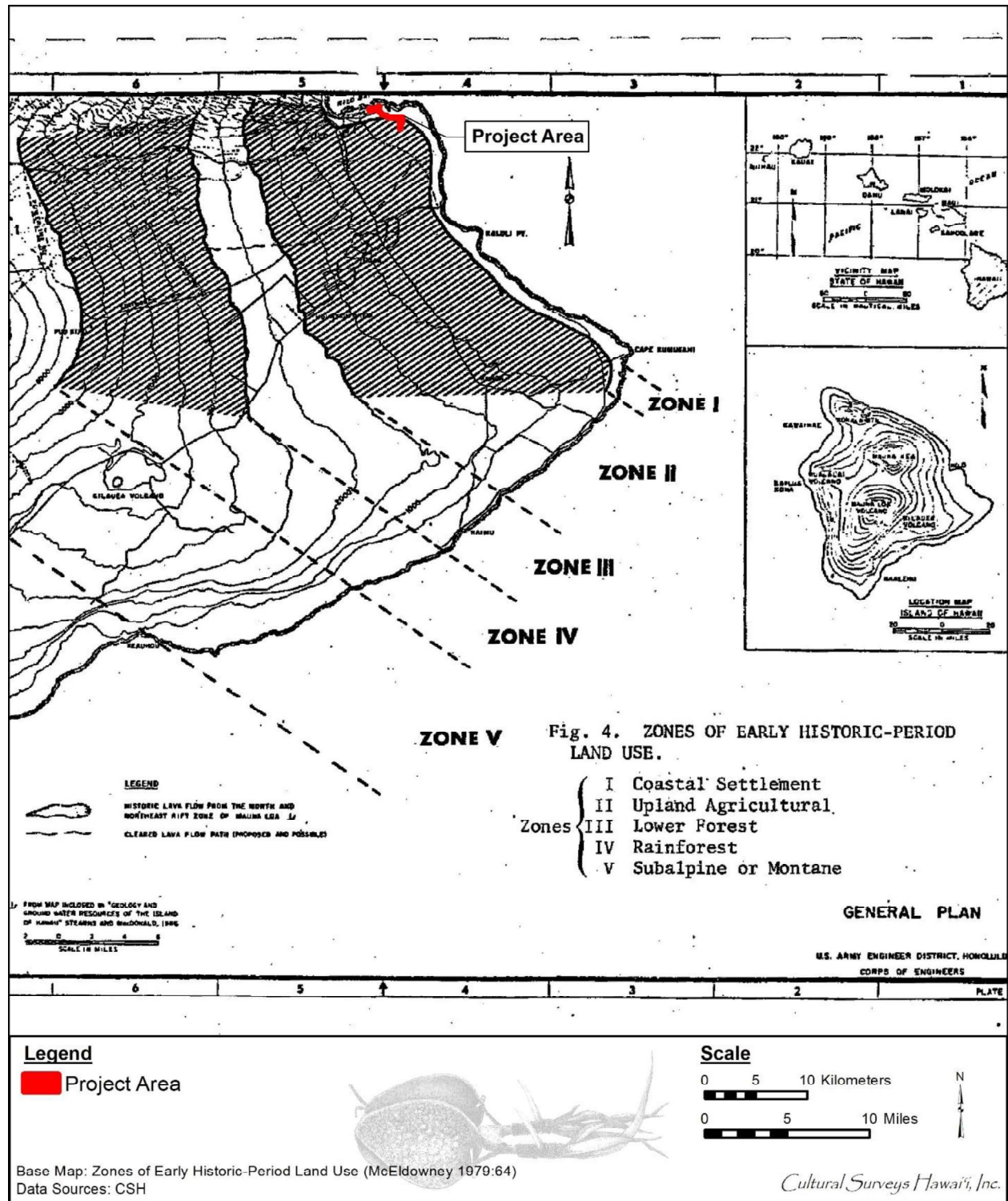


Figure 9. Map showing Zones of Early Historic-Period Land Use as described by McEldowney (1979:64)

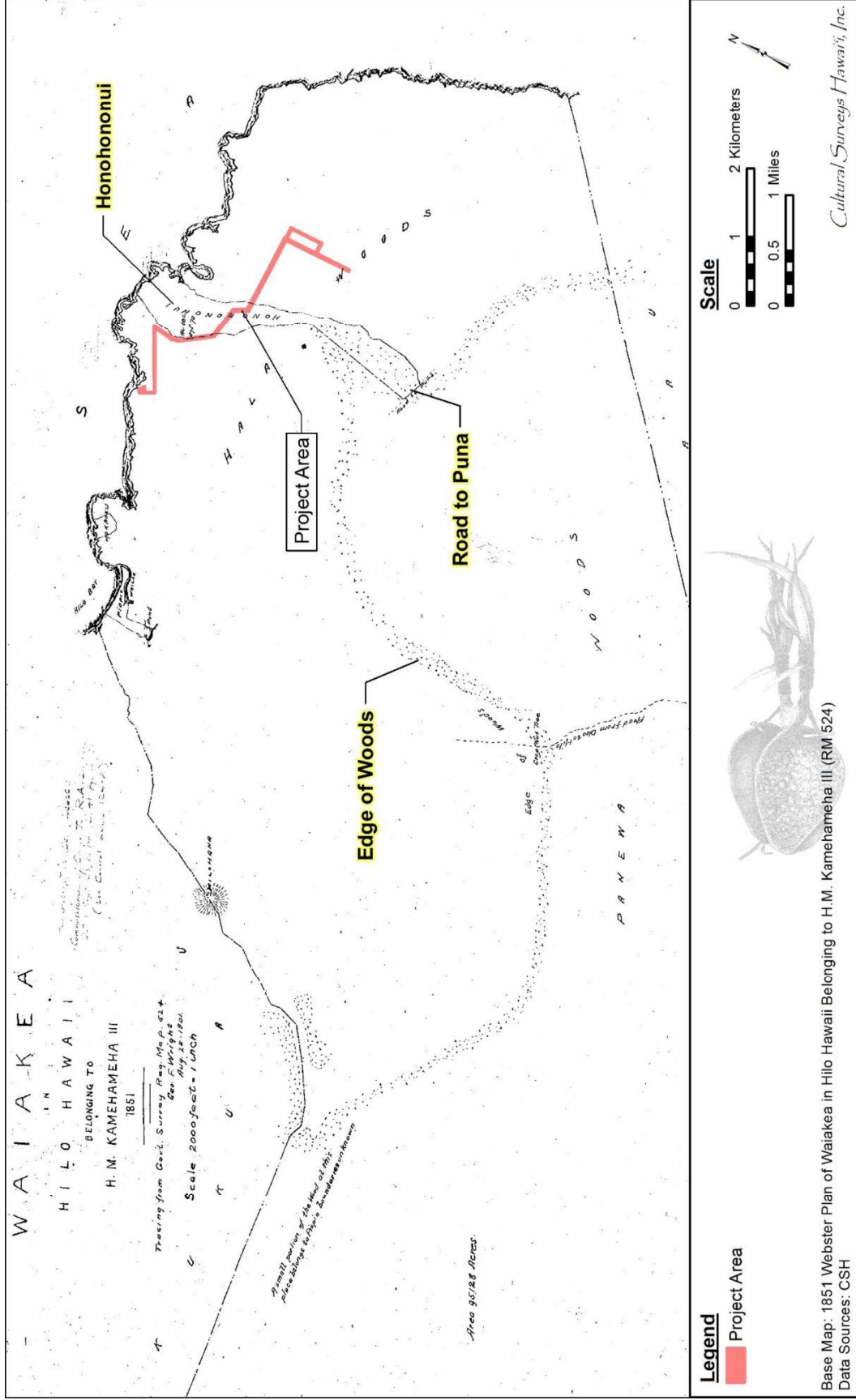


Figure 10. Portion of the 1851 Webster plan of Waiakea, showing the location of the project area (in red) in relation to the “Halo Woods,” “Panewa [Pana‘ewa] Woods,” “Road to Puna,” and ‘ili kū of “Honohononui”

