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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF: OCCL: AJR

CDUA: HA-3830

NOV - 9 2018

Scott Glenn, Director
Office of Environmental Quality Control
Department of Health, State of Hawaii
235 S. Beretania Street, Room 702
Honolulu, Hawaii 96813

SUBJECT: **PUBLICATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE PROPOSED RAMOS SINGLE FAMILY RESIDENCE PROJECT**
Piha, North Hilo District, Island of Hawaii
TMK: (3) 3-2-004:038

Dear Mr. Glenn,

With this letter, the Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) hereby transmits the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI) for the proposed *Ramos Single Family Residence Project* located on TMK: (3) 3-2-004:038 in Piha, North Hilo District, Island of Hawaii for publication in the **November 23, 2018** edition of the *Environmental Notice*.

RECEIVED
2018 NOV 9 P 3:00
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Enclosed is a completed OEQC Publication Form, one (1) copy of the DEA-AFONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

If there are any questions regarding this letter, please contact Alex J. Roy, M.Sc. of our Conservation and Coastal Lands staff, at 808-587-0316.

Sincerely,

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

Attachments: *OEQC Publication Form*
DEA-AFONSI (1 copy)
CD-RW w/ Pub Form, DEA-AFONSI

19-154

APPLICANT
PUBLICATION FORM

Project Name:	Ramos Single-Family Residence in the Conservation District at Pīhā
Project Short Name:	Ramos Residence at Pīhā
HRS §343-5 Trigger(s):	Use of Land in Conservation District
Island(s):	Hawai'i
Judicial District(s):	North Hilo
TMK(s):	3-3-2-004:038
Permit(s)/Approval(s):	
Approving Agency:	Hawai'i State Department of Land and Natural Resources
Contact Name, Email, Telephone, Address	Sam Lemmo, Administrator, DLNR-OCCL 808-587-0377 dlnr.occl@hawaii.gov DLNR- Office of Conservation and Coastal Lands 1151 Punchbowl Street, Room 131 Honolulu HI 96813
Applicant:	
Contact Name, Email, Telephone, Address	Pedro Pablo Ramos 3193 Scrub Oak Trail Oviedo, Florida 32765-9743 C/O James Leonard 808-896-3459; jmleonard.mac.com
Consultant:	
Contact Name, Email, Telephone, Address	Ron Terry, Geometrician Associates LLC 808-969-7090 rterry@hawaii.rr.com P.O. Box 396 Hilo, Hawai'i 96721

Status (select one)	**Submittal Requirements**
_x_ DEA-AFNSI	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEA, and 4) a searchable PDF of the DEA; a 30-day comment period follows from the date of publication in the Notice.
___ FEA-FONSI	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; no comment period follows from publication in the Notice.
____ FEA-EISPN	Submit 1) the approving agency notice of determination/transmittal letter on agency letterhead, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEA, and 4) a searchable PDF of the FEA; a 30-day comment period follows from the date of publication in the Notice.
____ Act 172-12 EISPN ("Direct to EIS")	Submit 1) the approving agency notice of determination letter on agency letterhead and 2) this completed OEQC publication form as a Word file; no EA is required and a 30-day comment period follows from the date of publication in the Notice.
____ DEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the DEIS, 4) a searchable PDF of the DEIS, and 5) a searchable PDF of the distribution list; a 45-day comment period follows from the date of publication in the Notice.
____ FEIS	Submit 1) a transmittal letter to the OEQC and to the approving agency, 2) this completed OEQC publication form as a Word file, 3) a hard copy of the FEIS, 4) a searchable PDF of the FEIS, and 5) a searchable PDF of the distribution list; no comment period follows from publication in the Notice.
____ FEIS Acceptance Determination	The approving agency simultaneously transmits to both the OEQC and the applicant a letter of its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS; no comment period ensues upon publication in the Notice.
____ FEIS Statutory Acceptance	The approving agency simultaneously transmits to both the OEQC and the applicant a notice that it did not make a timely determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and therefore the applicant's FEIS is deemed accepted as a matter of

law.

____ Supplemental EIS Determination — The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is or is not required; no EA is required and no comment period ensues upon publication in the Notice.

____ Withdrawal — Identify the specific document(s) to withdraw and explain in the project summary section.

____ Other — Contact the OEQC if your action is not one of the above items.

Project Summary

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

Pedro Ramos plans a single-family residence on his 18.3-acre Conservation District property near Ninole, Island of Hawai`i. The home would have a total of 3,554 square feet of developed area including a great room with kitchen, 2 bedrooms, 2 baths, several lanai, a carport, and a water tank. Other features include an improved driveway, solar panels, and an individual wastewater system. The location of structures and the driveway has been planned to maximize use of already disturbed area. Landclearing over less than a quarter-acre would produce short-term impacts to noise, air and water quality, and scenery, mitigated by Best Management Practices. A botanical survey has determined that no threatened or endangered plant species are present. The native ʻōhiʻa and tree ferns scattered in the area will be almost completely conserved, and invasive strawberry guava, eucalyptus and various melastomes will be removed to make way for native and Polynesian species meant to provide an attractive setting near the home and restore native forest surrounding it. Impacts to the islandwide-ranging endangered Hawaiian hoary bat and Hawaiian hawk will be avoided through vegetation removal timing. An archaeological survey has been conducted that found no archaeological sites, and a cultural impact assessment has determined that no cultural site or practices would be affected.

Draft Environmental Assessment

Ramos Single-Family Residence in the Conservation District at Pīhā

October 2018

TMK (3rd): 3-2-004:038
Pīhā, North Hilo District, County of Hawai‘i, State of Hawai‘i

APPLICANT:

Pedro Pablo Ramos
3193 Scrub Oak Trail
Oviedo, Florida 32765-9743

DETERMINING AGENCY:

State of Hawai‘i
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
1151 Punchbowl Street, Room 131
Honolulu, Hawai‘i 96813

CONSULTANT:

Geometrician Associates LLC
P.O. Box 396
Hilo, Hawai‘i 96721

Draft Environmental Assessment

Ramos Single-Family Residence in the Conservation District at Pīhā

TMK (3rd): 3-2-004:038
Pīhā, North Hilo District, County of Hawai‘i, State of Hawai‘i

APPLICANT:

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CONSULTANT:

Geometrician Associates LLC
P.O. Box 396
Hilo, Hawai‘i 96721

CLASS OF ACTION:

Use of Land in Conservation District

This document is prepared pursuant to:
The Hawai‘i Environmental Protection Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules (HAR)

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SUMMARY OF PROJECT, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Pedro Ramos (the applicant) seeks a Conservation District Use Permit (CDUP) to build a single-family residence on a portion of his 18.3-acre property at the end of a driveway that extends from near the *mauka* end of Pīhā-Kahuku Road. The property abuts the Hilo Forest Reserve, at 1,800 feet in elevation, in the North Hilo District of the Island of Hawai‘i. The plan for the home consists of a split-level structure with 2 bedrooms; 2 baths; a great room with a kitchen, dining and living area; a foyer; a wardrobe/laundry; several lanai; a hot tub; and a carport. Around the home will be an array of ground and roof-mounted solar photovoltaic panels, a satellite telecommunications dish, a water catchment system consisting of a 10,000 gallon tank and a 5,000-gallon tank; a pump room; a propane storage tank; a back-up electrical generator and an individual wastewater system meeting or exceeding all regulatory requirements. The total developed area as defined under the Conservation District rules is 3,554 square feet.

The location of structures and the driveway has been planned to maximize use of already disturbed area and minimize disturbance of native vegetation. A botanical survey has determined that no threatened or endangered plant species are present. Clearing timing restrictions will help prevent impacts to endangered Hawaiian hoary bats and Hawaiian hawks, which are widely distributed throughout the island of Hawai‘i. An archaeological survey has been conducted that found no archaeological sites, and a cultural impact assessment has determined that no cultural site or practices would be affected. The surroundings are heavily forested and there are no views of the building site from other properties, except for the edge of State land directly *mauka*. No scenic impacts would occur. Landclearing would be minimal and occur over about a quarter-acre, with very minor short-term impacts to noise, air and water quality and scenery. These would be mitigated by Best Management Practices associated with the CDUP and grading permit. The applicant will ensure that all earthwork and grading conform to applicable laws, regulations and standards. In the unlikely event that additional undocumented archaeological resources, including shell, bones, midden deposits, lava tubes, or similar finds, are encountered during construction within the project site, work in the immediate area of the discovery will be halted and the State Historic Preservation Division will be contacted to determine the appropriate actions.

PART 1: PROJECT DESCRIPTION AND E.A. PROCESS

1.1 Project Description and Location

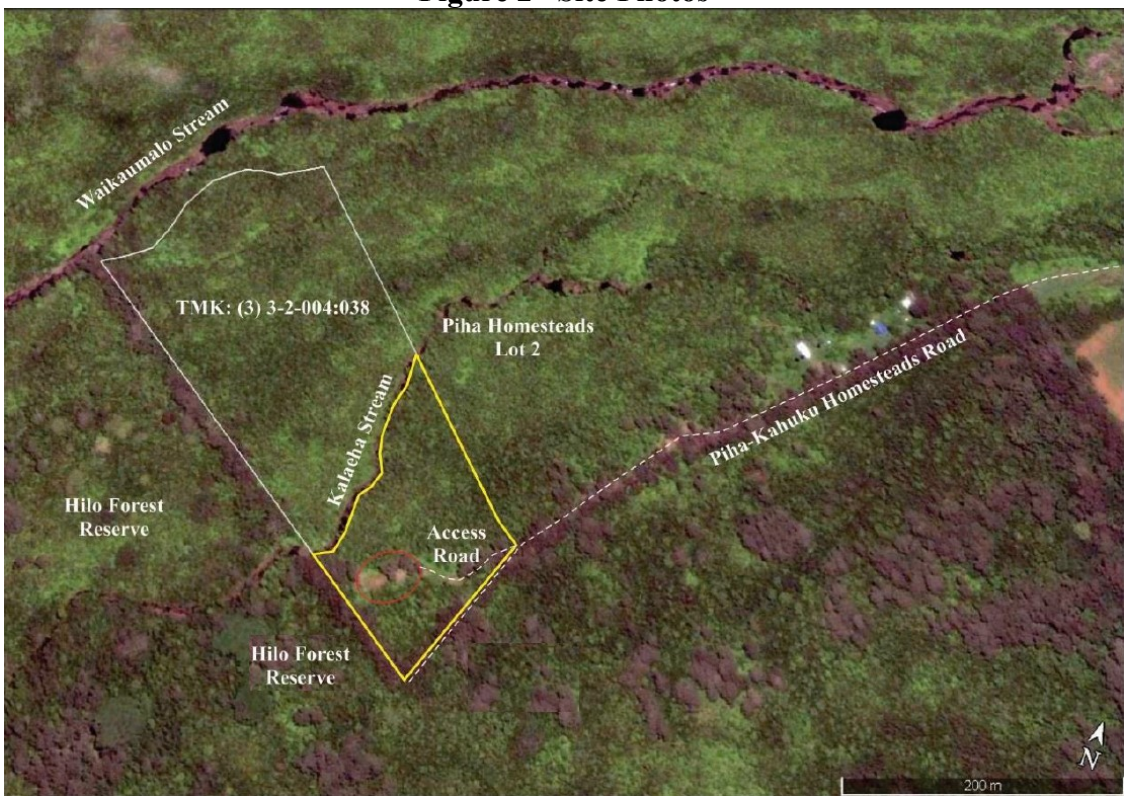
Pedro Ramos (the applicant) seeks a Conservation District Use Permit (CDUP) to build a single-family residence on a portion of his 18.3-acre property at the end of a driveway that extends from near the *mauka* end of Pīhā-Kahuku Road. The property abuts the Hilo Forest Reserve, at 1,800 feet in elevation, in the North Hilo District of the Island of Hawai‘i (Figures 1-2). The plan for the home consists of a split-level structure with 2 bedrooms; 2 baths; a great room with a kitchen, dining and living area; a foyer; a wardrobe/laundry; several lanai; a hot tub; and a carport (see Site Plan, Floor Plan and Elevation in Figure 3). Around the home will be an array of ground and roof-mounted solar photovoltaic panels, a satellite telecommunications dish, a water catchment system consisting of a 10,000 gallon tank and a 5,000-gallon tank; a pump room; a propane storage tank; a back-up electrical generator and an individual wastewater system meeting or exceeding all regulatory requirements (sf).

The location of structures and the driveway has been being planned to minimize disturbance of native vegetation and maintain a wide setback to a nearby gulch. Landclearing would be minimal in depth and extend over about a quarter-acre. A house pad and turnaround area will be built and minor improvements will be made to the driveway. As shown in the Landscape Plan sheet of Figure 3, the native ‘ōhi‘a and tree ferns scattered in the area will be almost completely conserved. Invasive plants, including strawberry guava, eucalyptus and various melastomes, will be removed to make way for native and Polynesian species meant to provide an attractive setting near the home and restore native forest surrounding it. About a dozen mostly juvenile ‘ōhi‘a trees in the house site that are bound up in the roots of the eucalyptus trees require removal, but at least six new ōhi‘a trees will be planted in the landscaping surrounding the house. A small area of already disturbed land will be set aside for a garden of vegetables in raised planter beds, and various fruit trees will be planted. The driveway will be gated, and a pig-proof hogwire fence will enclose the home and about a half-acre surrounding it to prevent pig damage.

Currently, there is limited access from Pīhā-Kahuku Road for those who wish to hunt or gather in the Hilo Forest Reserve, which lies *mauka* of the Ramos property. Consultation with neighbors, DLNR officials and others indicates that people park along various spots in the road and walk along trails that wind through various private properties as well as the paper route of the Pīhā-Kahuku Road extension until they are in the Forest Reserve. Mr. Ramos will provide a turnaround area just outside the gate on the driveway near the *makai* boundary of the property, where the driveway and the Pīhā-Kahuku Road diverge, to accommodate those seeking to access the Forest Reserve.

Figure 1 Project Location Map

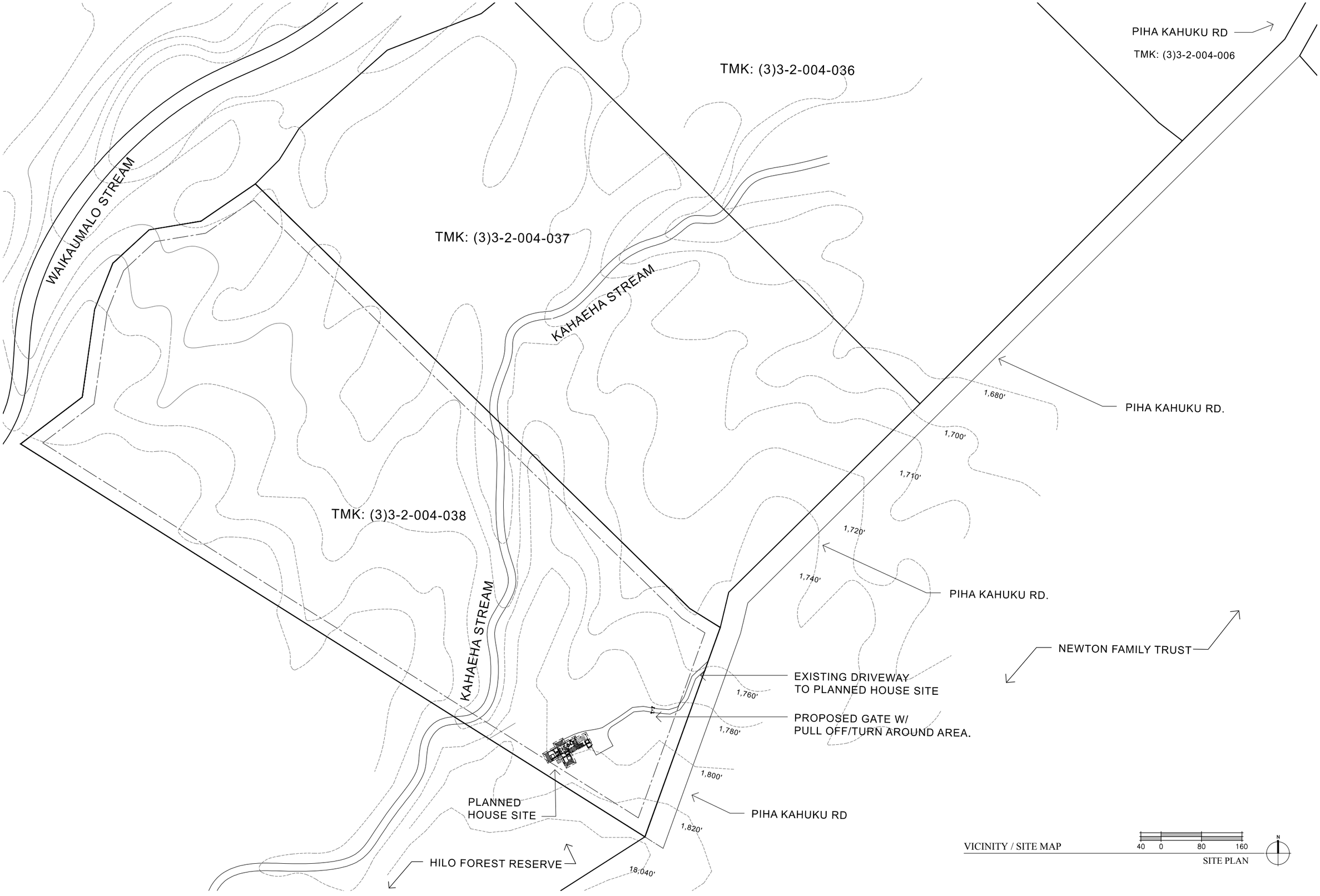
Figure 2 Site Photos

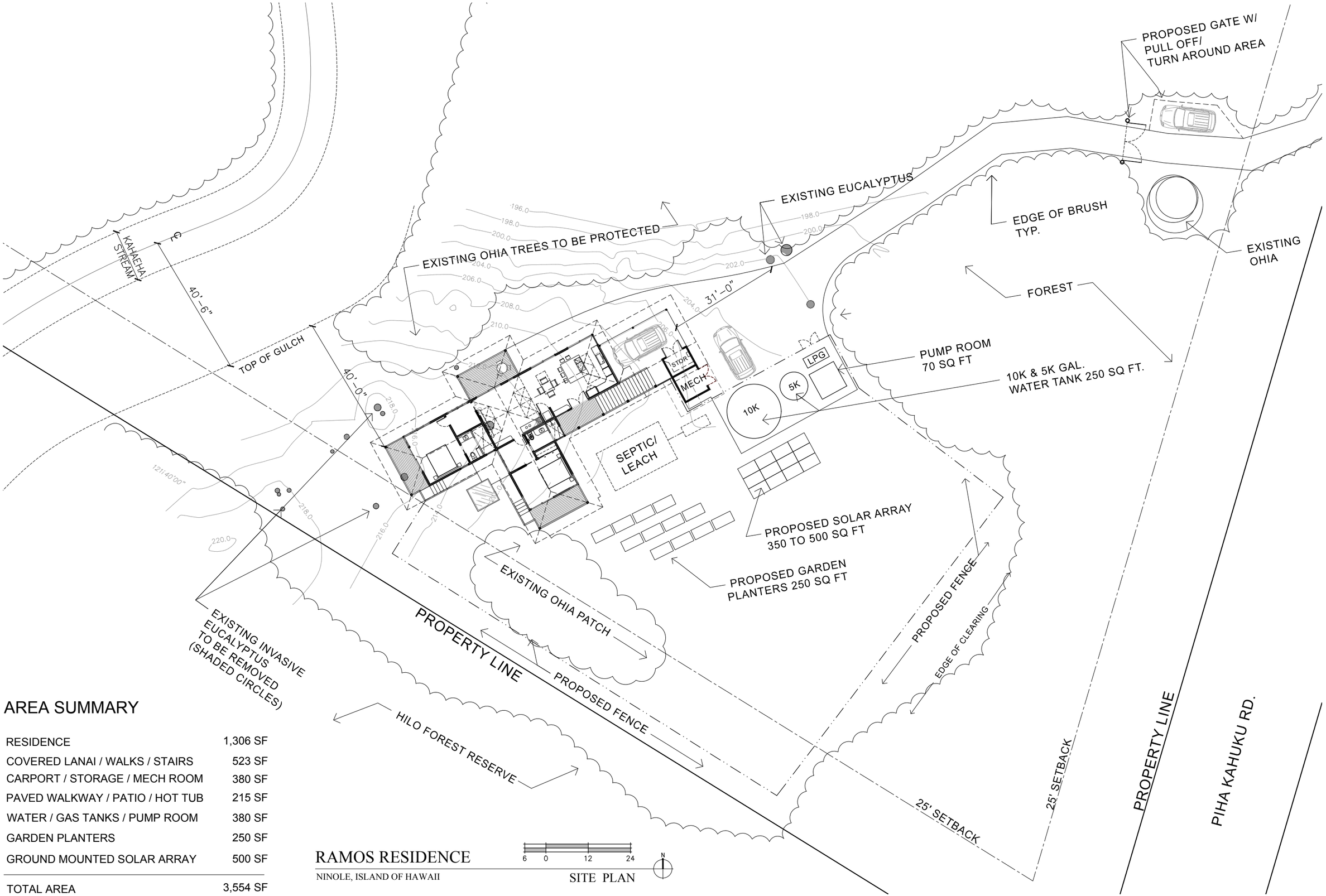


2a, Above: Aerial Image with Property Boundary from Google Earth ©
2b, Below: Proposed house site and eucalyptus trees beyond

Figure 2. Site Photos

2c, Above: View to NE at the end of driveway toward proposed driveway/parking area. 2d, Below: Driveway below house site


PIHA KAHUKU RD
TMK: (3)3-2-004-006
TMK: (3)3-2-004-036
TMK: (3)3-2-004-037
TMK: (3)3-2-004-038
WAIKAUMALO STREAM
KAHAEHA STREAM
KAHAEHA STREAM
PIHA KAHUKU RD.
PIHA KAHUKU RD.
NEWTON FAMILY TRUST
EXISTING DRIVEWAY
TO PLANNED HOUSE SITE
PROPOSED GATE W/
PULL OFF/TURN AROUND AREA.
PLANNED
HOUSE SITE
PIHA KAHUKU RD
HILO FOREST RESERVE
1,680'
1,700'
1,710'
1,720'
1,740'
1,760'
1,780'
1,800'
1,820'
18,040'
VICINITY / SITE MAP
40 0 80 160
SITE PLAN
N



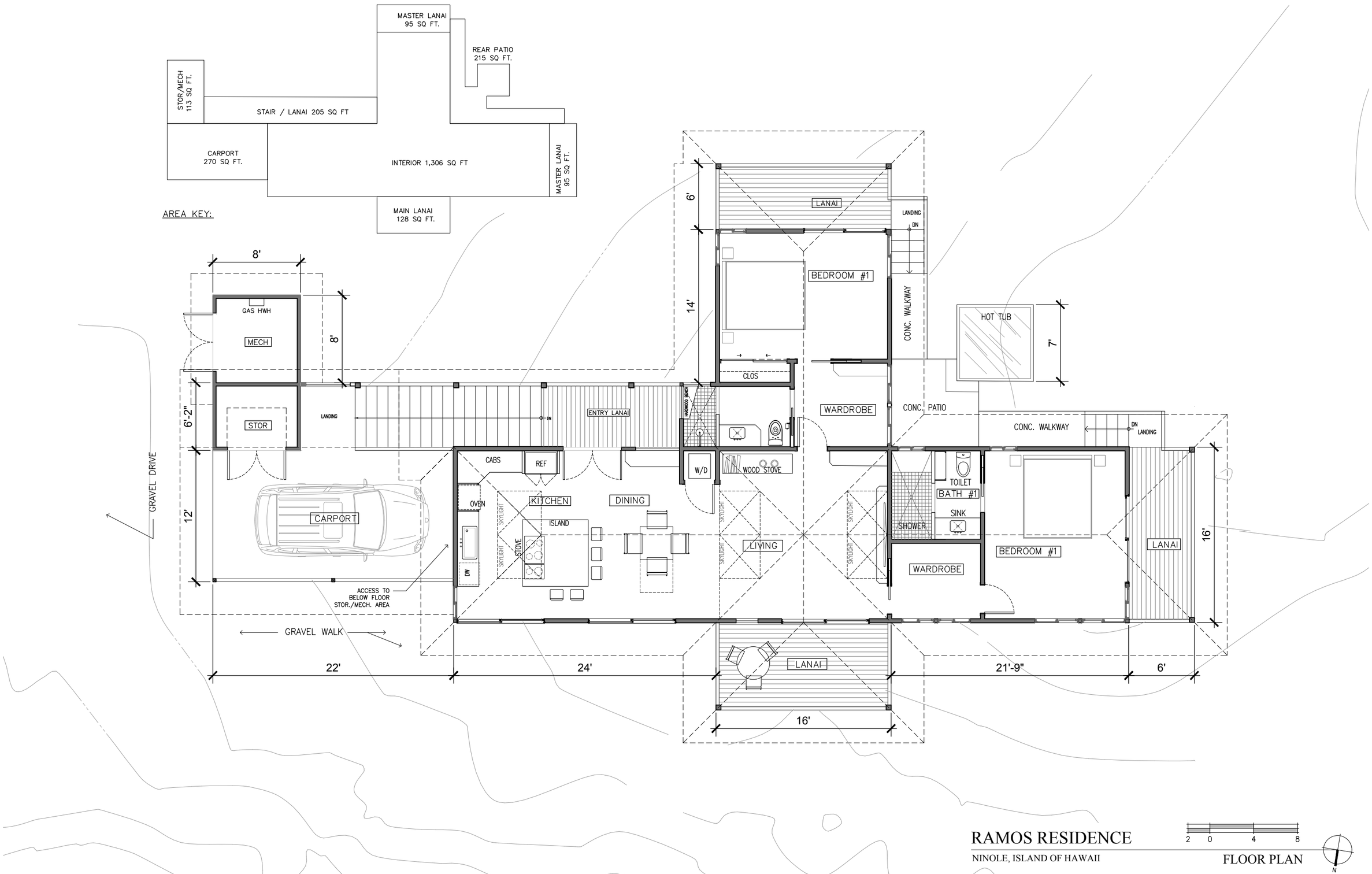
AREA SUMMARY

RESIDENCE	1,306 SF
COVERED LANAI / WALKS / STAIRS	523 SF
CARPORT / STORAGE / MECH ROOM	380 SF
PAVED WALKWAY / PATIO / HOT TUB	215 SF
WATER / GAS TANKS / PUMP ROOM	380 SF
GARDEN PLANTERS	250 SF
GROUND MOUNTED SOLAR ARRAY	500 SF
TOTAL AREA	3,554 SF

RAMOS RESIDENCE

NINOLE, ISLAND OF HAWAII

SITE PLAN



RAMOS RESIDENCE

NINOLE, ISLAND OF HAWAII

2 0 4 8

FLOOR PLAN

N

RAMOS RESIDENCE

NINOLE, ISLAND OF HAWAII

2 0 4 8

SOUTH ELEVATION

RAMOS RESIDENCE

NINOLE, ISLAND OF HAWAII

2 0 4 8

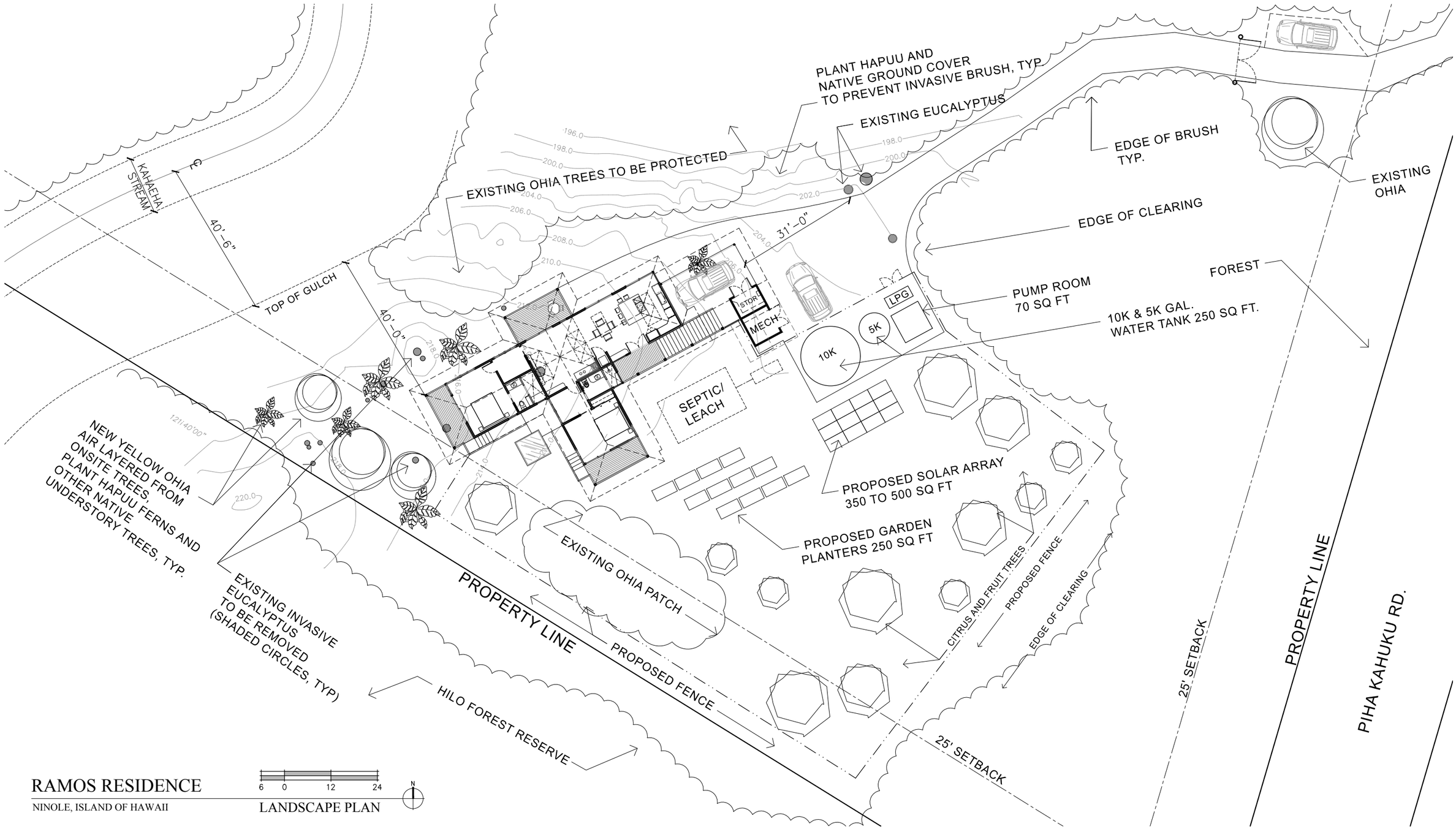
EAST ELEVATION

EXISTING TREES/PLANTS
Manono (Kadua spp.), Hame (Antidesma Pulvinatum), ‘Ōhi‘a, and Hapu‘u pulu.

PROPOSED NATIVE TREES TO BE PLANTED:
Ohia, Kopiko (Psychotria sp.), Kanawao (Broussaisia arguta), Kolea (Myrsine spp.), manono (Kadua spp.), and Hame (Antidesma Pulvinatum)

PROPOSED GROUNDCOVER TO BE PLANTED:
Lauai Fern, 'Uki'uki, and Pohinahina

PROPOSED FRUIT TREES:
Mango, Avocado, Banana, Soursop, Rambutan, Citrus (lemon, lime orange, mandarin orange, etc.), Pomegranate, Cacao, Mountain apple, and Ulu (breadfruit).



RAMOS RESIDENCE
NINOLE, ISLAND OF HAWAII
LANDSCAPE PLAN

1.2 Environmental Assessment Process

This Environmental Assessment (EA) process is being conducted in accordance with Chapter 343 of the Hawai‘i Revised Statutes (HRS). This law, along with its implementing regulations, Title 11, Chapter 200, of the Hawai‘i Administrative Rules (HAR), is the basis for the environmental impact assessment process in the State of Hawai‘i. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the anticipated finding that no significant impacts are expected to occur, based on the preliminary findings for each criterion made by the consultant in consultation with the Hawai‘i State Department of Land and Natural Resources, the determining agency. If, after considering comments to the Draft EA, DLNR concludes that, as anticipated, no significant impacts would be expected to occur, then the agency will issue a Finding of No Significant Impact (FONSI), and the action will be permitted to proceed to other necessary permits. If the agency concludes that significant impacts are expected to occur as a result of the proposed action, then an Environmental Impact Statement (EIS) will be prepared.

1.3 Public Involvement and Agency Coordination

The following agencies, organizations and individuals have been consulted during the Environmental Assessment Process:

County:

Planning Department	County Council	Civil Defense Agency
Fire Department	Department of Public Works	Police Department

State:

Department of Health, Environmental Planning Office
Department of Land and Natural Resource (DLNR), Land Division, DOFAW and OCCL
Office of Hawaiian Affairs

Private:

Sierra Club
Three Nearby Property Owners: Newton, Mata, Sanderson

Copies of communications received during early consultation are contained in Appendix 1a.

PART 2: ALTERNATIVES

2.1 Proposed Project, Alternative House Sites and Alternative Uses

The proposed project and its location are described in Section 1.1 above and illustrated in Figures 1-3. The location of the home site, in a longstanding clearing at the end of a driveway, was chosen because it is on a slightly flattened ridge and minimizes disturbance to topography and surrounding vegetation.

A number of other locations on the property could also theoretically serve as the site for a residence, but all would require significantly more clearing, and most would be closer to streams. Given the soil, vegetation and slopes, minimal clearing is a key consideration for the home site. There is no known environmental or other reason for seriously considering other sites on the property.

No other alternative uses for the property that are identified in the Conservation District Rules, such as a farm or a commercial nature park, are desired by the applicant, and thus none are addressed in this EA.

2.2 No Action

Under the No Action Alternative, the residence would not be built. The lot would remain unused, except for temporary camping and picnicking by the owner. This EA considers the No Action Alternative as the baseline by which to compare environmental effects from the project.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION

The 18.3-acre property is located at the *mauka* (southeastern, in this case) end of Pīhā-Kahuku Road, at 1,800 feet in elevation. A number of farms and residences, as well as water supply and communication facilities, are present on Pīhā-Kahuku Road, which is a County-owned and maintained facility for most of its length. The property is bordered by Waikaumalo Stream on the northwest, by the Pīhā Section of the Hilo Forest Reserve on the southwest, and by other private properties on the northeast and southeast. The term project site is used to mean the proposed driveway and house-pad area that will be affected by the proposed action, while the term project area is flexibly used to denote the broader Hāmākua Coast or, in some cases, the Island of Hawai‘i.

3.1 Physical Environment

3.1.1 Climate, Geology, Soils and Geologic Hazards

Environmental Setting

The project site receives an average of about 205 inches of rain annually, with a mean annual temperature of approximately 68 degrees Fahrenheit (Giambelluca et al 2014; UH Hilo-Geography 1998:57). Winds in the area are dominantly northeast trades, replaced periodically by winds with a southerly component that often bring with them volcanic haze, or vog (UH Hilo 1998).

The project site is on the southeastern flank of Mauna Kea. The lava flows that underlie it are dated from prior to 14,000 years before the present (BP), although areas several miles upslope have surface flows dated from as recently as 4,000 to 10,000 years BP (Wolfe and Morris 1996). All lava flows in this area are mantled with a thick layer of volcanic ash derived from Kohala and Mauna Kea volcanoes (USGS-HVO: 2009). Soil in the area is classified as Kaiwiki highly organic hydrous silty clay loam, 6 to 20

percent slopes. The deep, ash-derived soils that developed in the context of this geology and climate nurtured highly productive farming from early Hawaiian times through the century of sugar cane until today. Kaiwiki hydrous silty clay loams are fairly well drained but have medium to high runoff (U.S. Soil Conservation Service 1973). Locally boggy conditions quickly develop when the soil is compressed by cultivation, vehicles or animals.

The entire Island of Hawaiʻi is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the U.S. Geological Survey in this area of the island is Zone 8 on a scale of ascending risk 9 to 1 (Wright et al 1992). The relatively low hazard risk is because Mauna Kea is an inactive volcano. Zone 8 includes areas that have had no lava flows in the last 750 years, and only a few percent covered by lava in the past 10,000 years. Volcanic hazard here is thus very low.

The Island of Hawaiʻi experiences high seismic activity and is at risk from earthquake damage (USGS 2000), especially to structures that are poorly designed or built, as the 6.7-magnitude quake of 2006 and the 6.9-magnitude quake of 2018 demonstrated. The portion of the property site proposed for improvement is on a slightly flattened topographic ridge that descends into shallow valleys on either side. There are appropriate setbacks to surrounding steeper slopes, and there does not appear to be a substantial risk at the site from subsidence, landslides or other forms of mass wasting.

Impacts and Mitigation Measures

The current extremely wet climate of East Hawaiʻi poses challenges to homeowners in areas where stream flooding or localized road flooding can occasionally cut off access. Steep driveways in muddy areas can also become almost impassable. The access to the Ramos property does not involve any stream crossings outside of County road and State highway bridges that to date have nearly always adequately passed large floods. The driveway has been periodically maintained by stabilizing with gravel and removing eucalyptus tree roots, and it will continue to require regular periodic maintenance.

Guidance to federal agencies for addressing climate change issues in environmental reviews was released in August 2016 by the Council on Environmental Quality (US CEQ 2016). The guidance urged that when addressing climate change, agencies should consider: 1) the potential effects of a proposed action on climate change as indicated by assessing greenhouse gas emissions in a qualitative, or if reasonable, quantitative way; and, 2) the effects of climate change on a proposed action and its environmental impacts. It recommends that agencies consider the short- and long-term effects and benefits in the alternatives and mitigation analysis in terms of climate change effects and resiliency to the effects of a changing climate. Although this guidance has since been withdrawn for political reasons, the State of Hawaiʻi in Hawaiʻi Revised Statutes §226-109 encourages a similar analysis. It is possible, and even likely, that larger and more frequent tropical storms and even hurricanes will affect the Hawaiian Islands in the future. In addition, accelerating sea level rise is expected.

In order to deal with the potential for larger and more frequent tropical storms that could be part of a changing climate, the driveway has previously been reinforced, the home has been designed to

withstand hurricane force winds, and trees with the potential to be fall on the home are planned for removal (particularly several large non-native eucalyptus trees just *mauka* of the home site).

In general, geologic conditions do not impose undue constraints on the proposed action, as the lava flow hazard is very low, the seismic hazard is manageable with proper design that meets the Uniform Building Code, and the site is not otherwise geologically hazardous.

The applicant understands that there are some climatic and geologic hazards associated with homes on the slopes of Mauna Kea and has made the decision that a residence is not imprudent to construct or inhabit.

3.1.2 Flood Zones

Floodplain status for many areas of the island of Hawai‘i has been determined by the Federal Emergency Management Agency (FEMA), which produces the National Flood Insurance Program's Flood Insurance Rate Maps (FIRM). The flood zones for this region were recently mapped, and digital maps and reports are available from the Department of Land and Natural Resources at http://gis.hawaiinfip.org/fhat/. The property is within Flood Zone X, areas outside the mapped 500-year floodplain (Figure 4). There is no risk of tsunami inundation, and it is outside both the tsunami evacuation and any dam evacuation zone.

Notwithstanding the flood zone, the two steep stream channels and the lower portion of the stream banks on either side are subject to periodic stream flooding. Waikaumalo Stream is just outside the northwestern edge of the property, and Kalaeha Stream crosses lengthwise through the middle of the property. The proposed action does not appear to be affected in any way by stream flooding, which is restricted to the steep channels and does not overtop the high banks. The proposed home site and driveway are not near these two streams, and the driveway does not have to cross either.

3.1.3 Water Quality

The grading work would be limited to the home site its related spaces for driveway/parking, solar panels, septic system, water catchment and construction staging area. The total area of disturbance would be approximately a quarter-acre and would be set back a minimum of 75 feet from the closest stream. No grading activities would occur in areas with the potential to cause erosion near the stream banks. Grading will be planned and conducted to balance cut and fill material for the graded area in order to avoid the need to import or export of soils from the site. For trenching required for water pipelines and the septic system, extracted materials (spoils) will be used to refill the trenched areas and to blend the areas with the surrounding topography. As discussed in Section 3.3, a wastewater system fully conformant with State Department of Health Rules will be constructed to serve the home.

A County grading permit will be required. After actual grading plans are developed, the applicant and engineer will determine whether the area of disturbance is sufficiently large to require a National Pollutant Discharge Elimination System (NPDES) permit. Initial estimates indicate that the total grading

Figure 4. Flood Zone Map

Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HAWAII
TMK NO:	(3) 3-2-004:038
WATERSHED:	WAIEHU; WAIKAUMALO
PARCEL ADDRESS:	UNKNOWN ADDRESS NINOLE, HI 96773

Notes:

Flood Hazard Information

FIRM INDEX DATE:	SEPTEMBER 29, 2017
LETTER OF MAP CHANGE(S):	NONE
FEMA FIRM PANEL:	1551660450F
PANEL EFFECTIVE DATE:	SEPTEMBER 29, 2017

THIS PROPERTY IS WITHIN A TSUNAMI EVACUTION ZONE: NO
FOR MORE INFO, VISIT: http://www.scd.hawaii.gov/

THIS PROPERTY IS WITHIN A DAM EVACUATION ZONE: NO
FOR MORE INFO, VISIT: http://dlnreng.hawaii.gov/dam/

0 400 800 ft

Disclaimer: The Hawaii Department of Land and Natural Resources (DLNR) assumes no responsibility arising from the use, accuracy, completeness, and timeliness of any information contained in this report. Viewers/Users are responsible for verifying the accuracy of the information and agree to indemnify the DLNR, its officers, and employees from any liability which may arise from its use of its data or information.

If this map has been identified as 'PRELIMINARY', please note that it is being provided for informational purposes and is not to be used for flood insurance rating. Contact your county floodplain manager for flood zone determinations to be used for compliance with local floodplain management regulations.

FLOOD HAZARD ASSESSMENT TOOL LAYER LEGEND
(Note: legend does not correspond with NFHL)

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD - The 1% annual chance flood (100-year), also know as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. SFHAs include Zone A, AE, AH, AO, V, and VE. The Base Flood Elevation (BFE) is the water surface elevation of the 1% annual chance flood. Mandatory flood insurance purchase applies in these zones:

- **Zone A:** No BFE determined.
- **Zone AE:** BFE determined.
- **Zone AH:** Flood depths of 1 to 3 feet (usually areas of ponding); BFE determined.
- **Zone AO:** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined.
- **Zone V:** Coastal flood zone with velocity hazard (wave action); no BFE determined.
- **Zone VE:** Coastal flood zone with velocity hazard (wave action); BFE determined.
- **Zone AEF:** Floodway areas in Zone AE. The floodway is the channel of stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without increasing the BFE.

NON-SPECIAL FLOOD HAZARD AREA - An area in a low-to-moderate risk flood zone. No mandatory flood insurance purchase requirements apply, but coverage is available in participating communities.

- **Zone XS (X shaded):** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- **Zone X:** Areas determined to be outside the 0.2% annual chance floodplain.

OTHER FLOOD AREAS

- **Zone D:** Unstudied areas where flood hazards are undetermined, but flooding is possible. No mandatory flood insurance purchase apply, but coverage is available in participating communities.

Source: Hawai‘i DLNR: http://gis.hawaiinfip.org/fhat/

area will be far less than an acre and that an NPDES permit will not be required. Grading for the driveway and house lot will include practices to minimize the potential for sedimentation, erosion and pollution of coastal waters. The applicant will ensure that their contractor shall perform all earthwork and grading in conformance with:

(a) "Storm Drainage Standards," County of Hawai‘i, October, 1970, and as revised.
(b) Applicable standards of Chapter 27, "Flood Control," of the Hawai‘i County Code.
(c) Applicable standards and regulations of the Federal Emergency Management Agency.
(d) Applicable standards and regulations of Chapter 10, "Erosion and Sedimentation Control," of the Hawai‘i County Code.
(e) Conditions of an NPDES permit, if required, and any additional best management practices required by the Board of Land and Natural Resources.

Best Management Practices (BMPs) will include, but not be limited, to the following:

- The area of the minimum stream setback will be marked and fenced in the construction areas to avoid disturbance to the ground or vegetation within the setback area during construction;
- The total amount of land disturbance will be minimized. The construction contractor will be limited to the specific delineated construction work areas within the lot;
- The contractor will take special precautions, including use of a dual-layer sedimentation control system in erosion prone areas, to prevent any sediment leaving the work areas, particularly towards the direction of nearby streams;
- Construction activities with the potential to produce polluted runoff will not be allowed during unusually heavy rains or storm conditions that might generate storm water runoff; and
- Cleared areas will be replanted or otherwise stabilized as soon as possible.

With proper implementation of standard BMPs, the construction and use of the residence and associated facilities would be not expected to contribute to sedimentation, erosion, and pollution of stream waters.

3.1.4 Flora and Fauna

Environmental Setting: Flora

No prior botanical surveys are known to have been conducted on the property, but in the *Manual of the Flowering Plants of the Hawaiian Islands,* Gagne and Cuddihy (1990) classified the natural, pre-human vegetation in areas with similar geology, elevation and rainfall as Lowland Wet Forest. Dominant species were likely ‘ōhi‘a trees (*Metrosideros polymorpha*), uluhe (*Dicranopteris linearis*) and hapu‘u ferns (*Cibotium* spp.), and a larger variety of trees, shrubs, ferns and herbs[1]. In the steeper, shadier and rockier soils of the gulches, different assemblages of species may have been present. However, this area has a

[1] Latin names for organism are generally given after the first use of a common name in this report. Refer to Table 1 for a full list of observed plants.

long history of intensive cultivation. Areas *makai* of 2,000 feet in elevation on windward Mauna Kea were cultivated with dryland taro, sweet potatoes, and bananas for centuries after the arrival of Polynesians on the Hawaiian Islands approximately 1,000 years ago (Handy and Handy 1972). After 1850, most of the lowlands in the North Hilo District were cultivated in sugar cane, although it appears that sugar cane plantations did not extend quite as far *mauka* as the property, based on air photographs dated from 1965 in the collection of the University of Hawai‘i at Manoa (https://guides.library.manoa.hawaii.edu/c.php?g=704385&p=5001010). Handwritten notes on the parcel history maps in the County Real Property records indicate that the property was probably grazed. Although cane cultivation in the general area ceased in the 1980s, and no grazing is currently occurring, the existing seedbank of non-native plants and the constant activity of feral pigs, cattle and rats promotes a vegetation dominated by invasive plants in which many native plants are suppressed. As gulches were generally less affected by sugar cane cultivation and grazing, they tend to retain more native elements.

At the present time, the vegetation is a mixed native-non-native forest dominated by paperbark (*Melaleuca quinquenervia*), strawberry guava (*Psidium cattleianum*), and ‘ōhi‘a. There is a dense shrub layer dominated by the non-native *Melastoma candidum*, but also with significant cover of uluhe and hapu‘u. On the ground, non-native grasses and weeds dominate, including the highly invasive Koster’s curse (*Clidemia hirta)*. A number of native ferns and few non-native ones are present as epiphytes. A few native species that are found only in scattered locations – e.g. hame (*Antidesma platyphyllum*) and ‘ie‘ie (*Freycinetia arborea*) – are remnants of a once diverse native forest. The native plants found on the property are common in the region, on the island, and for most, throughout the Hawaiian Islands. A list of species detected on the project site (for botanical purposes, the entire third of the property southeast of Kalaeha Stream was surveyed) is provided in Table 1.

Environmental Setting: Fauna

During several visits in 2018, we observed very few individual birds on the property and only five species: Japanese white-eyes (*Zosterops japonicus*), northern cardinals (*Cardinalis cardinalis*), Japanese bush warblers (*Cettia diphone*), spotted doves (*Streptopelia chinensis*), and striped doves (*Geopilia striata*). Long-term observation would probably reveal a wider bird fauna. The relatively low elevation leads to warm temperatures that promote mosquitos, which are inimical to most native birds. None were identified, but it is highly likely that the property is occasionally utilized by the Hawai’i ‘amakihi (*Hemignathus virens*), as some populations of this native honeycreeper appear to have adapted to the mosquito borne diseases of the Hawaiian lowlands.

As with all of East Hawai‘i, several endangered native terrestrial vertebrates may be present in the general area and may overfly, roost, nest, or utilize resources of the property. These include the endangered Hawaiian hawk (*Buteo solitarius*), the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered band-rumped storm petrel (*Oceanodroma castro*), and the threatened Newell’s shearwater (*Puffinus auricularis newelli*).

Table 1. Plant Species Observed on Project Site

Scientific Name	Family	Common Name	Life Form	Status*
Adenophorus tamariscinus	Polypodiaceae	Wahine Noho Mauna	Fern	E
Ageratum conyzoides	Asteraceae	Ageratum	Herb	A
Antidesma platyphyllum	Euphorbiaceae	Hame	Tree	E
Arundina graminifolia	Orchidaceae	Bamboo orchid	Herb	A
Andropogon virginicus	Poaceae	Broomsedge	Herb	A
Axonopus fissifolius	Poaceae	Carpet Grass	Herb	A
Blechnum appendiculatum	Blechnaceae	Hammock Fern	Fern	A
Christella parasitica	Thelypteridaceae	Christella	Fern	E
Cibotium glaucum	Dicksoniaceae	Hapu‘u pulu	Fern	E
Cibotium menziesii	Dicksoniaceae	Hapu‘u mea	Fern	E
Clidemia hirta	Melastomataceae	Clidemia	Herb	A
Cyperus halpan	Cyperaceae	Sharp Edge Sedge	Herb	A
Cyperus polystachyos	Cyperaceae	Manyspike Flatsedge	Herb	I
Dicranopteris linearis	Gleicheniaceae	Uluhe	Fern	I
Digitaria sp.	Poaceae	Digitaria	Herb	A
Diplopterygium pinnatum	Gleicheniaceae	Uluhe Lau Nui	Fern	E
Elaphoglossum crassifolium	Lomariopsidaceae	Hoe a Maui	Fern	E
Erechtites valerianifolia	Asteraceae	Erechtites	Herb	A
Fimbristylis dichotoma	Cyperaceae	Fimbristylis	Herb	I
Freycinetia arborea	Pandanaceae	‘Ie ‘Ie	Vine	I
Grammitis tenella	Grammitidaceae	Kolokolo	Fern	E
Heterocentron subtriplinervium	Melastomataceae	Pearlflower	Shrub	A
Melaleuca quinquenervia	Myrtaceae	Paperbark Tree	Tree	A
Metrosideros polymorpha	Myrtaceae	‘Ōhi‘a	Tree	E
Nephrolepis exaltata	Nephrolepidaceae	Kupukupu	Fern	I
Nephrolepis multiflora	Nephrolepidaceae	Sword Fern	Fern	A
Ophioderma pendulum	Ophioglossaceae	Adder’s Tongue	Fern	I
Psidium cattleianum	Myrtaceae	Strawberry Guava	Tree	A
Psilotum nudum	Psilotaceae	Moa	Fern Ally	I
Sadleria cyatheoides	Blechnaceae	Ama‘u	Fern	E
Schizachyrium condensatum	Poaceae	Tufted Beardgrass	Herb	A
Sphaerocionium lanceolatum	Hymenophyllaceae	Palai Hinahina	Fern	E
Sphenomeris chinensis	Lindsaeacea	Pala‘ā	Fern	I
Sporobolus indicus	Poaceae	Sporobolus	Herb	A
Torenia glabra	Scrophulariaceae	Torenia	Tree	A

A=Alien E=Endemic I=Indigenous END=Federal and State Listed Endangered

Some native waterbirds might also be present in or near the property, particularly at Waikaumalo Stream, just beyond the far northwestern boundary. In the Hilo-Hāmākua Coast in general, waterbirds are found in streams, estuaries, natural and artificial ponds, and wetlands. The most common native waterbird is the indigenous black-crowned night heron, or ‘auku‘u (*Nycticorax nycticorax hoactli*). This bird is likely present at times in the property’s streams. It is also not unusual to spot the wide-ranging, friendly but

endangered Hawaiian goose or nēnē (*Branta sandwicensis*) in various parts of the island. Far less likely to be seen in the property's streams are two endangered waterbirds that are occasionally present in the Hāmākua coast: the Hawaiian duck or koloa maoli (*Anas wyvilliana*), and the Hawaiian coot or ʻalae keʻokeʻo (*Fulica alai)*. Of these, only the koloa maoli is noted in streams somewhat similar to Waikaumalo. No waterbirds were observed during any of the field visits to the property.

Aside from the Hawaiian hoary bat, all mammals in the project area are all introduced species, including feral cats (*Felis catus*), feral pigs (*Sus scrofa*), small Indian mongooses (*Herpestes a. auropunctatus*) and various species of rats (*Rattus* spp.). Several species of non-native reptiles and amphibians are also likely present. Coqui frogs (*Eleutherodactylus coqui*) were heard and an undetermined skink lizard (Family: Scincidae) was seen. None of these non-native vertebrates are of conservation concern and all are deleterious to native flora and fauna.

The *Hawaiʻi Watershed Atlas* (http://www.hawaiiwatershedatlas.com/ha_hilo.html) contains information about the watershed, stream character and biota of Waikaumalo Stream. The 18.6-mile long perennial stream has a watershed of 36.4 miles, indicating a long, narrow watershed with few tributaries – typical of streams in fairly young volcanic slopes. The maximum elevation of the watershed 8,884 feet above sea level. The cliffed coast provides no area for an estuary. The percent of the watershed in the different land use districts is as follows: 35.5% agricultural, 64.1% conservation, 0.4% rural, and 0% urban. About 37% of the watershed is controlled by the State, 17.2% by the Office of Hawaiian Affairs (according to the atlas), 34.5% is on federal land, and the remainder is in private hands. Fully 71.1% is in some form of watershed protection. Under various watershed quality criteria, Waikaumalo Stream ranks in the upper quartile of Hawaiian streams.

Surveys of varying intensities and goals were conducted at several locations on the upper reaches of Waikaumalo Stream in 1967, 1990 and 1995. The native fish ʻoʻopu alamoʻo (*Lentipes concolor*), ʻoʻopu ʻakupa (*Eleotris sandwicensis*), ʻoʻopu nākea (*Awaous guamensis*), (*Kuhlia xenura*), and ʻoʻopu nōpili (*Sicyopterus stimpsonis*), as well as the native shrimp or ōpaekalaʻole (*Atyoida bisulcata*) and various native insects, were recorded in the surveys. An unidentified amphipod, a worm, and a number of insects were also among the native fauna observed in the stream. No threatened or endangered species were recorded. Various non-native species including Tahitian prawns, Louisiana crayfish and guppies were also seen. Based upon existing knowledge of the stream biota, the area was rated as having some biotic importance according to the DLNR Division of Aquatic Resources Decision Rule criteria for native macrofauna diversity, but not for native insect diversity, native species abundance, presence of candidate endangered species, Newcomb's snail habitat, or absence of Priority 1 introduced species.

An endangered insect, the orangeblack Hawaiian damselfly (*Megalagrion xanthomelas*), lives in streams and wetlands at locations around the island's coastline, primarily in estuaries and ponds at sea level. On other islands, it has been sighted as high as 3,280 feet above sea level. According to conservationists, its limited habitat and small scattered populations may affect long-term stability. The species is susceptible to the effects of habitat loss and introduced species (https://xerces.org/orangeblack-hawaiian-damselfly/; https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=I063; DLNR-DOFAW 2013; Polhemus 1993 and 1995; Polhemus and Asquith 1996). The species has not been noted from Waikaumalo Stream.

No activity will occur within 1,200 feet of Waikaumalo Stream itself. Kalaeha Stream, one of three smaller tributary streams to Waikaumalo Stream, is within as close as 75 feet of project actions, although separated by a heavily forested area. This stream is not listed in the Hawai‘i Stream Assessment or Hawai‘i Watershed Atlas. Reconnaissance of this smaller stream found abundant native shrimp or ōpaekala‘ole (*Atyoida bisulcata*), which often inhabit the middle and upper reaches of streams in the Hawaiian Islands. Various insects, including a not conclusively identified native damselfly (*Megalagrion* sp., probably *M. blackburnii)* and a non-native *Tetragnatha* stream spider were among other fauna observed in the stream. No non-native fish, amphibians or crustaceans were observed. No threatened or endangered species were recorded.

Impacts and Mitigation Measures

The project’s small footprint and degree of physical disturbance combined with its location in an area of the property with few sensitive flora or fauna resources limits the biological impacts to negligible levels.

No rare, threatened or endangered plant species are present. Although a number of natives are present, the area of impact is dominated by non-natives. The owner wishes to preserve and enhance the native vegetation through gradual thinning of weedy species and promotion of native species through planting or simple weeding. With minimal care and input, the native component of the vegetation could increase. An issue for construction projects located in ‘ohi‘a forests has recently surfaced. A fungus called *Ceratocystis fimbriata* has led to a disease that is new to science and new to Hawai‘i – Rapid ‘Ohi’a Death (Hawai‘i DOFAW 2017). This disease has killed hundreds of thousands of ‘ohi‘a trees across more than 34,000 acres of the Big Island. It was first discovered in Lower Puna. Projects that harm or relocate ‘ohi‘a trees can spread the disease, and mitigation measures are recommended, although it is important to recognize that treatment protocols are evolving. The following mitigation is recommended:

- A small number of mostly juvenile ‘ohi‘a trees are planned for careful removal; identify any other ‘ohi‘a trees near the construction area and ensure that their branches are not accidentally broken during construction;
- Treat any unavoidable scars to prevent infestation of the fungus;
- Stack all removed ‘ohi‘a trees and dispose of by burying or chipping; do not remove from project site. Decontaminate boots and work tools prior to entering the construction site and after leaving;

The project avoids sensitive locations directly adjacent to streams, and in fact no activities whatsoever are proposed for the roughly two-thirds of the property from Waikaumalo Stream southeast to, and including, Kalaeha Stream. The precautions for preventing effects to water quality during construction listed in Sections 3.1.1 and 3.1.6 will reduce adverse impact on stream organisms to negligible levels.

Preventing certain biological impacts will require specific mitigation actions. In order to avoid impacts to the endangered but regionally widespread terrestrial vertebrates listed above, the applicant will commit to certain conditions, which are expected to be proposed for the CDUP. Specifically:

- Construction will refrain from activities that disturb or remove shrubs or trees taller than 15 feet between June 1 and September 15, when Hawaiian hoary bats may be sensitive to disturbance.
- If landclearing occurs between the months of March and September, inclusive, a pre-construction hawk nest search by a qualified ornithologist using standard methods will be conducted. If Hawaiian hawk nests are present, no land clearing will be allowed until October, when hawk nestlings will have fledged.
- Any exterior lighting will be shielded from shining upward, in conformance with Hawai‘i County Code § 14 – 50 et seq., to minimize the potential for disorientation of seabirds.

3.1.5 Air Quality, Noise, and Scenic Resources

Environmental Setting

Air quality in the area is generally excellent, due to its rural nature and minimal degree of human activity, although vog from Kilauea volcano is occasionally blown into this part of the North Hilo Coast. Noise on the site is very low, and what sounds exist are mostly natural sources, primarily birdsong and wind in trees. The occasional helicopter overflight causes some noise.

This deeply forested area has some visual quality, but because of the dense vegetation, sloping terrain and distance from public roads and other viewpoints, it offers no scenic resources. The County of Hawai‘i General Plan contains Goals, Policies and Standards intended to preserve areas of natural beauty and scenic vistas from encroachment. The General Plan discusses views of the gulches from the Hawai‘i Belt Road and Old Mamalahoa Highway as noted features of natural beauty in North Hilo. No features or views on or near the project site are noted.

Impacts and Mitigation Measures

The project would not affect air quality, scenery or noise levels in any substantial ways. Brief and minor adverse effects would occur during construction. However, there are no sensitive noise or visual receptors in the vicinity – with no houses or other structures within 1,200 feet of the proposed home site. Given the small scale and short duration of any noise impacts, coupled with the lack of sensitive receptors, noise mitigation would not be necessary. The single-family home would be in harmony with the rural landscape of North Hilo.

3.1.6 Hazardous Substances, Toxic Waste and Hazardous Conditions

Based on onsite inspection and the lack of any known former and current uses on the property, it appears that the site contains no hazardous or toxic substances and exhibits no other hazardous conditions. In addition to the measures related to water quality detailed in Section 3.1.3, in order to ensure to minimize the possibility for spills of hazardous materials, the applicant proposes the following:

- Unused materials and excess fill will be disposed of at an authorized waste disposal site.

- During construction, emergency spill treatment, storage, and disposal of all hazardous materials, will be explicitly required to meet all State and County requirements, and the contractor will adhere to "Good Housekeeping" for all appropriate substances, with the following instructions:
    - Onsite storage of the minimum practical quantity of hazardous materials necessary to complete the job;
    - Fuel storage and use will be conducted to prevent leaks, spills or fires;
    - Products will be kept in their original containers unless unresealable, and original labels and safety data will be retained;
    - Manufacturers' instructions for proper use and disposal will be strictly followed;
    - Regular inspection by contractor to ensure proper use and disposal;
    - Onsite vehicles and machinery will be monitored for leaks and receive regular maintenance to minimize leakage;
    - Construction materials, petroleum products, wastes, debris, and landscaping substances (herbicides, pesticides, and fertilizers) will be prevented from blowing, falling, flowing, washing or leaching into the ocean
    - All spills will be cleaned up immediately after discovery, using proper materials that will be properly disposed of;
    - Regardless of size, spills or toxic or hazardous materials will be reported to the appropriate government agency;
    - Should spills occur, the spill prevention plan will be adjusted to include measures to prevent spills from re-occurring and for modified clean-up procedures.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics

Existing Environment

The Ramos property is located at the *mauka* end of Pīhā-Kahuku Road, about 3 miles from the center of the nearest village, Ninole. This region of traditional Hawaiian settlement was transformed by commercial sugar cane cultivation into a collection of plantation camps and individual homes, some within old government grants and homestead lots. Like many villages along the Hāmākua coast, its former retail, service and government establishments were slowly consolidated and absorbed into a few larger towns. A small and picturesque post office box building still remains. Since the demise of sugar cane, the area at first lost population but then began to gain it, mostly from new residents to Hawai'i, many attracted by large lots in the uplands that could be farmed or ranched, host a vacation rental, enjoyed as a peaceful hideaway, or serve as a place from which to commute to Hilo. More and more residents tele-commute to jobs around the globe.

Ninole is too small to be measured as a discrete unit by the U.S. Census Bureau, but 2,041 residents were counted in the North Hilo District of which Ninole is a part in the 2010 U.S. Census. This is the smallest of all judicial districts in Hawai'i, but represents steady growth since the figure of 1,541 in 1990.

Impacts and Mitigation Measures

No adverse socioeconomic impacts are expected to result from the project. The project will have a very small positive economic impact for the County of Hawai‘i. The residence and associated improvements will not adversely affect population or demand for services.

3.2.2 Cultural and Historic Resources

An archaeological assessment survey of the portion of the property east of Kalaeha Stream and a cultural impact assessment of the project were prepared and are attached as Appendices 2 and 3, respectively. Research for this report included primary fieldwork, consultation of archaeological and ethnographical studies and primary documents including maps and Mahele testimony, and consultation of informants, including descendants of original grantees and several officials of the Division of Forestry and Wildlife (DOFAW) who administer hunting and/or have hunted in the area. In the interest of readability, the summary below does not include all scholarly references; readers interested in extended discussion and sources may consult these appendices. Separately, the Office of Hawaiian Affairs, Councilperson Valerie Poindexter, the Sierra Club, DOFAW officials and five neighbors were also consulted by mail, email, and/or telephone as part of the EA to determine whether they had any information on natural or cultural resources that might be present or affected, and additional research on cultural resources and impacts was conducted.

Historical and Cultural Background

The first inhabitants of Hawai‘i were believed to be settlers who had undertaken difficult voyages across the open ocean. For many years, researchers have proposed that early Polynesian settlement voyages between Kahiki (the ancestral homelands of the Hawaiian gods and people) and Hawai‘i were underway by A. D. 300, although recent work suggests that Polynesians may not have arrived in Hawai‘i until at least A. D. 1000 (Kirch 2012).

The initial inhabitants of Hawai‘i are believed to have come from the southern Marquesas Islands and settled initially on the windward side, eventually expanding to leeward areas. Early Hawaiian farmers developed new strategies and tools for their new environment (Kirch 2012; Pogue 1978). Societal order was maintained by their traditional philosophies and by the conical clan principle of genealogical seniority (Kirch 2012). Universal Polynesian customs brought from their homeland included the observance of major gods *Kane*, *Ku*, and *Lono*; the *kapu* system of law and order; cities of refuge, various beliefs, and the concepts of *mana* and the *‘aumakua* (Fornander 1969).

The Development Period, believed under Kirch’s new concept to have occurred from A. D. 1100 to 1350, brought an evolution of traditional tools, including a variation of the adze (*ko‘i*), and some new Hawaiian inventions such as the two-piece fishhook and the octopus-lure breadloaf sinker. That was followed by the Expansion Period (A. D. 1350 to 1650) which saw greater social stratification, intensive land modification, and population growth. This period was also the setting for the second major migration to

Hawai‘i, this time from Tahiti. Also established during this period was the *ahupua‘a*, a land-use concept that incorporated all of the eco-zones from the mountains to the shore and beyond. The usually wedge-shaped *ahupua‘a* provided a diverse subsistence resource base (Hommon 1986) and added another component to what was already becoming a well-stratified society (Kirch 2012).

As population grew during the following centuries so did the reach of inland cultivation in the upland environmental zones and consequent political and social stresses. During the Proto-Historic Period (A. D. 1650-1795), wars reflective of a complex and competitive social environment are evidenced by *heiau* building. During this period, sometime during the reign of Kalaniopu‘u (A. D. 1736-1758), Kamehameha I was born in North Kohala.

Ahupua‘a were ruled by *ali‘i ‘ai ahupua‘a* or lesser chiefs and managed by a *konohiki*. *Ali‘i* and *maka‘ainana*, or commoners, were not confined to the boundaries of *ahupua‘a* as resources were shared when a need was identified. *Ahupua‘a* were further divided into smaller sections such as *‘ili, mo‘o‘aina, pauku‘aina, kihapai, koele, hakuone* and *kuakua*. The chiefs of these land units have their allegiance to a territorial chief or *mo‘i* (literally translated as king) (Hommon 1986). The Ramos property is located within the *ahupua‘a* of Pīhā, which translates literally as “flotsam” (Pūku‘i et al. 1974), in the now-judicial district of North Hilo, which was part of the traditional *moku-o-loko* or district of Hilo. Hilo comprises dozens of *ahupua‘a* on the eastern/windward shores of Hawai‘i Island. As Pīhā encompasses *mauka* agricultural and forest resources and *makai* fisheries, residents were once able to procure nearly all that they needed to sustain their families and contribute to the larger community from within the land division.

Traditionally, the *moku* of Hilo was divided into three *‘okana* (land divisions) with place names that have their origins in legendary times. The three divisions are (from north to south): Hilo Palikū, Hilo One, and Hilo Hanakahi. The location of the Ramos property is within Hilo-pali-kū or “Hilo of the upright cliff” (Pukui et al. 1974:46), which extends north from the Wailuku River to Ka‘ula Gulch (Maly and Maly 2006). In *Pele and Hi‘iaka*, Emerson recounted the following *mele* that Hi‘iaka sang while journeying between Hilo and Puna through the forest territory of the *mo‘o* Pana‘ewa, which mentions the area (1993:32-33):

Pau ke aho i ke kahawai lau o Hilo	One’s strength is exhausted, climbing, climbing
He lau ka pu‘u, he mano ka iho‘na	The countless valleys and ridges of Hilo,
He mano na kahawai o Kula‘i-po	The streams without number of Ku-la‘i-po,
He wai Honoli‘i, he pali o Kama-e‘e,	The mighty water of Hono-li‘i, the precipice walls of Kama-e‘e
He pali no Koolau ka Hilo-pali-ku	And the pali of Ko‘olau: Such a land is Hilo-pali-ku.
He pali Wailuku, he one ke hele ia;	The banks of Wailuku are walls; the road to its crossing but sand;
He one e ke‘ehia la i Wai-olama.	Sandy the way at Wai-o-lama.

Kepā and Onaona Maly provided additional information pertaining to the ancient land division of Hilo Palikū in the following translation of an excerpt from a legendary account called "*Ka'ao Ho'oniua Pu'uwai no Ka-Miki"* ("The Heart Stirring Story of Ka-Miki"). This legend was originally published in Hilo's Hawaiian Language newspaper *Ka Hōku o Hawai'i*:

> Of Hilo Paliku it is said, one becomes short of breath traveling through Hilo, for there are many (400) hills, many (4,000) areas to descend, and many (40,000) streams, indeed while swimming through the waters of Hilo one becomes out of breath, but one is never out of water at Hilo! (Maly and Maly 2006:13)

Pukui (1983:107) provided a further poetic description of Hilo Palikū a part of an '*ōlelo no'eau* or poetical saying:

> *Hilo iki, pali 'ele'el*e.
> Translation: Little Hilo of the dark cliffs.
> Interpretation: Hilo-pali-ku, or Hilo-of-the-standing-cliffs, is always green because of the rain and mists.

King David Kalākaua (1888:284) described the lands of the northern portion of Hilo as he recounted the tale of 'Umi-a-Līloa presented in his book, the *Legends and Myths of Hawai'i*. His description of the region is taken from a time when North Hilo and Hāmakua were in the thick of the commercial sugar industry, but mentions the presence of scattered *lo'i kalo* and bananas:

> The northeastern coast of the island of Hawaii presents an almost continuous succession of valleys, with intervening uplands rising gently for a few miles, and then more abruptly toward the snows of Mauna Kea and the clouds. The rains are abundant on that side of the island, and the fertile plateau, boldly fronting the sea with a line of cliffs from fifty to a hundred feet in height, is scored at intervals of one or two miles with deep almost impassable gulches, whose waters reach the ocean either through rocky channels worn to the level of the waves, or in cascades leaping from the cliffs and streaking the coast from Hilo to Waipio with lines which seem to be molten silver from the great crucible of Kilauea.
>
> In the time of Liloa, and later, this plateau was thickly populated, and requiring no irrigation, was cultivated from the sea upward to the line of frost. A few *kalo* patches are still seen, and bananas grow, as of old, in secluded spots and along the banks of the ravines; but the broad acres are green with cane, and the whistle of the sugar-mill is heard above the roar of the surf that beats against the rock-bound front of Hamakua.

Native Planters in Old Hawaii (Handy et al 1972:538-9) discussed traditional planting areas and methods in the North Hilo area. While Waikaumalo Stream was not mentioned as a significant area of taro *lo'i*, it was noted that unirrigated taro was planted in the lower forest and along streams.

The specific Pīhā area appears to have been sparsely populated and there is little traditional information in the form of *mele*, *oli* or *ʻōlelo* concerning the area's inhabitants or happenings. Nevertheless, it is clear from work in similar areas of Hawaiʻi that different elevations of Pīhā comprised various social-ecological zones that had profound consequences for not only resources but also the sacredness of the landscape. The inland zones, or *wao*, are stratified by variations in elevation and rainfall, and are considered as a region all their own. As Handy et al. (1991:56) explained:

> *Wao* means the wild—a place distant and not often penetrated by man. The *wao laʻau* is the inland forested region, often a veritable jungle, which surmounts the upland *kula* slopes on every major island of the chain, reaching up to very high elevations especially on Kauai, Maui, and Hawaii. The Hawaiians recognized and named many divisions or aspects of the *wao*: first, the *wao kanaka*, the reaches most accessible, and most valuable, to man (*kanaka*); and above that, denser and at higher elevations, the *wao akua*, forest of the gods, remote, awesome, seldom penetrated, source of supernatural influences, both evil and beneficent. The *wao kele*, or *wao maʻu kele*, was the rain forest. Here grew giant trees and tree ferns (*ʻamaʻu*) under almost perpetual cloud and rain. The *wao kanaka* and the *wao laʻau* provided man with the hard wood of the *koa* for spears, utensils, and logs for boat hulls; pandanus leaves (*lau hala*) for thatch and mats; bark of the *mamaki* tree for making tapa cloth; candlenuts (*kukui*) for oil and lights; wild yams and roots for famine time; sandalwood, prized when shaved or ground as a sweet scent for bedding and stored garments. These and innumerable other materials were sought and found and worked by man in or from the *wao*.

Traditional life in Hawaiʻi' took a sharp turn on January 18, 1778 with the arrival of British Capt. James Cook in the islands. On a return trip to Hawaiʻi ten months later, Kamehameha visited Cook aboard his ship the *Resolution* off the east coast of Maui and helped Cook navigate his way to Hawaiʻi Island. Cook exchanged gifts with Kalaniopuʻu at Kealakekua Bay the following January, and Cook left Hawaiʻi in February. However, Cook's ship then sustained damage to a mast in a severe storm off Kohala and returned to Kealakekua, setting the stage for his death on the shores of the bay.

During the Proto-Historic Period there was a continuation of the trend toward intensification of agriculture, *aliʻi*-controlled aquaculture, settling of upland areas and development of traditional oral history. The *Ku* cult, *luakini heiau* and the *kapu* system were at their peaks, but the influence of western civilization was being felt in the introduction of trade for profit and a market-system economy. By 1810, the sandalwood trade established by Europeans and Americans twenty years earlier was flourishing. That contributed to the breakdown of the traditional subsistence system, as farmers and fishermen were required to toil at logging, which resulted in food shortages and a decline in population.

The rampant sandalwood trade resulted in the first Hawaiian national debt, as promissory notes and levies granted by American traders were enforced by American warships. The assimilation of western ways continued with the short-lived whaling industry to the production of sugarcane, which was more lucrative but carried a heavy environmental price.

Following the death of Kamehameha I in 1819, the customary relaxing of *kapu* took place. But with the introduction of Christianity shortly thereafter, his successor, Kamehameha II, renounced the traditional religion and ordered that *heiau* structures either be destroyed or left to deteriorate. The family worship of *ʻaumakua* images was allowed to continue.

In 1823, British missionary William Ellis and members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawaiʻi scouting communities in which to establish church centers for the growing Calvinist mission. Ellis recorded observations made during this tour in a journal, including Hilo Palikū:

> The country, by which we sailed, was fertile, beautiful, and apparently populous. The numerous plantations on the eminences and sides of the deep ravines or valleys, by which it was intersected, with the streams meandering through them into the sea, presented altogether a most agreeable prospect. The coast was bold, and the rocks evidently volcanic. We frequently saw water gushing out of hollows in the face of the rocks, or running in cascades from the top to the bottom (Ellis 1826:316).

In 1840, Lieutenant Charles Wilkes, head of the U.S. Exploring Expedition, traveled to northern Hilo and described the landscape of this region:

> The coast to the north of Hilo is slightly peculiar: it is a steep bluff, rising about two hundred feet; this is cut into small breaks here called "gulches," within which the villages are generally situated, and the natives grow banana and taro. In some places they cultivate small patches of sugarcane, which succeed well (Wilkes 1845).

The *Mahele ʻAina* took place in 1848, placing all land in Hawaiʻi into three categories: Crown Lands, Government Lands and Konohiki Lands. Ownership rights were "subject to the rights of the native tenants," or those individuals who lived on the land and worked it for their subsistence and for their chiefs.

Pīhā Ahupuaʻa is not listed in the Buke Māhele, but appears to have become Crown Land as a result of the Māhele, as J. Dominis, agent of the Crown Lands, would later apply for the settlement of the land division's boundaries. As part of that process, several older residents of the area provided testimony, including Ku, Hemahema, Kalaualoha, Kupahu, and D.H. Hitchcock, the Government Surveyor who surveyed the Pīhā boundaries. D.H. Hitchcock testified that he surveyed the boundaries of Pīhā Ahupuaʻa in October of 1874 with Ku as his *kamaʻāina* (person familiar with the land). Hitchcock also took Kalaualoha with him along a part of the Nanue boundary, and talked with Hemahema prior to the survey, but found that the recollections of Hemahema and Ku agreed regarding the boundaries, so only took Ku with him. The testimony indicated that the boundary between Kahuku and Pīhā Ahupuaʻa (a part of which is the eastern boundary of the Ramos property) was once marked by an "old trail" used by bird catchers to access the forest, and that the owner of Nanue Ahupuaʻa, Alapai, disputed the *mauka*-eastern boundary of Pīhā Ahupuaʻa as described by Ku and depicted by D.H. Hitchcock in his survey.