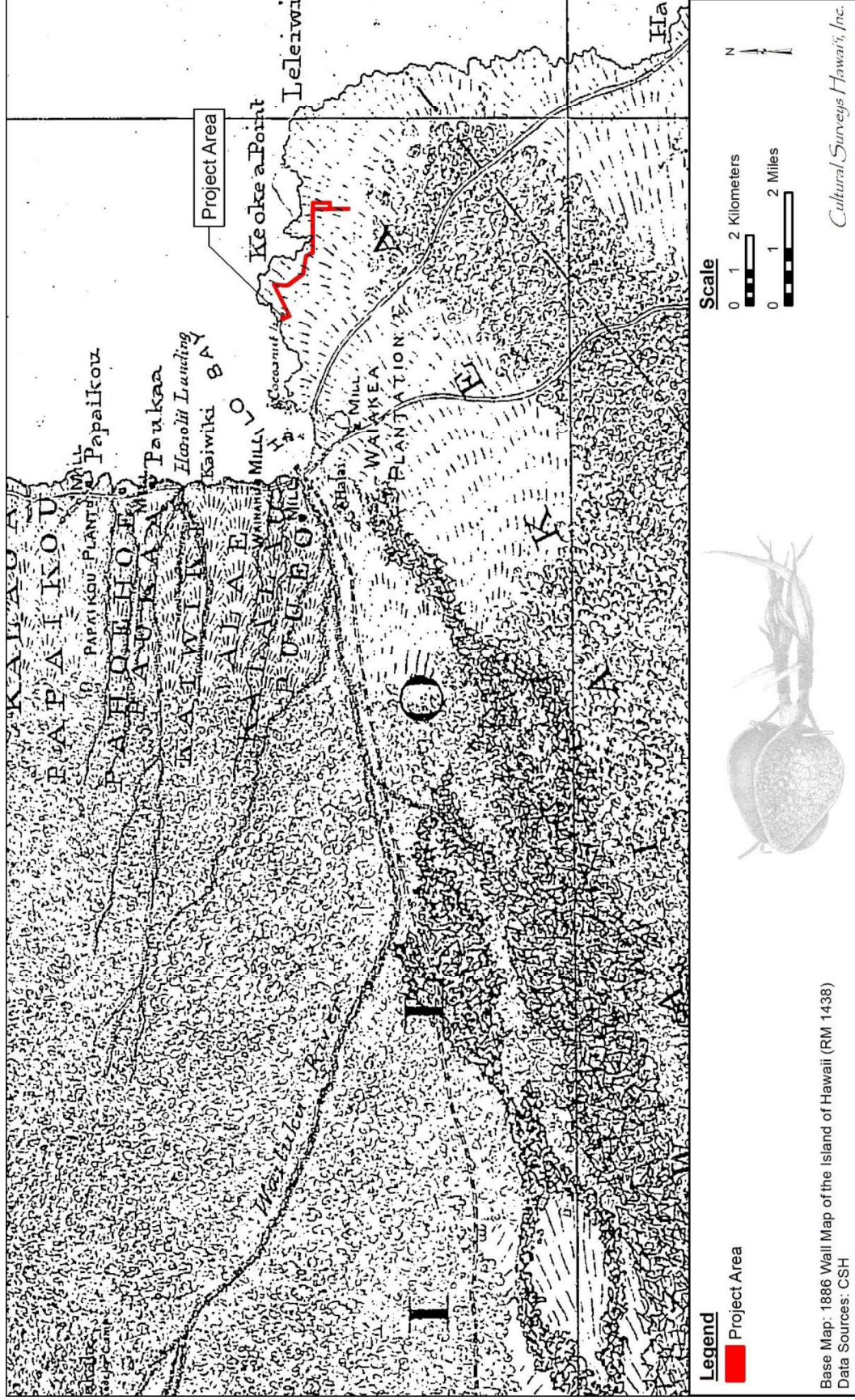


Figure 11. Portion of 1886 Wall map of the island of Hawai'i showing the project area

LRFI for the Pua Sewage Pump Station Force Main Project, Waiakea, South Hilo, Hawai'i Island
TMKs: (3) 2-1-011:004 and 010 por.; (3) 2-1-013:002, 143, 145, 146, and 147 por.

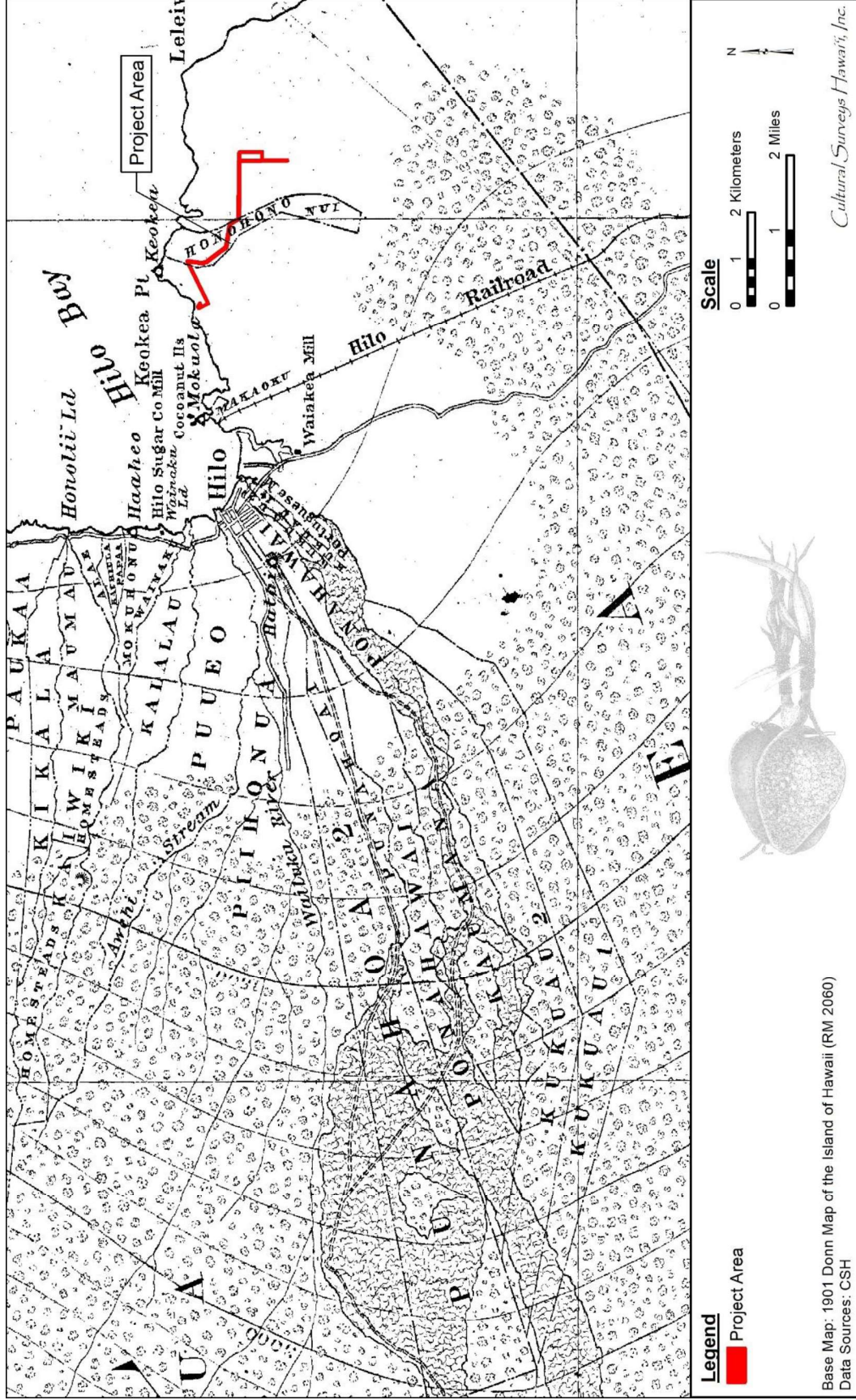


Figure 12. Portion of 1901 Donn map of the island of Hawai'i showing the project area

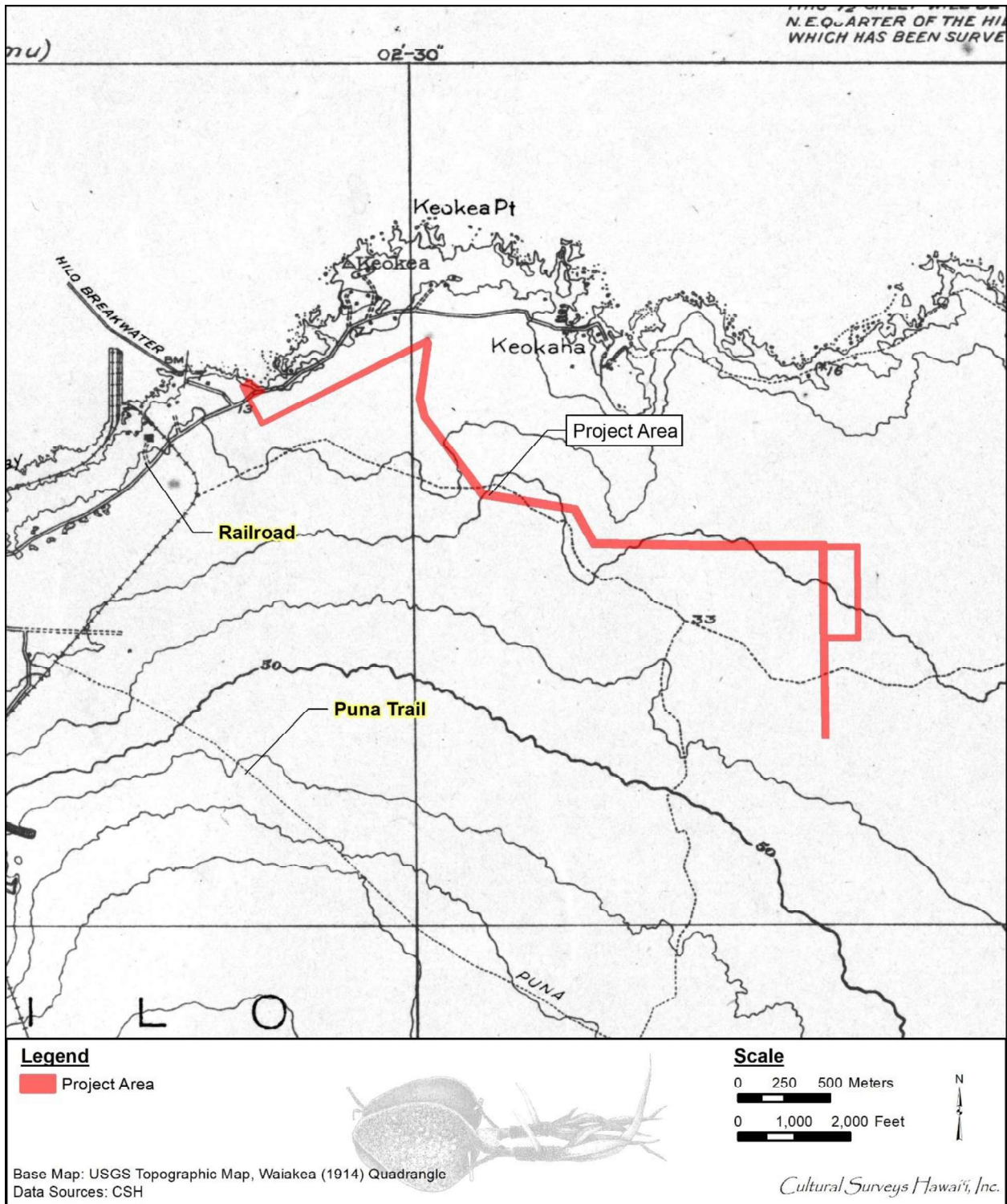


Figure 13. Portion of the 1914 Waiakea USGS 7.5-minute topographic quadrangle showing the project area in relation to the Waiakea Mill, Hilo Railroad, the Puna Trail, and other trails in the vicinity