Native tenants could claim and acquire title to *kuleana* parcels that they actively lived on or farmed at the time of the Māhele. The Kuleana Act of December 21, 1849 provided the framework by which native tenants could apply for and receive fee-simple interest in their kuleana lands from the Land Commission. The Board of Commissioners oversaw the program and administered the lands as Land Commission Awards (LCAw.). No claims were made for *kuleana* lands within Pīhā Ahupuaʻa during the Māhele ʻĀina of 1848.

Prior to the 1870s, the cultivation of sugar cane was becoming an important economic activity that also transformed land use in many districts of the Hawaiian Islands. This included the Hāmākua Coast, where population rapidly dropped in the mid-19th century as a result of both epidemics and migration of rural inhabitants to towns and cities. Following the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Kingdom of Hawaiʻi that guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, a number of new sugar plantations incorporated in the Islands. In 1878, Claus Spreckels, with W.G. Irwin & Company as his agent, established the Hakalau Plantation Company on 9,000 acres of land located along the North Hilo coast, 16 miles from Hilo (Dorrance and Morgan 2000). The fields of the Hakalau Plantation Company ranged from 250 feet above sea level along the shoreline bluffs to 2,000 feet above sea level at their western (*mauka*) limits. The cane was conveyed by flume from the various fields to its mill site, where it was then processed. The Hakalau Mill, built in 1890 on the shore at the foot of a 200-foot bluff within Hakalau Gulch, produced 5,000 tons of sugar annually during its early years (Ibid). Until 1913 when a railroad connecting the plantation to the port at Hilo was built, the plantation shipped its product from the Hakalau Landing to Honolulu via inter-island vessels that anchored offshore. The lands of Pīhā Ahupuaʻa (containing 4,250 acres) were leased to the Hakalau Plantation Co. on February 11, 1892 (see C.S.F. 449), and the *makai* lands were cleared and used for the cultivation of sugarcane.

The fields of the Hakalau Plantation Company never reached as far *mauka* as what is now the Ramos property, which remained forest land throughout the late nineteenth century. The importance of the forest lands and their valuable watersheds for agricultural purposes and the well-being of the people in general was recognized quite early on by the Territorial Government of Hawaiʻi as well as the burgeoning Hawaiian sugar industry. Consequently, a proclamation recommending that 110,000 acres of land in the Districts of North and South Hilo be reserved from development was signed by Lt. Governor A.L.C. Atkinson on July 24, 1905, and the Hilo Forest Reserve was created. The reserve, which abuts the eastern boundary of the Ramos property, was described by the Division of Forestry in 1906 as follows:

> The Hilo Forest Reserve embraces the area of heavy forest on the lower slopes of Mauna Kea, lying between the 1855 and 1881 Lava Flows back of Hilo Town and the Hamakua District line, and extending from a line varying in elevation from 1,750 to over 2,000 feet, drawn back of and above the sugar plantations to another line along the upper edge of the woods, at an elevation of approximately 6,000 feet. The water from this reserve is of great importance to all the plantations along the coast, being at present used for the most part for fluming cane to the mill. From the character of the country many of the streams could be utilized for the production of power. This

> will be an important consideration when the Hilo District comes to be developed, as it is sometime bound to be. The object of the Hilo Forest Reserve is to protect the sources of this important water supply (Hawaii Territory Division of Forestry 1906:25).

The Land Act of 1895 broadened the definition of public land and placed Hawai‘i’s Crown Lands (such as Pīhā) into the public domain. The Land Act, coupled with clarifications to Hawai‘i’s land policies set forth in the 1900 Organic Act, made land available to family farmers through homesteading programs. Many of the Territory lease lands held by the Hakalau Plantation Company were divided into homestead lots (Horowitz et al. 1969). By the early twentieth century, as the plantation’s lease on its Pīhā lands was set to expire, the Territorial Government began the process of subdividing the *makai* section of the *ahupua‘a* below the Hilo Forest Reserve into homesteads. The survey of the Pīhā homestead tract began in 1912 and was completed by 1913. “The land of Piha was subdivided into 28 lots, comprising 393.81 acres, 5 miles of roads containing 20.44 acres, and flumes and ditches and remnant covering 5.95 acres” (Department of Interior 1913:65). The Pīhā-Kahuku Homestead Road created as part of the Pīhā homestead subdivision appears to follow the route of the older road described along the boundary between those two *ahupua‘a* during the Boundary Commission hearings of 1875. Following the subdivision of the Pīhā homesteads, the Hakalau Plantation, owned at the time by C. Brewer & Co., brought up the question of the boundary between the homesteads and the adjoining lands owned or controlled by the company, which they felt had been encroached upon. Additional surveys of the Pīhā homestead tract, involving extensive triangulation work, were then made during the early part of 1914, until the matter was decided to the satisfaction of all parties involved (Department of the Interior 1914:521).

While many of the *makai* lots of the newly created Pīhā Homesteads (Lots 9-28) were sold at auction in June of 1914 to various homesteaders, the more *mauka* lots (Lots 1-8, which include the Ramos property) were not. This is perhaps because they were less accessible or less developed, and therefore less desirable. Instead, a general 10-year lease (Lease No. 878; Figure 13) for Lots 1-8 of the Pīhā Homesteads (and Lots 13-16 of the adjoining Kahuku Homesteads) was purchased at public auction by the Hakalau Plantation Company on July 14, 1915 (U.S. Department of the Interior 1916:526).

For unknown reasons this lease was never fully executed, and Lots 1-8 were eventually sold to various homesteaders. Lot 1, the Ramos property, was purchased (along with Lot 2) by William Breithaupt on August 23, 1916 as Grant No. 8584. Several of his family members purchased other lands within Pīhā Homesteads, including Lots 5-6, 7-8, and 15-16. It appears that Breithaupt once ran cattle on Lot 1, and that he was responsible for helping to construct a portion of the fence along the *makai* boundary of the Hilo Forest Reserve.

The Hakalau Plantation Company continued to operate on lands *makai* of the Ramos property throughout the first half of the twentieth century, but by the early 1940s, nearly 40 percent of the sugarcane on the plantation was grown by independent growers, some of whom had purchased Pīhā Homestead lots. In 1943, the neighboring Wailea Milling Company merged with the Hakalau Plantation Company, expanding the operation, and by 1944 the plantation had reached its maximum output, producing 26,000

tons of sugar that year (Dorrance and Morgan 2000). On April 1, 1946, the Hakalau Mill and the railroad connecting the plantation to Hilo were severely damaged by a *tsunami* triggered by an earthquake in the Aleutian Islands. The mill was rebuilt, but the railroad shut down and the product was trucked to the docks at Hilo. In 1962, C. Brewer & Co. merged the Hakalau Plantation Company into the Pepeekeo Sugar Company, its southern neighbor, and the Hakalau Mill was shut down (Dorrance and Morgan 2000). In 1973, C. Brewer & Co. then merged the Pepeekeo Sugar Company into the Mauna Kea Sugar Company, combining under one corporate name what had once been five separate sugar plantations situated along the Hilo coast. This plantation, later named Mauna Kea Agribusiness Company, harvested its last crop in 1994 and then closed its doors for good.

With a century of reliance on sugar cane as the mainstay of the economy suddenly gone, the region was left essentially without an economic mainstay. Ranching and farming of diversified crops varying from silage corn to cacao to mushrooms to tea have occupied some of the lands and employ growing numbers of workers. Tourism based on the attractions in and near Honokaʻa and Honomu also provides local jobs. Despite this, it would appear that most residents either commute to Hilo or the west side of the island for jobs, have independent, often web-based businesses, or subsist mostly on retirement or trust income. For long-time residents, a major issue of this transformation has been maintenance of the shoreline and forest access formerly enjoyed as part of the lifestyle of the plantation community. Hunting and fishing remain important subsistence and social activities that are being jeopardized by deteriorating roads, new fences and gates, and no-trespassing signs.

Despite changes, there is a feeling of continuity and heritage in this community. In the words of the draft Hāmākua Community Development Plan (Hawaiʻi County Planning Department 2018: 20):

> The region referred to as Hamakua stretches along north of Hilo along the upright cliffs (Hilo Paliku) to the majestic, historic valley of Waipiʻo and up the slopes to the sacred summit of Mauna Kea. It is against this sweeping, lush green landscape that the people of the Hamakua region have flourished for generations. The region was historically renowned as a powerful religious, economic, and demographic center of Hawaiʻi Island and from early times, the region was known for its agriculture. One cannot truly understand Hamakua's people without appreciating the legacy that agriculture has stamped on this land and its people.
>
> For some, Hamakua is a place where their ancestors flourished for centuries and for others, agricultural employment drew their ancestors to emigrate from foreign lands. Here they raised their children and learned to love the land and sea as their own. Still others have come in search of a simpler way of life, drawn by the beauty of the land and a host of personal stories that testify to the magical attraction that draws people to places where they feel at home. Together, these groups form the modern communities of Hamakua.
>
> Regardless of their background, the people of Hamakua share a deep appreciation for the historical heritage of their small towns and highly value preserving an ʻohana-centered community that emphasizes quality of life, neighborhood cooperation, and the aloha spirit. The people of Hamakua

recognize that their future is tied to the preservation of their way of life and the natural and cultural resources that have sustained them for generations.

Archaeological Investigations and Resources

Previous archaeological studies conducted in the general project area and reviewed in Appendix 2 provided a working model for the types and density of features that the archaeologists could expect on the project site. The upland forest areas of Hilo were used traditionally for catching birds and gathering forest resources, both of which are transitory activities that are unlikely to have left a substantial, or easily recognizable, archaeological record. Access to the forest lands in the vicinity of the Ramos property was facilitated by a bird catcher's trail that followed the boundary between Kahuku and Pīhā ahupuaʻa, passing near the eastern boundary of the Ramos property. This trail once intersected with a canoe maker's trail from Nanue Ahupuaʻa near the *mauka* boundary of Kahuku Ahupua'a, in the general vicinity of the southern corner of the Ramos property. While the actual Precontact/early Historic trail routes, if they ever entered the property at all, are likely to be difficult to identify archaeologically given the thickly vegetated terrain and the overlay of historic land use, rock constructions once built adjacent to the trails, such as temporary shelters or cairns, may be encountered. The route of the trail along the Pīhā/Kahuku boundary was likely similar to the route of the existing (bulldozed) alignment of the Pīhā-Kahuku Homestead Road, which remains a public right-of-way, but is not part of the Ramos property. Historic use of the property in Pīhā Homesteads, which was purchased by William Breithaupt in 1916, may be marked by archaeological features related to ranching, habitation, or other early twentieth century homesteading activities.

Fieldwork consisted of a pedestrian survey of a roughly 5-acre portion of the property, which includes all of the area proposed for activity with a large buffer of areas not planned for activity all the way to Kalaeha Stream. The archaeological survey was conducted on February 1, 2018 by Robert B. Rechtman, Ph.D., Matthew R. Clark, M.A., and Ashton Dircks Ah Sam, B.A. During the survey, fieldworkers walked northwest/southeast oriented pedestrian transects spaced at 25-meter intervals across the entire project site, between the Pīhā-Kahuku Homesteads Road and Kalaeha Stream. While some portions of the survey area were densely overgrown with ʻuluhe, and the up and down terrain was bisected by numerous, eroded drainage channels making walking difficult and slow going, the ground visibility was generally adequate for identifying any extant archaeological remains that may have been present. In the vicinity of the site for the proposed single-family dwelling, where the hand clearing of vegetation had occurred prior to the survey, ground visibility was excellent. No archaeological remains of any kind were identified on the surface of the study area as a result of the pedestrian survey.

The survey was provided to SHPD for their review and comment on May 10, 2018. To date, there has been no response. Although no archaeological sites or other historic properties appear to present, in the unlikely event that any unanticipated archaeological resources are unearthed within the project site during the proposed development activities, work in the immediate vicinity of those resources should be halted and SHPD should be contacted in compliance with Hawaiʻi Administrative Rules 13§13-280.

Cultural Resources and Practices

Investigations of the property and its history did not reveal any cultural resources or practices on the project site itself. No consulted individuals with ties to and history with the area had any specific information concerning this area, and no archaeological features are present. Streams are present in the northwestern part of the property but will not be affected by any aspect of the proposed action. No gathering of plant or animal material is noted from the property.

However, historical documentation reveals that the *wao* of Pīhā were used for the procurement of special resources and were specifically utilized for bird-catching and the hewing and carving of *koa* wood for canoes. Although the traditional cultural practices and craft specialization associated with these traditions are no longer actively practiced in Pīhā, the recognition of their practice and importance reinforces the importance of the *mauka* Pīhā lands to the Hawaiian people. Boundary commission testimonies for Pīhā in 1875 revealed that an old trail utilized by bird catchers extended along the boundary of Pīhā and Kahuku Ahupuaʻa, which is coterminous with the eastern boundary of the Ramos property. According to the testimony, a canoe road in Nanue, the *ahupuaʻa* that begins only slightly to the northeast of the Ramos property where Kahuku terminates, extended *mauka* and led to a place named Kaʻahina where canoes were made. The presence of these trails and their association with known traditional customs and practices in the area emphasize Pīhā's significance as a cultural landscape and its value to the Hawaiian people's cultural identity.

The forested lands immediately *mauka* of the Ramos property have been protected under conservation as the Hilo Forest Reserve since 1905. Its lands and watersheds, the protection of which were the primary reason for the establishment of the reserve, remained virtually untouched by the flourishing sugar industry that dominated the more *makai* lands of Pīhā and adjacent areas. Protected within these forests are many of the same natural resources that were extant during the Precontact and early Historic Periods. Prior to the establishment of the Hilo Forest Reserve, large populations of feral animals, particularly pigs, have wreaked havoc on the health of the forest. While the creation of the reserve focused primarily on the protection of the forest watersheds, it provided the added benefit of controlling the feral pig population through the subsequent establishment of DOFAW, which manages various natural area, forest, and game management reserves, wildlife sanctuaries, and public bird/mammal hunting areas throughout the State of Hawaiʻi. Although no evidence was uncovered as part of the cultural impact assessment, the Hilo Forest Reserve may be utilized for gathering other forest resources, such as wood or lei materials.

Recreational hunting of introduced species of feral pigs is not recognized by many cultural experts as a traditional Hawaiian cultural practice, but it is nonetheless a long-standing tradition practiced in the islands for over a century and a half (Maly et al n.d.). The pigs originally introduced by the Polynesians were for the most part domesticated, and were an important food product and cultural resource in ancient Hawaiʻi, but they were not recreationally hunted (ibid.). As the *wao* were considered sacred, particularly the *wao akua*, great care was taken by the Hawaiians as they passed through. Entry into the depths of the *wao* was conducted with focused intention for the collection of very special natural resources including feathers, wood, foliage, and medicine. It is within the custom of exercising profound respect for the

spiritual and physical entities that inhabit the *wao akua* that these resources were protected in the ancient days. As noted by Maly et al. (n.d.), "*Pua'a* were valuable cultural resources, but in ancient times were kept away from the *wao akua*, which held so much more value to Hawaiians than a single species such as a pig." Following the demise of the Polynesian-introduced pig and the population influx of Western-introduced pig species, who thrived on a seemingly endless supply of forest forage, every layer of the *wao* has been infiltrated and the state of native Hawaiian forests are in continual decline as a result. The recreational hunting program managed by DOFAW serves to mitigate degradation to native vegetation caused by feral pigs by allowing the public to hunt within designated hunting units within the reserve. Thus, it can be argued that the continuation of pig hunting within the Pīhā Section of the Hilo Forest Reserve will aid in restoring the *mauka* lands to a more natural state, particularly in the absence of fences that can exclude feral ungulates.

When assessing potential cultural impacts to resources, practices, and beliefs, input gathered from community members with genealogical ties and/or long-standing residency relationships to the study area is vital. It is precisely these individuals who ascribe meaning and value to traditional resources and practices. Community members may also retain traditional knowledge and beliefs unavailable elsewhere in the historical or cultural record of a place.

As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify and help determine the significance of potential cultural resources, practices, and beliefs associated with the affected project area, along with potential cultural impacts and appropriate mitigation as necessary. A notice describing the action and location and inviting consultation was published in the Office of Hawaiian Affairs (OHA) newspaper *Ka Wai Ola* (March 2018). To date, there have been no response to the *Ka Wai Ola* notice. However, with the knowledge that the primary regional resources are associated with forest use, the cultural team at ASM Affiliates consulted with officials with expertise in the use of these resources. Contact was made with Joey Mello, the Hawai'i Branch DOFAW Wildlife Program Manager for East Hawai'i, along with Ian Cole of DOFAW, David Penn, the current Program Specialist for DOFAW's Legacy Land Conservation/Native Ecosystems Protection & Management, Clement Chang, a Trails and Access Specialist with DOFAW. Furthermore, eleven members of the Breithaupt family, a family with known historical ties to the Ramos property and other Pīhā Homestead parcels in the immediate vicinity, were contacted. The granddaughter of Ernest McComber Breithaupt, son of A.K. Breithaupt (Grant 7862), responded to the inquiry and indicated that her mother might be of assistance, but to date she has not contacted ASM. None of the other Breithaupt family members who were contacted have responded to ASM's inquiry to date.

The full results of the consultation are included in Appendix 3. Key information concerning historical and modern access points to Unit C of the Hilo Forest Reserve (the area adjacent to the Ramos property) was obtained during the interview with Ian Cole. This area is utilized to hunt feral pigs and wild sheep situated, particularly in the upper reaches of Pīhā and nearby Laupāhoehoe within the Hilo Forest Reserve. According to Mr. Cole, the entrance into the Unit C hunting area is publicly accessible by Mānā Road, where a hunter check station is present. He related that there is no formal *makai* access to Unit C through the Pīhā-Kahuku Road that extends to the southeastern corner of the Ramos property (despite the

presence of an old DOFAW sign on the road stating "Hilo Forest Reserve Piha Section Right of Way Trail", but that a number of informal access points exist in various locations in North Hilo and have been and are utilized by individuals seeking to hunt within the reserve. There are several hunter check stations (e.g. in Laupāhoehoe and ʻŌʻokala) which hunters use to access different hunting units, but Mr. Cole explained that in some cases hunters may enter through these various other check points and traverse to Unit C, bypassing the official checkpoint, thereby not leaving a paper trail. As such, assessing the number of hunters who utilize Unit C is not possible. He further indicated that DOFAW does maintain a presence in the Pīhā section of the reserve, particularly above Laupāhoehoe and in *mauka* Pīhā, and are especially concerned with the hunters who pass through different hunting units into Unit C with their canines, as hunters in Unit C are not permitted to hunt with the aid of dogs. According to Mr. Cole, the issue of hunter access into the forest reserve has been and remains as a particularly a troublesome issue in the Hāmākua District. He did not see how the construction of a single-family residence on the Ramos property would impact hunters, as there is technically no formal access to Unit C through Pīhā-Kahuku road, and certainly not accessible through privately-owned property, including the Ramos property.

In addition to consultation within the Cultural Impact Assessment, the EA project team discussed hunting access with Victor Souza, a long-time resident of Pīhā-Kahuku Road and hunter in the area. Mr. Souza remembered two routes into the Forest Reserve: the old "main trail" that ran, and still runs as far as he knows, through the private property just to the east, and a secondary route up the Pīhā-Kahuku Road and the driveway that branches off it. The latter route was formerly in such bad shape that it was walked rather than driven. When he was informed of Mr. Ramos' access plans, he said that they appeared acceptable and that it was good that Mr. Ramos wanted to facilitate access.

Impacts to and Mitigation for Cultural Resources and Practices

As stated in Section 1, landowner Pedro Ramos recognizes the somewhat diffuse access situation for those who hunt or gather in the Hilo Forest Reserve. No official access exists on or near his property, and the Pīhā-Kahuku Road in this area is only a paper road that is not easily traversable because of overgrowth. Consultation with neighbors, DLNR officials and others indicates that people park along various spots in the road and walk along trails that wind through various private properties as well as the paper route of the Pīhā-Kahuku Road extension until they are in the Forest Reserve. Mr. Ramos will provide a turnaround area on the driveway at the *makai* boundary of the property, where the driveway and the Pīhā-Kahuku Road diverge, to accommodate those seeking to access the Forest Reserve.

As such, the proposed construction of a single-family residence on the Ramos property will not impede access to the forest for pig hunting and any potential cultural utilization of forest resources. Should individuals with genealogical and/or historical relationships with Pīhā reinitiate using the forest lands for the gathering traditional resources such as *koa* and *ʻōhiʻa* for timbers, or other plants for medicinal and/or ceremonial purposes, a use which should be encouraged, no aspect of the project will restrict this. It is likely that restoring access to those with ties to the land who wish to access it and rejuvenate traditional resource procurement will aid in the rehabilitation of the forest. As such, this will only aid in the restoration of native vegetation which has been encroached upon and slowly overrun by invasive species.

Given the above consultation and assessment, it was the conclusion of the cultural impact assessment that the proposed development of a single-family residence on the Ramos Property would not result in impacts to any traditionally valued cultural or historical resources nor will it impact any traditional cultural practices or beliefs. The Draft EA was distributed to agencies and groups who might have knowledge in order to confirm this finding.

3.3 Public Roads, Services and Utilities

3.3.1 Roads and Access

Existing Environment, Impacts and Mitigation Measures

The sole road access to the project site is via an existing rough driveway that extends *mauka* from the paved terminus of Pīhā-Kahuku Road (see Figure 2 for ground an aerial photos). The existing driveway that currently extends to proposed house site has previously been and improved with gravel but left unpaved. Near the residence, the driveway will be expanded and improved and will include an unpaved parking and turn-around area. Mr. Ramos will also provide a turnaround area on the driveway at the *makai* boundary of the property, where the driveway and the Pīhā-Kahuku Road diverge, to accommodate those seeking to access the Forest Reserve.

3.3.2 Public Utilities and Services

Environmental Setting, Impacts and Mitigation Measures

Ground and rooftop-mounted solar photovoltaic panels together with a backup generator would provide electricity and a satellite dish would provide telecommunications. There would be no extension of electric lines from Pīhā-Kahuku Road.

Domestic water would be supplied via a catchment system directly adjacent to the home (see Figure 3 for location). The proposed storage is expected to be more than adequate to meet the expected demand, based on the owner‘s expected use of less than 200 gallons per day.

Wastewater would be treated with a septic system in conformance with State Department of Health regulations (see Figure 3 for location). No parks, schools or other public facilities are present nearby. Police, fire and emergency medical services are available from stations about eight road miles away in Laupāhoehoe. For onsite fire protection, the applicant proposes use of the water tanks.

There will be no adverse impact to any public or private utilities. The addition of one single-family home will have no measurable adverse impact to or additional demand on public facilities such as schools, police or fire services, or recreational areas. Mr. Ramos acknowledges and understands that this lot, along with almost all other residences in the rural areas of the North Hilo District, is not located within a mile of emergency services.

3.4 Secondary and Cumulative Impacts

Due to its small scale, the proposed project would not produce any major secondary impacts, such as population changes or effects on public facilities.

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. The County of Hawai‘i occasionally performs road maintenance on Pīhā-Kahuku Road. No substantial government or private projects such as roadways, schools, businesses, or subdivisions, are known to be occurring or in planning for this portion of North Hilo. There are several dozen private lots on the two-mile Pīhā-Kahuku Road. At any given time, a home or agricultural structure or communications facility may be undergoing maintenance or construction, and occasionally there are two or more minor projects occurring simultaneously. The adverse effects of building a single-family residence in this context are very minor and involve temporary disturbances to air quality, noise, traffic and visual quality during construction. It should again be noted that the proposed home is in a somewhat isolated, sparsely populated area, and no accumulation of adverse construction effects would be expected. Other than the precautions for preventing adverse impacts during construction listed above in Sections 3.1.3 and 3.1.6, no special mitigation measures should be required to counteract the small adverse cumulative effect.

3.5 Required Permits and Approvals

County of Hawai‘i:

Plan Approval and Grubbing, Grading, and Building Permits

State of Hawai‘i:

Conservation District Use Permit
Wastewater System Approval

3.6 Consistency with Government Plans and Policies

3.6.1 Hawai‘i County General Plan

The *General Plan* for the County of Hawai‘i is the document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2005. The General Plan’s Land Use Allocation Guide Map designates the property as Open. The *General Plan* is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Below are pertinent sections followed by a discussion of conformance.

ECONOMIC GOALS

(a) Provide residents with opportunities to improve their quality of life through economic development that enhances the County's natural and social environments.
(b) Economic development and improvement shall be in balance with the physical, social, and cultural environments of the island of Hawaii.
(d) Provide an economic environment that allows new, expanded, or improved economic opportunities that are compatible with the County's cultural, natural, and social environment.

Discussion: The proposed construction and occupation of a single-family home would be in balance with the natural, cultural and social environment of the County, would create temporary construction jobs for local residents, and would indirectly boost the economy through construction industry purchases from local suppliers. A multiplier effect takes place when these employees spend their income for food, housing, and other living expenses in the retail sector of the economy. Such activities are in keeping with the overall economic development of the island.

ENVIRONMENTAL QUALITY GOALS

(a) Define the most desirable use of land within the County that achieves an ecological balance providing residents and visitors the quality of life and an environment in which the natural resources of the island are viable and sustainable.
(b) Maintain and, if feasible, improve the existing environmental quality of the island.
(c) Control pollution.

ENVIRONMENTAL QUALITY POLICIES

(a) Take positive action to further maintain the quality of the environment.

ENVIRONMENTAL QUALITY STANDARDS

(a) Pollution shall be prevented, abated, and controlled at levels that will protect and preserve the public health and well being, through the enforcement of appropriate Federal, State and County standards.
(b) Incorporate environmental quality controls either as standards in appropriate ordinances or as conditions of approval.
(c) Federal and State environmental regulations shall be adhered to.

Discussion: The proposed construction and occupation of a single-family home would not have a substantial adverse effect on the environment and would not diminish the valuable natural resources of the region. The home and associated improvements would be compatible with the existing rural single-family homes and agricultural and recreational uses in the area. Pertinent environmental regulations would be followed, including those for mitigation of water quality impacts.

HISTORIC SITES GOALS

(a) Protect, restore, and enhance the sites, buildings, and objects of significant historical and cultural importance to Hawaii.
(b) Appropriate access to significant historic sites, buildings, and objects of public interest should be made available.

HISTORIC SITES POLICIES

(a) Agencies and organizations, either public or private, pursuing knowledge about historic sites should keep the public apprised of projects.
(b) Amend appropriate ordinances to incorporate the stewardship and protection of historic sites, buildings and objects.
(c) Require both public and private developers of land to provide historical and archaeological surveys and cultural assessments, where appropriate, prior to the clearing or development of land when there are indications that the land under consideration has historical significance.
(d) Public access to significant historic sites and objects shall be acquired, where appropriate.

Discussion: An archaeological survey determined that no historic sites were present. There are no known cultural resources or known or expected cultural uses on the lot; access to traditional forest resources and hunting areas will not be affected.

FLOOD CONTROL AND DRAINAGE GOALS

(a) Protect human life.
(b) Prevent damage to man-made improvements.
(c) Control pollution.
(d) Prevent damage from inundation.
(e) Reduce surface water and sediment runoff.
(f) Maximize soil and water conservation.

FLOOD CONTROL AND DRAINAGE POLICIES

(a) Enact restrictive land use and building structure regulations in areas vulnerable to severe damage due to the impact of wave action. Only uses that cannot be located elsewhere due to public necessity and character, such as maritime activities and the necessary public facilities and utilities, shall be allowed in these areas.
(g) Development-generated runoff shall be disposed of in a manner acceptable to the Department of Public Works and in compliance with all State and Federal laws.

FLOOD CONTROL AND DRAINAGE STANDARDS

(a) "Storm Drainage Standards," County of Hawaii, October, 1970, and as revised.
(b) Applicable standards and regulations of Chapter 27, "Flood Control," of the Hawaii County Code.
(c) Applicable standards and regulations of the Federal Emergency Management Agency (FEMA).
(d) Applicable standards and regulations of Chapter 10, "Erosion and Sedimentation Control," of the Hawaii County Code.
(e) Applicable standards and regulations of the Natural Resources Conservation Service and the Soil and Water Conservation Districts.

Discussion: The proposed home site, turnaround area and driveway, which comprise the small area planned for modification, are within Zone X, or areas outside of the 500-year floodplain as determined by detailed methods in the Flood Insurance Rate Maps (FIRM). The project will conform to applicable drainage regulations and policies of the County of Hawai'i.

NATURAL BEAUTY GOALS

(a) Protect, preserve and enhance the quality of areas endowed with natural beauty, including the quality of coastal scenic resources.
(b) Protect scenic vistas and view planes from becoming obstructed.
(c) Maximize opportunities for present and future generations to appreciate and enjoy natural and scenic beauty.

NATURAL BEAUTY POLICIES

(a) Increase public pedestrian access opportunities to scenic places and vistas.
(b) Develop and establish view plane regulations to preserve and enhance views of scenic or prominent landscapes from specific locations, and coastal aesthetic values.

Discussion: The improvements are minor and consistent with traditional uses of the land and will not cause scenic impacts or impede access.

NATURAL RESOURCES AND SHORELINES GOALS

(a) Protect and conserve the natural resources from undue exploitation, encroachment and damage.
(b) Provide opportunities for recreational, economic, and educational needs without despoiling or endangering natural resources.
(c) Protect and promote the prudent use of Hawaii's unique, fragile, and significant environmental and natural resources.
(d) Protect rare or endangered species and habitats native to Hawaii.
(e) Protect and effectively manage Hawaii's open space, watersheds, shoreline, and natural areas.
(f) Ensure that alterations to existing land forms, vegetation, and construction of structures cause

minimum adverse effect to water resources, and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation, or failure in the event of an earthquake.

NATURAL RESOURCES AND SHORELINES POLICIES

(a) Require users of natural resources to conduct their activities in a manner that avoids or minimizes adverse effects on the environment.
(c) Maintain the shoreline for recreational, cultural, educational, and/or scientific uses in a manner that is protective of resources and is of the maximum benefit to the general public.
(d) Protect the shoreline from the encroachment of man-made improvements and structures.
(h) Encourage public and private agencies to manage the natural resources in a manner that avoids or minimizes adverse effects on the environment and depletion of energy and natural resources to the fullest extent.
(p) Encourage the use of native plants for screening and landscaping.
(r) Ensure public access is provided to the shoreline, public trails and hunting areas, including free public parking where appropriate.
(u) Ensure that activities authorized or funded by the County do not damage important natural resources.

Discussion: Natural resources will not be affected the proposed action, and there would be very minimal alteration of natural landforms. Access to natural resources would not be affected. No unreasonable exposure to natural hazards not shared by every resident of the island would occur.

HĀMĀKUA COMMUNITY DEVELOPMENT PLAN

The Hāmākua Community Development Plan (CDP) planning area encompasses not only the judicial district of Hāmākua, but also that of North Hilo, and a portion of the South Hilo district commonly referred to as Rural South Hilo (Wainaku to Hakalau. It is being developed under the framework of the February 2005 County of Hawai‘i General Plan, but it has not yet been adopted. In February 2018, the Planning Director recommended that the CDP be adopted with some changes that clarify and strengthen the plan (http://www.hawaiicountycdp.info/hamakua-cdp/recommended-cdp-2018).

Community Development Plans are intended to translate broad General Plan Goals, Policies, and Standards into implementation actions as they apply to specific geographical regions around the County. CDPs are also intended to serve as a forum for community input into land-use, delivery of government services and any other matters relating to the planning area.

The Hāmākua CDP does not specify land use per se on the property, but has policies relevant to construction of a single-family home in certain aspirational priorities for natural and cultural resources and community infrastructure:

- Protects coastal areas, agricultural land, and mauka forests from development
- Protects open space, areas with natural beauty, and scenic view planes

- Guides the development of programs to strengthen protections for coastal and agricultural lands as well as open space and view planes
- Preserves historic resources
- Ensures appropriate public access to the shoreline and mauka forests
- Guides the development of a regional network of trails
- Guides collaborative stewardship and enhancement of coastal and forest ecosystems, cultural resources, agricultural lands, public access, and trails
- Concentrates future development in the existing towns, villages, and subdivisions
- Supports the preservation of village and town character and guides the enhancement of communities' unique sense of place

Discussion: The proposed single-family home would not represent development of *mauka* forest lands, as the property was subdivided as part of the Pīhā-Kahuku Homesteads in the early part of last century as a site for farming, ranching and residences. A home on this lot fulfills the purpose of this rural subdivision. No pristine native vegetation, rare species, forest resources would be affected. A home on this secluded site would have no adverse effect on natural beauty and scenic view planes. No historic properties are affected, and there would be impact to the access to the forest. Occupation of the home would promote additional patronage of local businesses in Laupāhoehoe and Honomū, helping to preserve the quality of life and economy. The construction of a single-family home here would be consistent with the CDP.

3.6.2 Conservation District

The State Land Use District for the Ramos property is Conservation. Its subzone is Resource, for which, according to Hawai'i Administrative Rules (HAR) §13-5-15, a single-family residence is an identified use. Any proposed use must undergo an examination for its consistency with the goals and rules of this district and subzone. The applicant has concurrently prepared a Conservation District Use Application (CDUA), to which this EA is an appendix. The CDUA includes a detailed evaluation of the consistency of the project with the criteria of the Conservation District permit process. Briefly, the following individual consistency criteria should be noted:

1. The proposed land use is consistent with the purpose of the Conservation District;

The development of the single-family residence is in conformance with the purpose of the Conservation District. It is an identified use within the Conservation District, requiring a Board Permit for such use. The owner is committed to conserve, protect and preserve the natural features on the subject property. The proposed use will not impact public forest reserve access or the public's ability to utilize forest reserve resources present mauka of the property. Additionally, due to the careful and limited nature of the proposed development, there would be no significant impacts to the natural or cultural resources of the area.

2. The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur;

The objective of the Resource subzone "…*is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas."* A single-family residence is an identified use in the Resource subzone under HAR 13-5-24, R-8. The proposed home conforms to the design standards in 13-5-41 and will ensure the sustained use of the natural resources in the project area by mitigating potential impacts, as outlined in this EA.

3. The proposed land use complies with provisions and guidelines contained in Chapter 205A, Hawaii Revised Statutes (HRS), entitled "Coastal Zone Management," where applicable;

The proposed land uses is outside the Special Management Area (SMA) and is thus not subject to County SMA rules. The use complies with all provisions and guidelines contained in Chapter 205A, Hawaiʻi Revised Statutes (HRS), entitled *Coastal Zone Management*.

4. The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region;

Because of the relatively minor nature of the project and the lack of threatened or endangered plant species or pristine native ecosystems, the proposed single-family residence is not likely to cause adverse biological impacts. Impacts to the island wide-ranging endangered Hawaiian hoary bat and Hawaiian hawk will be avoided through timing of vegetation removal and/or hawk nest survey. The proposed action will also have no impact on the public's current access to or use of the forest reserve.

5. The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels;

The proposed use is consistent with single-family residential use in the area. The proposed home will be split-level, 2,490 square feet in size (including lanais, porches, carport and utility structures such as water tank), and outside the flood zone. It will be in area not visible to the public on any public road or any other public vantage point. This identified use, which conforms to the design standards in HAR 13-5-41, will ensure the sustained use of the natural resources in the project area by mitigating impacts. The use will not adversely affect the surrounding properties or how these properties are utilized. This land use will be attractive and compatible with the area, as there are scattered single-family residences on other lots on Pīhā-Kahuku Road.

6. The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable;

The proposed use of the subject property for a single-family residence will help conserve, protect and preserve the natural features of the area.

7. Subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District;

The proposed action does not involve or depend upon subdivision and will not lead to any increase in intensity of use beyond the requested single-family residence.

8. The proposed land use will not be materially detrimental to the public health, safety and welfare.

The proposed single-family residence will not be detrimental to the public health, safety, and welfare.

PART 4: DETERMINATION, FINDINGS AND REASONS

4.1 Determination

The applicant expects that the State of Hawai‘i, Department of Land and Natural Resources, will determine that the proposed action will not significantly alter the environment, as impacts will be minimal, and that this agency will accordingly issue a Finding of No Significant Impact (FONSI). This determination will be reviewed based on comments to the Draft EA, and the Final EA will present the final determination.

4.2 Findings and Supporting Reasons

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resource would be committed or lost. Various common native plants are present but native ecosystems would not be adversely affected, particularly given the limited scale of disturbance and the context within the most disturbed quarter-acre of the 18-acre property. No adverse impact upon vegetation or endangered species should occur. An archaeological inventory survey has determined that no historic sites are present on the property or would be affected. No valuable cultural resources and practices such as forest access, fishing, gathering, hunting, or access to ceremonial sites would be affected in any way.

2. *The proposed project will not curtail the range of beneficial uses of the environment.* No restriction of beneficial uses would occur by residential use on this lot.

3. *The proposed project will not conflict with the State's long-term environmental* policies. The State's long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of life. The project is environmentally benign and minor, and it is thus consistent with all elements of the State's long-term environmental policies.

4. *The proposed project will not substantially affect the economic or social welfare of the community or State.* The project would not have any substantial effect on the economic or social welfare of the Big Island community or the State of Hawai‘i.

5. *The proposed project does not substantially affect public health in any detrimental way.* The project would not affect public health and safety in any way. Wastewater will be disposed of in conformance with State Department of Health regulations.

6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities*. The small scale of the proposed project would not produce any major secondary impacts, such as population changes or effects on public facilities.

7. *The proposed project will not involve a substantial degradation of environmental quality*. The

project is minor and environmentally benign, and thus it would not contribute to environmental degradation.

8. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* Thorough survey has determined that no endangered plant species are present. Other than Hawaiian hoary bats and Hawaiian hawks, island wide-ranging species that will experience no adverse impacts due to mitigation in the form of timing of vegetation removal and/or hawk nest survey, no rare, threatened or endangered species of fauna are known to exist on or near the project site, and none would be affected by any project activities.

9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The adverse effects of building a single-family residence are limited very minor and temporary disturbance to traffic, air quality, noise, and visual quality during construction. This area is fairly isolated from sensitive receptors. The County of Hawai‘i occasionally performs road maintenance on Pīhā-Kahuku Road. There are no substantial government or private projects in construction or planning, and no accumulation of adverse construction effects would be expected. Other than the precautions for preventing adverse effects during construction listed above, no special mitigation measures should be required to counteract the small adverse cumulative effect.

10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* No substantial effects to air, water, or ambient noise would occur. Brief, temporary effects would occur during construction and would be mitigated. The context of the property's location, with no residences, parks, or other sensitive uses nearby, will help avoid noise impacts. Erosion and sedimentation impacts will be avoided by implementation of Best Management Practices during grading, which will occur in a very limited area.

11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* The proposed home site is not located in a flood zone or any other hazardous area, and it would not affect any such area.

12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic views are located nearby or would be affected in any way. The attractive design of the home, combined with a context in which the home would not be visible from public vantage points, would ensure that the scenery of the project area would not be affected.

13. *The project will not require substantial energy consumption*. Negligible amounts of energy input would be required for construction and occupation of the residence. Electrical power will be provided via a solar photovoltaic (PV) system. The project has adapted to climate change by accounting for the potential for larger storms, through minimizing hard surfaces that generate runoff in heavy rainfall and removing invasive trees that could fall during strong winds.

REFERENCES

Dorrance, W., and F. Morgan. 2000. *Sugar Islands: The 165-Year Story of Sugar in Hawaii*. Honolulu: Mutual Publishing Co.

Ellis, W. 1826. Narrative of a Tour Through Hawai‘i, or, Owhyhee; With Remarks on the History, Traditions, Manners, Customs, and Language of the Inhabitants of the Sandwich Islands. London: H. Fisher, Son, and P. Jackson.

Emerson, N.B. 1993. *Pele and Hi‘iaka*. Honolulu: ‘Ai Pohaku Press.

Fornander, A. 1969. *An Account of the Polynesian Race: Its Origin and Migrations*. Tokyo: Charles E. Tuttle Co., Inc.

Gagne, W., and L. Cuddihy. 1990. “Vegetation,” pp. 45-114 in W.L. Wagner, D.R. Herbst, and S.H. Sohmer, eds., *Manual of the Flowering Plants of* Hawai‘i. 2 vols. Honolulu: University of Hawai‘i Press.

Giambelluca, T.W., Q. Chen, A.G. Frazier, J.P. Price, Y.-L. Chen, P.-S. Chu, J.K. Eischeid, and D.M. Delparte. 2014. Online Rainfall Atlas of Hawai‘i. *Bull. Amer. Meteor. Soc*., doi: 10.1175/BAMS-D-11-00228.1.

Handy, E.S. and E.G. Handy. 1972 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Bishop Museum, Bulletin 233. Honolulu.

Hawai‘i County Planning Department. 2005. *General Plan, County of Hawai‘i*. Hilo.

_____. 2018. *Hāmākua Community Development Plan* (January 2018 draft). Hilo. Available at (http://www.hawaiicountycdp.info/hamakua-cdp/recommended-cdp-2018 (accessed March 2018).

Hawai‘i DOFAW (Department of Land and Natural Resources, Division of Forestry & Wildlife). 2017. *Rapid ‘Ōhi‘a Death: Part I: Strategic Response Plan for Hawai‘i, 2017-201*9. Honolulu.

Hawaii Territory Division of Forestry. 1906. “Report of the Division of Forestry for the year ending December 31, 1905. Territory of Hawai‘i Board of Agriculture and Forestry.” Honolulu: Hawaiian Gazette Co. Ltd.

Heliker, C. 1990. V*olcanic and seismic hazards on the Island of Hawaii*. U.S. Geological Survey General Interest Publication.

Horowitz, R., J. Finn, L. Vargha, and J. Ceaser. 1969. “Public Land Policy in Hawai‘i: An Historical Analysis. Report No. 5, 1969.” Legislative Reference Bureau. University of Hawai‘i, Honolulu.

Hommon, R. 1986. Social Evolution in Ancient Hawai‘i. IN Kirch, P. (editor), *Island Societies*: *Archaeological Approaches to Evolution and Transformation*:55-88. Cambridge: Cambridge University Press.

Kalākaua, His Majesty. 1888. *The Legends and Myths of Hawai‘i. The Fables and Folk-Lore of a Strange People*. New York: Charles L. Webster & Company.

Kirch, P.V. 2012. *A Shark Going Inland Is My Chief: The Island Civilization of Ancient Hawai‘i*. Berkeley, CA.: University of California Press.

Maly, K., and O. Maly. 2006. *Hilo Palikū–Hilo of the Upright Cliffs: A Study of Cultural-Historical Resources of Lands in the Laupāhoehoe Forest Section, Ahupua‘a of the Waipunalei-Mauluanui Region, North Hilo District, Island of Hawai‘i*. Kumu Pono Associates Study HiHETF116-Laupāhoehoe Prep. for United States Department of Agriculture Forest Service – Institute of Pacific Islands Forestry, Hilo.

Maly, K., B. Pang, and C. Burrows. n.d. P*igs in Hawai‘i, from Traditional to Modern*. Accessed at http://www.eastmauiwatershed.org/wpcontent/uploads/2013/01/Puaa-cultural-fact-sheet-04.03.pdf. Accessed April 5, 2018.

Pogue, J. 1858 [1978]. *Moolelo Hawaii*. Hale Paipalapala Aupuni, Honolulu (Rev. Ed.).

Pukui, M.K. 1983. *‘Ōlelo No‘eau: Hawaiian Proverbs & Poetical Sayings*. 1st. edition. Honolulu: Bishop Museum Press.

Pukui, M.K, Elbert S.H, and E.T. Mookini. 1976. *Place Names of Hawai`i*. Honolulu: University of Hawai`i Press.

U.S. Council on Environmental Quality (CEQ). 2016. *Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*. Guidance dated August 1, 2016, signed by C. Goldfuss, CEQ.

U.S. Dept. of Commerce, Economics and Statistics Administration, Bureau of the Census, 2011, http://factfinder.census.gov/.

U.S. Geological Survey (USGS). 2000. *Seismic Hazard Maps for Hawaii*. By F.W. Klein, A.D. Frankel, C.S. Mueller, R.L. Wesson and P.G. Okubo.

U.S. Geological Survey, Hawaiian Volcanoes Observatory: (USGS-HVO). 2009. “One man’s soil is another man’s ash.” 10/19/2009 Volcano Watch column: http://www.hawaii247.com/2009/10/19/volcano-watch-one-man%E2%80%99s-soil-is-another-man%E2%80%99s-ash/

U.S. Department of the Interior. 1914 "Report of the Governor of Hawai'i." In Reports of the Department of the Interior For the Fiscal Year ended June 30, 1914, Volume II, Indian Affairs and Territories, pps. 479-544. Government Printing Office, Washington D.C.

University of Hawai'i at Hilo, Dept. of Geography. 1998. *Atlas of Hawai'i*. 3rd ed. Honolulu: University of Hawai'i Press.

University of Hawai'i at Manoa, Sea Grant College Program. 2014. *Climate Change Impacts in Hawai'i - A summary of climate change and its impacts to Hawai'i's ecosystems and communities*. UNIHI-SEAGRANT-TT-12-04.

Wilkes, C. 1845. *Narrative of the United States Exploring Expedition During the Years 1838–1842, Under the Command of C. Wilkes, U.S.N.,* Volume 4. Philadelphia: Lea and Blanchard.

Wolfe, E.W., and J. Morris. 1996. *Geologic Map of the Island of Hawai'i.* USGS Misc. Investigations Series Map i-2524-A. Washington, D.C.: U.S. Geological Survey.

Wright, T.L., Chun, J.Y.F, Esposo, J., Heliker, Christina, Hodge, J., Lockwood, J.P., and Vogt, S.M. 1992. *Map showing lava-flow hazard zones, Island of Hawaii: U.S. Geological Survey Miscellaneous Field Studies Map MF-2193, scale 1:250,000*.

Draft Environmental Assessment
Ramos Single-Family Residence
in the Conservation District at Pīhā

APPENDIX 1a
Comments in Response to Early Consultation

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Mayor

Wil Okabe
Managing Director

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APRIL 27, 2018

ATTN: RON TERRY
GEOMETRICIAN ASSOCIATES, LLC.
P.O. BOX 396
HILO, HAWAII 96721
(via email to rterry@hawaii.rr.com)

SUBJECT: EARLY CONSULTATION FOR ENVIRONMENTAL ASSESSMENT FOR PROPOSED SIGNLE-FAMILY RESIDENCE IN THE CONSERVATION DISTRICT, NORTH HILO DISTRICT, ISLAND OF HAWAII
TMK: (3) 3-2-004:038

We received the subject dated April 13, 2018 and have the following comments:

The subject parcel is in an area designated as Zone X on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Zone X is an area determined to be outside the 500-year floodplain.

All activities shall comply with the requirements of Hawaii County Code (HCC), Chapter 10, Erosion and Sedimentary Control.

Construction within the County right-of-way shall comply with HCC, Chapter 22, County Streets.

Should there be any questions concerning this matter, please contact Ms. Robyn Matsumoto in our Engineering Division at (808) 961-8924.

BEN ISHII, Division Chief
Engineering Division

RM

Harry Kim
Mayor

Paul K. Ferreira
Police Chief

Kenneth Bugado Jr.
Deputy Police Chief

County of Hawai`i

POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawai`i 96720-3998
(808) 935-3311 • Fax (808) 961-8865

April 25, 2018

Mr. Ron Terry, Principal
Geometrician Associates
P. O. Box 396
Hilo, HI 96721

Dear Mr. Terry:

Subject: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District, North Hilo District, Island of Hawaii, TMK (3) 3-2-004:038

Staff, upon reviewing the provided documents, does not anticipate any significant impact to traffic and/or other public safety concerns. We are not requesting a copy of the Draft EA when completed.

Thank you for allowing us the opportunity to comment.

If you have any questions, please contact Captain Andrew Burian, Commander of the North Hilo and Hāmākua Districts, at (808) 775-7533.

Sincerely,

MITCHELL K. KANEHAILUA JR.
ASSISTANT POLICE CHIEF
AREA I OPERATIONS BUREAU

AB:lli/180390

From: Jerome K. Yasuhara <jeromey@oha.org>
Sent: Monday, April 30, 2018 1:49 PM
To: 'rterry@hawaii.rr.com' <rterry@hawaii.rr.com>
Cc: Jerome K. Yasuhara <jeromey@oha.org>
Subject: Early Consultation for EA for Proposed Single-Family Residence in the Conservation District, North Hilo District, Island of Hawai`i, TMK (3rd) 3-2-004:038

Aloha e Mr. Terry,

Concerning the above-referenced project, this is indicating our request to receive notice of the availability of the Draft EA when it is completed. Mahalo.

Me ka ha`aha`a,
Jerome Yasuhara

Jerome Yasuhara | Ka `Aho Pueo, Kia`i Känäwai | **Compliance Specialist**
OFFICE OF HAWAIIAN AFFAIRS

OFFICE OF HAWAIIAN AFFAIRS
560 N. Nimitz Highway, Suite 200 | Honolulu, HI 96817
☎: 808.594.0129 | 🖷: 808.594.1825 | ✉: jeromey@oha.org

Harry Kim
Mayor

Darren J. Rosario
Fire Chief

Renwick J. Victorino
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Suite 2501 • Hilo, Hawai'i 96720
(808) 932-2900 • Fax (808) 932-2928

April 30, 2018

Ron Terry
Geometrician Associates
P.O. Box 396
Hilo, Hawai'i 96721

Dear Mr Terry:

SUBJECT: Early Consultation for Environmental Assessment for Proposed Single Family Residence in the Conservation District, North Hilo District, Island of Hawai'i, TMK (3) 3-2-004:038

In regards to the above-referenced Early Consultation for Environmental Assessment application, the following shall be in accordance:

NFPA 1, UNIFORM FIRE CODE, 2006 EDITION
Note: Hawai'i State Fire Code, National Fire Protection Association 2006 version, with County of Hawaii amendments. County amendments are identified with a preceding "C~" of the reference code.

Chapter 18 Fire Department Access and Water Supply

18.1 General. Fire department access and water supplies shall comply with this chapter.

For occupancies of an especially hazardous nature, or where special hazards exist in addition to the normal hazard of the occupancy, or where access for fire apparatus is unduly difficult, or areas where there is an inadequate fire flow, or inadequate fire hydrant spacing, and the AHJ may require additional safeguards including, but not limited to, additional fire appliance units, more than one type of appliance, or special systems suitable for the protection of the hazard involved.

18.1.1 Plans.

18.1.1.1 Fire Apparatus Access. Plans for fire apparatus access roads shall be submitted to the fire department for review and approval prior to construction.

18.1.1.2 Fire Hydrant Systems. Plans and specifications for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction.

C~ 18.1.1.2.1 Fire Hydrant use and Restrictions. No unauthorized person shall use or operate any Fire hydrant unless such person first secures permission or a permit from the owner or representative of the department, or company that owns or governs that water supply or system. Exception: Fire Department personnel conducting firefighting operations, hydrant testing, and/or maintenance, and the flushing and acceptance of hydrants witnessed by Fire Prevention Bureau personnel.

18.2 Fire Department Access.

18.2.1 Fire department access and fire department access roads shall be provided and maintained in accordance with Section 18.2.

18.2.2* Access to Structures or Areas.

18.2.2.1 Access Box(es). The AHJ shall have the authority to require an access box(es) to be installed in an accessible location where access to or within a structure or area is difficult because of security.

18.2.2.2 Access to Gated Subdivisions or Developments. The AHJ shall have the authority to require fire department access be provided to gated subdivisions or developments through the use of an approved device or system.

18.2.2.3 Access Maintenance. The owner or occupant of a structure or area, with required fire department access as specified in 18.2.2.1 or 18.2.2.2, shall notify the AHJ when the access is modified in a manner that could prevent fire department access.

18.2.3 Fire Department Access Roads. (*may be referred as FDAR)

18.2.3.1 Required Access.

18.2.3.1.1 Approved fire department access roads shall be provided for every facility, building, or portion of a building hereafter constructed or relocated.

18.2.3.1.2 Fire Department access roads shall consist of roadways, fire lanes, parking lots lanes, or a combination thereof.

18.2.3.1.3* When not more than two one- and two-family dwellings or private garages, carports, sheds, agricultural buildings, and detached buildings or structures 400ft^2 (37 m^2) or less are present, the requirements of 18.2.3.1 through 18.2.3.2.1 shall be permitted to be modified by the AHJ.

18.2.3.1.4 When fire department access roads cannot be installed due to location on property, topography, waterways, nonnegotiable grades, or other similar conditions, the AHJ shall be authorized to require additional fire protection features.

18.2.3.2 Access to Building.

18.2.3.2.1 A fire department access road shall extend to within in 50 ft (15 m) of at least one exterior door that can be opened from the outside that provides access to the interior of the building. Exception: 1 and 2 single-family dwellings.

18.2.3.2.1.1 When buildings are protected throughout with an approved automatic sprinkler system that is installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, the distance in 18.2.3.2.1 shall be permitted to be increased to 300 feet.

18.2.3.2.2 Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 ft (46 m) from fire department access roads as measured by an approved route around the exterior of the building or facility.

18.2.3.2.2.1 When buildings are protected throughout with an approved automatic sprinkler system that is installed in accordance with NFPA 13, NFPA 13D, or NFPA 13R, the distance in 18.2.3.2.2 shall be permitted to be increased to 450 ft (137 m).

18.2.3.3 Multiple Access Roads. More than one fire department access road shall be provided when it is determined by the AHJ that access by a single road could be impaired by vehicle congestion, condition of terrain, climatic conditions, or other factors that could limit access.

18.2.3.4 Specifications.

18.2.3.4.1 Dimensions.

C~ 18.2.3.4.1.1 FDAR shall have an unobstructed width of not less than 20ft with an approved turn around area if the FDAR exceeds 150 feet. **Exception:** FDAR for one and two family dwellings shall have an unobstructed width of not less than 15 feet, with an area of not less than 20 feet wide within 150 feet of the structure being protected. An approved turn around area shall be provided if the FDAR exceeds 250 feet.

C~ 18.2.3.4.1.2 FDAR shall have an unobstructed vertical clearance of not less then 13ft 6 in.

C~ 18.2.3.4.1.2.1 Vertical clearances may be increased or reduced by the AHJ, provided such increase or reduction does not impair access by the fire apparatus, and approved signs are installed and maintained indicating such approved changes.

18.2.3.4.1.2.2 Vertical clearances shall be increased when vertical clearances or widths are not adequate to accommodate fire apparatus.

C~ 18.2.3.4.2 Surface. Fire department access roads and bridges shall be designed and maintained to support the imposed loads (25 Tons) of the fire apparatus. Such FDAR and shall be comprised of an all-weather driving surface.

18.2.3.4.3 Turning Radius.

C~ 18.2.3.4.3.1 Fire department access roads shall have a minimum inside turning radius of 30 feet, and a minimum outside turning radius of 60 feet.

18.2.3.4.3.2 Turns in fire department access road shall maintain the minimum road width.

18.2.3.4.4 Dead Ends. Dead-end fire department access roads in excess of 150 ft (46 m) in length shall be provided with approved provisions for the fire apparatus to turn around.

18.2.3.4.5 Bridges.

18.2.3.4.5.1 When a bridge is required to be used as part of a fire department access road, it shall be constructed and maintained in accordance with county requirements.

18.2.3.4.5.2 The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus.

18.2.3.4.5.3 Vehicle load limits shall be posted at both entrances to bridges where required by the AHJ.

18.2.3.4.6 Grade.

C~ 18.2.3.4.6.1 The maximum gradient of a Fire department access road shall not exceed 12 percent for unpaved surfaces and 15 percent for paved surfaces. In areas of the FDAR where a Fire apparatus would connect to a Fire hydrant or Fire Department Connection, the maximum gradient of such area(s) shall not exceed 10 percent.

18.2.3.4.6.2* The angle of approach and departure for any means of fire department access road shall not exceed 1 ft drop in 20 ft (0.3 m drop in 6 m) or the design limitations of the fire apparatus of the fire department, and shall be subject to approval by the AHJ.

18.2.3.4.6.3 Fire department access roads connecting to roadways shall be provided with curb cuts extending at least 2 ft (0.61 m) beyond each edge of the fire lane.

18.2.3.4.7 Traffic Calming Devices. The design and use of traffic calming devices shall be approved the AHJ.

18.2.3.5 Marking of Fire Apparatus Access Road.

18.2.3.5.1 Where required by the AHJ, approved signs or other approved notices shall be provided and maintained to identify fire department access roads or to prohibit the obstruction thereof of both.

18.2.3.5.2 A marked fire apparatus access road shall also be known as a fire lane.

18.2.4* Obstruction and Control of Fire Department Access Road.

18.2.4.1 General.

18.2.4.1.1 The required width of a fire department access road shall not be obstructed in any manner, including by the parking of vehicles.

18.2.4.1.2 Minimum required widths and clearances established under 18.2.3.4 shall be maintained at all times.

18.2.4.1.3* Facilities and structures shall be maintained in a manner that does not impair or impede accessibility for fire department operations.

18.2.4.1.4 Entrances to fire departments access roads that have been closed with gates and barriers in accordance with 18.2.4.2.1 shall not be obstructed by parked vehicles.

18.2.4.2 Closure of Accessways.

18.2.4.2.1 The AHJ shall be authorized to require the installation and maintenance of gates or other approved barricades across roads, trails, or other accessways not including public streets, alleys, or highways.

18.2.4.2.2 Where required, gates and barricades shall be secured in an approved manner.

18.2.4.2.3 Roads, trails, and other access ways that have been closed and obstructed in the manner prescribed by 18.2.4.2.1 shall not be trespassed upon or used unless authorized by the owner and the AHJ.

18.2.4.2.4 Public officers acting within their scope of duty shall be permitted to access restricted property identified in 18.2.4.2.1.

18.2.4.2.5 Locks, gates, doors, barricades, chains, enclosures, signs, tags, or seals that have been installed by the fire department or by its order or under its control shall not be removed, unlocked, destroyed, tampered with, or otherwise vandalized in any manner.

18.3 Water Supplies and Fire Hydrants

18.3.1* A water supply approved by the county, capable of supplying the required fire flow for fire protection shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45 720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ. For on-site fire hydrant requirements see section 18.3.3.

EXCEPTIONS:

1. When facilities or buildings, or portions thereof, are completely protected with an approved automatic fire sprinkler system the provisions of section 18.3.1 may be modified by the AHJ.
2. When water supply requirements cannot be installed due to topography or other conditions, the AHJ may require additional fire protection as specified in section 18.3.2 as amended in the code.
3. When there are not more than two dwellings, or two private garage, carports, sheds and agricultural. Occupancies, the requirements of section 18.3.1 may be modified by AHJ.

18.3.2* Where no adequate or reliable water distribution system exists, approved reservoirs, pressure tanks, elevated tanks, fire department tanker shuttles, or other approved systems capable of providing the required fire flow shall be permitted.

18.3.3* The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be provided on a fire apparatus access road on the site of the premises or both, in accordance with the appropriate county water requirements.

18.3.4 Fire Hydrants and connections to other approved water supplies shall be accessible to the fire department.

18.3.5 Private water supply systems shall be tested and maintained in accordance with NFPA 25 or county requirements as determined by the AHJ.

18.3.6 Where required by the AHJ, fire hydrants subject to vehicular damage shall be protected unless located within a public right of way.

18.3.7 The AHJ shall be notified whenever any fire hydrant is placed out of service or returned to service. Owners of private property required to have hydrants shall maintain hydrant records of approval, testing, and maintenance, in accordance with the respective county water requirements. Records shall be made available for review by the AHJ upon request.

C~ 18.3.8 Minimum water supply for buildings that do not meet the minimum County water standards:

Buildings up to 2000 square feet, shall have a minimum of 3,000 gallons of water available for Firefighting.

Buildings 2001- 3000 square feet, shall have a minimum of 6,000 gallons of water available for Firefighting.

Buildings, 3001- 6000 square feet, shall have a minimum of 12,000 gallons of water available for Firefighting.

Buildings, greater than 6000 square feet, shall meet the minimum County water and fire flow requirements.

Multiple story buildings shall multiply the square feet by the amount of stories when determining the minimum water supply.

Commercial buildings requiring a minimum fire flow of 2000gpm per the Department of Water standards shall double the minimum water supply reserved for firefighting.

Fire Department Connections (FDC) to alternative water supplies shall comply with 18.3.8 (1)-(6) of *this code.*

NOTE: In that water catchment systems are being used as a means of water supply for firefighting, such systems shall meet the following requirements:

1) In that a single water tank is used for both domestic and firefighting water, the water for domestic use shall not be capable of being drawn from the water reserved for firefighting;

2) Minimum pipe diameter sizes from the water supply to the Fire Department Connection (FDC) shall be as follows:
   a) 4" for C900 PVC pipe;
   b) 4" for C906 PE pipe;
   c) 3" for ductile Iron;
   d) 3' for galvanized steel.

3) The Fire Department Connection (FDC) shall:
   a) be made of galvanized steel;
   b) have a gated valve with 2-1/2 inch, National Standard Thread male fitting and cap;
   c) be located between 8 ft and 16 ft from the Fire department access. The location shall be approved by the AHJ;
   d) not be located less than 24 inches, and no higher than 36 inches from finish grade, as measured from the center of the FDC orifice;
   e) be secure and capable of withstanding drafting operations. Engineered stamped plans may be required;
   f) not be located more than 150 feet of the most remote part, but not less than 20 feet, of the structure being protected;
   g) also comply with section 13.1.3 and 18.2.3.4.6.1 of *this code.*

4) Commercial buildings requiring a fire flow of 2000gpm shall be provided with a second FDC. Each FDC shall be independent of each other, with each FDC being capable of flowing 500gpm by engineered design standards. The second FDC shall be located in an area approved by the AHJ with the idea of multiple Fire apparatus'conducting drafting operations at once, in mind.

5) Inspection and maintenance shall be in accordance to NFPA 25.

6) The owner or lessee of the property shall be responsible for maintaining the water level, quality, and appurtenances of the system.

EXCEPTIONS TO SECTION 18.3.8:

1) Agricultural buildings, storage sheds, and shade houses with no combustible or equipment storage.

2) Buildings less than 800 square feet in size that meets the minimum Fire Department Access Road requirements.

3) For one and two family dwellings, agricultural buildings, storage sheds, and detached garages 800 to 2000 square feet in size, and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 1000 feet.

4) For one and two family dwellings, agricultural buildings, and storage sheds greater than 2000square feet, but less than 3000 square feet and meets the minimum Fire Department Access Road requirements, the distance to the Fire Department Connection may be increased to 500 feet.

5) For buildings with an approved automatic sprinkler system, the minimum water supply required may be modified.

If there are any questions regarding these requirements, please contact the Fire Prevention Bureau at (808) 932-2911.

DARREN J. ROSARIO
Fire Chief

RP:ds

Harry Kim
Mayor

Michael Yee
Director

Daryn Arai
Deputy Director

West Hawai'i Office
74-5044 Ane Keohokalole Hwy
Kailua-Kona, Hawai'i 96740
Phone (808) 323-4770
Fax (808) 327-3563

County of Hawai'i

PLANNING DEPARTMENT

East Hawai'i Office
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720
Phone (808) 961-8288
Fax (808) 961-8742

May 2, 2018

Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawai'i 96721

Dear Mr. Terry:

SUBJECT: Early Consultation for Preparation of an Environmental Assessment for Proposed Single-Family Residence in the Conservation District
TMK: (3) 3-2-004:038, North Hilo District, Island of Hawai'i

Thank you for your letter dated April 13, 2018, requesting comments from this office regarding the preparation of a Draft Environmental Assessment (DEA) for the subject property.

The subject parcel consists of 18.3 acres and is in the State Land Use Conservation (C) district. In addition, the parcel is designated Conservation (C) by the Hawai'i County General Plan Land Use Pattern Allocation Guide (LUPAG) Map. The subject parcel is not zoned because it is a forest reserve and authority lies in the State Land Use (SLU) designation of Conservation. The subject parcel is also located in the Watershed Protection Priority 1 area.

The principle permitting jurisdiction is the State of Hawai'i Board of Land and Natural Resources. Therefore, the comments we are providing only concern general information about the parcel. Because the subject parcel is in the SLU Conservation District, the owner will need to submit a Conservation District Use Application (CDUA). Additional information can be found in Department of Land and Natural Resources (DLNR) Hawai'i Administrative Rules (HAR) Title 13 Chapter 5.

The DEA should describe how the proposed project is consistent with the policies, standards, and courses of action of the County of Hawai'i General Plan 2005 (as amended). The project site is located in the Hāmākua Community Development Plan (CDP) planning area. The Hāmākua

CDP has not yet been adopted and is currently in the final stages of the planning process. However, the DEA should outline the proposed project's coherence with the DRAFT Hāmākua CDP, which is available for viewing and download at the following web address: http://www.hawaiicountycdp.info/hamakua-cdp/recommended-cdp-2018.

Given that the site for the proposed project is adjacent to the Hilo Forest Reserve, the Hakalau Forest National Wildlife Refuge, and the Waikaumalo Stream, appropriate attention should be given to identify potential impacts (ROD, little fire ants, stream pollution, etc.) the proposed use may have on surrounding areas.

We have no further comments to offer at this time. Please keep us informed and provide our department with a copy of the DEA for our review and comment.

If you have any questions, please feel free to contact Keiko Mercado of this office at Keiko.Mercado@hawaiicounty.gov or (808) 961-8134.

Sincerely,

for

MICHAEL YEE
Planning Director

KM:ja
\\COH33\planning\public\wpwin60\Keiko\EA-EIS Review\preconsultationEA-Piha.Homesteads.332004038.doc

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 17, 2018

Geometrician Associates, LLC
Attention: Mr. Ron Terry
P.O. Box 396
Hilo, Hawaii 96721

via email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District located at North Hilo, Island of Hawaii; TMK: (3) 3-2-004:038 for **Pedro Ramos**

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from the (a) Engineering Division, (b) Office of Conservation & Coastal Lands, and (c) Land Division – Hawaii District on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at (808) 587-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

'18 APR 20 PM02:16 ENGINEERING

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

April 20, 2018

MEMORANDUM

RECEIVED
LAND DIVISION
2018 MAY -3 AM 11:04
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

~~TO:~~ FROM

DLNR Agencies:
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

~~FROM:~~ To Russell Y. Tsuji, Land Administrator
SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District
LOCATION: North Hilo, Island of Hawaii; TMK: (3) 3-2-004:038
APPLICANT: Geometrician Associates on behalf of **Pedro Ramos**

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by **May 14, 2018.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: _____

Print Name: ~~Carty S. Chang, Chief Engineer~~

Date: 5/2/18

Attachment
cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District, North Hilo, Island of Hawaii; TMK: (3) 3-2-004:038

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4846.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 5/2/18

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

FYI

2018 MAR 20 A 10:52

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2018 MAY -7 AM 10:43
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

April 20, 2018

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District
LOCATION: North Hilo, Island of Hawaii; TMK: (3) 3-2-004:038
APPLICANT: Geometrician Associates on behalf of **Pedro Ramos**

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by **May 14, 2018.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: K. Tiger Mills

Print Name: K. Tiger Mills

Date: May 7 2018

Attachment
cc: Central Files

DAVID Y. IGE
GOVERNOR OF
HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

JEFFREY T. PEARSON, P.E.
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:TM

Correspondence: HA 18-196

MAY - 7 2018

Ron Terry
Geometrician Associates, LLC
PO Box 396
Hilo, HI 96721

SUBJECT: Early Consultation for Environmental Assessment for a Proposed Single Family Residence Located at Piha-Kahuku Road, Waikaumalo, North Hilo, Hawai'i, TMK: (3) 3-2-004:038

Dear Mr. Terry:

The Office of Conservation and Coastal Lands (OCCL) has reviewed your information regarding the subject matter. The location appears to lie within the Resource subzone of the Conservation District.

A single family residence is an identified land use in the Resource subzone that could be applied for pursuant to the Hawai'i Administrative Rules (HAR) §13-5-24 R-7 SINGLE FAMILY RESIDENCE (D-1) a single family residence that conforms to design standards as outlined in this chapter. This proposed land use requires the filing of a Conservation District Use Application (CDUA) and all required attachments such as an Environmental Assessment. The proposed land use will require a Board permit, therefore to allow, modify or deny the proposed land use would be at the discretion of the Board of Land and Natural Resources.

If improvements are required to facilitate proposed construction of the residence outside of the subject parcel such as road amendments, please include these proposed land uses along with a description of the scope of work and location within the CDUA. Besides the residence, please attempt to site all proposed improvements [photovoltaic, water catchment, individual wastewater system, wall, fence, etc.] on one site plan. The description of these features should include dimensions and purpose.

Recent issues pertaining to climate change, rapid 'ohia death, as well as proposed mitigation for both should be addressed in the environmental assessment. Should you have any questions regarding this correspondence, contact Tiger Mills of our Office at (808) 587-0382.

Sincerely,

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

C: County of Hawai'i
-Planning

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

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HILO, HAWAII

April 20, 2018

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2018 MAY -4 AM 11: 00
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

MEMORANDUM

FROM:
TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Hawaii District
X Historic Preservation

TO:
FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District
LOCATION: North Hilo, Island of Hawaii; TMK: (3) 3-2-004:038
APPLICANT: Geometrician Associates on behalf of **Pedro Ramos**

Transmitted for your review and comment is information on the above-referenced subject matter. We would appreciate your comments by **May 14, 2018.**

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: [signature]

Print Name: GORDON C. HEIT

Date: 5/1/18

Attachment
cc: Central Files

Draft Environmental Assessment
Ramos Single-Family Residence
in the Conservation District at Pīhā

APPENDIX 2
Archaeological Assessment Survey

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An Archaeological Assessment of a Portion of Lot 1 of the Pīhā Homesteads

TMK: (3) 3-2-004:038 por.

Pīhā Ahupuaʻa
North Hilo District
Island of Hawaiʻi

DRAFT VERSION

Prepared By:

Matthew R. Clark, M.A.

Prepared For:

Mr. Pedro Pablo Ramos
3193 Scrub Oak Trail
Oviedo, FL 32765

March 2018

ASM affiliates
Archaeology • History • Anthropology • Architectural History
Hilo Office: (808) 969-6066 Fax: (808) 443-0065
507-A E. Lanikaula Street, Hilo, HI 96720
Honolulu Office: (808) 439-8089 Fax: (808) 439-8087
820 Mililani Street, Suite 700, Honolulu, HI 96813

ASM Project Number 29530.00

An Archaeological Assessment of a Portion of Lot 1 of the Pīhā Homesteads

TMK: (3) 3-2-004:038 por.

Pīhā Ahupuaʻa
North Hilo District
Island of Hawaiʻi

ASM affiliates

EXECUTIVE SUMMARY

At the request of Mr. Pedro Pablo Ramos (landowner), ASM Affiliates conducted an archaeological survey of a roughly 5-acre portion of Lot 1 of the Pīhā Homesteads (TMK: (3) 3-2-004:038 por.), Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi. The current study, which was conducted in support of an Environmental Assessment (EA) being prepared for the development of a single-family residence on the property, was undertaken in accordance with Hawaiʻi Administrative Rules 13§13–284, and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in Hawaiʻi Administrative Rules 13§13–276. According to 13§13-284-5(b)(5)(A) when no archaeological resources are discovered during an archaeological survey the production of an Archaeological Assessment report is appropriate. Compliance with the above standards is sufficient for meeting the historic preservation review process requirements of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawaiʻi Planning Department.

The archaeological survey was conducted on February 1, 2018 by Robert B. Rechtman, Ph.D., Matthew R. Clark, M.A., and Ashton Dircks Ah Sam, B.A. During the survey, fieldworkers walked northwest/southeast oriented pedestrian transects spaced at 25-meter intervals across the entire study area, between the Pīhā-Kahuku Homesteads Road and Kalaeha Stream. As a result of the survey no archaeological resources were identified within the study area. Given these findings, it is our conclusion that the proposed construction of a single-dwelling on a portion of TMK: (3) 3-2-004:038 will not affect any historic properties. With respect to the historic preservation review process of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawaiʻi Planning Department, our recommendation is that no further work needs to be conducted. In the unlikely event that significant archaeological resources are discovered during the construction of the proposed dwelling, work shall cease in the area of the discovery and DLNR-SHPD contacted pursuant to HAR 13§13-280-3.

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1. INTRODUCTION

At the request of Mr. Pedro Pablo Ramos (landowner), ASM Affiliates conducted an archaeological survey of a roughly 5-acre portion of Lot 1 of the Pīhā Homesteads (TMK: (3) 3-2-004:038 por.), Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (Figures 1and 2). The current study, which was conducted in support of an Environmental Assessment (EA) being prepared for the development of a single-family residence on the property, was undertaken in accordance with Hawaiʻi Administrative Rules 13§13–284, and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports as contained in Hawaiʻi Administrative Rules 13§13–276. According to 13§13-284-5(b)(5)(A) when no archaeological resources are discovered during an archaeological survey the production of an Archaeological Assessment report is appropriate. Compliance with the above standards is sufficient for meeting the historic preservation review process requirements of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawaiʻi Planning Department. This report provides a study area description, a detailed culture-historical background, a discussion of prior archaeological studies conducted in the vicinity of the current study area, and the results of the field investigation.

STUDY AREA DESCRIPTION

The current study area consists of a roughly 5-acre portion of TMK: (3) 3-2-004:038 (Lot 1 of the Pīhā Homesteads) located in Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (see Figures 1and 2). Situated at an elevation of roughly 1,680 to 1,840 feet (512 to 560 meters) above sea level, the study parcel is the *mauka*-most of the Pīhā Homestead lots. It is accessed by the Pīhā-Kahuku Homestead Road, which extends 4.75 kilometers (2.95 miles) from Old Māmalahoa Highway to the eastern corner of the study area (Figure 3), transitioning from a paved road, to a gravel road, to a four-wheel drive road as it progresses up slope (Figure 4). The study area includes only the southwestern portion of the larger 18.3-acre parcel, an area that is bounded to the southeast and southwest by old fence lines that mark the *makai* the boundaries of the Hilo Forest Reserve (Figure 5), to the northwest by Kalaeha Stream (Figure 6), and to the northeast by Lot 2 of the Pīhā Homesteads. The area is currently undeveloped and covered by thick vegetation typical of Hawaiʻi's lowland rainforests, except near the outlet of Pīhā-Kahuku Homestead Road, at the location of the proposed single-family residence, where some hand clearing of brush has occurred (Figure 7). Vegetation cover within the study area consists primarily of strawberry guava (*Psidium cattleianum*), *ōhiʻa* (*Metrosideros polymorpha*), *uluhe* (*Dicranopteris linearis*), and various other grasses, vines, ferns, shrubs, and weeds, with some large paper bark trees (*Melaleuca leucadendra*) growing near the proposed building site. Soils in this area are classified as Kaiwiki highly organic hydrous silty clay loam on 6 to 20 percent slopes (Soil Survey Staff, USDA 2018). These soils have formed on Pleistocene lava flows of the Hāmākua Volcanic Series (Qhm) that originated from Mauna Kea Volcano 64,000 to 300,000 years ago (Sherrod et al. 2007). Rainfall in the vicinity of the study area averages 5,285 millimeters (208 inches) per year, and the mean annual air temperatures is 66°F (19°C) (Giambelluca et al. 2013, 2014).