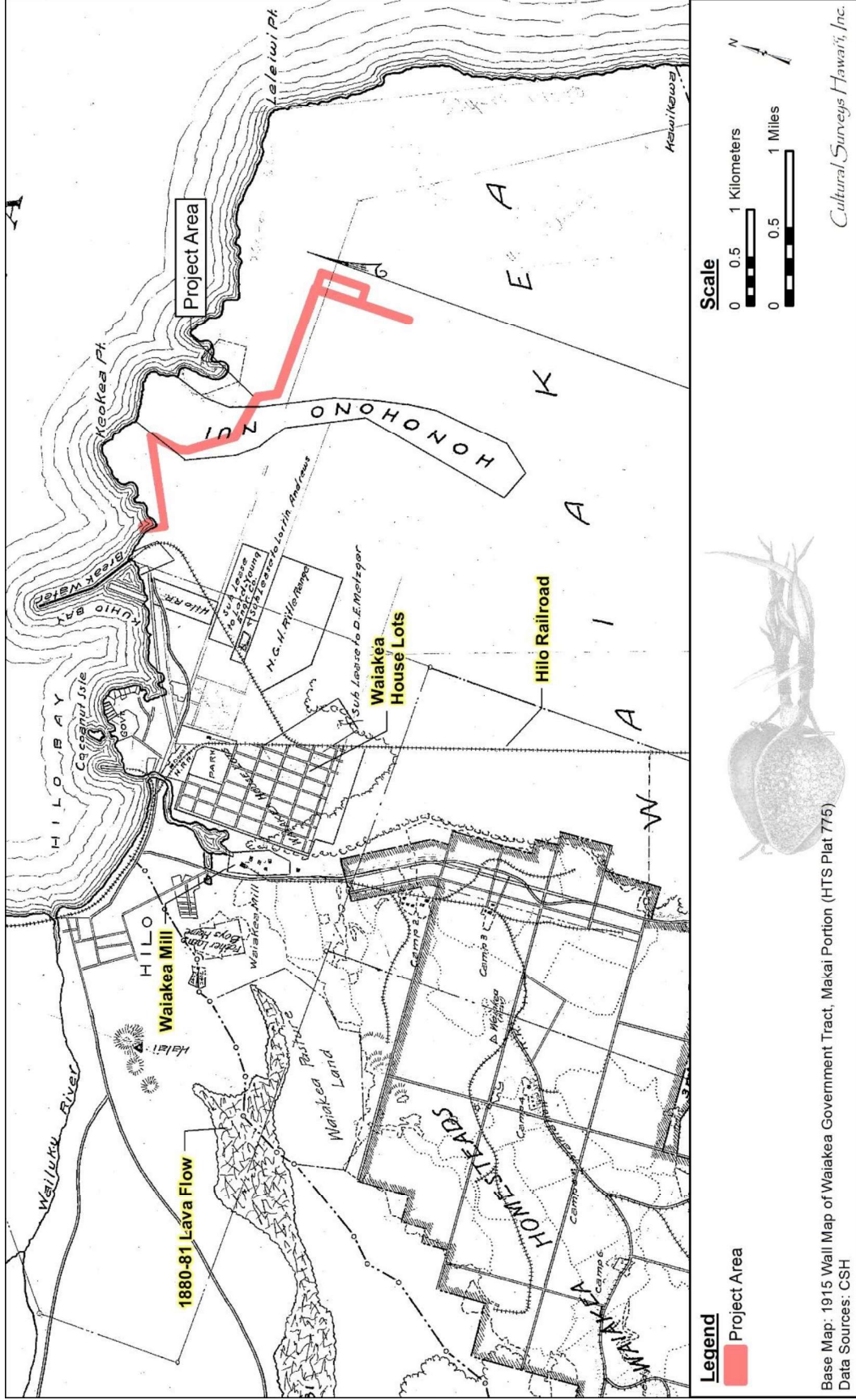


Figure 14. Portion of the 1915 Wall Map of Waiakea Government Tract showing the project area in proximity to developments including the Hilo Breakwater, wharves, railroads, Waiakea House Lots, National Guard of Hawaii Rifle Range, and the 'ili kū of Honohononui

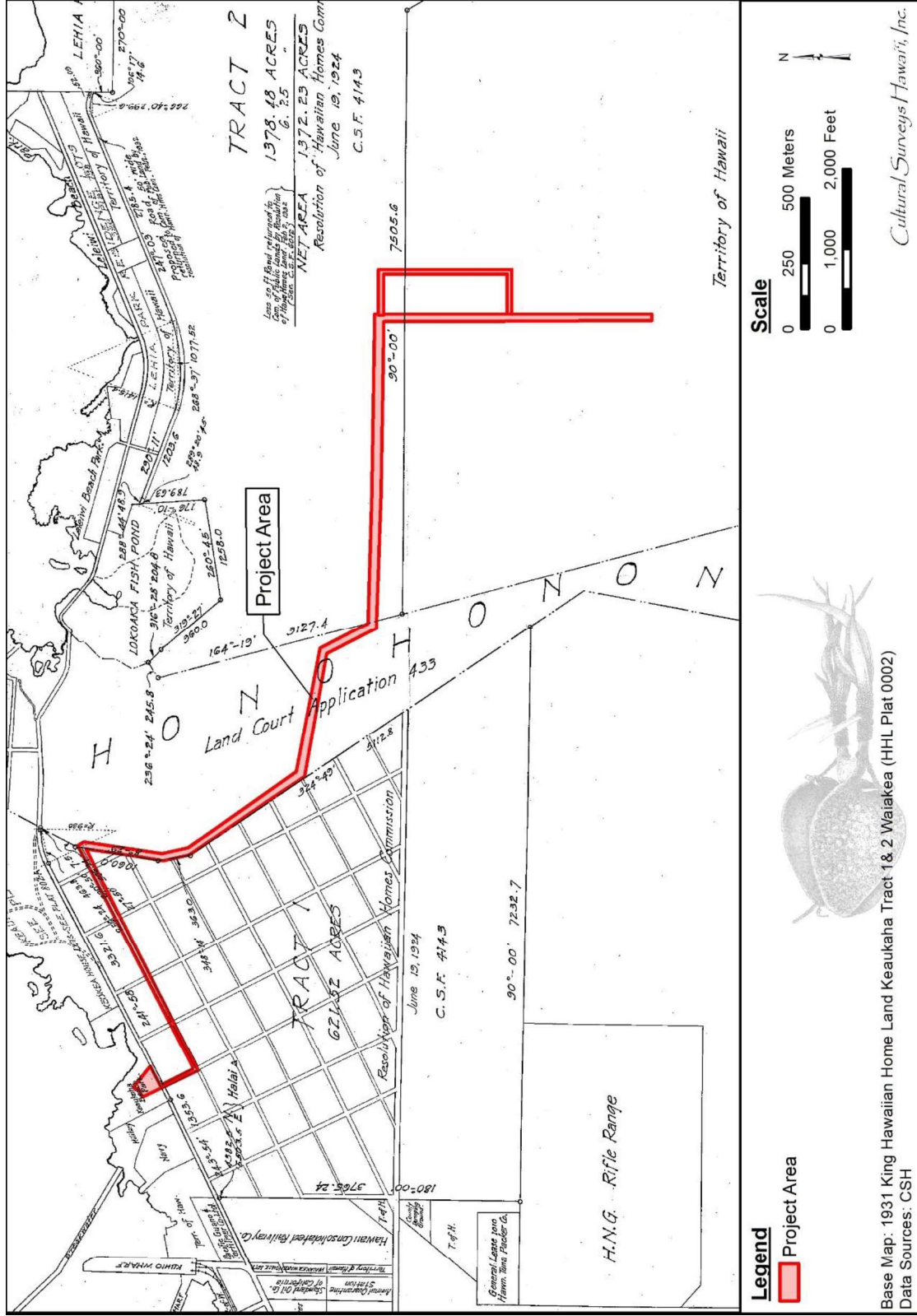


Figure 15. 1931 King map of Hawaiian Homeland Keaukaha Tract showing the location of the project area

LRFI for the Pua Sewage Pump Station Force Main Project, Waiakea, South Hilo, Hawai'i Island
 TMKs: (3) 2-1-011:004 and 010 por.; (3) 2-1-013:002, 143, 145, 146, and 147 por.