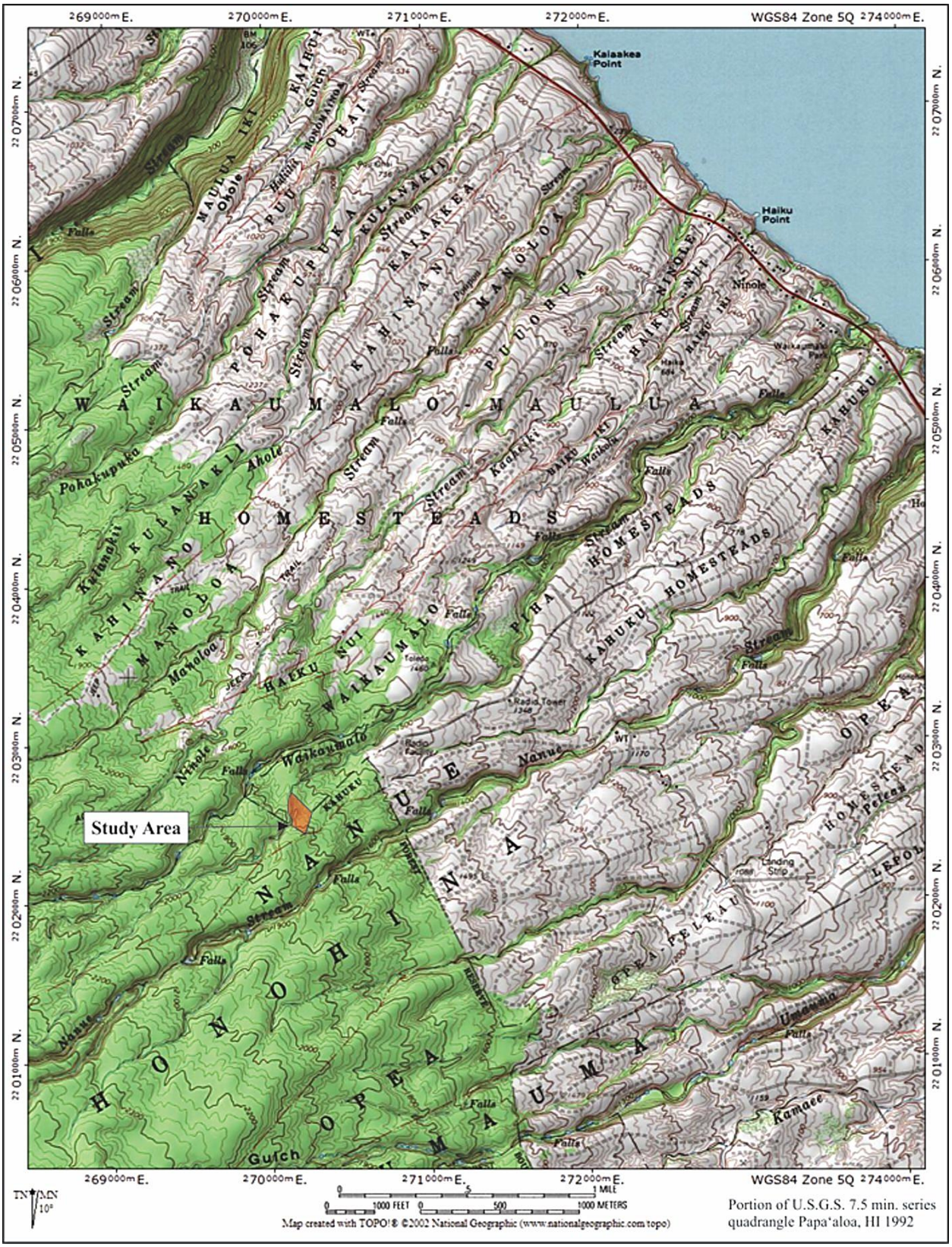

Figure 1. Study area location.

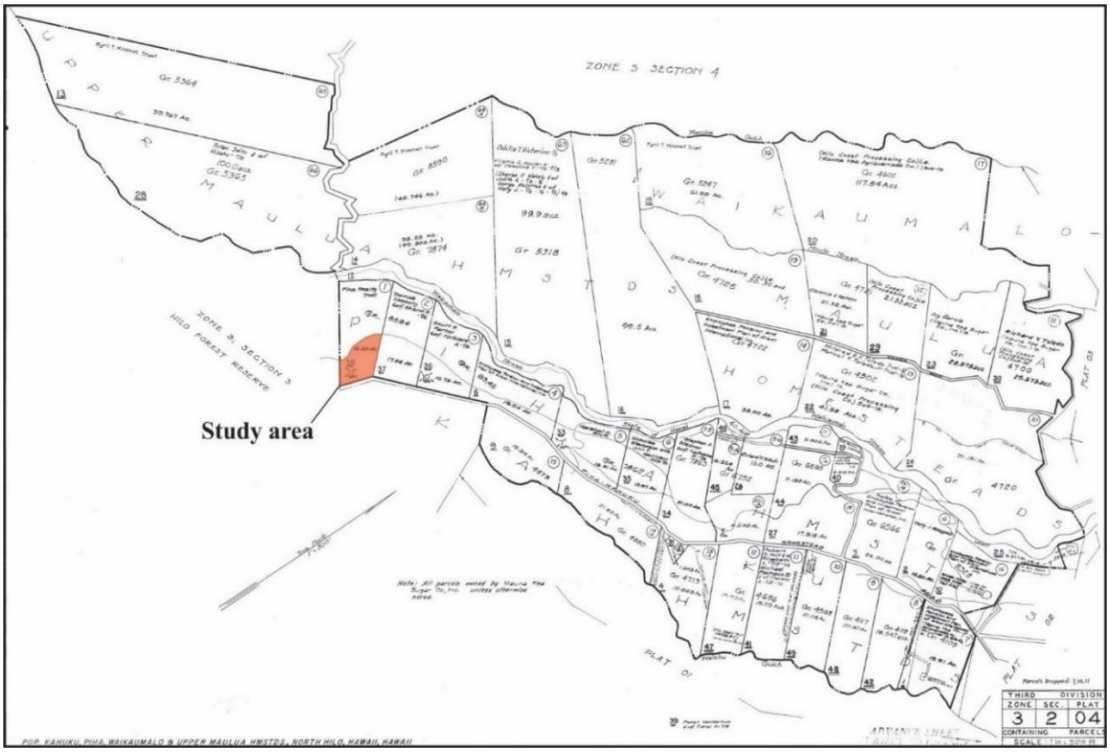

Figure 2. Tax Map Key (TMK): (3) 3-2-004 showing the current study area (portion of Parcel 038).

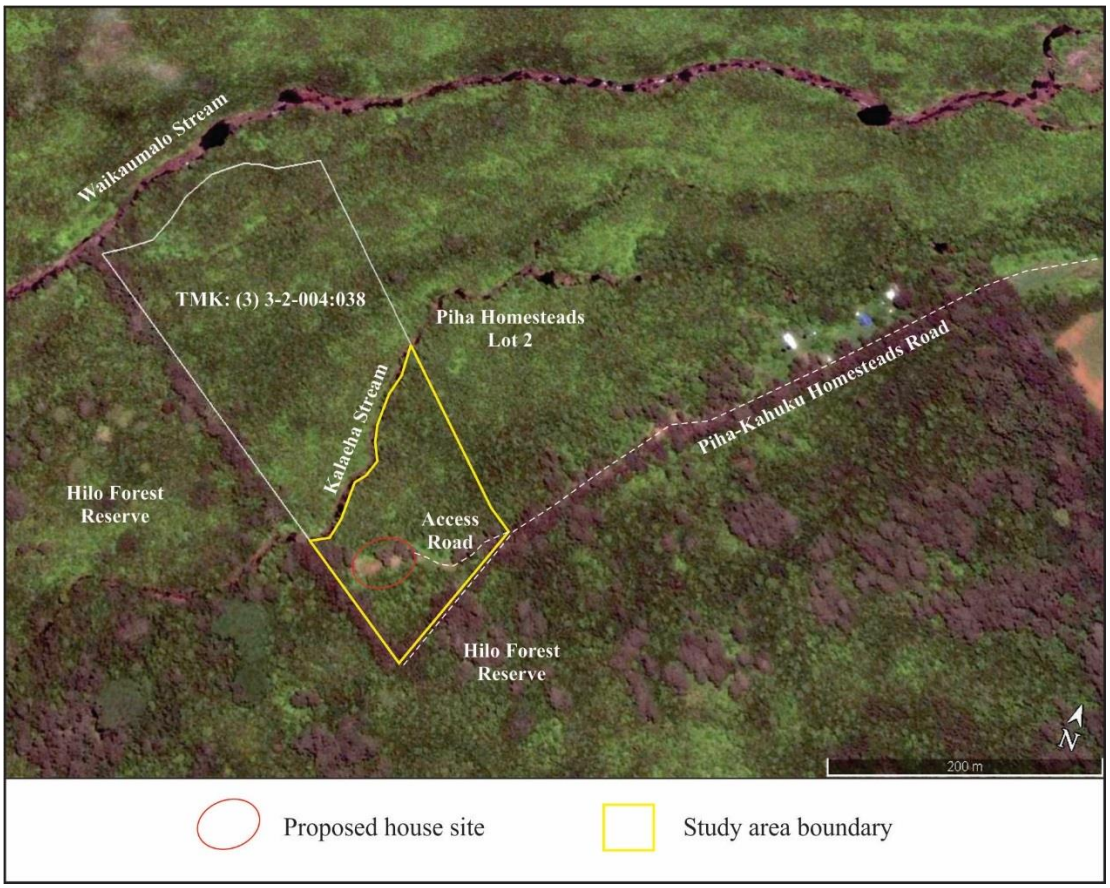

Figure 3. Google Earth image showing the current study area.

Figure 4. Pīhā-Kahuku Homestead Road near the eastern corner of the study area, view to the southwest.

Figure 5. Old fence line along the southwestern boundary of the study area, view to the southwest.

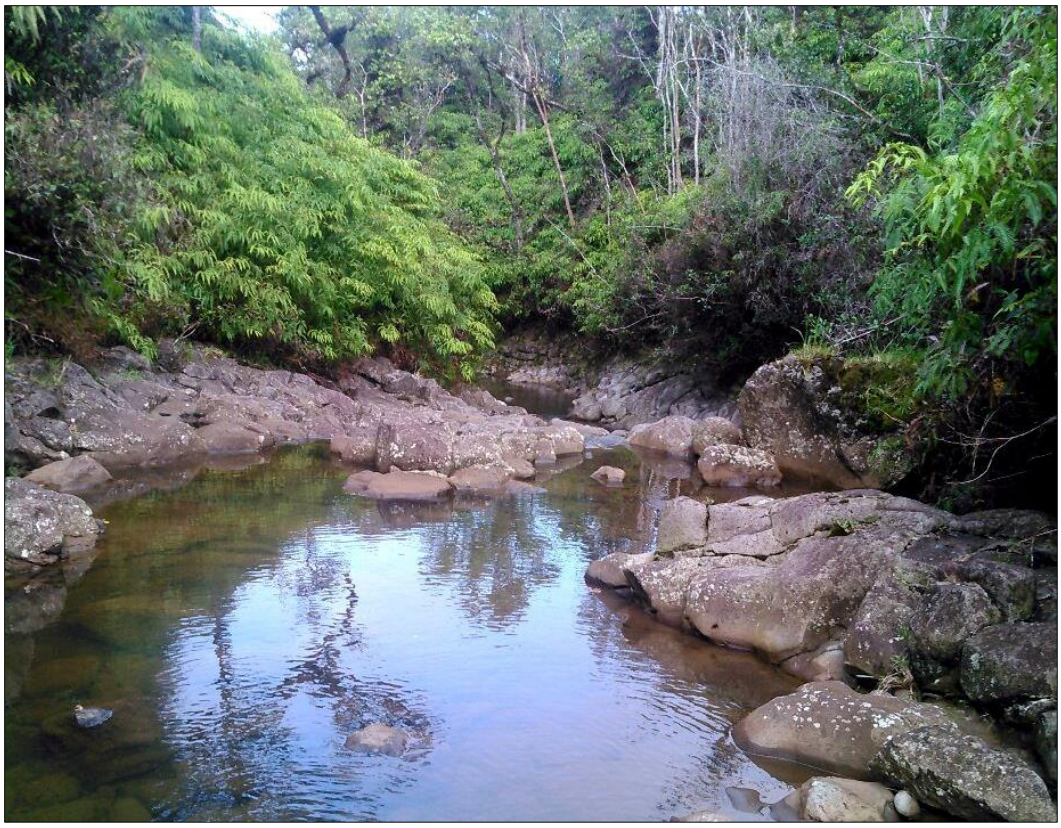

Figure 6. Kalaeha Stream, view to the north.

Figure 7. Hand cleared vegetation at the proposed house location, view to the east.

2. BACKGROUND

To generate a set of expectations regarding the nature of cultural resources that might be encountered within the study area, and to establish an environment within which to assess the significance of any such resources, a brief culture-historical background for the North Hilo District and Pīhā Ahupuaʻa is presented, followed by a summary of prior archaeological research conducted in the vicinity of the study area.

CULTURE-HISTORICAL CONTEXT

The current study area is located within the *ahupuaʻa* of Pīhā, in the District of North Hilo, on the windward coast of Hawaiʻi Island (Figure 8). This portion of the district was traditionally referred to as *Hilo-pali-Kū* or "Hilo of the upright cliffs" (Maly and Maly 2006). The name describes the region's treacherous coastline, with its sheer cliffs broken only by a string of narrow gulches containing streams that pour down from the slopes of Mauna Kea. Pīhā, which literally translates as "flotsam" (Pukui et al. 1974:184), meaning any floating material carried by flood waters or the sea, is one of many land divisions (*ahupuaʻa*) extending inland from the coast of North Hilo with boundaries that generally follow the meanderings of the gulches, and encompass the tablelands in between. It was along these gulches, and on the tablelands near the ocean's edge, that the first Polynesian settlers of this part of Hilo lived. Over generations they shaped and utilized the natural environment to provide all they needed for sustenance and survival. In the process they created a uniquely Hawaiian culture that was wholly adapted to that environment. The brief generalized cultural sequence that follows below provides a time frame for the peopling of Hawaiʻi, the development of Hawaiian culture, the expansion and intensification of the Hawaiian population, and the resulting stresses on it from the earliest Polynesian settlers to the time of European Contact.

A Generalized Model of Hawaiian Prehistory

This generalized cultural sequence is based on Kirch's (1985) model, but is amended to include more recent revisions offered by Kirch (2011) and Athens et al. (2014). The conventional wisdom has been that first inhabitants of Hawaiʻi Island probably arrived by at least A.D. 300, and focused habitation and subsistence activity on the windward side of the island (Burtchard 1995; Kirch 1985; Hommon 1986). However, there is no archaeological evidence for occupation of Hawaiʻi Island (or perhaps anywhere in Hawaiʻi) during this initial settlement, or colonization stage of island occupation (A.D. 300 to 600). More recently, Kirch (2011) and Athens et al. (2014) have convincingly argued that Polynesians may not have arrived to the Hawaiian Islands until at least A.D. 1000, but expanded rapidly thereafter. The implications of this on the currently accepted chronology would alter the timing of the Settlement, Developmental, and Expansion Periods, possibly shifting the Settlement Period to A.D. 1000 to 1100, the Developmental Period to A.D. 1100 to 1350, and the Expansion Period to A.D. 1350 to 1650.

The initial settlement in Hawaiʻi is believed to have occurred from the southern Marquesas Islands. This was a period of great exploitation and environmental modification, when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order. Order was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1969), the Hawaiians brought from their homeland certain universal Polynesian customs: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *ʻaumakua* concept; various epiphenomenal beliefs; and the concept of *mana*. Initial permanent settlements in the islands were established at sheltered bays with access to fresh water and marine resources. Communities shared extended familial relations and there was an occupational focus on the collection of marine resources.

Over a period of several centuries the areas with the richest natural resources became populated and perhaps even crowded, and there was an increasing separation of the chiefly class from the common people. As the environment reached its maximum carrying capacity, the result was social stress, hostility, and war between neighboring groups (Kirch 1985). Soon, large areas of Hawaiʻi were controlled by a few powerful chiefs.

The Development Period brought about a uniquely Hawaiian culture. The portable artifacts found in archaeological sites of this period reflect not only an evolution of the traditional tools, but some distinctly Hawaiian inventions. The adze (*koʻi*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. A few areas in Hawaiʻi, such as rhe summit region of Mauna Kea, produced quality basalt for adze production. The two-piece fishhook and the octopus-lure breadloaf sinker were also Hawaiian inventions of this period, as are ʻ*ulu maika* stones and *lei niho palaoa*. The later was a status item worn by those of high rank, indicating a trend toward greater status differentiation (Kirch 1985).

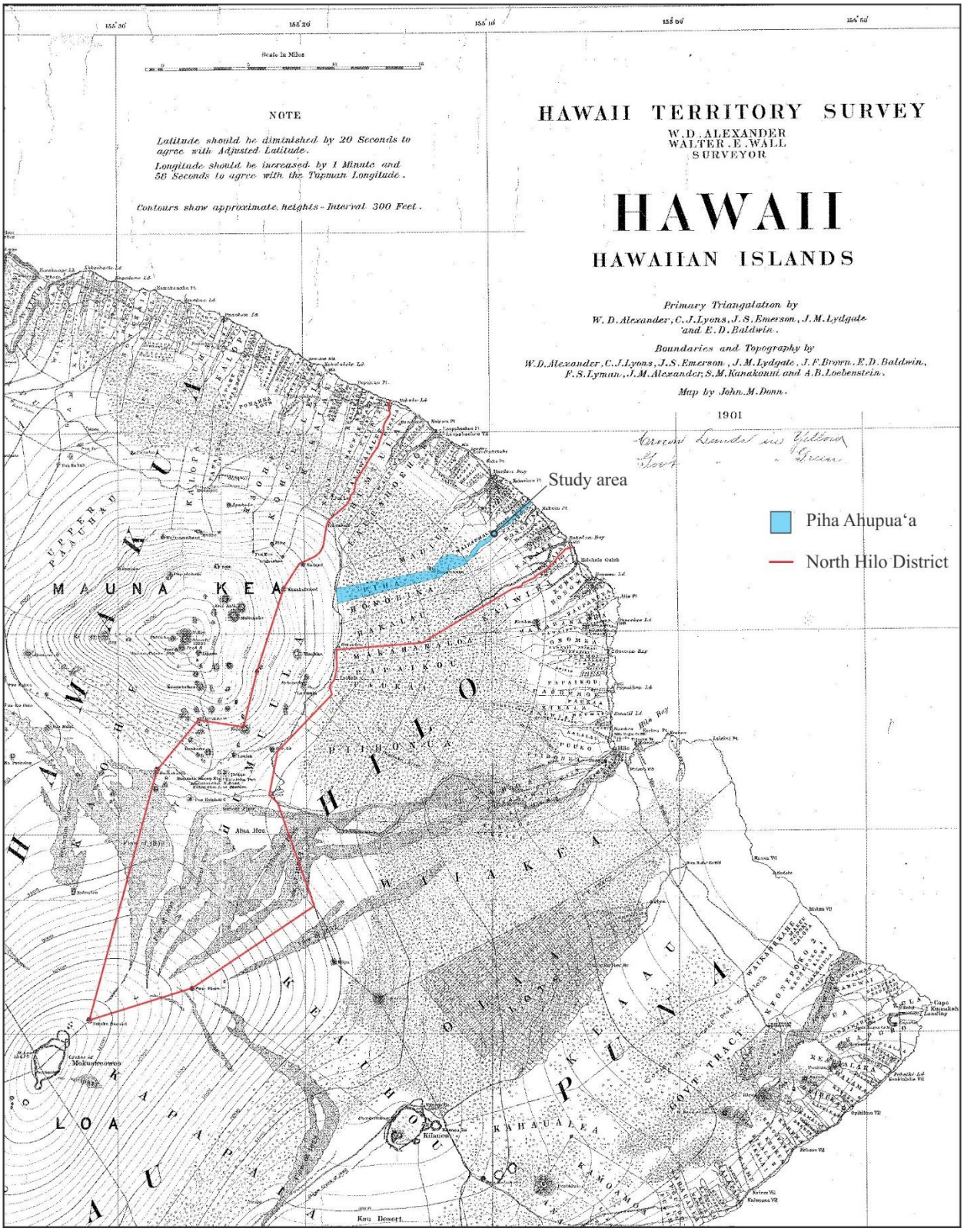

Figure 8. 1901 map of Hawaiʻi Island (prepared by John M. Donn 1901), showing the North Hilo District, Pīhā Ahupuaʻa, and the approximate location of the current study area.

The Expansion Period was characterized by the greatest social stratification, major socioeconomic changes, and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands had been settled and the more marginal leeward areas were being developed. The greatest population growth occurred during the Expansion Period. Subsistence patterns intensified as crop farming evolved into large irrigated field systems and expanded into the marginal dry land areas. The *loko* or fishpond aquaculture flourished during this period (Bellwood 1978; Kirch 1985).

The concept of the *ahupuaʻa* was likely established during the Expansion Period (Kirch 1985), adding another component to a then well-stratified society. This land unit became the equivalent of a local community, with its own social, economic, and political significance. *Ahupuaʻa* were ruled by *aliʻi ʻai ahupuaʻa*, or lesser chiefs, who, for the most part, had complete autonomy over this generally economically self-supporting piece of land, which was managed by a *konohiki*. *Ahupuaʻa* were usually wedge or pie-shaped, incorporating all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986).

The *aliʻi* and the *makaʻāinana* (commoners) were not confined to the boundaries of the *ahupuaʻa*; when there was a perceived need, they also shared with their neighbor *ahupuaʻa ohana* (Hono-ko-hau 1974). The *ahupuaʻa* were further divided into smaller sections such as the *ʻili, moʻoʻaina, paukuʻaina, kihapai, koele*, *hakuone*, and *kuakua* (Hommon 1986, Pogue 1978). The chiefs of these land units gave their allegiance to a territorial chief or *mōʻī* (king). *Heiau* building flourished during the Expansion Period as religion became more complex and embedded in a sociopolitical climate of territorial competition. Monumental architecture, such as *heiau*, "played a key role as visual markers of chiefly dominance" (Kirch 1990:206).

It was during the Expansion Period that a second major migration settled in Hawaiʻi, this time from Tahiti in the Society Islands. According to Kamakau (1976) the *kahuna* Pāʻao settled in the islands during the 13th century. Pāʻao was the keeper of the god Kuʻkaʻilimoku, and had fought bitterly with his older brother, the high priest Lonopele. After much tragedy on both sides, Pāʻao was expelled from his homeland by Lonopele. He prepared for a long voyage, and set out across the ocean in search of a new land. On board Pāʻao's canoes were thirty-eight men (*kānaka*), two stewards (*kānaka ʻāʻīpuʻupuʻu*), the chief Pilikaʻaiea (Pili) and his wife Hinaʻaukekele, Nāmauʻu o Malaia, the sister of Pāʻao, and the prophet Makuakaʻūmana (Kamakau 1991). In 1866 Kamakau (1991:100-102) told the following story of their arrival in Hawaiʻi:

> Puna on Hawaiʻi Island was the first land reached by Pāʻao, and here in Puna he built his first heiau for his god Ahaʻula and named it Ahaʻula [Wahaʻula]. It was a luakini. From Puna, Pāʻao went on to land in Kohala, at Puʻuepa. He built a heiau there called Moʻokini, a luakini.
>
> It is thought that Pāʻao came to Hawaiʻi in the time of the aliʻi Laʻau because Pili ruled as moʻi after Laʻau. You will see Pili there in the line of succession, the moʻo kūʻauhau, of Hanalaʻanui. It was said that Hawaiʻi Island was without a chief, and so a chief was brought from Kahiki; this is according to chiefly genealogies. Hawaiʻi Island had been without a chief for a long time, and the chiefs of Hawaiʻi were aliʻi makaʻāinana or just commoners, makaʻāinana, during this time.
>
> . . . There were seventeen generations during which Hawaiʻi Island was without chiefs—some eight hundred years. . . . The lack of a high chief was the reason for seeking a chief in Kahiki, and that is perhaps how Pili became the chief of Hawaiʻi. He was a chief from Kahiki and became the ancestor of chiefs and people of Hawaiʻi Island.

The Pili line's initial ruling center was likely in Kohala, but Cartwright (1933) suggests that Pili resided in and ruled from Waipiʻo Valley in the Hāmākua District. Ethnohistorical traditions (Fornander 1880) indicate that valley was associated with at least nine successive Pili line rulers of Hawaiʻi Island, from Kahaʻimoeleʻa to Umi (from roughly A.D. 1460 to 1620). Prior to the establishment of these Pili rulers, Waipiʻo was the residential base for powerful local rulers dating back to at least the A.D. 1200s (Cartwright 1933).

Līloa and his son ʻUmi were two of the most renowned rulers of the Pili line. Both were from Hāmākua and had their ruling centers in Waipiʻo (Cordy 1994). ʻUmi, who is often credited with uniting the island of Hawaiʻi under one rule, had a chiefly father (Līloa) and a mother (Akahi) who was a commoner (Kamakau 1992). Līloa met Akahi when he secretly left the valley to visit his other Hāmākua lands. As a young boy ʻUmi was raised in the Hāmākua countryside by his mother, but he soon moved to Waipiʻo to reside with his father and learn the chiefly ways (Kamakau 1992). Waipiʻo remained a leading chiefly center until the end of ʻUmi's reign around ca. 1620 (Cordy 1994).

Kirch (1985) places the beginning of the Proto-Historic Period during the rule of Lonoikamakahiki. This was a time marked by both political intensification and stress and continual conquest by the reigning *aliʻi*. Wars occurred regularly between intra-island and inter-island polities during this period. It was during this time of warfare that Kamehameha, who would eventually rise to power and unite all the Hawaiian Islands under one rule, was born in the

District of North Kohala on the Island of Hawai‘i (Kamakau 1992). There is some controversy about the year of his birth, but Kamakau (1992:66-68) places the birth event sometime between A.D. 1736 and 1758, most likely nearer to the later date. This period was one of continual conquest by the reigning *ali‘i*. In A.D. 1775 Kalani‘ōpu‘u and his forces, who had already conquered Hana in eastern Maui, raided and destroyed the neighboring Kaupō District, then launched several more raids on Moloka‘i, Lāna‘i, Kaho‘olawe, and parts of West Maui. It was at the battle of Kalaeoka‘ilio that Kamehameha, a favorite of Kalani‘ōpu‘u, was first recognized as a great warrior and given the name of Pai‘ea (hard-shelled crab) by the Maui chiefs and warriors (Kamakau 1992).

History After Contact

Captain James Cook landed in the Hawaiian Islands on January 18, 1778. Ten months later, on a return trip to Hawaiian waters, Kalani‘ōpu‘u, who was at war with Kahekili, visited Cook on board the *Resolution* off the East coast of Maui. The following January [1779], Cook and Kalani‘ōpu‘u met again in Kealakekua Bay and exchanged gifts. In February, Cook set sail intending to leave the Hawaiian Islands, but a severe storm off the Kohala coast damaged a mast and he was forced to return to Kealakekua Bay. Cook’s return occurred at an inopportune time, and this misfortune cost him his life (Kuykendall and Day 1976).

Around A.D. 1780 Kalani‘ōpu‘u proclaimed that his son Kiwalao would be his successor, and he gave the guardianship of the war god Kū‘kā‘ilimoku to Kamehameha. Many chiefs, concerned about their land claims, which Kiwalao did not seem to honor, preferred Kamehameha as the next ruler. Encouraged by these chiefs Kamehameha usurped Kiwalao’s authority during a sacrificial ritual in Ka‘ū. He then withdrew to his home district of Kohala where he farmed the land, growing taro and sweet potatoes (Handy and Handy 1972). After Kalani‘ōpu‘u died in A.D. 1782 civil war broke out, Kiwalao was killed, and Kamehameha became the ruler of Hawai‘i Island. The wars between Maui and Hawai‘i continued until A.D. 1795 (Kuykendall and Day 1976; Handy and Handy 1972).

In 1793-1794 Captain George Vancouver, who had previously visited Hawai‘i with Cook in 1778-1779, returned leading his own expedition. It was on this voyage that Vancouver first introduced cattle to the Island of Hawai‘i, giving 17 head to King Kamehameha as a gift (Barrére 1983). Kamehameha placed a *kapu* on the cattle, and they were driven to the upland plain of Waimea to increase and multiply (Vancouver in Kuykendall 1938). Inevitably, some escaped and made their way to the mountain lands, where they would later play an important role in land use for much of the nineteenth and early twentieth centuries.

Demographic trends during the early Contact Period indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. There was a continued trend toward craft and status specialization, intensification of agriculture, *ali‘i* controlled aquaculture, upland residential sites, and the enhancement of traditional oral history. The Kū cult, *luakini heiau*, and the *kapu* system were at their peaks, although Western influence was already altering the cultural fabric of the Islands (Kirch 1985; Kent 1983). Foreigners had introduced the concept of trade for profit, and by the end of the 1700s, Hawai‘i saw the beginnings of a market system economy (Kent 1983). This marked the end of the Proto-Historic Period and the end of an era of uniquely Hawaiian culture.

By 1796 Kamehameha, with the aid of foreign weapons and advisors, had conquered all of the island kingdoms except Kaua‘i. In 1810, when Kaumuali‘i of Kaua‘i gave his allegiance to Kamehameha, the Hawaiian Islands were unified under a single rule (Kuykendall and Day 1976). Kamehameha would go on to rule the islands for another nine years. He and his high chiefs participated in foreign trade, but continued to enforce the rigid *kapu* system.

Kamehameha I died in 1819 at Kamakahonu in Kailua-Kona. With the passing of Kamehameha, his heir Liholiho was given the name of Kamehameha II. Ka‘ahumanu, the favorite wife of Kamehameha, announced the last commands of Kamehameha I:

> O heavenly one! I speak to you the commands of your grandfather. Here are the chiefs; here are the people of your ancestors; here are your guns; here are your lands. But we two shall share the rule over the land. Liholiho consented and became ruling chief over the government. (Kamakau 1992:220)

Following the death of a prominent chief, it was customary to remove all of the regular *kapu* that maintained social order and the separation of men and women and elite and commoner. Thus, following Kamehameha’s death a period of *‘ai noa* (free eating) was observed along with the relaxation of other traditional *kapu*. It was for the new ruler and *kahuna* to re-establish *kapu* and restore social order, but at this point in history traditional customs changed:

> The death of Kamehameha was the first step in the ending of the tabus; the second was the modifying of the mourning ceremonies; the third, the ending of the tabu of the chief; the fourth, the ending of carrying the tabu chiefs in the arms and feeding them; the fifth, the ruling chief’s decision

> to introduce free eating (*ʻainoa*) after the death of Kamehameha; the sixth, the cooperation of his aunts, Ka-ahu-manu and Ka-heihei-malie; the seventh, the joint action of the chiefs in eating together at the suggestion of the ruling chief, so that free eating became an established fact and the credit of establishing the custom went to the ruling chief. This custom was not so much of an innovation as might be supposed. In old days the period of mourning at the death of a ruling chief who had been greatly beloved was a time of license. The women were allowed to enter the heiau, to eat bananas, coconuts, and pork, and to climb over the sacred places. You will find record of this in the history of Ka-ula-hea-nui-o-ka-moku, in that of Ku-aliʻi, and in most of the histories of ancient rulers. Free eating followed the death of the ruling chief; after the period of mourning was over the new ruler placed the land under a new tabu following old lines. (Kamakau 1992:222)

Immediately upon the death of Kamehameha I, Liholiho was sent away to Kawaihae to keep him safe from the impurities of Kamakahonu brought about by the death of Kamehameha. After purification ceremonies Liholiho returned to Kamakahonu:

> Then Liholiho on this first night of his arrival ate some of the tabu dog meat free only to the chiefesses; he entered the *lauhala* house free only to them; whatever he desired he reached out for; everything was supplied, even those things generally to be found only in a tabu house. The people saw the men drinking rum with the women *kahu* and smoking tobacco, and thought it was to mark the ending of the tabu of a chief. The chiefs saw with satisfaction the ending of the chief's tabu and the freeing of the eating tabu. The *kahu* said to the chief, "Make eating free over the whole kingdom from Hawaii to Oahu and let it be extended to Kauai!" and Liholiho consented. Then pork to be eaten free was taken to the country districts and given to commoners, both men and women, and free eating was introduced all over the group. Messengers were sent to Maui, Molokai, Oahu and all the way to Kauai, Ka-umu-aliʻi consented to the free eating and it was accepted on Kauai. (Kamakau 1992:225)

When Liholiho, Kamehameha II, ate the *kapu* dog meat, entered the *lauhala* house and did whatever he desired it was still during a time when he had not reinstituted the eating *kapu* but others appear to have thought otherwise. Kekuaokalani, caretaker of the war god Kūʻkāʻilimoku, was dismayed by his cousin's (Liholiho) actions and revolted against him, but was defeated.

With an indefinite period of free-eating and the lack of the reinstatement of other *kapu* extending from Hawaiʻi to Kauaʻi, and the arrival of the Christian missionaries shortly thereafter, the traditional religion had been officially replaced by Christianity within a year following the death of Kamehameha I. By December of 1819 Kamehameha II sent edicts throughout the kingdom renouncing the ancient state religion, ordering the destruction of the *heiau* images, and ordering that the *heiau* structures be destroyed or abandoned and left to deteriorate. He did, however, allow the personal family religion, the *ʻaumakua* worship, to continue (Oliver 1961; Kamakau 1992). With the end of the *kapu* system changes in the social and economic patterns began to affect the lives of the common people. Liholiho moved his court to Oʻahu, lessening the burden of resource procurement for the chiefly class on the residents of Hawaiʻi Island. Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early Western visitors. Introduced foods often grown for trade included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845).

In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawaiʻi. They arrived in Kailua-Kona on March 30, 1820 to a society with a religious void to fill. Many of the *aliʻi,* who were already exposed to western material culture, welcomed the opportunity to become educated in a western style and adopt their dress and religion. Soon they were rewarding their teachers with land and positions in the Hawaiian government. In 1823, the Reverend William Ellis, one of the first Protestant missionaries to arrive in Hawaiʻi, passed along the South Hilo coast during his tour of Hawaiʻi Island. Having been warned against walking due to the ruggedness of the terrain, he sailed from Hilo to Laupāhoehoe in a canoe, and described the Hilo coastline he saw from the canoe as follows:

> The country, by which we sailed, was fertile, beautiful, and apparently populous. The numerous plantations on the eminences and sides of the deep ravines or valleys, by which it was intersected, by streams meandering through them into the sea, presented altogether a most agreeable prospect. (Ellis 2004:344)

With the arrival of foreigners in the islands, Hawaiʻi's culture and economy underwent drastic changes. Demographic trends during the early part of the nineteenth century indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. At first there was a continued trend toward craft and status specialization, intensification of agriculture, *aliʻi* controlled aquaculture, upland

residential sites, and the enhancement of traditional oral history (Kirch 1985; Kent 1983). Later, as the Historic Period progressed, Kamehameha I died, the *kapu* system was abolished, Christianity established a firm foothold in the islands, and introduced diseases and global economic forces had a devastating impact on traditional life-ways.

Overland travel across the central and northern Hilo District remained difficult throughout the first part of the nineteenth century due to its rugged coastline and many deep gulches. Transportation difficulties may have even temporarily delayed large-scale commercial exploitation of the *kula* lands in the vicinity of the project area (Desilets et al. 2004). Initial commercial exploitation of these lands was limited to small scale agriculture in areas with coastal access for shipping and receiving goods. The Reverend Titus Coan, who settled at the Hilo Mission Station in 1835, wrote that:

> For many years after our arrival there were no roads, no bridges, and no horses in Hilo, and all my tours were made on foot. . . The path was a simple trail, winding in a serpentine line, going down and up precipices, some of which could only be descended by grasping the shrubs and grasses, and with no little weariness and difficulty and some danger. (Coan 1882:31-32)

Pīhā Ahupuaʻa During the Māhele ʻĀina of 1848

By the mid-nineteenth century, the ever-growing population of Westerners in Hawaiʻi forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership, and in 1848 the *Māhele ʻĀina* became the vehicle for determining ownership of native lands. This change in land tenure was promoted primarily by the missionaries and Western businessmen in the island kingdom. Generally these individuals were hesitant to enter business deals on leasehold land. The *Māhele* (division) defined the land interests of Kamehameha III (the King), the high-ranking chiefs, and the *konohiki*. During the *Māhele*, all lands in the Kingdom of Hawaiʻi were placed in one of three categories: (1) Crown Lands (for the occupant of the throne); (2) Government Lands; and (3) *Konohiki* Lands (Chinen 1958:vii, 1961:13). The chiefs and *konohiki* were required to present their claims to the Land Commission to receive awards for lands provided to them by Kamehameha III. They were also required to provide commutations to the government in order to receive royal patents on their awards. The lands were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be surveyed. This process expedited the work of the Land Commission. Pīhā Ahupuaʻa is not listed in the *Buke Māhele*, but appears to have become Crown Land as a result of the *Māhele*, as J. Dominis, agent of the Crown Lands, would later apply for the settlement of the land division's boundaries.

All lands awarded during the *Māhele* were subject to the rights of the native tenants therein; those individuals who lived on the land and worked it for their subsistence and the welfare of the chiefs (Sinoto and Kelly 1970). Native tenants could claim, and acquire title to, *kuleana* parcels that they actively lived on or farmed at the time of the *Māhele*. The Kuleana Act of December 21, 1849 provided the framework by which native tenants could apply for and receive fee-simple interest in their *kuleana* lands from the Land Commission. The Board of Commissioners over saw the program and administered the lands as Land Commission Awards (LCAw.). No claims were made for *kuleana* lands within Pīhā Ahupuaʻa during the *Māhele ʻĀina* of 1848.

The 1875 Boundary Commission Hearings for Pīhā Ahupuaʻa

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawaiʻi to legally set the boundaries of the lands that were awarded during the *Māhele*. Subsequently, in 1874, the Commissioners of Boundaries were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were old native residents of the *ahupuaʻa*, many of whom had also been claimants for *kuleana* during the *Māhele*. The boundary testimonies were collected primarily between 1873 and 1885 and were usually given in Hawaiian, but transcribed in English as they occurred.

On February 8, 1875, on the application of J. Dominis, agent of the Crown Lands and administrator for the estate of M. Kekuanaoa, the Boundary Commission met at the court house in Hilo to settle the boundaries of Pīhā Ahupuaʻa (Boundary Commission Vol. B pgs. 325-330; Appendix A). Several older residents of the area provided testimony at the hearing including Ku, Hemahema, Kalaualoha, Kupahu, and D.H. Hitchcock, the Government Surveyor who surveyed the Pīhā boundaries (Figure 9). D.H. Hitchcock testified that he surveyed the boundaries of Pīhā Ahupuaʻa in October of 1874 with Ku as his *kamaʻāina* (person familiar with the land). Hitchcock also took Kalaualoha with him along a part of the Nanue boundary, and talked with Hemahema prior to the survey, but found that the recollections of Hemahema and Ku agreed regarding the boundaries, so only took Ku with him. From the testimony we learn that boundary between Kahuku and Pīhā *ahupuaʻa* (forming the eastern boundary of the current study area) was once marked by an "old trail" used by bird catchers to access the forest, and that the owner of Nanue Ahupuaʻa, Alapai, disputed the *mauka*-eastern boundary of Pīhā Ahupuaʻa as described by Ku and depicted by D.H. Hitchcock in Figure

9. The following summary of the 1875 Boundary Commission testimony for Pīhā concentrates on the Kahuku boundary of the *ahupuaʻa*, which is adjacent to the eastern boundary of the current study area.