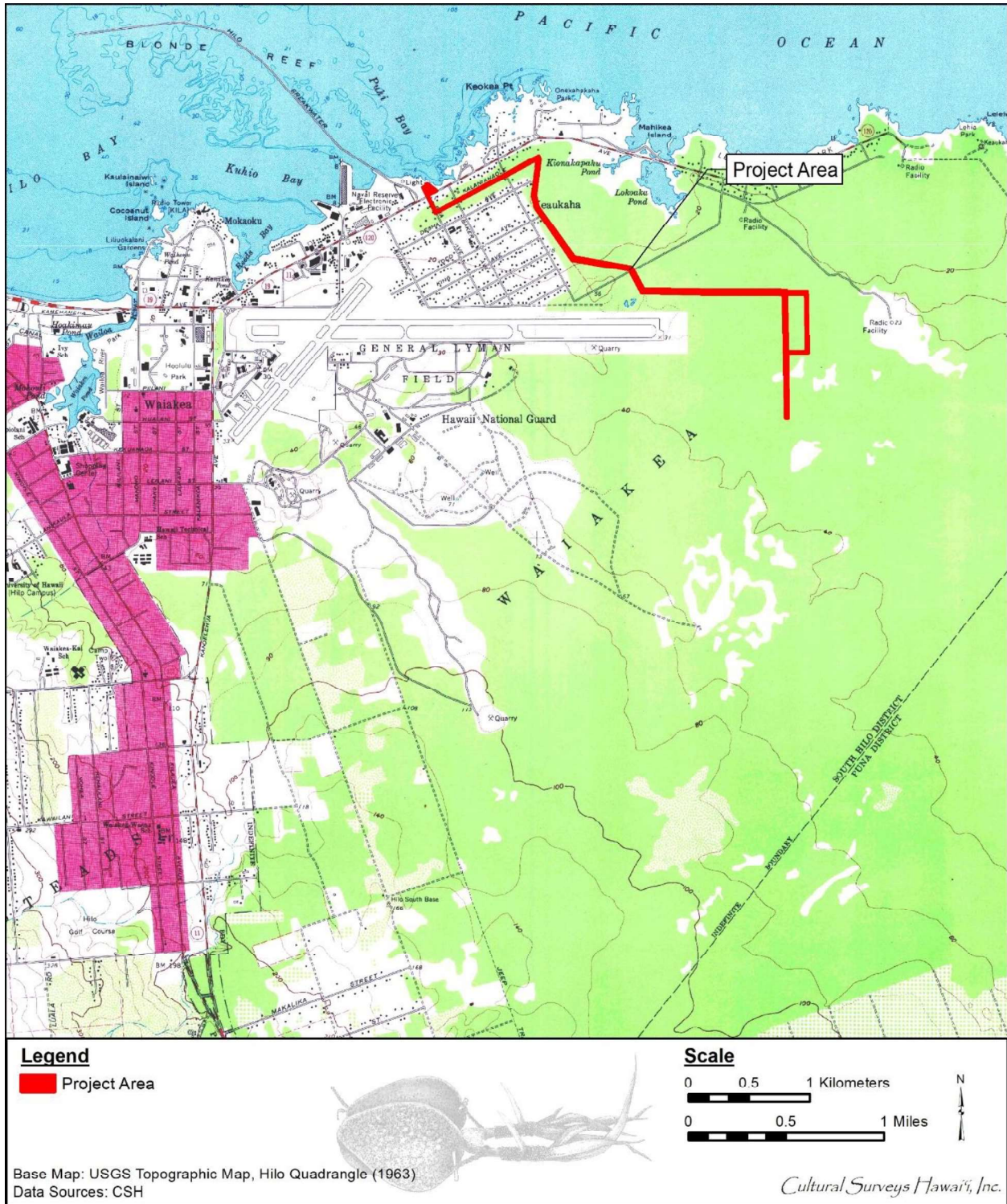


Figure 16. Portion of the 1963 Hilo USGS 7.5-minute topographic quadrangle showing the project area in relation to area development

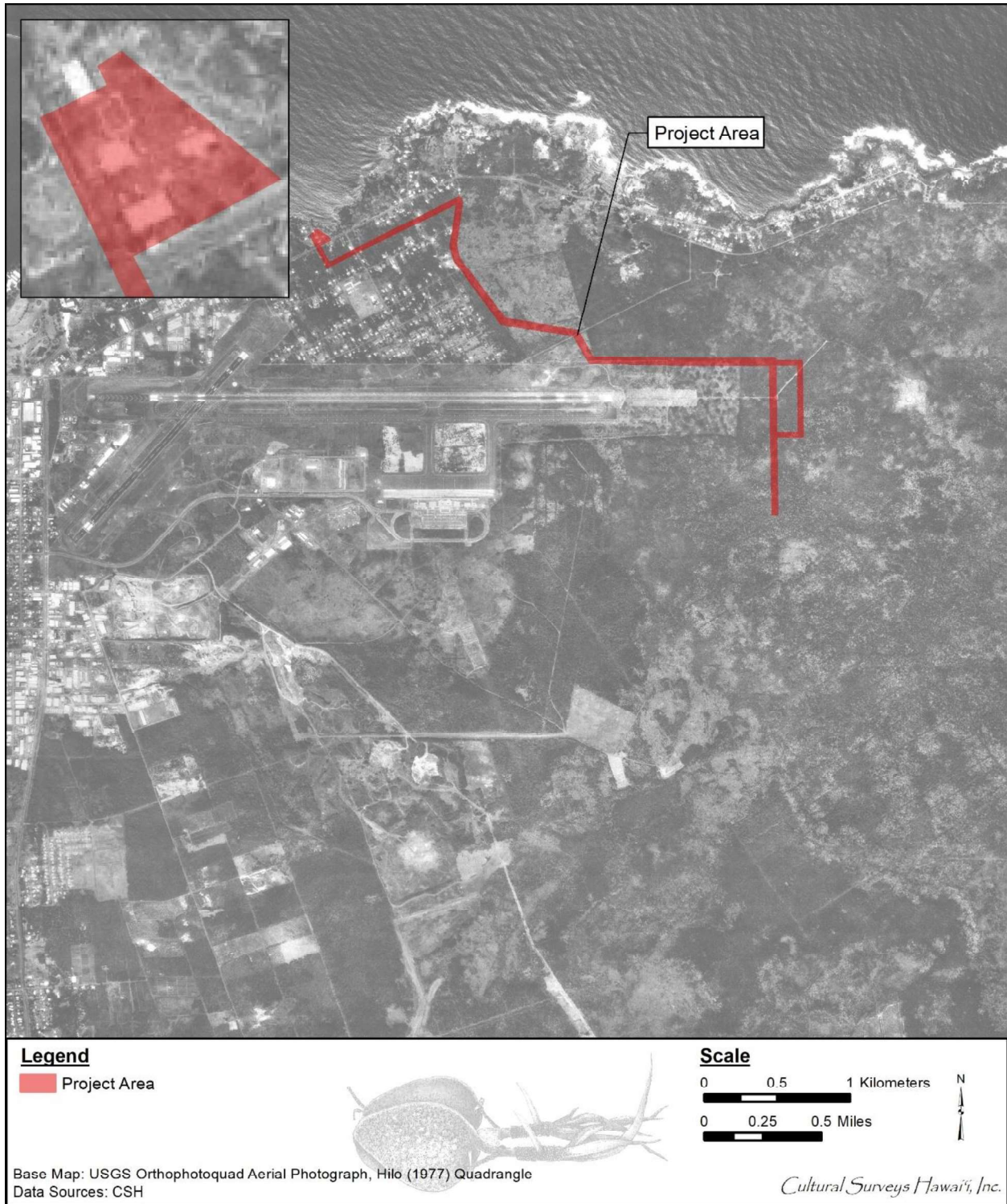


Figure 17. 1977 USGS Orthophoto showing continued development in the vicinity of the project area; note inset showing developments within the Pua SPS/force main parcel portion of the project area at the coast

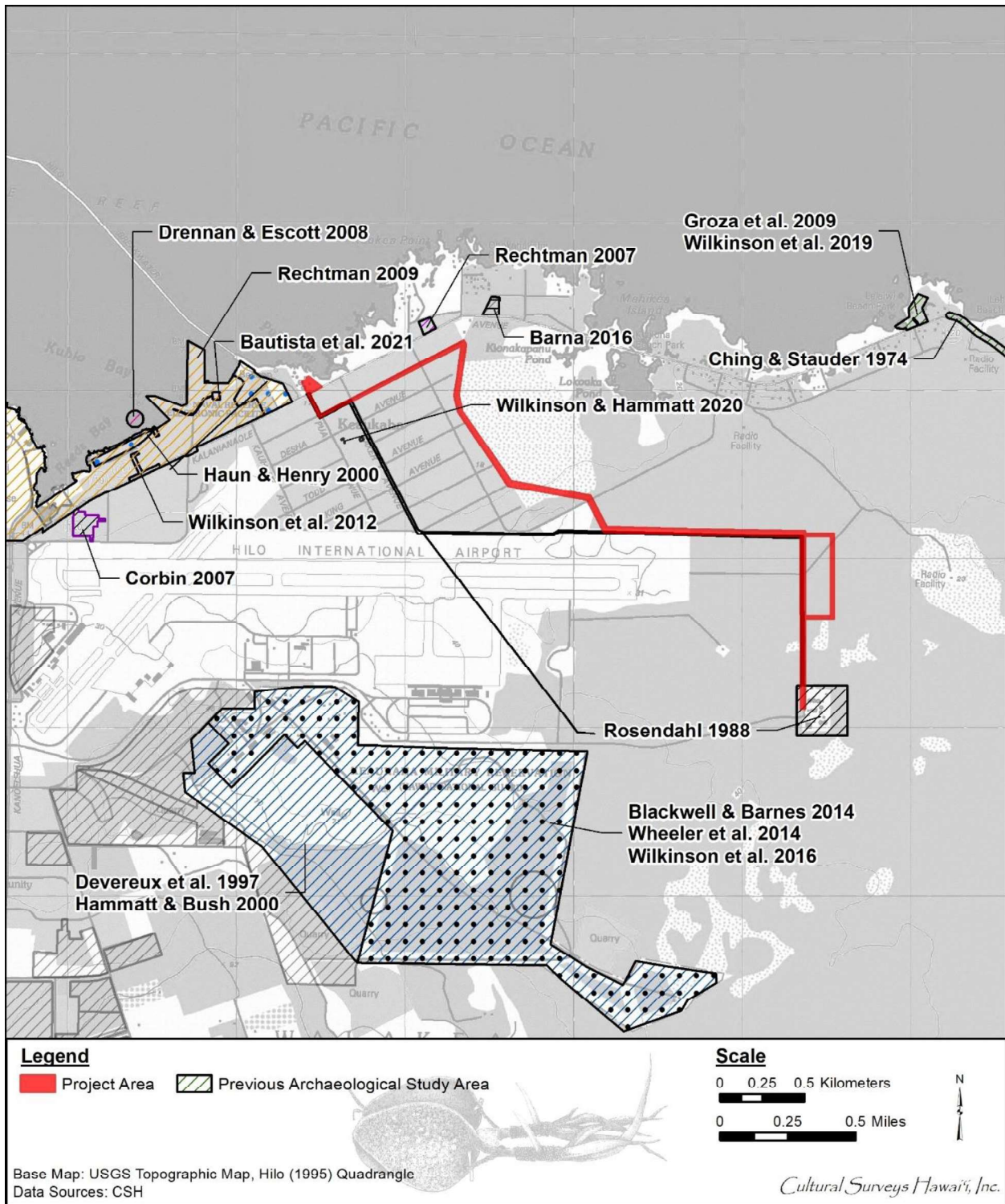


Figure 18. Portion of 1995 Hilo USGS topographic quadrangle showing the location of previous archaeological studies within 1.5 km of the project area; note previous studies located beyond this distance not shown

Table 1. Previous archaeological studies in the vicinity of the project area

Reference	Type of Study	Location	Results (SIHP # 50-10-35)
Ching and Stauder 1974	Archaeological reconnaissance	2.5-mile alignment referred to as “alternative A” between Keaukaha and South Hilo–Puna boundary	Documented four historic properties near South Hilo–Puna district boundary, well away from current project area: a stacked <i>pāhoehoe</i> wall along district boundary (SIHP # -06223), a platform/ monument burial (SIHP # -06224), a modified lava sink used as an animal enclosure (SIHP # -06225), and an enclosure interpreted as a habitation site (SIHP # -06227)
Kam 1983	Records check	State lands at Reed’s Bay, Waiākea, TMK: [3] 2-1-007:011	Records check found no previous documentation for an unnamed <i>heiau</i> depicted on modern tax map; <i>heiau</i> confirmed in field and assigned SIHP # -18695; site located well away from current project area
Rosendahl 1988	Archaeological reconnaissance survey	Hilo Wastewater Treatment Facility (including associated sewer line corridor extending 3,810 m to old plant site at Puhi Bay), Waiākea, TMKs: [3] 2-1-013:012, 013, 020, and 022 por.	No historic properties identified
Devereux et al. 1997	Archaeological reconnaissance survey	503.6 acres at Hawaii Army National Guard Keaukaha Military Reservation, Waiākea, TMKs: [3] 2-1-012:003 and 2-1-013:010	Documented two sites, located well away from current project area: CSH-1 (C-shape enclosure) and CSH-2 (coral mound); no SIHP numbers assigned; see Hammatt and Bush 2000 and Wheeler et al. 2014
Hammatt and Bush 2000	Archaeological inventory survey	503.6 acres at Hawaii Army National Guard Keaukaha Military Reservation, Waiākea, TMKs: [3] 2-1-012:003 and 2-1-013:010	Documented four historic properties, all located well away from current project area: SIHP #s -18869 (Puna Trail), -21657 (military C-shape initially identified by Devereux et al. 1997), -21658 (five <i>ahu</i> or cairns), and -21659 (modified blister); deaccessioned coral mound documented by Devereux et al. 1997

Reference	Type of Study	Location	Results (SIHP # 50-10-35)
Haun and Henry 2000	Archaeological inventory survey	Hilo Harbor, Waiākea, TMKs: [3] 2-1-009:002, 012, 041, 042, and 2-1-009:020-037	Documented SIHP # -22486, early 1900s U.S. engineer facilities; site located well away from current project area
Corbin 2007	Archaeological assessment (AIS with negative finds)	Keaukaha, Waiākea, TMK: [3] 2-1-6:001	No historic properties identified
Rechtman 2007	Archaeological inventory survey and limited cultural assessment	Koko Palms at Keaukaha, Waiākea, TMKs: [3] 2-1-14:004 and 005	Documented a twentieth century single-family residential house site (SIHP Site RC-0452-1) complex; no SIHP number assigned; site not in direct proximity to current project area
Drennan and Escott 2008	Underwater archaeological reconnaissance and historical investigation	Pier 3 in Hilo Bay, Waiākea	Documented newly identified SIHP # -26466 (historic shipwreck) and previously identified SIHP # -22486 (early 1900s U.S. engineer facilities); both sites located well away from current project area
Groza et al. 2009	Archaeological literature review and field inspection	Richardson Ocean Park, Waiākea, TMK: [3] 2-1-019:010	Documented site complex associated with historic Richardson home (CSH-1) and associated features (CSH-5 through CSH-8); two walled fishponds (CSH-3); a sea wall (CSH-4) related to historic habitation; possible grave site (CSH-2) and former Malo house site (CSH-9) not located due to very dense vegetation; no SIHP numbers assigned; see Wilkinson et al. 2019
Rechtman 2009	Archaeological assessment survey	Hilo Bayfront Trails project, Pi'ihonua, Punahoa, Pōnāhawai, Kūkūau, and Waiākea	No historic properties identified; preparation of archaeological monitoring plan recommended given potential for disturbed and/or undisturbed subsurface burials
Wilkinson et al. 2012	Archaeological literature review and field inspection	Pier 4 at Hilo Harbor, Waiākea, TMK: [3] 2-1-007	No historic properties identified in study area; noted railroad used to extend through project area but no remains present; also noted presence of SIHP # -22486 at coast nearby

Reference	Type of Study	Location	Results (SIHP # 50-10-35)
Blackwell and Barnes 2014	Historic building survey and evaluation report	Six Hawaii Army National Guard Facilities Statewide, including Keaukaha Military Reservation, Waiākea, TMKs: [3] 2-1-012:003, 131, and 2-1-013:010	Documented ten buildings and four ranges, all but one historic in age; all buildings and ranges recommended not eligible for listing in National Register of Historic Places (NRHP); all buildings located well away from current project area
Wheeler et al. 2014	Phase I (surface) archaeological inventory survey and monitoring plan	Hawaii Army National Guard Keaukaha Military Reservation, Waiākea, TMKs: [3] 2-1-012:003, 131, and 2-1-013:010	Documented five previously identified historic properties (SIHP #s -18869, Puna Trail; -21657, military C-shaped enclosure; -21658, mound complex; -21771, complex; -23273, trail and agricultural complex); and six newly identified historic properties (SIHP #s -30008, lava tube shelter; -30009, modified outcrop complex; -30010, historic complex; -30011, historic complex; -30012, historic trail; and -30038, trail segment associated with Puna Trail); all sites located well away from current project area
Barna 2016	Archaeological inventory survey	1.91 acres in Waiākea, TMKs: [3] 2-1-015:017 and 055	Documented SIHP # -30513, portion of former Kong's Floraleigh Botanical Gardens and associated historic buildings; site not in direct proximity to current project area
Wilkinson et al. 2016	Phase II (subsurface) archaeological inventory survey	Hawaii Army National Guard Keaukaha Military Reservation, Waiākea Ahupua`a, TMKs: [3] 2-1-012:003 and 2-1-013:010	Documented three previously identified historic properties (SIHP #s -21771, -30008, and -30010) and two newly identified historic properties (SIHP #s -30216, historic terrace; and -30217, agricultural complex); all sites located well away from current project area

Reference	Type of Study	Location	Results (SIHP # 50-10-35)
Wilkinson et al. 2019	Archaeological inventory survey	Richardson Ocean Park, TMK: [3] 2-1-019:010	Documented eight newly identified historic properties: SIHP #s -30503 (historic 1920s residence known as “Richardson House”), -30504 (historic modified outcrop), -30505 (historic seawall complex), -30506 (outcrop with historic modifications), -30507 (circular stone alignment representing possible historic grave site/burial), -30508 (Honokea Pond), -30509 (Waiuli Pond), and -30892 (historic boat house complex); all sites located well away from current project area
Wilkinson and Hammatt 2020	Archaeological literature review and field inspection	Keaukaha Elementary School, Waiākea, TMK: [3] 2-1- 020:001 por.	Documented two architectural properties greater than 50 years old (Building B, constructed in 1951 and renovated in 2015; and Building C, constructed in 1956); buildings not assigned SIHP designation(s); consultation with SHPD recommended; these buildings not in proximity to current project area
Bautista et al. 2021	Archaeological literature review and field inspection	Hilo Harbor, Waiākea, TMKs: [3] 2-1-009:007 por., 043 por., and 053 por.	Documented one architectural property, portions greater than 50 years old (CSH-1, existing Hawaiian Cement facility); site not assigned SIHP designation; consultation with SHPD recommended; site not in proximity to current project area

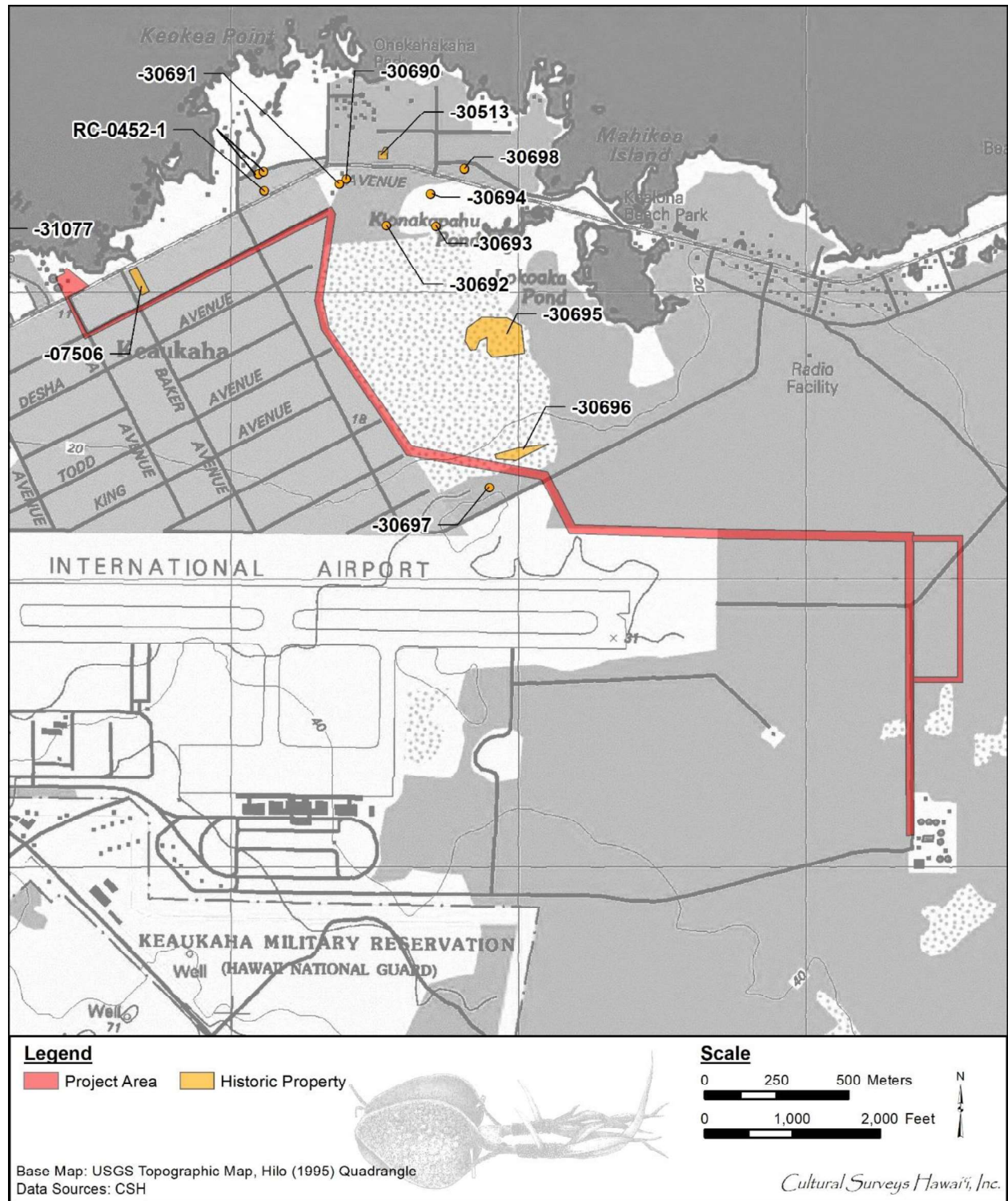


Figure 19. Portion of 1995 Hilo USGS topographic quadrangle showing the location of historic properties previously documented within 500 m of the project area; note historic properties located beyond this distance not shown