Ku, described in the boundary commission records as "an old man" born during the time of Kamehameha I, stated that he had learned the boundaries of Pīhā from his grandfather, Hue, and his father, Mahiai, both of whom were bird catchers, and that his older brother, Koia, was once *konohiki* of the *ahupuaʻa*. Ku accompanied Hitchcock during the boundary survey and pointed out the boundaries to him, showing him a stone *ahu* at the *mauka* corner of Pīhā (where the *ahupuaʻa* is cut off by Humuʻula) that his brother had built during the reign of Kamehameha II. With regards to the trail along the Pīhā/Kahuku boundary, Ku testified that:

> …My grandfather made the road on Honohina to Moohalohalo, and I made the road to Hopuwai, Kahuku bounds Piha on Hilo side at shore, there is a small gulch there called Alanaio on boundary, thence runs up gulch a short distance above road to head of it, thence up old trail to Kaawau, thence bounded by Nanue up old trail to Nenelu old kauhale [group of houses], thence up trail to Waipahehoe a kahawai [stream/gulch] and kauhale, the old trail does not reach to the gulch, but turns to the left…(page 325)

When cross-examined Ku clarified that:

> …Piha and Nanue join at Kawau cutting off Kahuku. I have stated that the mauka boundary of Nanue is at Kaahina not at Nahuina of Waipahoehoe. There is an old kauhale kalaiwaa [group of canoe carvers' houses] at this place, this is the boundary I have always known. Nanue had no old road. The birds in olden times belonged to Piha and not to Nanue. (page 326)

Hemahema, described as a "quite old man" in the testimony, stated that he had learned the boundaries of Pīhā from his father, Waiwai, who was the *konohiki* of "these lands to Pohakupua [six *ahupua* northwest of Pīhā]," and that he had gone bird catching with his grandfather on the lands. He testified that bird catchers from Pīhā and Malua *ahupuaʻa* (adjacent to the northwestern *mauka* boundary of Pīhā) used to catch birds in common. With regards to the trail along the Hilo side boundary of Pīhā, Hemahema stated that:

> …Kahuku bounds Piha at the shore at Hilo side, a small gulch, boundary runs up trail to Nahuina where Piha and Nanue join and Kahuku ends, thence boundary runs up trail to Kaahina near Waipahoehoe, this is as far as I ever knew about Nanue…(page 327)

When cross-examined Hemahema clarified that:

> …Nahuina and kumukawau are the same…From Kawau boundary between Nanue and Pīhā runs up old trail to Kaahina this is a far as I ever knew Nanue to run. It is where Hakai made a canoe. I heard from Kihili, Napihe and Kulaipahu that this was the mauka end of Nanue. Hapai ma said the same thing. (page 327)

Kalaualoha, described as an "old man" in the testimony, stated that he had learned the boundaries of Pīhā from "Kaulanahiai, Koia, and Waikane, now dead." Kalaualoha, who was the father-in-law of Alapai, the owner of Nanue Ahupuaʻa at that time, disagreed with the boundary testimony of Ku and Hemahema, and went with Hitchcock to point out what he believed to be the correct boundary between Nanue and Pīhā to be (see Figure 9). Kalaualoha testified that:

> …Piha and Nanue join each other at Kawau an old trail into the woods, thence boundary runs up this trail to Waipahoehoe, thence boundary runs up this stream to Mahuia kauhale on Piha, thence boundary runs up to Koapololei, thence up old trail to upper edge of woods to Kalapaohelo, to a place called Kaluaalu…In olden times the birdcatchers used to go up the Honohina and Piha roads, they could not go up the Nanue as the road was so bad. The canoe road of Nanue ran to mauka of Kaahiwa, there it ended. But the roads on Honohina and Piha ran way mauka…(page 329)

Kupahu, the uncle of Alapai (the owner of Nanue Ahupuaʻa), who was described as a "quite old man" in the testimony, stated that he knew a little about the boundaries of Pīhā because he "went up the road to Kalapaohelo after beef" (page 329), and that Koia, his guide, pointed out the boundaries to him. Kupahu's testimony only addressed the *mauka*-eastern boundary of Pīhā where it joins Nanue. He stated that, "…Kahuku ends at Nahuina, and there Nanue and Piha join, Kumukawai is one name of this place…" (page 329).

At the conclusion of the testimony it was decided by R. A. Lyman, the Commissioner of Boundaries, that the boundaries of Pīhā as given by Ku be accepted, that the notes of the survey be filed (see Figure 9), and Certificate of Boundaries be issued accordingly (see Appendix A).

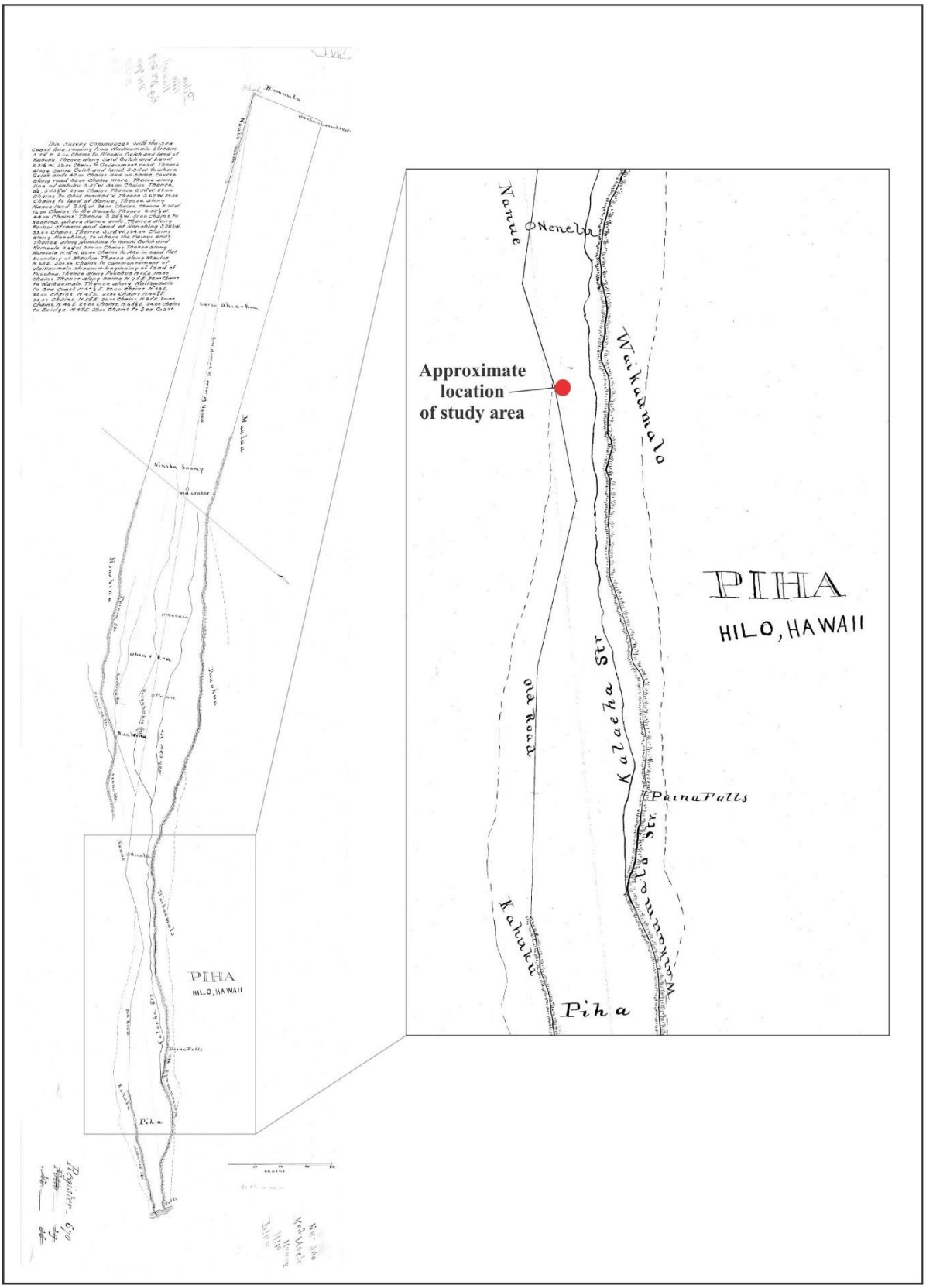

Figure 9. Hawai‘i Registered Map No. 670 (Hitchcock n.d.) showing Pīhā Ahupua‘a in ca. 1874, with the approximate location of the current study area indicated.

Pīhā Ahupuaʻa During the Late Nineteenth and Twentieth Centuries

Following the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Kingdom of Hawaiʻi, which guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, a number of new sugar plantations incorporated in the Islands. In 1878, Claus Spreckels, with W.G. Irwin & Company as its agent, established the Hakalau Plantation Company on 9,000 acres of land located along the North Hilo coast, 16 miles from Hilo (Dorrance and Morgan 2000). The fields of the Hakalau Plantation Company ranged from 250 feet above sea level along the shoreline bluffs to 2,000 feet above sea level at their western (*mauka*) limits. The cane was flumed from the various fields to its mill site, where it was then processed. The Hakalau Mill, built in 1890 on the shore at the foot of a 200-foot bluff with Hakalau Gulch, produced 5,000 tons of sugar annually during its early years (Dorrance and Morgan 2000). Initially, and continuing until 1913 when a railroad connecting the plantation to the port at Hilo was built, the plantation shipped its product from the Hakalau Landing to Honolulu via inter-island vessels that anchored offshore. The lands of Pīhā Ahupuaʻa (containing 4,250 acres) were leased to the Hakalau Plantation Co. on February 11, 1892 (see C.S.F. 449), and the *makai* lands were cleared and used for the cultivation of sugarcane.

The fields of the Hakalau Plantation Company never reached as far *mauka* as the current study area, however, which remained forest land throughout the late nineteenth century. The importance of the forest lands and their valuable watersheds for agricultural purposes and the well-being of the people in general was recognized quite early on by the Territorial Government of Hawaiʻi, and by the burgeoning sugar industry in the islands. Consequently, a proclamation recommending that 110,000 acres of land in the Districts of North and South Hilo be reserved from development was signed by Lt. Governor A.L.C. Atkinson on July 24, 1905, and the Hilo Forest Reserve was created (Figure 10). The reserve, which abuts the southern and eastern boundaries of the current study area (Figure 11), was described by the Division of Forestry in 1906 as follows:

> The Hilo Forest Reserve embraces the area of heavy forest on the lower slopes of Mauna Kea, lying between the 1855 and 1881 Lava Flows back of Hilo Town and the Hamakua District line, and extending from a line varying in elevation from 1,750 to over 2,000 feet, drawn back of and above the sugar plantations to another line along the upper edge of the woods, at an elevation of approximately 6,000 feet. The water from this reserve is of great importance to all the plantations along the coast, being at present used for the most part for fluming cane to the mill. From the character of the country many of the streams could be utilized for the production of power. This will be an important consideration when the Hilo District comes to be developed, as it is sometime bound to be. The object of the Hilo Forest Reserve is to protect the sources of this important water supply. (Division of Forestry 1906:25)

Following the passage of the Land Act of 1895, which broadened the definition of public land, placed Hawaiʻi's Crown Lands (such as Pīhā) into the public domain, and made land available to family farmers through homesteading programs, and the clarifications to Hawaiʻi's land policies set forth in the Organic Act, which went into effect on June 14, 1900, many of the lease lands held by the Hakalau Plantation Company were divided into homestead lots (Horwitz et al. 1969). By the early twentieth century, as the plantation's lease on its Pīhā lands was set to expire, the Territorial Government began the process of subdividing the *makai* section of the *ahupuaʻa*, below the forest reserve line, into homesteads. The survey of the Pīhā homestead tract began in 1912 and was completed by 1913 (Figure 12), when the Survey Department of the Territory of Hawaiʻi reported that "the land of Piha was subdivided into 28 lots, comprising 393.81 acres, 5 miles of roads containing 20.44 acres, and flumes and ditches and remnant covering 5.95 acres" (Department of Interior 1913:65). The Pīhā-Kahuku Homestead Road created as part of the Pīhā homestead subdivision appears to follow the route of the older road described along the boundary between those two *ahupuaʻa* during the Boundary Commission hearings of 1875.

Following the subdivision of the Pīhā homesteads, the Hakalau Plantation, now owned by C. Brewer & Co., brought up the question of the boundary between the homesteads and the adjoining lands owned or controlled by the company, which they felt had been encroached upon. Additional surveys of the Pīhā homestead tract, involving extensive triangulation work, were then made during the early part of 1914, until the matter was decided to the satisfaction of all parties involved (Department of the Interior 1914:521).

While many of the *makai* lots of the newly created Pīhā Homesteads (Lots 9-28) were sold at auction in June of 1914 to various homesteaders, the more *mauka* lots (Lots 1-8), perhaps because they were less accessible or less developed, and therefore less desirable, were not. Instead, a general 10-year lease (Lease No. 878; Figure 13) for Lots 1-8 of the Pīhā Homesteads (and Lots 13-16 of the adjoining Kahuku Homesteads) was purchased at public auction by the Hakalau Plantation Company on July 14, 1915 (Department of the Interior 1916:526).

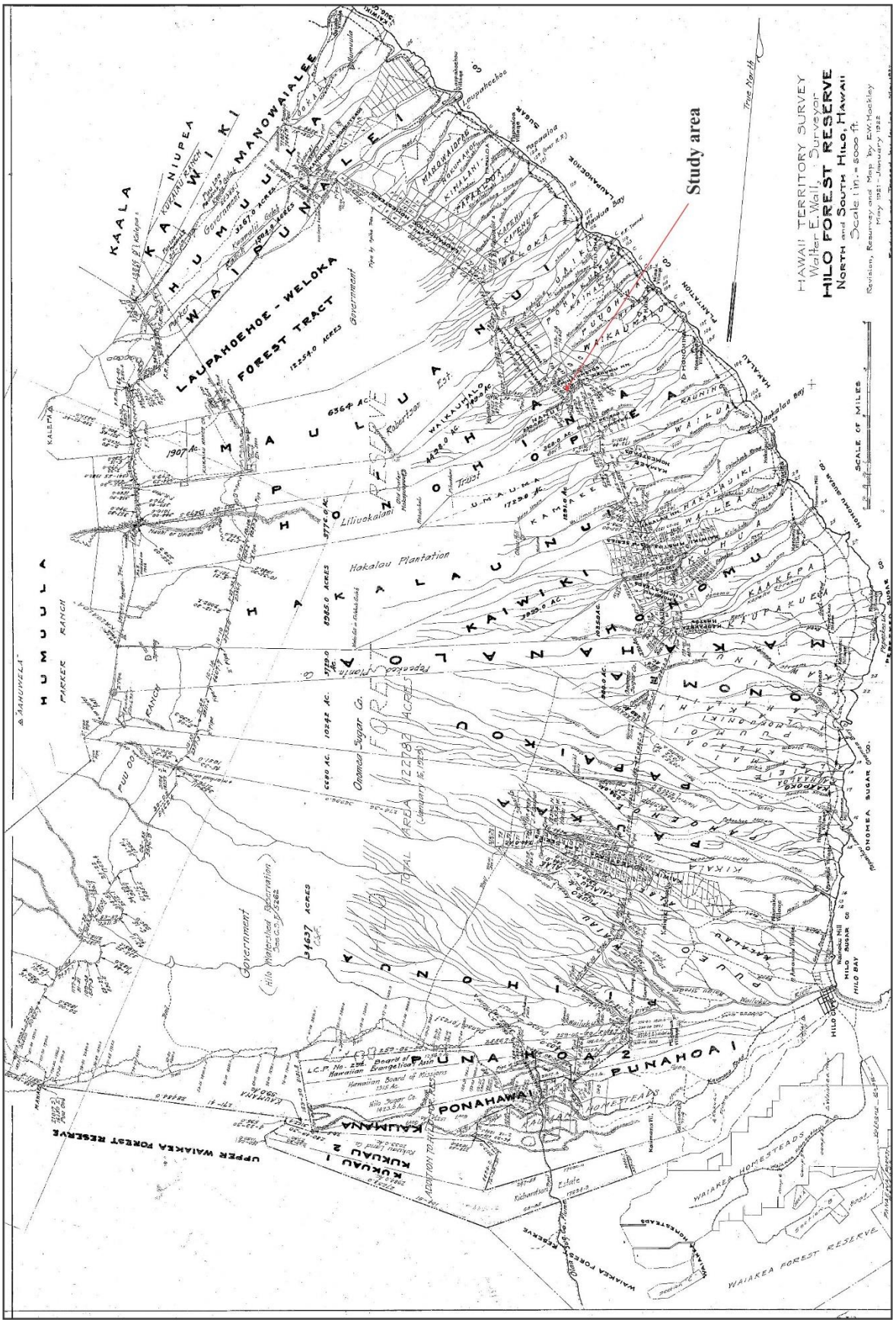

Figure 10. Map of the Hilo Forest Reserve (HTS Plat 799) with the location of the current study area indicated (Hockley 1922).

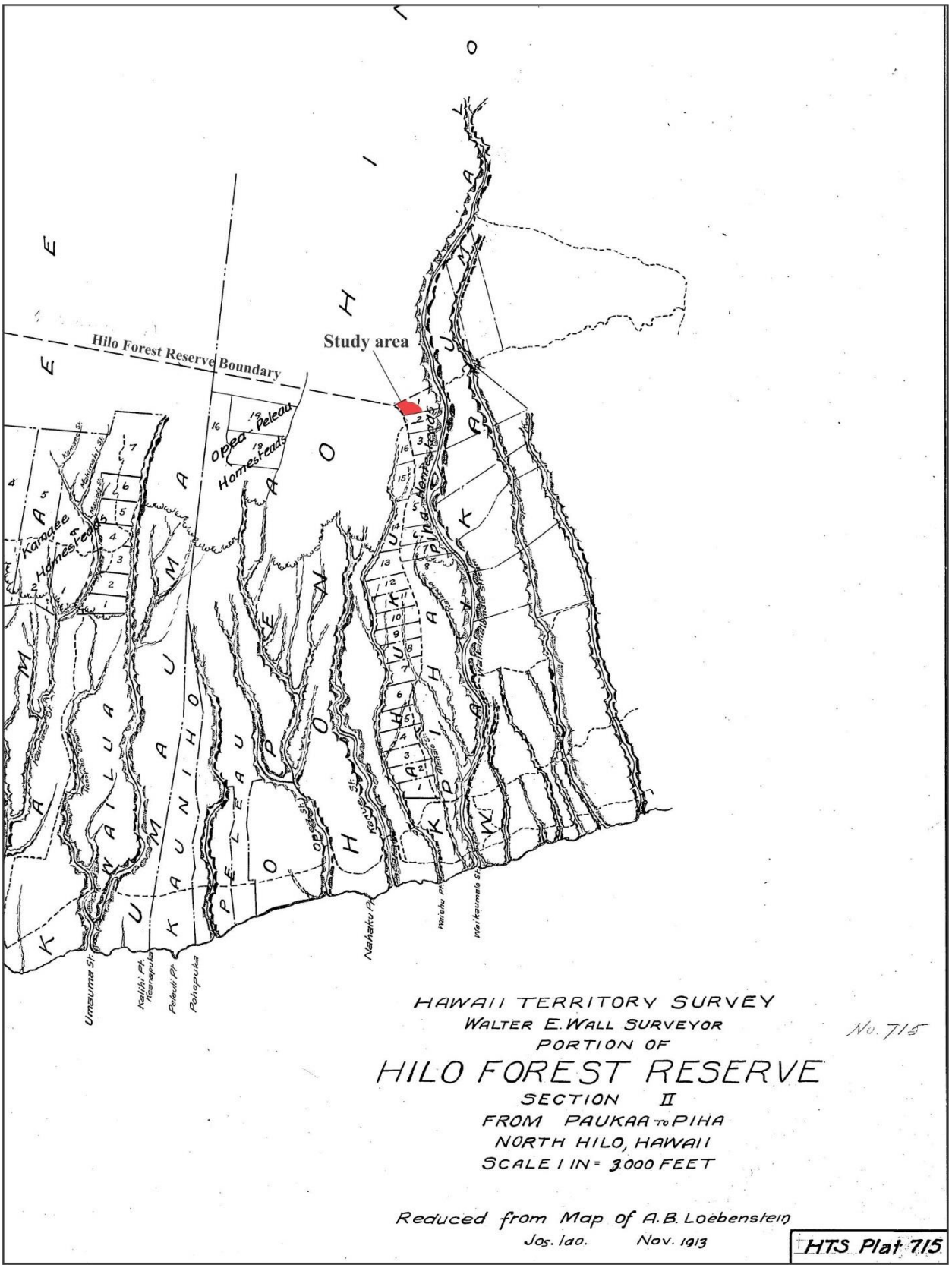

Figure 11. Portion of a 1913 map of Section II of the Hilo Forest Reserve (HTS Plat 715) with the location of the current study area indicated (Iao 1913).

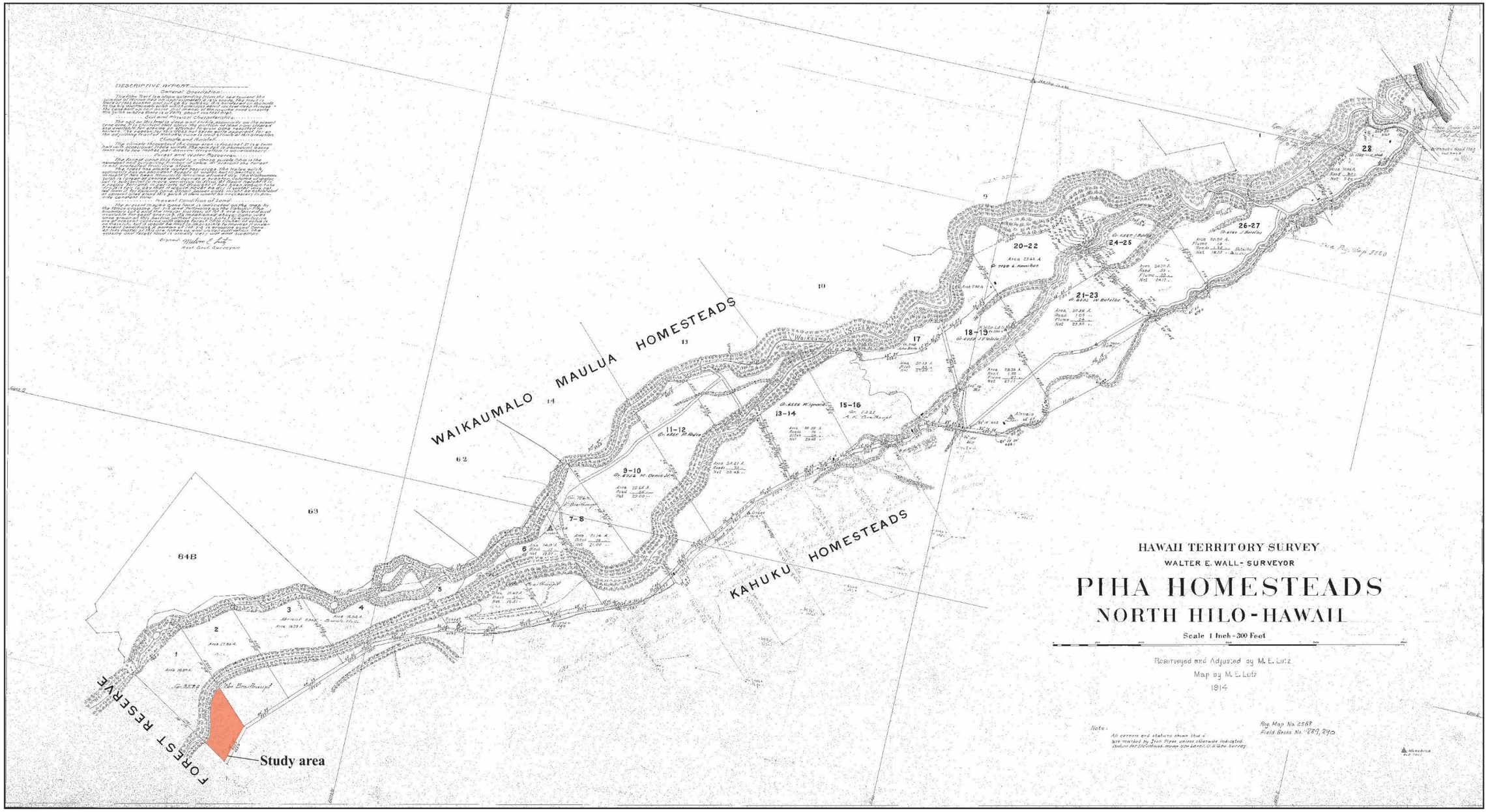

Figure 12. Map of the Pīhā Homesteads showing the location of the current study area (Lutz 1914).

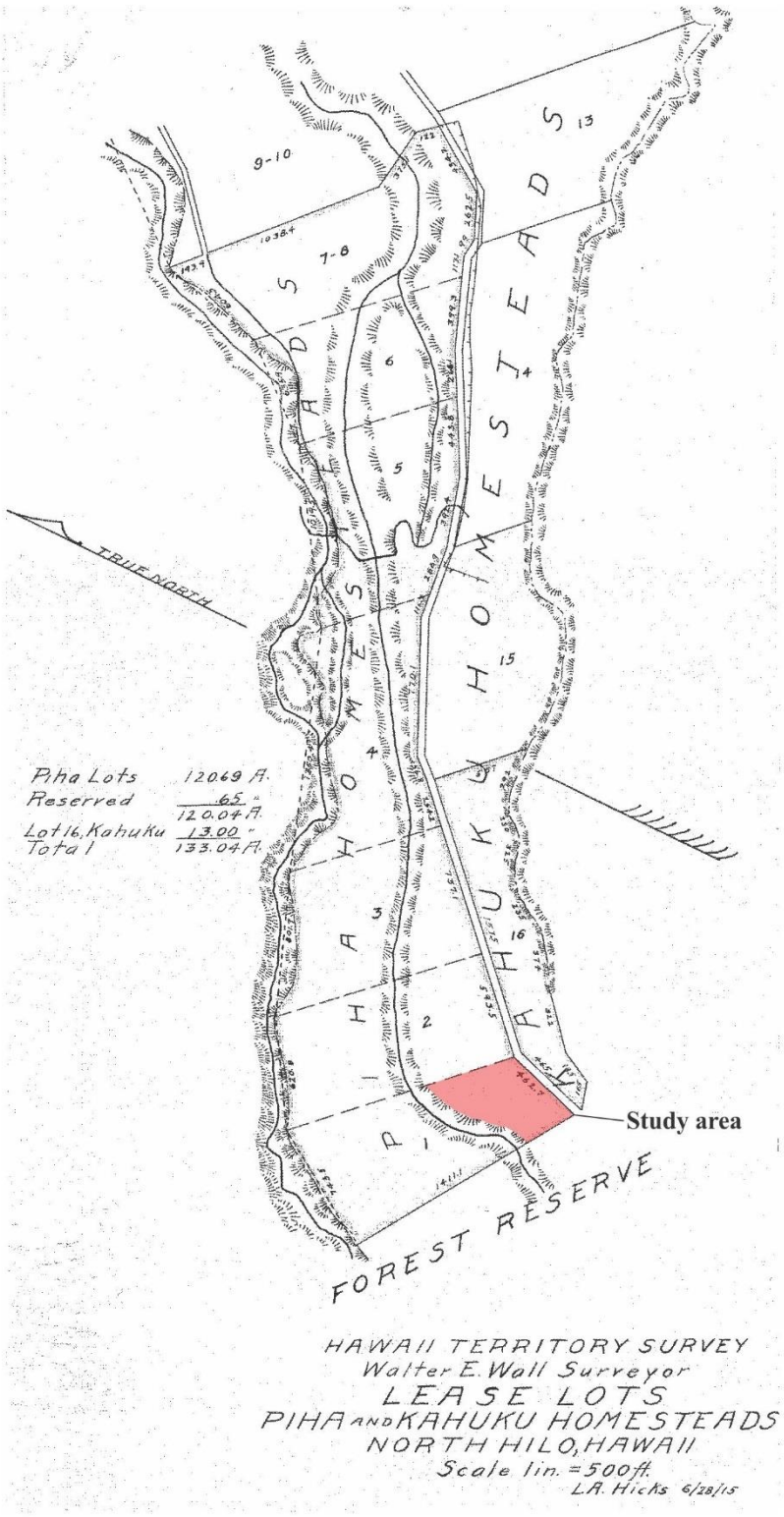

Figure 13. Map showing the Pīhā-Kahuku Homestead lands leased to the Hakalau Plantation Company on July 14, 1915 (Hicks 1915).

This Hakalau Plantation Company's lease (see Figure 13), for unknown reasons, was never fully executed and Lots 1-8 were eventually sold to various homesteaders. Lot 1, which includes the current study area, was purchased (along with Lot 2) by William Breithaupt on August 23, 1916 as Grant No. 8584. Several other Breithaupt's purchased lands within the Pīhā Homesteads as well, including A.K. Breithaupt (Lots 15-16; Grant No. 8328), Ella Breithaupt (Lots 7-8; Grant No. 7863), and Otto Breithaupt (Lots 5-6; Grant No. 7862). It appears that William Breithaupt once ran cattle on Lot 1, and that he was responsible for helping to construct a portion of the fence along the *makai* boundary of the Hilo Forest Reserve. In May of 1922, the Assistant Superintendent of Forestry reported that "…A stretch of about 1000 feet along the mauka boundary of Piha Lot 1, from Kalaiha Gulch to Waikaumalo Gulch, remains to be built. William Breithaupt, owner of the lot, was advised to finish the fence at once, and he expects to complete it during July" (Kraebel 1922:179). However, by September of 1922 the Superintendent of Forestry, reported that:

> It has been necessary to bring pressure to bear on Wm. Breithaupt, the owner of Lot 1 of the Piha Homesteads. We supplied wire to him last December and he built an excellent fence on the forest reserve boundary for a distance of .58 mile, but since April he has done little or no work. He has 900 feet more of fence to build and has been notified that unless this is completed by the end of August and all his cattle gathered in, we will proceed against him for cattle trespass. (Judd 1922:207)

This pressure appears to have been effective, as the Superintendent of Forestry reported in November of 1922 that Mr. Breithaupt had finally finished the 0.77-mile length fence along the forest reserve boundary of Pīhā Homesteads Lot 1 to his satisfaction.

The Hakalau Plantation Company continued to operate on lands *makai* of the current study area throughout the first half of the twentieth century, but by the early 1940s, nearly 40 percent of the of the sugarcane on the plantation was grown by independent growers, some of whom had purchased Pīhā Homestead lots. In 1943, the neighboring Wailea Milling Company (also started by Claus Spreckels) was merged into the Hakalau Plantation Company, expanding the operation, and by 1944 the plantation had reached its maximum production, producing 26,000 tons of sugar that year (Dorrance and Morgan 2000). On April 1, 1946, the Hakalau Mill and the railroad connecting the plantation to Hilo were severely damaged by a *tsunami* triggered by an earthquake in the Aleutian Islands. The mill was rebuilt, but the railroad shut down and the product was trucked to the docks at Hilo. In 1962, C. Brewer & Co. merged the Hakalau Plantation Company into the Pepeʻekeʻō Sugar Company, its southern neighbor, and the Hakalau Mill was shut down (Dorrance and Morgan 2000). In 1973, C. Brewer & Co. then merged the Pepeʻekeʻō Sugar Company into the Mauna Kea Sugar Company, combining under one corporate name what had once been five separate sugar plantations situated along the Hilo coast. This plantation, later named Mauna Kea Agribusiness Company, harvested its last crop in 1994 and then closed its doors for good.

PREVIOUS ARCHAEOLOGICAL STUDIES

A review of reports and correspondence on file at the SHPD office in Hilo indicates that no prior archaeological studies have been conducted in the vicinity of the current study area, but that SHPD has previously written "no effect" letters for at least eight parcels situated *makai* of the current study area within the Pīhā and Kahuku Homesteads. These "no effect" letters include a November 1, 1996 letter for TMK: (3) 3-2-004:025 (*Log No. 18344 Doc No. 9610ms04*), an April 24, 1998 letter for TMK: (3) 3-2-004:027 (*Log No. 21307 Doc No. 9804PM15*), a June 1, 1998 letter for TMK: (3) 3-2-004:039 (*Log No. 21050 Doc No. 9802PM03*), an August 18, 1998 letter for TMK: (3) 3-2-004:041 (*Log No. 22025 Doc No. 9807ms17*), a June 19, 2001 letter for TMK: (3) 3-2-004:043 and 044 (*Log No. 27706 Doc No. 0105ms08*), a December 31, 2010 letter for TMK: (3) 3-2-004:045 (*Log No. 28884 Doc No. 0112PM10*), and an April 17, 2013 letter for TMK: (3) 3-2-004:046 (*Log No. 2013.2304 Doc No. 1304SN05*) (see Figure 2). The reason generally given for SHPD's belief that the proposed development of these parcels would have "no effect" on significant historic sites, was that a review of aerial photographs revealed that intensive cultivation of sugarcane had already altered the land. No archaeological survey of the parcels listed above was undertaken by SHPD.

Very few archaeological studies have been conducted anywhere within the district of the North Hilo at elevations similar to the current study area. The first archaeological work conducted in East Hawaiʻi was that of the early twentieth century *heiau* researchers Thrum and Stokes (Thrum 1908, Stokes and Dye 1991). Neither investigator was able to identify *heiau* within Pīhā Ahupuaʻa or, for that matter, within the larger region between the town of Hilo and Laupāhoehoe Ahupuaʻa. In the early 1930s, A.E. Hudson, working under the aegis of the Bishop Museum, also conducted archaeological investigations in East Hawaiʻi, surveying primarily along the coast of the district (Hudson 1932). He found little in the region *makai* of the study area, although he did note the presence of a .25 mile square area of taro terraces in the upper part of Hakalau Gulch. According to Hudson (1932:218), there was formerly a kōnane board in the bottom of Hakalau Gulch, and the gulch was at one time a robber's stronghold.

More recently, Walker and Rosendahl (1994a, 1994b) conducted an archaeological study of some 595 acres of Hakalau Nui Ahupuaʻa, South Hilo District, situated between Hawaii Belt Road and the 1,500-foot elevation contour. Low-level aerial (helicopter) survey was conducted over some of the uncultivated, forested portions of that study area, and other uncultivated areas were inspected using "variable-coverage (partial to 100%) variable-intensity ground survey" (Walker and Rosendahl 1994b:2). Walker and Rosendahl reported that the study area had been extensively modified during the Historic Period for sugarcane cultivation, and that no archaeological sites or "significant cultural materials of any kind" were found (Walker and Rosendahl 1994b:2).

Tomonari-Tuggle (1996) prepared a cultural resource overview for the Hakalau National Wildlife Refuge that included lands *mauka* of the current study area (but not Pīhā Ahupuaʻa). Very little archaeological survey was undertaken as part of the study, but Tomonari-Tuggle (1996:67-72) does provide a predictive model for site distribution within the upland forests of Hilo. She notes that the forest areas were used primarily for the collection of special resources, and that:

> …Traditionally these resources would have been birds (for featherwork) and hardwoods (for tools and canoes). In historical times, birds and hardwoods would have continued as resources, with the addition of cattle for meat and hides. The upland forests may also have been transited by individuals going from the coast to the upper slopes or summit of Mauna Kea...
>
> These transitory activities would likely have left neither a substantial nor easily recognized archaeological record. Further, the density and rapid regrowth of vegetation in the rainforest would also make any remains virtually impossible to identify once abandoned. (Tomonari-Tuggle 1996:67)

Specific site types discussed by Tomonari-Tuggle (1996) that might be encountered within the upland forests of the Hilo District include temporary shelters used by bird catchers, canoe builders, bullock hunters, scientists, travelers, surveyors, shrines or other religious structures, ponds and waterholes, roads and trails, bullock pits, surveyor's marks and ranch structures. She describes the lowest forest zone, above the current study area as the "Wet *ʻŌhiʻa* Zone," an area that was largely used as a source of specialized forest resources such as hardwoods for crafts or construction, and forest birds for feathers.

3. STUDY AREA EXPECTATIONS

Based on the culture-historical context and the findings of previous archaeological studies presented above a set of archaeological expectations for the current study area is now presented. As discussed by Tomonari-Tuggle (1996) the upland forest areas of Hilo were used traditionally for catching birds and gathering forest resources, both of which are transitory activities that are unlikely to have left a substantial, or easily recognizable, archaeological record. As indicated in the 1875 Boundary Commission testimony for Pīhā Ahupuaʻa, however, access to the forest lands in the vicinity of the study area was facilitated by a bird catcher's trail that followed the boundary between Kahuku and Pīhā *ahupuaʻa*, passing near the eastern boundary of the study parcel. This trail once intersected with a canoe makers trail from Nanue Ahupuaʻa near the *mauka* boundary of Kahuku Ahupuaʼa, in the general vicinity of the southern corner of the current study area. While the actual Precontact/early Historic trail routes, if they ever entered the current study area at all, are likely to be difficult to identify archaeologically given the thickly vegetated terrain and the overlay of historic land use, rock constructions once built adjacent to the trails, such as temporary shelters or cairns, may be encountered. The route of the trail along the Pīhā/Kahuku boundary was likely similar to the route of the existing (bulldozed) alignment of the Pīhā-Kahuku Homestead Road, which remains a public right-of-way, but is not part of the current survey area. Historic use of Lot 1 of the Pīhā Homesteads, which was purchased by William Breithaupt in 1916, may be marked by archaeological features related to ranching, habitation, or other early twentieth century homesteading activities.

4. CURRENT FIELD INVESTIGATION

Fieldwork consisted of a pedestrian survey of a roughly 5-acre portion of Lot 1 of the Pīhā Homesteads (TMK: (3) 3-2-004:038 por.), Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (see Figures 1 and 2). The archaeological survey was conducted on February 1, 2018 by Robert B. Rechtman, Ph.D., Matthew R. Clark, M.A., and Ashton Dircks Ah Sam, B.A. During the survey, fieldworkers walked northwest/southeast oriented pedestrian transects spaced at 25-meter intervals across the entire study area, between the Pīhā-Kahuku Homesteads Road and Kalaeha Stream (see Figure 3). While some portions of the survey area were densely overgrown with *ʻuluhe*, and the up and down terrain was bisected by numerous, eroded drainage channels making walking difficult and slow going, the ground visibility was generally adequate for identifying any extant archaeological remains that may have been present. In the vicinity of the site for the proposed single-family dwelling, where the hand clearing of vegetation had occurred prior to the survey, ground visibility was excellent (see Figure 7). No archaeological remains of any kind were identified on the surface of the study area as a result of the pedestrian survey.