Table 2. Previously documented historic properties within the vicinity of the project area

SIHP #	Site Type	# of Features	Function	Likely Age	Prior Study Reference/Source	Comment/description
50-10-35-07506	Kamehameha Hall	—	Social/meeting hall	Historic (1938)	HICRIS Resource, Historic Hawai'i Foundation	Vernacular one-story wooden building with corrugated metal double pitched hipped roof; housed Royal Order of Kamehameha, Mamalaha Chapter; nominated to National Register under significance Criteria A and C
-30513	Complex	4	Botanical garden/tourism	Historic (late 20 th Century)	Barna 2016	Site complex (Features A–D) associated with former Kong's Floraleigh Botanical Garden in operation from 1956–1986; assessed as significant under Criteria a, c, and d; recommended for no further work
-30690	Artifact scatter	—	Trash deposit	Historic	HICRIS Resource	Surface scatter of at least 30 historic glass bottles spread over a 15m x 14m long area; all bottles intact and none collected; site in fair condition and bottles likely discarded after 1946
-30691	Modified pond	—	Unknown/possible aquaculture	Unknown	HICRIS Resource	Collapsed lava sink containing brackish water and containing a stone retaining wall and a stone-edged spit; in poor to fair condition with modern debris around the pond; unknown function but possibly aquaculture
-30692	Lava tube with artifact scatter	—	Not specified	Historic	HICRIS Resource	Lava tube containing historic artifact scatter of complete glass bottles, jugs, and jars, metal drums, and other metal fragments; area disturbed by bulldozing in 1990s
-30693	Modified pond	—	Unknown	Unknown; possible historic?	HICRIS Resource	Collapsed lava sink containing brackish water and a small stone wall on southern edge; in fair condition, unknown function, and no cultural material found; wall was constructed after 1946 tsunami
-30694	Complex	2	Unknown	Historic	HICRIS Resource	Complex containing two features, concrete slab and series of seven concrete posthole footings; in poor to fair condition, unknown function, possible WWII military quarters as land was leased by U.S. military during that time

SIHP #	Site Type	# of Features	Function	Likely Age	Prior Study Reference/Source	Comment/description
50-10-35-30695	Artifact scatter	—	Trash deposit	Historic	HICRIS Resource	Surface scatter of large variety of historic cultural material including fragments of glass and ceramic, and modern trash; in poor condition, all artifacts broken or in fragments; function is a discard pile from 1940s and '50s
-30696	Wall segments	—	Boundary	Historic	HICRIS Resource	Three stone wall segments affected by bulldozing in 1990s; in poor condition, and no other cultural material observed; appears to have functioned as boundary walls marking a property constructed in historic period
-30697	Modified lava tube	—	Not specified	Not specified	HICRIS Resource	Modified lava tube that contains a low internal stone wall and small amounts of marine shell midden and charcoal; roughly L-shaped stone wall located to north of entrance
-30698	Wall	—	Boundary	Historic	HICRIS Resource	Roughly linear stone wall segment oriented north-south; in fair condition, no cultural material associated with it; likely used as boundary marker constructed after 1946 tsunami
-31077	Hilo Harbor	Unknown	Transportation	Historic/Modern	HICRIS Resource	HICRIS notes describe a 25.322-acre parcel containing three properties identified as the Quonset Hut, Pier 2/3 Shed, and the Water Tower
N/A (RC-0452-1	Complex	4	Habitation	Historic	Rechtman 2007	Four twentieth century features including three house foundations and small-scale commercial fishpond; assessed as significant under Criterion d; recommended for no further work



Figure 20. Photo overlooking the existing force main corridor along the northern side of the airport runway; view to west



Figure 21. Photo overlooking a portion of the existing force main corridor within the project area; view to south



Figure 22. Photo of Tree Works crew clearing vegetation along a portion of the existing force main corridor within the project area; view to southwest



Figure 23. Photo overlooking a recently cleared portion of the existing force main corridor within the project area; view to south

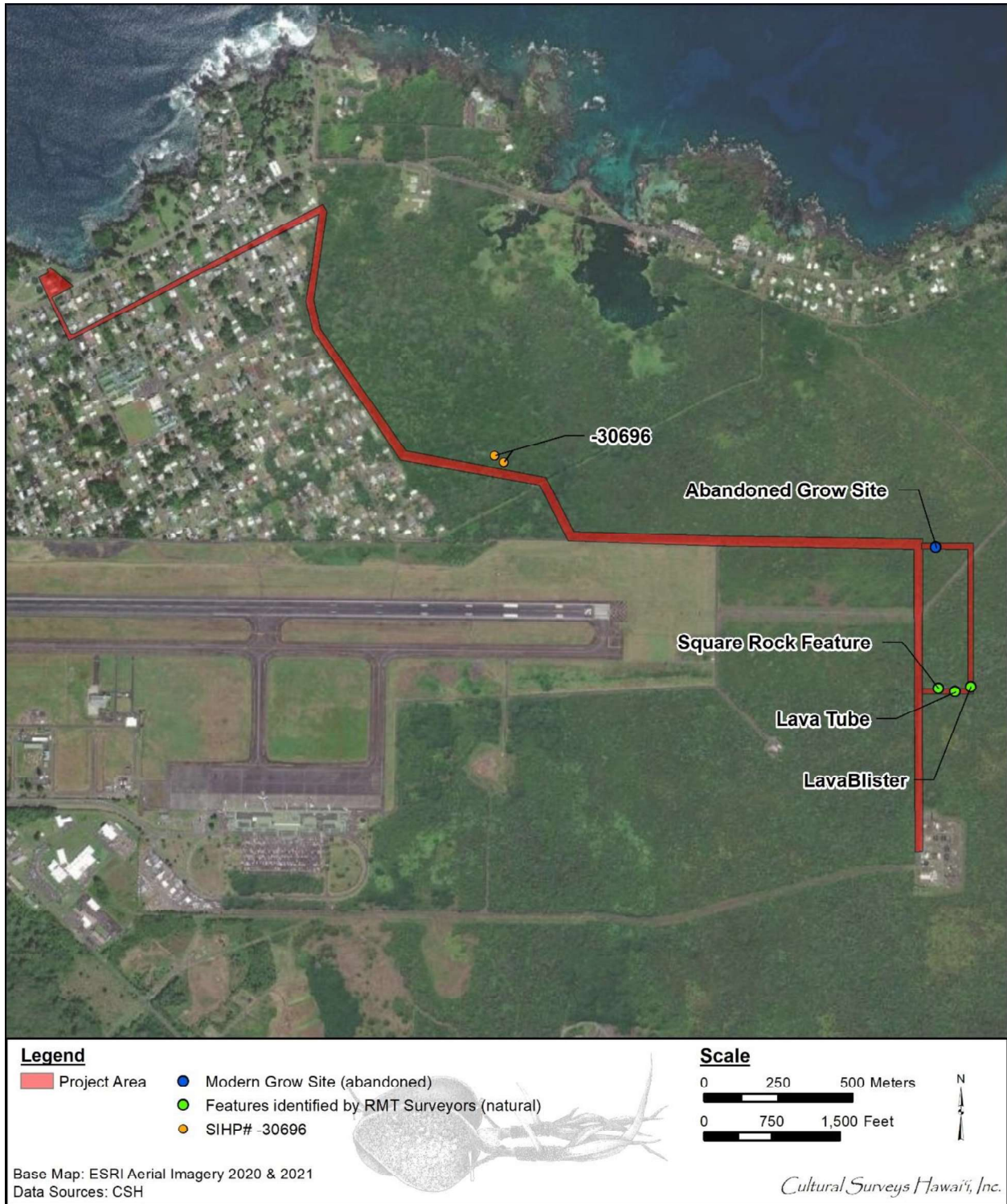


Figure 24. Aerial imagery (ESRI 2021 and 2022) showing points of interest identified and/or investigated during the field inspection; note no known or potential historic properties were identified within the project area



Figure 25. Photo showing one of the SIHP # -30696 rock wall remnants relocated near but outside the existing force main alignment; view to northeast



Figure 26. Photo showing one of the SIHP # -30696 rock wall remnants relocated near but outside the existing force main alignment; view to east



Figure 27. Photo showing vegetation along the northern leg of the proposed new force main alignment; note flag left by R.M. Towill survey crew; view to west



Figure 28. Photo showing vegetation within the uncleared eastern leg of the proposed new force main alignment; view to north



Figure 29. Photo overlooking the square-shaped rock feature identified by the surveyor; feature was determined to be a natural depression; view to east



Figure 30. Photo showing the entrance to the lava tube identified by the surveyor; feature was determined to lack cultural modification; view to southwest



Figure 31. Photo showing the interior of the lava tube identified by the surveyor; feature was determined to lack cultural modification; view to southwest



Figure 32. Photo showing the lava blister feature identified by the surveyor; feature was determined to lack cultural modification; view to north



Figure 33. Photo of black plastic grow bags at the abandoned modern grow site in the new force main alignment; view to south



Figure 34. Photo of glass bottles at the abandoned modern grow site in the new force main alignment; view to west



Figure 35. Photo overlooking a portion of the project corridor along Nahale-A Avenue; view to southwest



Figure 36. Photo overlooking a portion of the project corridor along Pua Avenue; view to southeast



Figure 37. Photo overlooking the fully developed Pua SPS facility along the coast near Puhi Bay; view to north



Figure 38. Photo overlooking the rear of the pump station and operations building at the Pua SPS facility; view to southeast



Figure 39. Photo overlooking the landscaped area in the northwestern portion of the Pua SPS facility; view to north



Figure 40. Photo overlooking the landscaped area, including a large monkeypod tree, in the southeastern portion of the Pua SPS facility; view to northwest



Figure 41. Photo showing the concrete structure located west of the pump station and operations building at the Pua SPS facility; view to south



Figure 42. Photo showing a parking area with a portable office building and container storage in the eastern portion of the Pua SPS; view to southeast



Figure 43. Photo looking up the driveway through the force main parcel; view to northwest



Figure 44. Photo overlooking the office building located in the southern portion of the force main parcel; view to east



Figure 45. Photo overlooking the concrete pond and storage structures within the force main parcel; the existing sewer easement extends from the driveway across the grassy area and between the storage structures to the SPS parcel; view to northeast



Figure 46. Photo overlooking the concrete pond and storage structures within the force main parcel; view to southeast

References Cited

Apple, R.A.

1965 *Trails: Stepping Stones to Kerbstones*. Bishop Museum Special Publication 53. Bishop Museum Press, Honolulu.

Barna, Benjamin

2016 *An Archaeological Inventory Survey of the Former Hilo Tropical Gardens Property, TMKs: (3) 2-1-015:017 and 055, Waiākea Ahupua'a, South Hilo District, Island of Hawai'i*. ASM Affiliates, Hilo, Hawai'i.

Bautista, Olivier M., Sarah Wilkinson, and Hallett H. Hammatt

2021 *Archaeological Literature Review and Field Inspection for the Hawaiian Cement Hilo Harbor Terminal Project, Waiākea Ahupua'a, South Hilo District, Hawai'i Island, TMKs: [3] 2-1-009:007 por., 043 por., and 053 por.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Blackwell, Chad and Jeanne Barnes

2014 *Historic Building Survey and Evaluation Report at Six Facilities, Hawai'i Army National Guard*. HDR, Honolulu.

Ching, Francis K.W. and Catherine Stauder

1974 *The Archaeology of South Hilo, Hawai'i: Archaeological Reconnaissance and Preliminary Historical Investigation of the Proposed 2 1/2 Mile Alignment (Alt. A) Between Keaukaha and the South Hilo–Puna Boundary*. Archaeological Research Center Hawai'i, Lāwa'i, Hawai'i.

Clark, John R.K.

1985 *Beaches of the Big Island*. University of Hawaii Press, Honolulu.

Condé, Jesse C. and Gerald M. Best

1973 *Sugar Trains: Narrow Gauge Rails of Hawai'i*. Glenwood Publishers, Felton, California.

Corbin, Alan A.

2007 *Archaeological Assessment Survey for SHPD Determination of "No Historic Properties Affected" HPM Building Supply Distribution Center, Land of Waiakea, South Hilo District, Island of Hawai'i (TMK:3-2-1-06:1)*. Paul H. Rosendahl, Ph.D., Inc, Hilo, Hawai'i.

Devereux, Thomas, Douglas Borthwick, and Hallett H. Hammatt

1997 *Archaeological Reconnaissance Survey of Keaukaha Military Reservation South Hilo District Hawai'i Island (Hawai'i National Guard) 503.6 acre parcel, TMK: 2-1-12:3 and 2-1-13:10*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Donn, John M.

1901 Hawaii Territory Survey map of Hawaii Island. Registered Map 2060. Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu. Available online at <http://dags.hawaii.gov/survey/search.php>

Drennan, Trisha M. and Glenn G. Escott

2008 *An Underwater Archaeological Reconnaissance and Historical Investigation of a Wreck Site Near Pier 3 in Hilo Bay, Ahupua'a of Waiākea, South Hilo District, Hawai'i Island, Hawai'i [TMK: (3) 2-1-7 POR.]*. Scientific Consultant Services, Inc., Honolulu.

Emerson, Nathaniel B.

1915 *Pele and Hi'iaka*. Reprinted copyright 1993. University of Hawai'i at Mānoa, Honolulu.

ESRI

2020, 2021 World Imagery. Esri, Redlands, California. Available online at www.arcgisonline.com/maps/World_Imagery

Fornander, Abraham

1916–1919 *Fornander Collection of Hawaiian Antiquities and Folk-lore*. Bishop Museum Memoirs, vols. IV–VI. Bishop Museum Press, Honolulu.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K.**Eischeid, and D.M. Delparte**

2013 Online Rainfall Atlas of Hawai'i. *Bulletin of the American Meteorological Society volume 94, pp. 313-316, doi: 10.1175/BAMS-D-11-00228.1*. Electronic document, <http://rainfall.geography.hawaii.edu>.

Groza, Randy, David W. Shideler, and Hallett H. Hammatt

2009 *Archaeological Literature Review and Field Inspection for the Proposed Richardson Ocean Park Improvements Project, Waiākea Ahupua'a, South Hilo District, Hawai'i Island, TMK [3] 2-1-019:010*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Hammatt, Hallett H. and Anthony Bush

2000 *Archaeological Inventory Survey of Selected Portions of the Hawai'i Army National Guard 503.6 acre Keaukaha Military Reservation, Waiākea Ahupua'a South Hilo District, Hawai'i Island*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Handy, E.S. Craighill and Elizabeth G. Handy

1972 *Native Planters in Old Hawai'i: Their Life, Lore, and Environment*. Bishop Museum Bulletin 233. Bernice Pauahi Bishop Museum, Honolulu.

Haun, Alan and Dave Henry

2000 *Archaeological Inventory Survey Hilo Harbor Facilities Expansion (TMK: 2-1-09:2, 12, 41, 42 & 2-1-07:20-37), Land of Waiākea, South Hilo District, Island of Hawai'i*. Haun and Associates, Kea'au, Hawai'i.

Hawai'i TMK Service

2010 Tax Map Keys [3] 2-1-011 and 2-1-013. Hawai'i TMK Service, Honolulu.

Hudson, Alfred E.

1932 *Archaeology of East Hawai'i*. Department of Anthropology manuscript, Bernice Pauahi Bishop Museum, Honolulu.

Kam, Wendall

1983 *Reconnaissance Survey Files: Unrecorded Heiau on State Lands, Waiākea, South Hilo, Hawai'i (TMK 2-1-07:11)*. State of Hawai'i Department of Land and Natural Resources, Historic Preservation Office, Honolulu.

Kamakau, S.M.

1961 *Ruling Chiefs of Hawai'i*. Kamehameha Schools Press, Honolulu.

Kelly, Marion, Barry Nakamura, and Dorothy B. Barrère

1981 *Hilo Bay: A Chronological History, Land and Water Use in the Hilo Bay Area, Island of Hawai'i*. Bernice Pauahi Bishop Museum, Honolulu.

King, R.D.

1931 Revised Keaukaha Tracts 1 and 2. R.D. King, Surveyor. Plat 0002-0HH. Hawai'i Land Survey Division, State of Hawai'i, Department of Accounting and General Services, Honolulu. Available online at <http://dags.hawaii.gov/survey/search.php>.

McEldowney, Holly

1979 *Archaeological and Historical Literature Search and Research Design: Lava Flow Control Study, Hilo, Hawai'i*. Department of Anthropology. Bernice Pauahi Bishop Museum, Honolulu.

Nogelmeier, M. Pukakea, translator

2006 *The Epic Tale of Hi'iakapoliopole*. Awaiaulu: Hawaiian Literature Project, Honolulu.

Rechtman, Robert B.

2007 *Archaeological Inventory Survey and Limited Cultural Assessment of the Koko Palms at Keaukaha Project Area (TMK:3-2-1-14:004 and 005) Waiakea Ahupua'a South Hilo District Island of Hawai'i*. Rechtman Consulting, Kea'au, Hawai'i.

2009 *Draft Archaeological Assessment Survey for the Proposed Hilo Bayfront Trails Project, Pi'ihonua, Punahoa, Pōnāhawai, Kūkūau, and Waiākea Ahupua'a, South Hilo District, Island of Hawai'i*. Rechtman Consulting, LLC, Hilo, Hawai'i.

Rosendahl, Margaret L.K.

1988 *Archaeological Reconnaissance Survey for Environmental Impact Statement (EIS) Hilo Wastewater Treatment Facility Site, Land of Waiakea, District of South Hilo, Island of Hawaii (TMK:2-1-13:Por.12,13,20,22)*. Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Sato, H., Warren Ikeda, Robert Paeth, Richard Smythe, and Minoru Takehiro, Jr.

1973 *Soil Survey of the Island of Hawaii*. U.S. Department of Agriculture and University of Hawai'i Agricultural Experiment Station.

Thrum, Thomas G.

1923 *More Hawaiian Folk Tales*. A.C. McClurg & Company, Chicago, Illinois.

USDA (U.S. Department of Agriculture)

2001 Soil Survey Geographic (SSURGO) database. U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/>.

USGS (U.S. Geological Survey)

- 1914 Waiakea USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.
- 1963 Hilo USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.
- 1977 Orthophoto, Hilo, Hawai'i. USGS Information Services, Denver, Colorado.
- 1995 Hilo USGS 7.5-minute topographic quadrangle. USGS Information Services, Denver, Colorado.

Waihona 'Aina

- 2022 *The Māhele Database*. Electronic document, <http://waihona.com>.

Wall, Walter A.

- 1886 Hawai'i Island. W.A. Wall, Surveyor. Registered Map 1438. Hawai'i Land Survey Division, State of Hawai'i, Department of Accounting and General Services, Honolulu. Available online at <http://dags.hawaii.gov/survey/search.php>.

Wall, Walter E.

- 1915 Hawai'i Island. W.E. Wall, Surveyor. Registered Map 1808. Hawai'i Land Survey Division, State of Hawai'i, Department of Accounting and General Services, Honolulu. Available online at <http://dags.hawaii.gov/survey/search.php>.

Webster, William

- 1851 Waiākea. [Map] William Webster, Surveyor. Registered Map 524. Hawai'i Land Survey Division, State of Hawai'i, Department of Accounting and General Services, Honolulu. Available online at <http://dags.hawaii.gov/survey/search.php>.