5. CONCLUSION AND RECOMMENDATIONS

As a result of the pedestrian survey no archaeological resources were identified within the current study area. Given these findings, it is our conclusion that the proposed construction of a single-dwelling on a portion of TMK: (3) 3-2-004:038 will not affect any historic properties. With respect to the historic preservation review process of both the Department of Land and Natural Resources–State Historic Preservation Division (DLNR–SHPD) and the County of Hawaiʻi Planning Department, our recommendation is that no further work needs to be conducted. In the unlikely event that significant archaeological resources are discovered during the construction of the proposed dwelling, work shall cease in the area of the discovery and DLNR-SHPD contacted pursuant to HAR 13§13-280-3.

REFERENCES CITED

Athens, J., T. Reith, and T. Dye

2014 A Paleoenvironmental and Archaeological Model-based Age Estimate for the Colonization of Hawai‘i. *American Antiquity* 79(1):144-155.

Barrère, D.

1983 Report 2: Notes on the Lands of Waimea and Kawaihae. In Clark and Kirch (editors) *Archaeological Investigation of the Mudlane-Waimea-Kawaihae Road Corridor, Island of Hawaii*. Prepared for State of Hawaii, Department of Transportation, B.P. Bishop Museum 1983:25–38.

Bellwood, P.

1978 *The Polynesians, Prehistory of an Island People*. London: Thames and Hudson, Ltd.

Burtchard, G.

1995 Population and Land Use on the Keauhou Coast, the Mauka Land Inventory Survey, Keauhou, North Kona, Hawai‘i Island. Part I: Narrative Volume. International Archaeological Research Institute, Inc. (IARII). Prepared for Belt Collins and Associates and Kamehameha Investment Corporation, Honolulu.

Cartwright, B.

1933 Some Aliis of the Migratory Period. *Bishop Museum Occasional Papers,* 10(7). Honolulu.

Chinen, J.

1958 *The Great Mahele: Hawaii's Land Division of 1848*. Honolulu: University of Hawaii Press.

Coan, T.

1882 *Life in Hawaii: An Autobiographic Sketch of Mission Life and Labors 1835–1881*. New York: Randolph.

Cordy, R.

1994 A Regional Synthesis of Hāmākua District, Island of Hawai‘i. Historic Preservation Division, Department of Land and Natural Resources, State of Hawai‘i.

Department of the Interior

1914 “Report of the Governor of Hawai‘i.” In *Reports of the Department of the Interior For the Fiscal Year ended June 30, 1914*, Volume II, Indian Affairs and Territories, pps. 479-544. Government Printing Office, Washington D.C.

1916 “Report of the Governor of Hawai‘i.” In *Reports of the Department of the Interior For the Fiscal Year ended June 30, 1916*, Volume II, Indian Affairs and Territories, pps. 483-548. Government Printing Office, Washington D.C.

Desilets, M., A. Kasberg, and R. Rechtman

2004 Archaeological and Limited Cultural Assessment of TMKs: 3-2-9-03: 13, 29, and 60, Wailea Ahupua‘a, South Hilo District, Island of Hawai‘i. Rechtman Consulting Report RC-0247. Prepared for McCully Works, Inc., Hilo, Hawai‘i.

Division of Forestry

1906 Report of the Division of Forestry for the year ending December 31, 1905. Territory of Hawai‘i board of agriculture and Forestry. Hawaiian Gazette Co. Ltd., Honolulu.

Donn, J. M.

1901 *Hawaii, Hawaiian Islands. Hawaii* Territorial Survey Map. Registered Map 2060. http://hdl.handle.net/10524/49272, accessed August 9, 2017.

Dorrance, W., and F. Morgan
2000 *Sugar Islands: The 165-Year Story of Sugar in Hawaii*. Mutual Publishing Co., Honolulu.

Ellis, W.
2004 *Journal of William Ellis, A Narrative of an 1823 Tour Through Hawai'i.* Mutual Publishing.

Fornander, A.
1969 *An Account of the Polynesian Race: Its Origins and Migrations*. Tokyo: Charles E. Tuttle Co., Inc.

Giambelluca, T., Q. Chen, A. Frazier, J. Price, Y. Chen, P. Chu, J. Eischeid, and D. Delparte
2013 Online Rainfall Atlas of Hawai'i. *Bull. Amer. Meteor*. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

Giambelluca, T., X. Shuai, M. Barnes, R. Alliss, R. Longman, T. Miura, Q. Chen, A. Frazier, R. Mudd, L. Cuo, and A. Businger.
2014 Evapotranspiration of Hawai'i. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai

Handy, E., and E. Handy
1972 *Native Planters in Old Hawai'i*. B.P. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu. (With M. Pukui).

Hitchcock, D. H.
n.d. *Piha, Hilo Hawai'i.* Hawai'i Registered Map No. 670. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Hicks, L. A.
1915 *Lease Lots Piha and Kahuku Homesteads North Hilo Hawai'i.* Copy of Survey Furnished (C.S.F.) Map No. 2597. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Hockley, E. W.
1922 *Hilo Forest Reserve North and South Hilo, Hawai'i.* Hawai'i Territory Survey Plat 799, revision, resurvey, and map by E.W. Hockley May 1921—January 1922, reduced and traced by Jos. Iao—May 1922. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Hommon, R.
1986 Social Evolution in Ancient Hawai'i. IN Kirch, P.V. (ed.), *Island Societies: Archaeological Approaches to Evolution and Trans-formation*: 55-88. Cambridge: University Press.

Hono-ko-hau Study Advisory Commission
1974 The Spirit of Ka-Loko Hono-Ko-Hau. National Park Service, U.S. Department of the Interior.

Horowitz, R., J. Finn, L. Vargha, and J. Ceaser
1969 Public Land Policy in Hawai'i: An Historical Analysis. Report No. 5, 1969. Legislative Reference Bureau. University of Hawai'i, Honolulu.

Iao, J.
1913 *Hilo Forest Reserve Section II From Paukaa to Piha North Hilo, Hawai'i.* Hawai'i Territory Survey Plat 715, reduced from map of A. B. Loebenstein by Jos. Iao Nov. 1913. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Judd, C.S.
1922 "Report of Superintendent of Forestry, July, 1922." Letter dated August 19, 1922 in the *Forester and Agriculturalist,* Vol. XIX, No. 9, pps. 204-210. September, 1922, Honolulu.

Kamakau, S.
1976 The Works of the People of Old: Na hana a ka Poʻe Kahiko. *B.P. Bishop Museum Special Publication 61*. Bishop Museum Press, Honolulu.

1991 *Tales and Traditions of the People of Old*. Honolulu: Bishop Museum Press.

1992 *Ruling Chiefs of Hawaii*. The Kamehameha Schools Press, Honolulu (revised edition).

Kent, N.
1983 *Hawaii: Islands Under Influence*. University of Hawai'i Press, Honolulu.

Kirch, P.
1984 *Evolution of the Polynesian Chiefdoms*. Cambridge University Press, New York.

1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory.* Honolulu: University of Hawaii Press.

1990 Monumental Architecture and Power in Polynesian Chiefdoms: A Comparison of Tonga and Hawaii. *World Archaeology* 22(2).

2011 When did the Polynesians Settle Hawaiʻi? A Review of 150 Years of Scholarly Inquiry and a Tentative Answer. *Hawaiian Archaeology* Vol. 12:3-26.

Kraebel, C.J.
1922 "Report of Assistant Superintendent of Forestry, June, 1922." Letter dated July 24, 1922 in the *Forester and Agriculturalist*, Vol. XIX, No. 8, pps. 177-179. August, 1922, Honolulu.

Kuykendall, R.
1938 *The Hawaiian Kingdom 1778–1854. Foundation and Transformation*. Honolulu: University Press of Hawaii.

Kuykendall, R., and A. Day
1976 *Hawaii: A History From Polynesian Kingdom to American Statehood*. Prentice-Hall, Inc., Englewood Cliffs.

Lutz, M. E.
1914 *Piha Homesteads North Hilo-Hawaiʻi.* Hawaiʻi Territory Survey Registered Map No. 2568, resurveyed and adjusted by M.E. Lutz. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Maly, K., and O. Maly
2006 HILO PALIKŪ–HILO OF THE UPRIGHT CLIFFS: A Study of Cultural-Historical Resources of Lands in the Laupāhoehoe Forest Section, Ahupuaʻa of the Waipunalei-Mauluanui Region, North Hilo District, Island of Hawaiʻi. Kumu Pono Associates Study HiHETF116-Laupāhoehoe (120506a). Prepared for United States Department of Agriculture Forest Service – Institute of Pacific Islands Forestry, Hilo.

Oliver, D.
1961 *The Pacific Islands*. University of Hawaii Press, Honolulu.

Pogue, J.
1978 *Moolelo Hawaii*. Hale Paipalapala Aupuni, Honolulu (Revised Edition).

Pukui, M., S. Elbert, and E. Moʻokini
1974 *Place Names of Hawaii*. *Revised and Expanded Edition.* Honolulu: University of Hawaii Press, Honolulu.

Sherrod, D. R., J. M. Sinton, S. E. Watkins, and K. M. Brunt
2007 Geologic Map of the State of Hawai`i. Open-File Report 2007-1089. U.S. Department of the Interior, U.S. Geological Survey. http://pubs.usgs.gov/of/2007/1089/.

Sinoto, Y., and M. Kelly
1970 Archaeological and Historical Survey of Pakini-Nui and Pakini-Iki Coastal Sites, Waiahukini, Kailikii, and Hawea, Ka‘u, Hawaii. *Departmental Report Series* 75-1. Department of Anthropology, B.P. Bishop Museum, Honolulu.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture
2018 Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/, accessed February 12, 2018.

Stokes, J.F.G., and T. Dye
1991 Heiau of the Island of Hawai‘i. *Bishop Museum Bulletin in Anthropology 2*. Bishop Museum Press, Honolulu.

Thrum, T.G.
1908 Heiaus and Heiau Site Throughout the Hawaiian Islands. Island of Hawaii. *Hawaiian Almanac and Annual 1909*:38-47. Honolulu.

Tomonari-Tuggle, M.
1996 Bird Catchers and Bullock Hunters in the Upland Mauna Kea Forest: A Cultural Resource Overview of the Hakalau Forest National Wildlife Refuge, Island of Hawai‘i. North and South Hilo District, Island of Hawai‘i. International Archaeological Research Institute, Inc., Honolulu, Hawai‘i. Prepared for U.S. Fish and Wildlife Service, Hilo, Hawai‘i.

Walker, A., and P. Rosendahl
1994a Interim Report: Archaeological Inventory Survey, Chin Chuck Road Project Area, Land of Hakalau Nui, South Hilo District, Island of Hawai‘i (TMK:2-9-02:23 and 2-9-04-:56). PHRI Report 1563-102894. Prepared for Mr. Eben Dale, C. Brewer Homes, Inc. c/o PBR Hawaii.

1994b Archaeological Inventory Survey, Chin Chuck Road Project Area, Land of Hakalau Nui, South Hilo District, Island of Hawaii (TMK:2-9-02:23 and 2-9-04:56). PHRI Report 1563-111194. Prepared for Mr. Eben Dale, C. Brewer Homes, Inc. c/o PBR Hawaii.

Wilkes, C.
1845 *Narrative of the United States Exploring Expedition During the Years 1838–1842, Under the Command of C. Wilkes, U.S.N.,* Volume 4. Philadelphia: Loa and Blanchard.

APPENDIX A – Boundary Commission Documents, Pīhā Ahupua‘a

The Ahupuaa of Piha, District of Hilo, Island of Hawaii 3rd J.C.

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On this the 8th day of February A.D. 1875, the commission of Boundaries for the Island of Hawaii 3rd J.C. met at the Court house, Hilo, Hawaii, on the application of J. C. Dominis Admtr Est M. Kekuanaoa for the settlement of the boundaries of Piha, Situated in Distrct of Hilo, Island of Hawaii. Due notice of hearing personally served on all owners or agents of adjoining lands as far as known.

Present – E. G. Hitchcock on part of applicant, Agent of Crown Lands J. C. Dominis, and P. Keelikolani, D. Kamai for Hawaiian Government, Alapai for self.

Maps and notes of survey filed.

For Petition see Folio 242 Book A

– Testimony –

Ku x. Sworn. (An old man)

I was born at Honohina, Hilo, at time of Kholenas during reign of Kamehameha I. Was old enough to cook at time of Ohua. my kupuna-kane Hue and my father Mahsai. Bird catch-ers told me boundaries. My Grandfather made the road on Honohina to Moohalohalo, and I made the road to Hopuwai, Kahuku bounds Piha on Hilo side at shore, there is a small gulch there called Alanaio on boundary, thence runs up gulch to a short distance above road to head of it, thence up old trail to Kaawau, thence bounded by Manui, up old trail to Nenelu old Kaukale, thence up trail to Waipahoehoe a Kahawai and Kaukale, the old trail does not reach to the gulch but turns to the left, the old bound-ary between lands running to Piwaiuha, till time Hapai made cattle, then boundary was carried up to Kaahina, where Piha ends and Manui end, and Honohina

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join about this place, thence boundary between Honohina and Piha runs up the Pamiu gulch, to the head of the gulch, thence up through the woods to Nauhi gulch, and to Kalapaohelo on Haimakua boundary. Humuula bounds it on the mauka side above the woods. There is a pile of stones at Kalapaohelo, that my older brother Koia put up when he was Konohiki of land. Waikaumalo bounds Piha at shore on Haimakua side, there is a gulch there, the water belongs to Waikaumalo, thence the boundary between these two lands runs up stream to place called Halepai, thence up gulch bounded by Puuohiia to Kumuohia, there gulch ends and Piha is bounded by Mauhua Nui to Kalapaohelo a straight boundary. The bird catchers used to go back and forth in old times on Piha and Mauhua. Koia pointed out boundaries to me. I went with D. H. Hitchcock a short time since, and pointed out boundaries to him from shore to above woods. I told him where Mamani grew was Humuula. The Ahu was built in time of Kamehameha II. I saw it built. I never saw mamani there in olden times at this place, but now I see there are some young mamani trees there. Kalauaioha, Alapai, J. and Kaiahua were along with us. I made the road up through the woods at time of (Kuakini's) killing cattle by Kuakini.

Cd by D. Kamai.

By Alapai, Piha and Namu join at Kawaa cutting off Kahuiku. I have stated that the mauka boundary of Namu is at Kaahina not at Nahuina of Waipahoehoe. There is an old Kaahale Kalainoa at this place, this is the boundary I have always known. Namu had no old road. The birds in olden times belonged to Piha and not to Namu.

Hemahenua Sworn. (Quite old man)-

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in Hamakua, moved to Hilo to Puuohira when quite young and went over these lands with Waiwai my father. He was Konohiki of these lands to Pohakupuka. Went with my Kupunakane bird catching. Waikaumalo bounds Piha on Hamakua side at shore, boundary runs up gulch to Kaalaiki at Halaopai, where Puuohia bounds it, boundary runs up gulch to Ninika where Puuohua ends, and Maliua bounds it to the mountain. Bird catchers from these two lands used to catch in common. The mauka boundary is at Kalapaohelo above the woods at old Ahu. There are several Ahus there now. Kumuula bounds it on mauka side to Nauhi gulch. Kahuku bounds Piha at shore at Hilo side, a small gulch, boundary runs up gulch to head, and up old trail to Nahuipa where Piha and Nanue join and Kahuku ends, thence boundary runs up trail to Kaahina near Waipahoehoe, this is as far as I ever knew about Nanue, then bounded by Honohina, do not know as Honohina runs through woods, but know that Piha runs up to Nauhi gulch. I do not know what gulch it is makai now.

Q. by D. Kamai, Ninika is at mauka end of Puuohua, Kumuohia is on Piha place. Nahuina and Kumukawau are the same.

" by Alapai, From Kawai boundary between Nanue and Piha runs up old trail to Kaahina, this is as far as I ever knew Nanue to run. It is where Hapai made a canoe. I heard from Kiliili, Nakuhe and Kulaipahu that this was the mauka end of Nanue. Hapai ma said the same thing.

D. H. Hitchcock Sworn. I surveyed Piha last October. Ku was my kamaaina. Kalauaiotha went along on part of Nanue. I had already talked with Henkahema, and as he agreed with Ku I did not take him, but surveyed the land as Ku pointed it out, commencing at shore on Hilo side went to [illegible] said that

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Kapuku ended. I then went up to below Waipahoehoe where Kalaualoha said that boundary went on to gulch, Waipahoehoe and up stream, Nanue, ran through woods, but Ku and Hemahema said that the bound-ary ran up trail to Kaahiva. The other two men said it (Nanue) ended at Kaahuia. I found, that most of the gulches ended at Ruiika, and gulches from mauka ended at swamps. When I got to Nauhi gulch at upper edge of woods both, Kalaualoha and Ku said that it was the upper corner of Piha. Ku said Piha was bounded there by Honohina, and Kalaualoha that it was bounded by Nanue. They both went to a sandy place and pointed out an old pile of stones at Kalapaoheio and said that was boundary between Piha and Maulua, it is in the upper edge of woods, with a few young mamani below it. I think it is about 25 chains makai of Lumaia road. I surveyed the Waikaunalo side, giving the general courses, and distances of gulches, and marked trees. This map and notes of survey filed today, are the ones I made out from my field notes.

C.S.

Kalaualoha Sworn, (old man).

I live at Nanue, was born at Honohina, know boundaries of Piha, Kulamahiai, Koia, and Waikane. Now dead told me boundaries. Piha and Nanue joins each other at Kawaiu on old trail into woods, thence boundary runs up this trail to Waipahoehoe, thence boundary runs up this stream to Mahuia Kauhale on Piha, thence boundary runs up to Koapololei, thence up old trail to upper edge of woods to Kalapaoheio, to a place called Kaluaalu about as far on the Puna side of Kalapaoheio as from here to Waikuku gulch. Nanue reaches to Kalupalu. Nauhi gulch is in the middle of Nanue. Nauhi gulch only runs a short distance into woods

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In olden times the birdcatchers used to go up the Honohina and Piha roads, they could not go up Nanue as the road was so bad. The canoe road of Nanue ran to maiika of Kaahiwa, there it ended. But the roads on Honohina and Piha ran way mauka. Alapai now owns Nanue, I and his father in law. I did not tell Hitchcock that Naushi was the boundary of Piha. I was a witness on boundary of Nanue and Humuula.

Kuipahu sworn. (Quite an old man).

Was born at time of Peelen, in Kona, moved to Hilo with parents to Punohua, afterwards moved to Nanue, I am uncle to Alapai. Know a little about boundaries of Piha. Went up road to Kalapaohelo after beef. Koia was our guide and told me boundaries: Piha is bounded by Nanue from shore Kahuku between. Kahuku ends at Nahuina, and there Nanue and Piha join, Kumukawai is one name of this place thence boundary runs up to Waipahoehoe gulch across gulch up road to upper edge of woods to place called Kalapaohelo at Puna bar of Kualapaohelo. ——

Cd. Know places called Pahau & Mahuia, there the boundary is at road. Know Kumuohia. It is on the boundary between Nanue and Piha, Know Kukai &c, (Places Hitchcock states are on boundary between Mauhina and Piha). —— ——

Testimony Closed.

E.S. Hitchcock moved that testimony given by Kalawaloha as to boundaries between Humuula and Piha and Nanue be introduced as evidence — Granted —

Alapai states that he accepts Kaahiwa as the mauka boundary of Nanue. ——

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Decision

Boundaries of Piha decided to be as given in evidence of Ku, and Notes of Survey filed. Certificate to be issued accordingly.—

R. A. Lyman
Com of Boundaries 3rd J. C.—

Copied by J. B. Castle.

The above is a true copy of the evidence, and decision of Boundaries of Piha, Hilo Hawaii, Given Oct 11th 1875.
For Certificate of Boundaries see No. 64. Fols 124, 125, 126, & 127. Liber I—

R A Lyman
Commissioner of Boundaries 3rd J. C.

Copied see Fols 127, 128 Liber I.

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For Testimony of Piha, Hilo,
See Folio 325 Book B.

Land Boundary Commission } No. 64.
Hawaii 3rd J.C.

Certificate of the Boundaries of Piha, District of Hilo Island of Hawaii 3rd J.C.

Upon the Application of "J. O. Dominis Administrator of the Estate of M. Kekuanaoa," and by virtue of the authority vested in me by law as Sole Commissioner of Land Boundaries for the Island of Hawaii 3rd J.C. I hereby decide and certify the Boundaries of the Ahupuaa of Piha, situated in the District of Hilo, Island of Hawaii, to be as hereinafter set forth.

Given under my hand at Hilo, Hawaii,
This Second day of March A. D. 1875.

R A Lyman
Commissioner of Boundaries 3rd J.C.

Boundaries of Piha.

Commencing at the falls of the Waikaumalo stream at the sea-coast, and running along the coast to the Alenaio gulch, the boundary of

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the land of Kahuku;

1. South 54°00' East 6.00 Chains, (Here) along the Alenaio gulch to Government Road on the land of Kahuku;
2. South 31°30' West 32.00 Chains;
3. South 34°00' West 72.00 Chains, along Alenaio gulch 42.00 Chains, (Here the gulch ends); thence along the road between Kahuku & Piha 30.00 Chains
4. South 51°00' West 34.00 Chains, along said road;
5. South 53°30' West 27.00 " " " "
6. South 58°00' West 22.00 " " " " to Ohia tree marked x;
7. South 62°00' West 24.00 Chains along said road;
8. South 35°30' West 31.00 " " " " to where Kahuku ends and the Nanue road joins in.
9. South 31°30' West 28.00 Chains along Nanue;
10. South 70°00' West 16.00 Chains " " to the Nuku.
11. Still along the road between Nanue and Piha to within 6.00 Chains of the Waipahoehoe Stream, bearing, South 55°30' West 44.00 Chains;
12. Thence following the Nanue road, (The Piha road here branches off), and going to a place called Kaahina, at the junction of the Kaahina and Painiu streams which form the Nanue Stream; South 28°30' West 51.00 Chains;
13. South 28°30' West 33.00 Chains along the Painiu stream and land of Honohina;

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14. South 58°00' West 124.00 Chains to where the Painiu stream peters out;
15. South 66°00' West 350. Chains, to and along Nauhi gulch to a koa tree marked x on its South bank, to the land of Hummula.
16. Thence along the land of Hummula to an old "Ahu" in the midst of a sand flat to the North of the "Lapa Ohelo", (Old Ku, my kamaaina, after an absence of forty years went directly to the old Ahu and pointed it out as the boundary between Piha & Maulua) to land of Maulua; Bearing,
North 16°00' West 66°00 Chains;
17. North 68°00' East 320.00 Chains along the land of Maulua and to the commencement of Waikaumalo stream.
18. North 52°00' East 170.00 Chains along Puuohua and Waikaumalo gulch;
19. North 73°00' East 96.00 Chains along Puuohua and Waikaumalo gulch; Here the land of Waikaumalo begins.
20. North 44°30' East 29.00 Chains along Waikaumalo gulch;
21. North 46°00' East 26.00 Chains along Waikaumalo gulch;
22. North 43°00' East 27.00 Chains along Waikaumalo stream and land;
23. North 44°30' East 34.00 Chains along Waikaumalo stream and land to Paina falls;
24. North 58°00' East 26.00 Chains along

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the Waikaumalo stream and land;
25. North 25°00' East 20.00 Chains along the Waikaumalo stream and land;
26. North 46°00' East 23.00 Chains along the Waikaumalo stream and land;
27. North 68°30' East 24.00 Chains along the Waikaumalo stream and land to bridge;
28. North 43°00' East 39.00 Chains along the Waikaumalo stream and land to the Sea-coast at point of Commencement.
Containing an Area of 4.250 Acres.
As surveyed by D. H. Hitchcock.
R B Lyman

R B Lyman
Commissioner of Boundaries 3rd Dist.

Costs paid in full Mar. 3. 1875.

1 day hearing 10.- 33 folio testimony 8.25 Certificate 2.- Stamp 5 description Cos 10 folio 5 — 26.25

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Draft Environmental Assessment
Ramos Single-Family Residence
in the Conservation District at Pīhā

APPENDIX 3
Cultural Impact Assessment

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A Cultural Impact Assessment of a Portion of Lot 1 of the Pīhā Homesteads

TMK: (3) 3-2-004:038 (por.)

Pīhā Ahupuaʻa
North Hilo District
Island of Hawaiʻi

DRAFT VERSION

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April 2018

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ASM Project Number 29530.00

A Cultural Impact Assessment of a Portion of Lot 1 of the Pīhā Homesteads

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1. INTRODUCTION

At the request of James Leonard on behalf of Mr. Pedro Pablo Ramos, ASM Affiliates has prepared this Cultural Impact Assessment (CIA) for the development of a single-family residence on a portion of a 18.3-acre Conservation Zoned property (TMK: (3) 3-2-004:038) located in Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi. (Figures 1, 2, and 3).

This CIA will serve as a companion document to an Environmental Assessment (EA) being prepared in compliance with Hawaiʻi Revised Statutes Chapter 343; as well as pursuant to Act 50; and in accordance with the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impact*, adopted by the Environmental Council, State of Hawaiʻi, on November 19, 1997. As stated in Act 50, which was proposed and passed as Hawaiʻi State House of Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, "environmental assessments . . . should identify and address effects on Hawaii's culture, and traditional and customary rights . . . native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the ʻaloha spirit' in Hawaiʻi. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on governmental agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups."

Below is a description of the general study area and proposed development activity, followed by a detailed culture-historical background and a presentation of prior studies; all of which combine to provide a physical and cultural context for the current study area. The results of the consultation process are then presented, along with a discussion of potential impacts to the cultural landscape as well as appropriate actions and strategies to mitigate any such impacts.

STUDY AREA DESCRIPTION

The current study area consists of a roughly 5-acre portion of TMK: (3) 3-2-004:038 (Lot 1 of the Pīhā Homesteads) located in Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (see Figures 1and 2). Situated at an elevation of roughly 1,680 to 1,840 feet (512 to 560 meters) above sea level, the study parcel is the *mauka*-most of the Pīhā Homestead lots. It is accessed by the Pīhā-Kahuku Homestead Road, which extends 4.75 kilometers (2.95 miles) from Old Māmalahoa Highway to the eastern corner of the study area, transitioning from a paved road, to a gravel road, to a four-wheel drive road as it progresses up slope. The study area includes only the southwestern portion of the larger 18.3-acre parcel, an area that is bounded to the southeast and southwest by old fence lines that mark the *makai* the boundaries of the Hilo Forest Reserve, to the northwest by Kalaeha Stream, and to the northeast by Lot 2 of the Pīhā Homesteads. The area is currently undeveloped and covered by thick vegetation typical of Hawaiʻi's lowland rainforests, except near the outlet of Pīhā-Kahuku Homestead Road, at the location of the proposed single-family residence, where some hand clearing of brush has occurred. Vegetation cover within the study area consists primarily of strawberry guava (*Psidium cattleianum*), *ōhiʻa* (*Metrosideros polymorpha*), ʻ*uluhe* (*Dicranopteris linearis*), and various other grasses, vines, ferns, shrubs, and weeds, with some large paper bark trees (*Melaleuca leucadendra*) growing near the proposed building site. Soils in this area are classified as Kaiwiki highly organic hydrous silty clay loam on 6 to 20 percent slopes (Soil Survey Staff, USDA 2018). These soils have formed on Pleistocene lava flows of the Hāmākua Volcanic Series (Qhm) that originated from Mauna Kea Volcano 64,000 to 300,000 years ago (Sherrod et al. 2007). Rainfall in the vicinity of the study area averages 5,285 millimeters (208 inches) per year, and the mean annual air temperatures is 66°F (19°C) (Giambelluca et al. 2013, 2014).

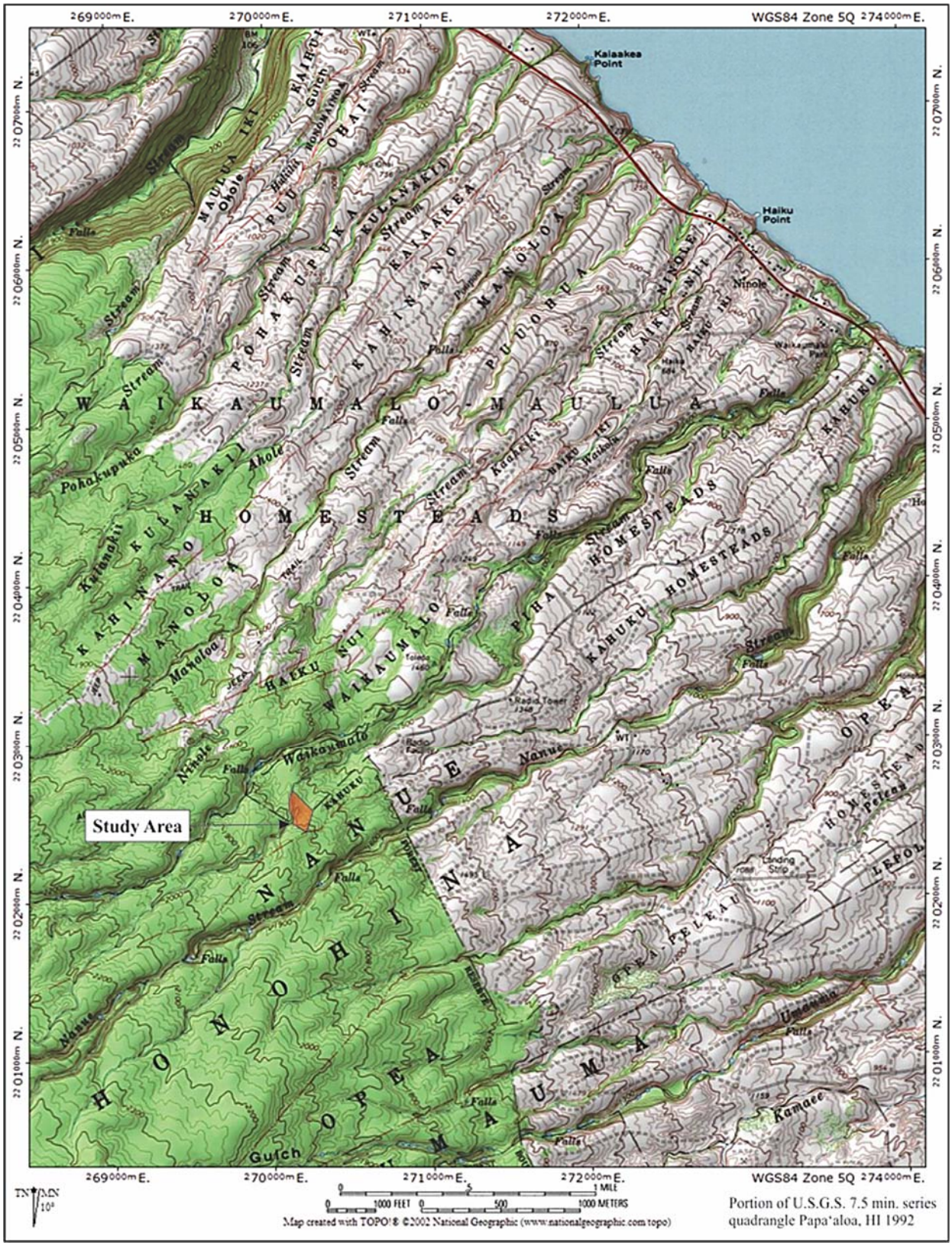

Figure 1. Study area location plotted on a portion of the U.S.G.S. 7.5-minute series, Papa‘aloa, HI quadrangle, 1992 (shaded red).

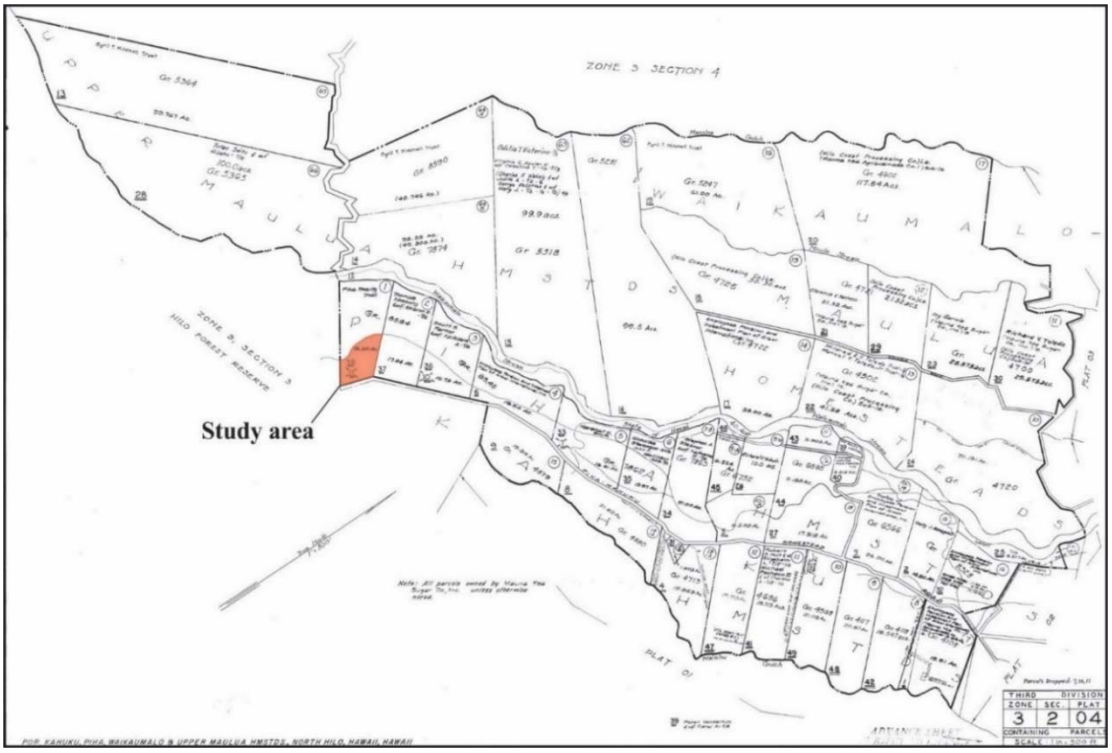

Figure 2. Tax Map Key (TMK): (3) 3-2-004 showing the current study area (portion of Parcel 038).

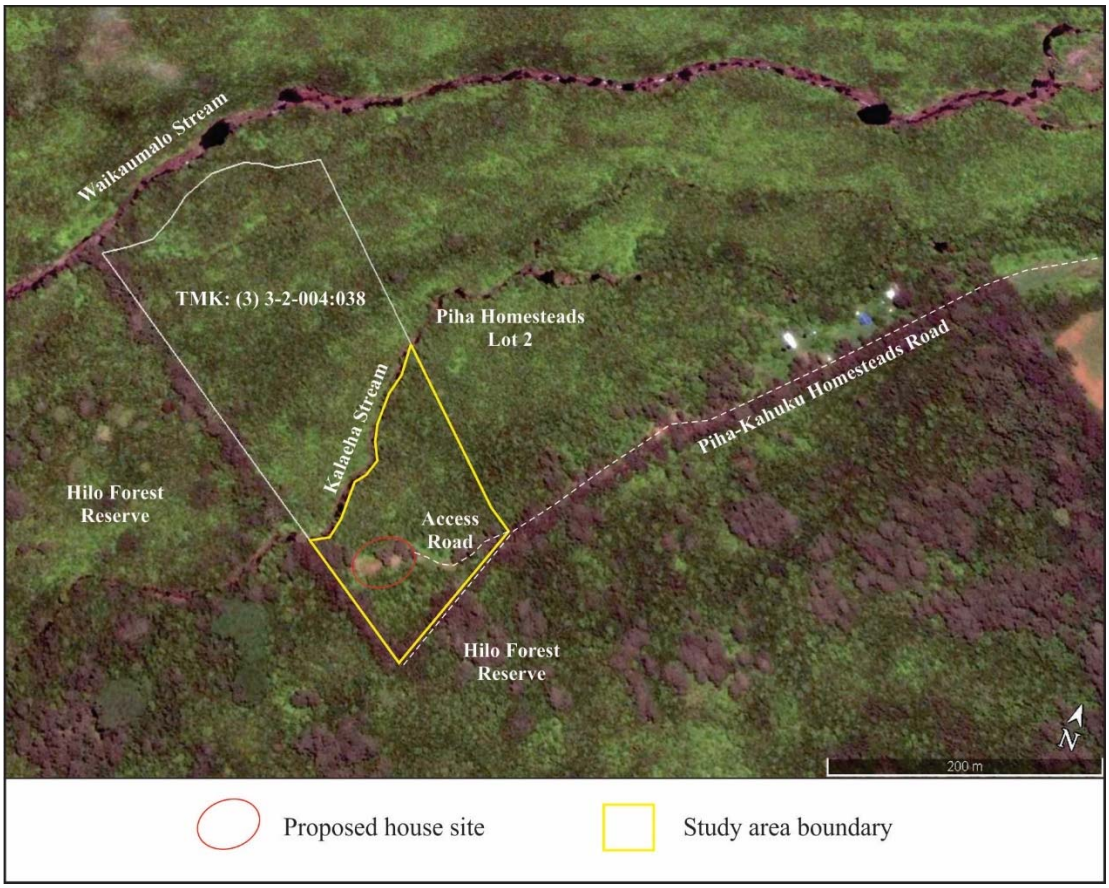

Figure 3. Google Earth™ image showing the current study area location.

2. BACKGROUND

This section of the report includes a discussion of the cultural-historical background for the study area and a synthesis of relevant prior research. This information is presented to provide a comprehensive understanding of the cultural significance of the study area and general vicinity and to establish an analytical basis for the assessment of any potential cultural impacts. The ability to assess the cultural significance of the current study area is contingent upon developing (at a minimum), a comprehensive understanding of the *ahupuaʻa* in which the study area is located. As will be demonstrated in the ensuing section, a consideration of the broader region and island landscape is also required at times.

CULTURE-HISTORICAL CONTEXT

The chronological summary presented below begins with the peopling of the Hawaiian Islands and a generalized model of Hawaiian Prehistory followed by a summary of Historic events in the Hawaiian Islands after the arrival of foreigners. The discussion continues with a presentation of historical references to Pīhā Ahupuaʻa and the general North Hilo area. This summary includes oral traditions and first-hand Historic accounts recorded by visitors and missionaries. Land use practices in the study area vicinity are also presented, including commercial sugar cultivation.