Wheeler, Momi, Olivier Bautista, Sarah Wilkinson, and Hallett H. Hammatt

- 2014 *Archaeological Inventory Survey and Monitoring Plan, Phase I, Keaukaha Military Reservation (KMR) Hawai'i Army National Guard Facility Waiākea Ahupua'a, South Hilo District, Island of Hawai'i, TMKs: [3] 2-1-012:003, 131 and [3] 2-1-013:010*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Wilkinson, Sarah, Olivier M. Bautista, and Hallett H. Hammatt

- 2016 *Archaeological Inventory Survey, Phase II, Keaukaha Military Reservation (KMR) Hawai'i Army National Guard Facility Waiākea Ahupua'a, South Hilo District, Island of Hawai'i, TMKs: [3] 2-1-012:003 and [3] 2-1-013:010*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.
- 2019 *Archaeological Inventory Survey Report for the Proposed Richardson Ocean Park Improvements Project, Waiākea Ahupua'a, South Hilo District, Hawai'i Island, TMK: [3] 2-1-019:010*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Wilkinson, Sarah and Hallett H. Hammatt

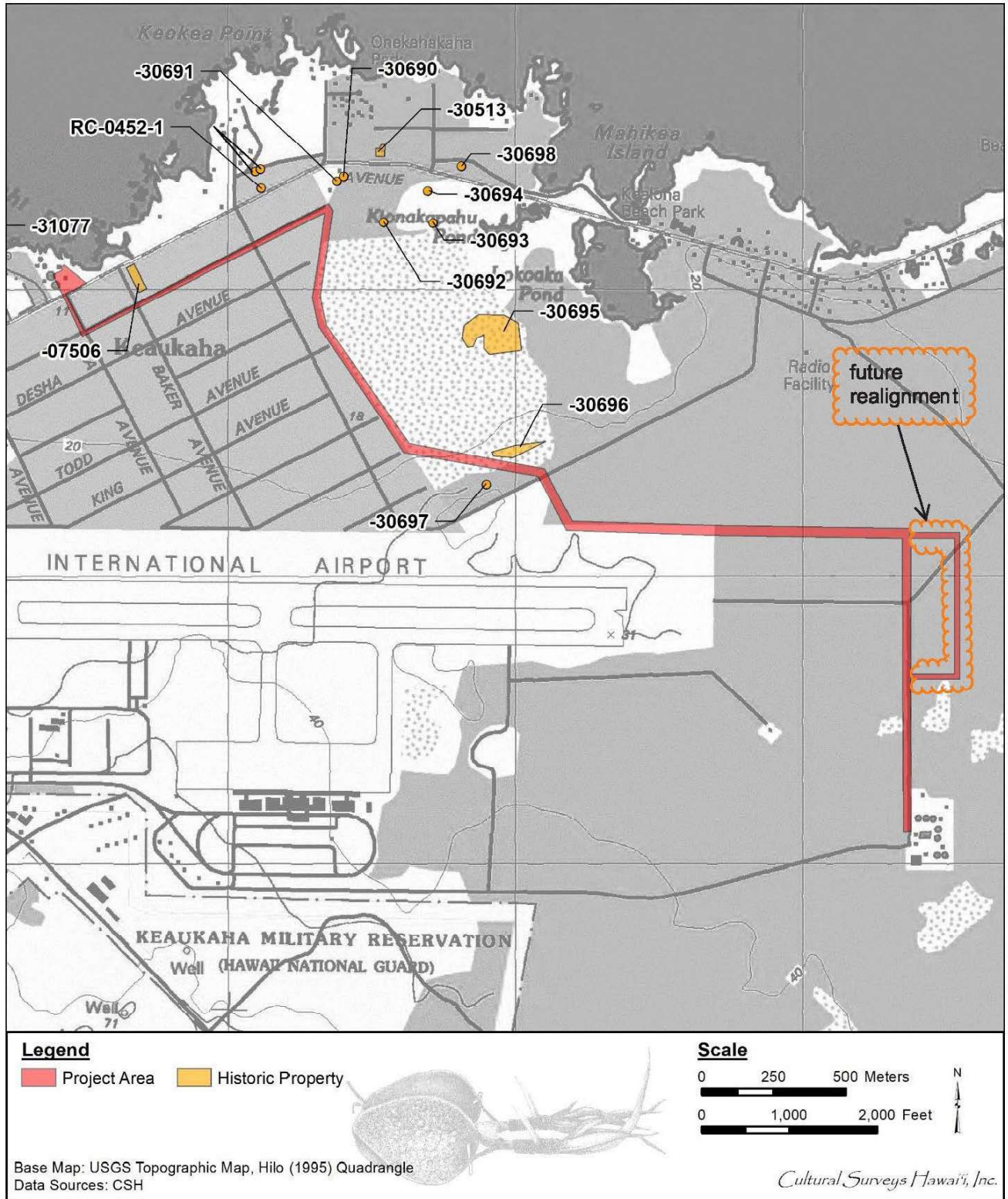
- 2020 *Archaeological Literature Review and Field Inspection for the Keaukaha Elementary School Miscellaneous Repairs and Maintenance FY2010 Project, DOE Job No.: P11055-10, Waiākea Ahupua'a, South Hilo District, Hawai'i Island, TMK: [3] 2-1-020:001 por.* Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Wilkinson, Sarah, Aulii Mitchell, and Hallett H. Hammatt

2012 *Archaeological Literature Review and Field Inspection for the Proposed Kumau Street Entrance Improvements, Pier 4, Hilo Harbor, Waiākea Ahupua a, South Hilo District, Island of Hawai'i TMK: (3) 2-1-007*. Cultural Surveys Hawai'i, Inc., Kailua, Hawai'i.

Attachment E

Attachment E. Historic Properties Previously Documented Within 500 m of APE



Attachment F

SECTION 106 CONSULTATION CONTACT LIST
PUA FORCE MAIN INSTALLATION AND REHABILITATION
(CLEAN WATER STATE REVOLVING PROJECT PRIORITY LIST NO. C150062-43)

Representative	Affiliation/Organization	Contact Information
SHPO Contact		
Dr. Downer, Alan	SHPO Administrator	Kakuhiewa Building 601 Kamokila Blvd., Suite 555 Kapolei, HI 96707 Phone: 808-692-8015 Fax: 808-692-8020 E-mail: alan.s.downer@hawaii.gov (submit via HICRIS)
NHO Contacts		
Aila, William Jr.	Chairman, Hawaiian Homes Commission	P.O. Box 1879, Honolulu, Hawai'i, 96805 william.j.ailajr@hawaii.gov
Almeida, Antoinette Kaulani	President, Panaewa Hawaiian Home Lands Community Association	132 Kaieie Place, Hilo, HI 96720 (808) 938-3330 panaewahlca@gmail.com
Anthony, Kamala	Leleiwi Community Association; Hui Ho'oleimaluō	@ LCA: 19 Iwalani Street, Hilo, HI 96720 @ Hui Ho'oleimaluō: 2306 Kalani'ana'ole Street, Hilo, HI 96720 kamala.anthony@huihooleimaluo.com (808) 430-2032
Brown, Samson	President, Au Puni o Hawaii	apohi21@gmail.com 21 Pohai Street Hilo, HI 96720
Farden, Hailama	President, Association of Hawaiian Civic Clubs	PO Box 1135 Honolulu, HI 96807 ahcc.nuhou@gmail.com

Representative	Affiliation/Organization	Contact Information
Fergertstrom, Hanalei	Spokesperson, Na Kupuna Moku O Keawe	P.O. Box 951 Kurtistown, HI 96760 (808) 938-9994 hankhawaiian@yahoo.com
Hanohano, Pi'ilani	Government Relations Coordinator, Kamehameha Schools - Community Relations and Communications Group, Government Relations	567 South King Street, Ste 400 Honolulu, HI 96813 (808) 523-6368 pihanoha@ksbe.edu
Hiraishi, Michelle Malia	Executive Director, Hui Mālama Ola Nā 'Ōiwi	69 Railroad Ave, Ste A-3 Hilo, HI 96720 (808) 969-9220 michelle@huimalamahawaii.com
Dr. Hussey, Sylvia Cc: Kamakana Ferreira (Lead Compliance Specialist), Lauren Morawski (Compliance Archaeologist), Shane Nelson (Community Outreach Advocate)	Chief Executive Officer, Office of Hawaiian Affairs	560 N. Nimitz Hwy. Suite 200 Honolulu, HI 96817 808-594-1835 kamakanaf@oha.org laurenm@oha.org shanen@oha.org
Kahawaiolaa, Patrick L.	President, Keaukaha Community Association	P.O. Box 5146, Hilo, HI 96720 (808) 937-8217 kcaiprez@gmail.com
Lewis, Joseph Kūhiō Lewis	CEO, Council for Native Hawaiian Advancement	91-1270 Kinoiki Street, Building 1 Kapolei, HI 96707 (808) 596-8155 info@hawaiiancouncil.org

Representative	Affiliation/Organization	Contact Information
Mahoney, Scott c/o Jordan Calpito and Christian Omerod, SHPD Burial Sites Specialists Cc: Traven Apiki (HIIBC Hilo Representative)	Chair, Hawai'i Island Burial Council	SHPD Hilo Office 40 Po'okela Street Hilo, HI 96720 (Also be sure to email the letter to jordan.v.calpito@hawaii.gov and christian.omerod@hawaii.gov as SHPD staff have been working remotely)
Napeahi, Terri	Aha Moku Council, Hilo Representative	tnpeahi@yahoo.com
Rodrigues, Vincent Hinano	SHPD History & Culture Branch Chief	130 Mahalani Street Wailuku, Hawai'i 96793 (808) 243-4640 (808) 243-5838 (f) Hinano.R.Rodrigues@hawaii.gov
Trask, Mililani	Convenor, Na Koa Ikaika Ka Lahui Hawaii	PO Box 6377 Hilo, HI 96720 (808) 961-4811 mililani.trask@icllchawaii.com
Wise, Taffi	Executive Director, Kanu o ka 'Aina Learning 'Ohana	PO Box 6511 Kamuela, HI 96743 (808) 887-1117 taffi@kalo.org
Dr. Wong-Wilson, Noe Noe	President, Hawaiian Civic Club of Hilo	PO Box 592 Hilo, HI 96720
--	Keaukaha Pana'ewa Farmers Association	P.O. Box 6844 Hilo, HI 96720 kp.farmers@gmail.com
	Department of Hawaiian Home Lands – East Hawaii District	160 Baker Avenue Hilo, HI 96720 DHHL.contactcenter@hawaii.gov