A Generalized Model of Hawaiian Prehistory

While the question of the timing of the first settlement of Hawaiʻi by Polynesians remains unanswered, several theories have been offered that derive from various sources of information (i.e., genealogical, oral-historical, mythological, radiometric). However, none of these theories is today universally accepted (c.f., Kirch 2011). What is more widely accepted is the answer to the question of where Hawaiian populations came from and the transformations they went through on their way to establish a uniquely Hawaiian culture. The initial settlement in Hawaiʻi is believed to have originated from the southern Marquesas Islands (Emory in Tatar 1982). During these early times, Hawaiʻi's inhabitants were primarily engaged in subsistence level agriculture and fishing (Handy et al. 1991). This was a period of great exploitation and environmental modification when early Hawaiian farmers developed new subsistence strategies by adapting their familiar patterns and traditional tools to their new environment (Kirch 1985; Pogue 1978). Their ancient and ingrained philosophy of life tied them to their environment and kept order; which was further assured by the conical clan principle of genealogical seniority (Kirch 1984). According to Fornander (1880), the Hawaiians brought from their homeland certain universal Polynesian customs and belief: the major gods Kāne, Kū, and Lono; the *kapu* system of law and order; cities of refuge; the *ʻaumakua* concept; and the concept of *mana*. The initial permanent settlements were established at sheltered bays with access to fresh water and marine resources. These communities shared extended familial relations and there was an occupational focus on the collection of marine resources. Over a period of a few centuries, the areas with the richest natural resources became populated and perhaps even crowded, and there was an increasing separation of the chiefly class from the common people. As populations increased so did societal conflict, which resulted in hostility and war between neighboring groups (Kirch 1985). Soon, large areas of Hawaiʻi were controlled by a few powerful chiefs.

As time passed, a uniquely Hawaiian culture developed. The portable artifacts found in archaeological sites of this next period reflect an evolution of the traditional tools and distinctly Hawaiian inventions. The adze (*koʻi*) evolved from the typical Polynesian variations of plano-convex, trapezoidal, and reverse-triangular cross-section to a very standard Hawaiian rectangular quadrangular tanged adze. The two-piece fishhook and the octopus-lure breadloaf sinker are Hawaiian inventions of this period, as are *ʻulu maika* stones and *lei niho palaoa*. The latter was a status item worn by those of high rank, indicating a trend toward greater status differentiation (Kirch 1985). As the population continued to expand so did social stratification, which was accompanied by major socioeconomic changes and intensive land modification. Most of the ecologically favorable zones of the windward and coastal regions of all major islands were settled and the more marginal leeward areas were being developed. During this expansion period, additional migrations to Hawaiʻi occurred from Tahiti in the Society Islands. Rosendahl (1972) has proposed that settlement at this time was related to seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites were occupied during the winter months, with a focus on agriculture. An increasing reliance on agricultural products may have caused a shift in social networks as well; as Hommon (1976) argues, kinship links between coastal settlements disintegrated as those links within the *mauka-makai* settlements expanded to accommodate the exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the *ahupuaʻa* system sometime during the A.D. 1400s (Kirch 1985), which added another component to an already well-stratified society. The implications of this model include a shift in residential patterns from seasonal, temporary

occupation, to permanent dispersed occupation of both coastal and upland areas.

The *ahupuaʻa* became the equivalent of a local community, with its own social, economic, and political significance, which added another component to a then well-stratified society. *Ahupuaʻa* were ruled by *aliʻi ʻai ahupuaʻa* or chiefs who controlled the *ahupuaʻa* resources; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land. *Ahupuaʻa* lands were in turn, managed by an appointed *konohiki* or lesser chief-landlord. The *aliʻi-ʻai-ahupuaʻa*, in turn, answered to an *aliʻi ʻai moku* (chief who claimed the abundance of the entire district). Thus, *ahupuaʻa* resources supported not only the *makaʻāinana* (commoners) and *ʻohana* (families) who lived on the land but also contributed to the support of the royal community of regional and/or island kingdoms. *Ahupuaʻa* are land divisions that typically incorporated all of the eco-zones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). Although the *ahupuaʻa* land division typically incorporated all of the eco-zones, their size and shape varied greatly. This form of district subdividing was integral to Hawaiian life and was the product of resource management planning that was strictly adhered to. In this system, the land provided fruits and vegetables and some meat for the diet, and the ocean provided a wealth of protein resources (Rechtman and Maly 2003). In communities with long-term royal residents, divisions of labor (with specialists in various occupations on land and in the procurement of marine resources) were also strictly enforced.

By the seventeenth century, large areas of Hawaiʻi Island were controlled by a few powerful *aliʻi ʻai moku*. There is island-wide evidence to suggest that growing conflicts between independent chiefdoms were resolved through warfare, culminating in a unified political structure at the district level. It has been suggested that the unification of the island resulted in a partial abandonment of portions of leeward Hawaiʻi, with people moving to more favorable agricultural areas (Barrera 1971; Schilt and Sinoto 1980). ʻUmi a Līloa, a renowned *aliʻi* of the Pili line, is often credited with uniting the Island of Hawaiʻi under one rule during the Precontact Period (Cordy 1994).

A Brief History of Hawaiʻi After Western Contact

The arrival of Western explorers in Hawaiʻi signified the end of the Precontact Period, and the beginning of the Historic Period. With the arrival of foreigners, Hawaiʻi's culture and economy underwent drastic changes. Demographic trends during the late Proto-Historic Period/early Historic Period indicate population reduction in some areas, due to war and disease, yet increase in others, with relatively little change in material culture. At first there was a continued trend toward craft and status specialization, intensification of agriculture, *aliʻi* controlled aquaculture, the establishment of upland residential sites, and the enhancement of traditional oral history. The Kū cult, *luakini heiau*, and the *kapu* system were at their peaks, although western influence was already altering the cultural fabric of the Islands (Kirch 1985; Kent 1983). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha I had conquered Oʻahu, Maui and Molokaʻi, in 1795, Hawaiʻi saw the beginnings of a market system economy (Kent 1983). Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, Irish potatoes, Indian corn, beans, figs, oranges, guavas, and grapes (Wilkes 1845). Later, as the Historic Period progressed, Kamehameha I died, the *kapu* system was abolished, Christianity established a firm foothold in the islands, and introduced diseases and global economic forces began to have a devastating impact on traditional life-ways in the Hawaiian Islands. This marked the end of the Proto-Historic Period and the end of an era of uniquely Hawaiian culture.

Kirch (1985) places the beginning of the Proto-Historic Period during the rule of Lonoikamakahiki. This was a time marked by both political intensification and stress and continual conquest by the reigning *aliʻi*. Wars occurred regularly between intra-island and inter-island polities during this period. It was during this time of warfare that Kamehameha, who would eventually rise to power and unite all of the Hawaiian Islands under one rule, was born in the District of North Kohala on the Island of Hawaiʻi (Kamakau 1992). There is some controversy about the year of his birth, but Kamakau (1992) places the birth event sometime between a.d. 1736 and 1758, most likely nearer to the later date.

PĪHĀ AHUPUAʻA AND GREATER NORTH HILO

The current study area is located within the *ahupuaʻa* of Pīhā, in the District of North Hilo, on the windward coast of Hawaiʻi Island (Figure 4). The name describes the region's treacherous coastline, with its sheer cliffs broken only by a string of narrow gulches containing streams that pour down from the slopes of Mauna Kea. Pīhā, which literally translates as "flotsam" (Pukui et al. 1974:184), meaning any floating material carried by flood waters or the sea, is one of many land divisions (*ahupuaʻa*) extending inland from the coast of North Hilo with boundaries that generally follow the meanderings of the gulches, and encompass the tablelands in between. This *ahupuaʻa* is located within the traditional *moku* (district) of Hilo, which is one of six *moku* of Hawaiʻi Island. The Hawaiian proverb, "*Hilo, mai Mawae a ka pali o Maulua*" details the extent of the district spanning from Mawae the southernmost boundary and Maulua as the northernmost boundary (Pukui 1983:108). Handy et al. (1991:538) provides a general description of the district:

> Hilo as a major division of Hawaiʻi included the southeastern part of the windward coast most of which was in Hamakua, to the north of Hilo Bay. This, the northern portion, had many scattered settlements above streams running between high, forested kula lands, now planted with sugar cane. From Hilo Bay southeastward to Puna the shore and inland are rather barren and there were few settlements. The population of Hilo was anciently as now concentrated mostly around and out from Hilo Bay, which is still the island's principal port. The Hilo Bay region is one of lush tropical verdure and beauty, owing to the prevalence of nightly showers and moist warmth which prevail under the northeasterly trade winds into which it faces. Owing to the latter it is also subject to violent oceanic storms and has many times in its history suffered semidevastation from tidal waves unleashed by earthquake action in the Aleutian area of the Pacific.

Traditionally, the *moku* of Hilo was divided into three *ʻokana* (land divisions) with place names that have their origins in legendary times. The three divisions are (from north to south): Hilo Palikū, Hilo One, and Hilo Hanakahi. The location of the current study area coincides best with Hilo-pali-kū or "Hilo of the upright cliff" (Pukui et al. 1974:46), which extends north from the Wailuku River to Kaʻula Gulch (Maly and Maly 2006). In *Pele and Hiʻiaka*, Emerson recounts the following *mele* that Hiʻiaka sang while journeying between Hilo and Puna through the forest territory of the *moʻo* Panaʻewa, which mentions the study area vicinity:

Pau ke aho i ke kahawai lau o Hilo:	One's strength is exhausted, climbing, climbing
He lau ka puʻu, he mano ka ihoʻna;	The countless valleys and ridges of Hilo,—
He mano na kahawai o Kulaʻi-po;	The streams without number of Ku-laʻi-po,
He wai Honoliʻi, he pali o Kama-eʻe,	The mighty water of Hono-liʻi, the precipice walls of Kama-eʻe
He pali no Koolau ka Hilo-pali-ku;	And the pali of Koʻolau: Such a land is Hilo-pali-ku.
He pali Wailuku, he one ke hele ia;	The banks of Wailuku are walls; The road to its crossing but sand;
He one e keʻehia la i Wai-olama.	Sandy the way at Wai-o-lama. (1993:32-33)

Kepā and Onaona Maly provide additional information pertaining to the ancient land division of Hilo Palikū in the following translation of an excerpt from a legendary account called "*Kaʻao Hoʻoniua Puʻuwai no Ka-Miki"* ("The Heart Stirring Story of Ka-Miki"). This legend was originally published in Hilo's Hawaiian Language newspaper *Ka Hōku o Hawaiʻi*:

> Of Hilo Paliku it is said, one becomes short of breath traveling through Hilo, for there are many (400) hills, many (4,000) areas to descend, and many (40,000) streams, indeed while swimming through the waters of Hilo one becomes out of breath, but one is never out of water at Hilo! (Maly and Maly 2006:13)

The other two ancient land divisions are located to the south of the current study area. Hilo-one, or sandy Hilo, extends along the shoreline of Hilo Bay between the Wailoa and Wailuku rivers (Edith Kanakaʻole Foundation 2012); while Hilo Hanakahi, "Hilo, [land of] chief Hanakahi" (Pukui and Elbert 1986:129), extends from the Wailoa River to include Keaukaha. The *ahupuaʻa* in which the current study area is situated lies within the verdant region of Hilo Palikū, as described by Pukui (1983:107):

> *Hilo iki, pali ʻeleʻele.*
> Little Hilo of the dark cliffs.
> Hilo-pali-ku, or Hilo-of-the-standing-cliffs, is always green because of the rain and mists.

‘Ōlelo No‘eau of Hilo

The oral tradition of Hawai‘i is perhaps best preserved in *‘ōlelo no‘eau*, which have been passed down throughout the generations. Many *‘ōlelo no‘eau* speak of Hilo and most mention the region’s abundant water and agricultural prosperity. The following proverbs illustrate Hilo in great detail, and appear below as they were interpreted and published in *‘Ōlelo No‘eau, Hawaiian Proverbs & Poetical Sayings* by Mary Kawena Pukui (1983):

> *‘Au umauma o Hilo i ka wai.*
> Hilo has breasted the water.
> To weather the storm. The district of Hilo had many gulches and streams and was difficult to cross.
> (1983:28)
>
> *Halulu me he kapua‘i kanaka la ka ua o Hilo*
> The rain of Hilo makes a rumbling sound like the treading of feet.
> (ibid.:53)
>
> *Hilo ‘ai lū‘au.*
> Hilo, eater of taro greens.
> The people of Hilo were said to be fond of cooked taro greens. When storms came to Hilo, it was impossible to obtain fish from the streams or the sea. The people had to be content with taro greens.
> (ibid.:107)
>
> *Hilo ‘āina ua lokuloku.*
> Hilo of the pouring rain.
> (ibid.:107)
>
> *Hilo i ka ua Kani-Lehua.*
> Hilo of the Kanilehua rain.
> The Kanilehua rain, or the rain that patters in the *lehua* forest, is frequently referred to in the chants and songs of Hilo.
> (ibid.:168)
>
> *Hilo mahi ha‘aheo.*
> Hilo of the proud farmers.
> The climate makes the soil of Hilo very easy to till, so the farmers used to make a game of planting. They used long digging sticks to make the holes and wore *lei* to work. Working in unison, they made a handsome picture.
> (ibid.:107)
>
> *Hilo, mai Mawae a ka pali o Maulua.*
> Hilo, from Mawae to the cliff of Maulua.
> The extent of the Hilo district is from Mawae on the Puna side to Maulua on the Hāmākua side.
> (ibid.:108)
>
> *Hilo, nahele paoa i ke ‘ala.*
> Hilo, where the forest is imbued with fragrance.
> Hilo’s forest is fragrant with *hala* and *lehua* blossoms.
> (ibid.:108)
>
> *Hilo pa‘ele ku.*
> Hilo is dark all over.
> (ibid.:108)
>
> *Ka ua lei mā‘ohu o Waiānuenue.*
> The rain of Waiānuenue that is like a wreath of mist.
> Wai-ānuenue (Rainbow-water) in Hilo, Hawai‘i, is now known as Rainbow Falls. On sunny days a rainbow can be seen in the falls, and on rainy days the rising vapor is suggestive of a wreath of mist.
> (ibid.:170)
>
> *Kau i ka lani ka holowa‘a ua o Hilo.*
> Placed high in heaven is the rain trough of Hilo.
> An expression of admiration for a person of regal bearing.
> (ibid.:173)

Ka ua he‘e nehu o Hilo.
The *nehu*-producing rain of Hilo.
The people knew the season when the schools of *nehu* fish followed the rain.
(ibid.:167)

Ku pāpū Hilo i ka ua.
Hilo stands directly in the path of the rain.
(ibid.:207)

Le‘a ka ‘ai a ka ‘iola, ua nui ka ‘ili.
The rats joyously eat their fill, there are many skins [remaining].
There were two Hilo brothers who lived at Kukuau and Pu‘ueo. The latter was very prosperous but neglectful of his needy brother. One day the Kukuau man decided to visit his wealthy brother and found many friends eating. After watching them for a while he made this remark. It was overheard by someone who reported it to their host. When he came to see who it was he found that it was his own brother. Sadly he realized then how he had neglected his own kin while outsiders enjoyed his wealth. This saying is sometimes used for one who does for outsiders but neglects his own.
(ibid.:212)

Lu‘ulu‘u Hanakahi i ka ua nui.
Weighted down is Hanakahi by the heavy rain.
Hanakahi, Hilo, was named for a chief of ancient times. This expression was much used in dirges to express heaviness of the heart, as tears pour like rain.
(ibid.:219)

“Māmā Hilo?” “‘Ae, māmā Hilo i ka wai ‘ole.”
“Is Hilo light?” “Yes, Hilo is light for lack of water.”
A question asked of a runner, and his reply. It means that the way is clear, with no robbers or unpleasant experiences, and no rains to swell the streams and make traveling difficult.
(ibid.:232)

Noho maialile ka ua o Hilo, ‘elua wale no māua.
Keep your silence, O rain of Hilo, there are only two of us.
Uttered by Kanuha in retort when rebuked by the Reverend Titus Coan for Sabbath-breaking: “Hold your silence, for there are only two of us in authority” – meaning Kanuha and Governor Kuakini. Rev. Coan was not to give orders when either was present. Now it is used to mean, “Keep quiet. You’re not the boss around here.”
(ibid.:253)

Pau kea ho i ke kahawai lau o Hilo.
One’s strength is exhausted in crossing the many streams of Hilo.
Said of or by one who is weary with effort. First uttered by Hi‘iaka in a chant when she found herself weary after a battle with the lizard god Pana‘ewa.
(ibid.:287)

Pā mai, pā mai ka makani o Hilo; waiho aku i ka ipu iki, hō ma ii ka ipu nui.
Blow, blow, O winds of Hilo, put away the small containers and give us the large one.
La‘amaomao, the god of wind, was said to have a wind container called Ipu-a-La‘amaomao. When one desires more wind to make the surf roll high, or a kite sail aloft, he makes this appeal.
(ibid.:285)

Pāuli hiwa ka lani o Hilo.
Black with rainclouds is the sky of Hilo.
Sometimes said in humor when a dark-skinned person is seen.
(ibid.:287)

Pō Hilo i ka ua Kanilehua.
Hilo is darkened by the Kanilehua rain.
Said of one who is weighted by sorrow and grief.
(ibid.:293)

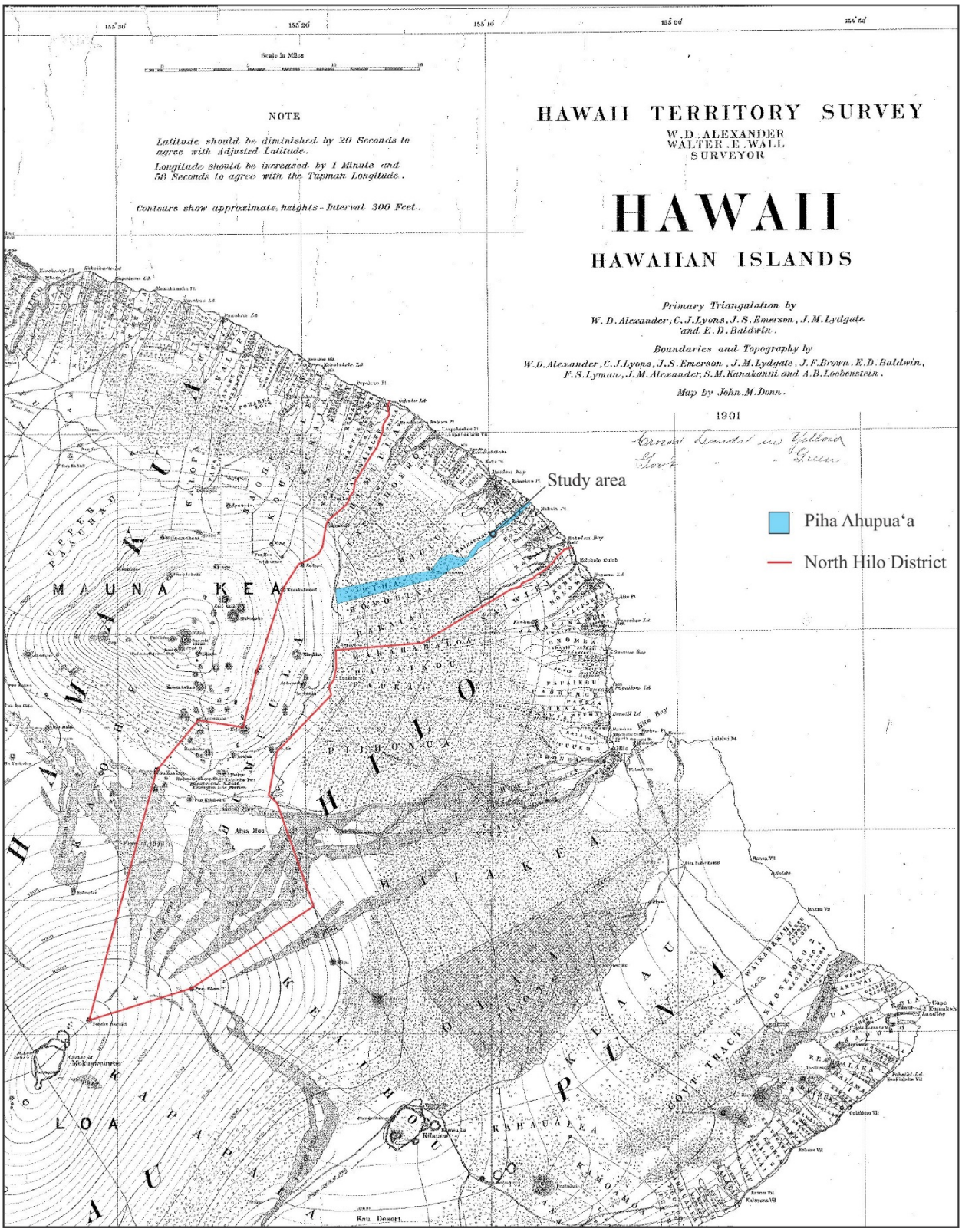

Figure 4. 1901 map of Hawai'i Island (prepared by John M. Donn 1901), showing the North Hilo District, Pīhā Ahupua'a, and the approximate location of the current study area.

The Legacy of the *Māhele ʻĀina* of 1848

By the mid-nineteenth century, the ever-growing population of Westerners in the Hawaiian Islands forced socioeconomic and demographic changes that promoted the establishment of a Euro-American style of land ownership. By 1840 the first Hawaiian constitution had been drafted and the Hawaiian Kingdom shifted from an absolute monarchy into a constitutional government. Convinced that the feudal system of land tenure previously practiced was not compatible with a constitutional government, the *Mōʻī* Kauikeaouli and his high-ranking chiefs decided to separate and define the ownership of all lands in the Kingdom (King n.d.). The change in land tenure was further endorsed by missionaries and Western businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be revoked from them at any time. After much consideration, it was decided that three classes of people each had one-third vested rights to the lands of Hawaiʻi: the (*Mōʻī*) monarch, the (*aliʻi*) chiefs and *konohiki* (land agents), and the *makaʻāinana* (common people or native tenants).

In 1845 the legislature created the Board of Commissioners to Quiet Land Titles (more commonly known as the Land Commission), first to adopt guiding principles and procedures for dividing the lands and granting land titles, and then to act as a court of record to investigate and ultimately award or reject all claims brought before them. All land claims, whether by chiefs for entire *ahupuaʻa* or by tenants for their house lots and gardens, had to be filed with the Land Commission within two years of the effective date of the Act (February 14, 1848) to be considered. This deadline was extended several times for the *aliʻi* and *konohiki*, but not for commoners (Alexander 1920; Soehren 2005)

The *Mōʻī* and some 245 *aliʻi* (Kuykendall 1938) spent nearly two years trying unsuccessfully to divide all the lands of Hawaiʻi amongst themselves before the whole matter was referred to the Privy Council on December 18, 1847 (King n.d.). Once the *Mōʻī* and his *aliʻi* accepted the principles of the Privy Council, the *Māhele ʻĀina* (Land Division) was completed in just forty days (on March 7, 1848), and the names of all of the *ahupuaʻa* and *ʻili kūpono* (nearly independent *ʻili* land division within an *ahupuaʻa*) of the Hawaiian Islands and the chiefs who claimed them, were recorded in the *Buke Mahele* (also known as the *Māhele* Book) (Soehren 2005). As this process unfolded the *Mōʻī*, who received roughly one-third of the lands of Hawaiʻi, realized the importance of setting aside public lands that could be sold to raise money for the government and also purchased by his subjects to live on. Accordingly, the day after the division when the last chief was recorded in the *Buke Māhele* (*Māhele* Book), the *mōʻī* commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike the *Mōʻī*, the *aliʻi* and *konohiki* were required to present their claims to the Land Commission to receive their Land Commission Award (LCAw.). The chiefs who participated in the *Māhele* were also required to provide commutations of a portion of their lands to the government to receive a Royal Patent that gave them title to their remaining lands. The lands surrendered to the government by the *Mōʻī* and *aliʻi* became known as "Government Land," while the lands that were personally retained by the *Mōʻī* became known as "Crown Land," and the lands received by the *aliʻi* became known as "*Konohiki* Land" (Chinen 1958:vii, 1961:13). Most importantly, all lands (Crown, Government, and Konohiki lands) identified and claimed during the *Māhele* were "subject to the rights of the native tenants" therein (Garavoy 2005:524). Finally, all lands awarded during the *Māhele* were identified by name only, with the understanding that the ancient boundaries would prevail until the land could be formally surveyed. This process expedited the work of the Land Commission. Pīhā Ahupuaʻa is not listed in the *Buke Māhele*, but appears to have become Crown Land as a result of the *Māhele*, as J. Dominis, agent of the Crown Lands, would later apply for the settlement of the land division's boundaries.

As the *Mōʻī* and *aliʻi* made claims to large tracts of land during the *Māhele*, questions arose regarding the protection of rights for the native tenants. To address this matter, on August 6, 1850, the *Kuleana* Act or Enabling Act was passed, allowing native tenants to claim a fee simple title to any portion of lands which they physically occupied, actively cultivated, or had improved (Garavoy 2005). Additionally, the *Kuleana* Act clarified rights to gather natural resources, as well as access rights to *kuleana* parcels, which were typically land locked. Lands awarded through the *Kuleana* Act were, and still are, referred to as *kuleana* awards or *kuleana* lands. The Land Commission oversaw the program and administered the *kuleana* as Land Commission Awards (Chinen 1958). Native tenants wishing to make a claim to their lands were required to submit a Native Register to the Land Commission, followed by Native Testimony given by at least two individuals (typically neighbors) to confirm their claim to the land. Upon successful submittal of the required documents, the Land Commission rendered their decision, and if successful, the tenant was issued the LCAw. No claims were made for *kuleana* lands within Pīhā Ahupuaʻa during the *Māhele ʻĀina* of 1848.

Commission of Boundaries (1862-1876)

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Kingdom of Hawaiʻi to legally set the boundaries of all the *ahupuaʻa* that had been awarded as a part of the *Māhele*. Subsequently, in 1874, the

Boundary Commission were authorized to certify the boundaries for lands brought before them. The primary informants for the boundary descriptions were old native residents who learned of the boundaries from their ancestors. The boundary information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and simultaneously transcribed into English. Although hearings for most *ahupuaʻa* boundaries were brought before the Boundary Commission and later surveyed by Government employed surveyors, in some instances, the boundaries were established through a combination of other methods. In some cases, *ahupuaʻa* boundaries were established by conducting surveys on adjacent *ahupuaʻa*. Or in cases where the entire *ahupuaʻa* was divided and awarded as Land Claim Awards and or Government issued Land Grants (both which required formal surveys), the Boundary Commission relied on those surveys to establish the boundaries for that *ahupuaʻa*. Although these small-scale surveys aided in establishing the boundaries, they lack the detailed knowledge of the land that is found in the Boundary Commission hearings.

On February 8, 1875, on the application application of J. Dominis, agent of the Crown Lands and administrator for the estate of M. Kekuanaoa, the Boundary Commission met at the court house in Hilo to settle the boundaries of Pīhā Ahupuaʻa (Boundary Commission Vol. B pgs. 325-330; Appendix A). Several older residents of the area provided testimony at the hearing including Ku, Hemahema, Kalaualoha, Kupahu, and D.H. Hitchcock, the Government Surveyor who surveyed the Pīhā boundaries (Figure 5). D.H. Hitchcock testified that he surveyed the boundaries of Pīhā Ahupuaʻa in October of 1874 with Ku as his *kamaʻāina* (person familiar with the land). Hitchcock also took Kalaualoha with him along a part of the Nanue boundary, and talked with Hemahema prior to the survey, but found that the recollections of Hemahema and Ku agreed regarding the boundaries, so only took Ku with him. From the testimony we learn that boundary between Kahuku and Pīhā *ahupuaʻa* (forming the eastern boundary of the current study area) was once marked by an "old trail" used by bird catchers to access the forest, and that the owner of Nanue Ahupuaʻa, Alapai, disputed the *mauka*-eastern boundary of Pīhā Ahupuaʻa as described by Ku and depicted by D.H. Hitchcock in Figure 5. The following summary of the 1875 Boundary Commission testimony for Pīhā concentrates on the Kahuku boundary of the *ahupuaʻa*, which is adjacent to the eastern boundary of the current study area.

Ku, described in the boundary commission records as "an old man" born during the time of Kamehameha I, stated that he had learned the boundaries of Pīhā from his grandfather, Hue, and his father, Mahiai, both of whom were bird catchers, and that his older brother, Koia, was once *konohiki* of the *ahupuaʻa*. Ku accompanied Hitchcock during the boundary survey and pointed out the boundaries to him, showing him a stone *ahu* at the *mauka* corner of Pīhā (where the *ahupuaʻa* is cut off by Humuʻula) that his brother had built during the reign of Kamehameha II. With regards to the trail along the Pīhā/Kahuku boundary, Ku testified that:

> …My grandfather made the road on Honohina to Moohalohalo, and I made the road to Hopuwai, Kahuku bounds Piha on Hilo side at shore, there is a small gulch there called Alanaio on boundary, thence runs up gulch a short distance above road to head of it, thence up old trail to Kaawau, thence bounded by Nanue up old trail to Nenelu old kauhale [group of houses], thence up trail to Waipahehoe a kahawai [stream/gulch] and kauhale, the old trail does not reach to the gulch, but turns to the left…(page 325)

When cross-examined Ku clarified that:

> …Piha and Nanue join at Kawau cutting off Kahuku. I have stated that the mauka boundary of Nanue is at Kaahina not at Nahuina of Waipahoehoe. There is an old kauhale kalaiwaa [group of canoe carvers' houses] at this place, this is the boundary I have always known. Nanue had no old road. The birds in olden times belonged to Piha and not to Nanue. (page 326)

Hemahema, described as a "quite old man" in the testimony, stated that he had learned the boundaries of Pīhā from his father, Waiwai, who was the *konohiki* of "these lands to Pohakupua [six *ahupua* northwest of Pīhā]," and that he had gone bird catching with his grandfather on the lands. He testified that bird catchers from Pīhā and Maulua *ahupuaʻa* (adjacent to the northwestern *mauka* boundary of Pīhā) used to catch birds in common. With regards to the trail along the Hilo side boundary of Pīhā, Hemahema stated that:

> …Kahuku bounds Piha at the shore at Hilo side, a small gulch, boundary runs up trail to Nahuina where Piha and Nanue join and Kahuku ends, thence boundary runs up trail to Kaahina near Waipahoehoe, this is as far as I ever knew about Nanue…(page 327)

When cross-examined Hemahema clarified that:

> …Nahuina and kumukawau are the same…From Kawau boundary between Nanue and Pīhā runs up old trail to Kaahina this is a far as I ever knew Nanue to run. It is where Hakai made a canoe. I heard from Kihili, Napihe and Kulaipahu that this was the mauka end of Nanue. Hapai ma said the same thing. (page 327)

Kalaualoha, described as an "old man" in the testimony, stated that he had learned the boundaries of Pīhā from "Kaulanahiai, Koia, and Waikane, now dead." Kalaualoha, who was the father-in-law of Alapai, the owner of Nanue Ahupuaʻa at that time, disagreed with the boundary testimony of Ku and Hemahema, and went with Hitchcock to point out what he believed to be the correct boundary between Nanue and Pīhā to be (see Figure 9). Kalaualoha testified that:

> …Piha and Nanue join each other at Kawau an old trail into the woods, thence boundary runs up this trail to Waipahoehoe, thence boundary runs up this stream to Mahuia kauhale on Piha, thence boundary runs up to Koapololei, thence up old trail to upper edge of woods to Kalapaohelo, to a place called Kaluaalu…In olden times the birdcatchers used to go up the Honohina and Piha roads, they could not go up the Nanue as the road was so bad. The canoe road of Nanue ran to mauka of Kaahiwa, there it ended. But the roads on Honohina and Piha ran way mauka…(page 329)

Kupahu, the uncle of Alapai (the owner of Nanue Ahupuaʻa), who was described as a "quite old man" in the testimony, stated that he knew a little about the boundaries of Pīhā because he "went up the road to Kalapaohelo after beef" (page 329), and that Koia, his guide, pointed out the boundaries to him. Kupahu's testimony only addressed the *mauka*-eastern boundary of Pīhā where it joins Nanue. He stated that, "…Kahuku ends at Nahuina, and there Nanue and Piha join, Kumukawai is one name of this place…" (page 329).

At the conclusion of the testimony it was decided by R. A. Lyman, the Commissioner of Boundaries, that the boundaries of Pīhā as given by Ku be accepted, that the notes of the survey be filed (see Figure 5), and Certificate of Boundaries be issued accordingly (see Appendix A).

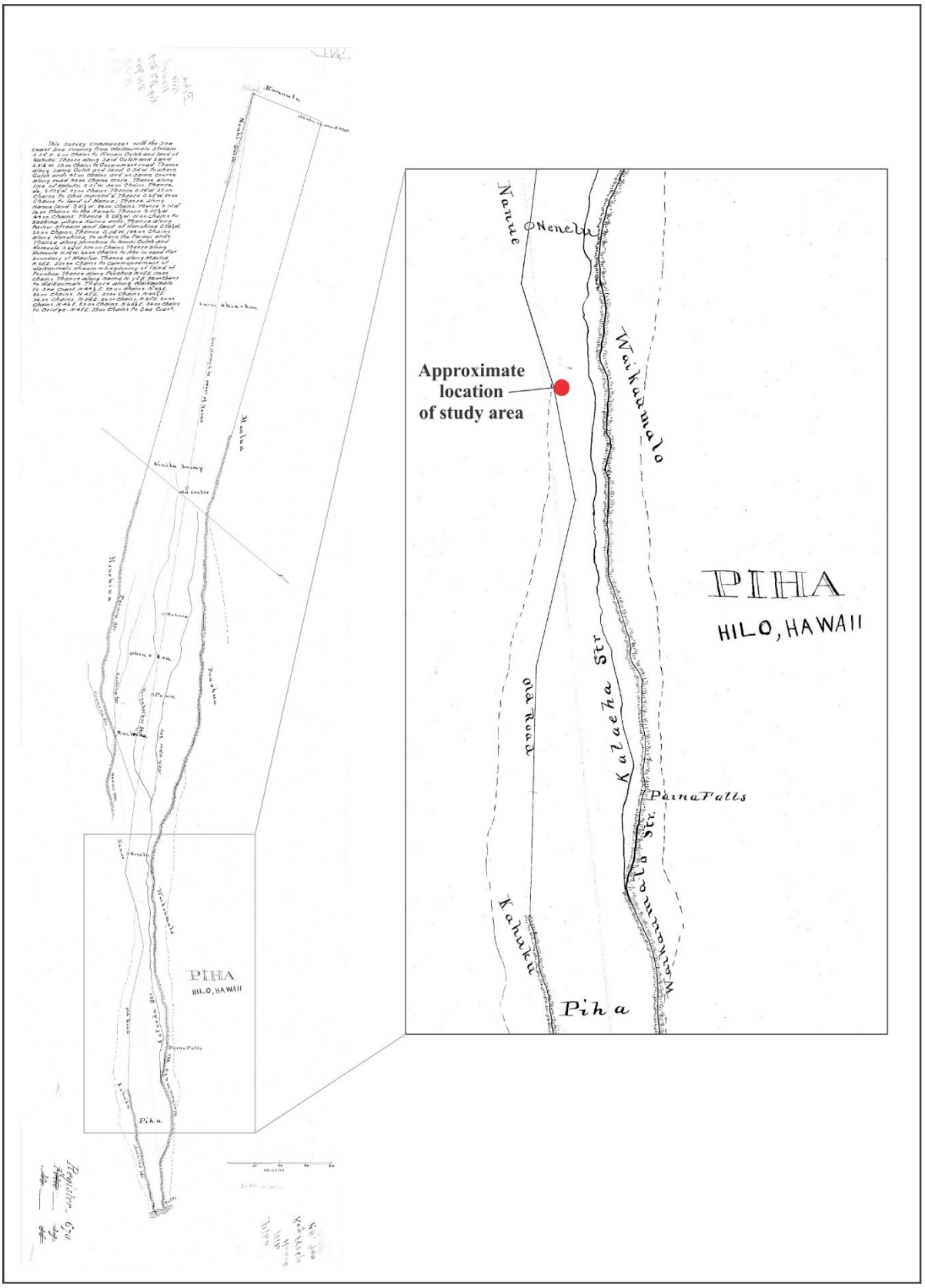

Figure 5. Hawai‘i Registered Map No. 670 (Hitchcock n.d.) showing Pīhā Ahupua‘a in ca. 1874, with the approximate location of the current study area indicated.

Historical Accounts of Pīhā and the Greater North Hilo District

Written accounts penned by early visitors to the Island of Hawai‘i offer insight into what life may have been like for the Hawaiians of Pīhā and North Hilo. Such accounts describe North Hilo as incredibly verdant and rich in fresh, flowing water, which was frequently noted as carving through mountain streams and emptying into the sea. Also remarked upon was the surprising population that lived along the coast from South Hilo to Laupāhoehoe to the north of Pīhā, particularly in the vicinity of the many steep gulches. Many of the individuals who traveled north or south along the coast to or from the Hāmākua District commented upon the rugged terrain, inescapably treacherous and everlasting. Ever-flowing streams and waterfalls fed by frequent mountain rainfall allowed for richly cultivated ravines and gulches, splendidly planted in taro, banana, and occasionally sugarcane.

In 1823, British missionary William Ellis and other members of the American Board of Commissioners for Foreign Missions (ABCFM) toured the island of Hawai‘i seeking out communities in which to establish church centers for the growing Calvinist mission (Ellis 2004). Ellis estimated that at the time of his visit, about 2,000 people lived in 400 houses or huts along the coastline at Hilo Bay (ibid.). Ellis described the residential and land use practices he observed while in the Hilo ("Hiro") District, which is applicable to the study area vicinity, thusly:

> *Hiro*, which we had now left, though not so extensive and populous as Kona, is the most fertile and interesting division on the island.
>
> The coast from Waiakea to this place is bold and steep, and intersected by numerous valleys or ravines; many of these are apparently formed by the streams from the mountains, which flow through them into the sea. The rocks along the coast are volcanic, generally a brown vesicular lava. In the sides and bottoms of some of the ravines, they were occasionally of very hard compact lava, or a kind of basalt.
>
> This part of the island, from the district of Waiakea to the northern point, appears to have remained many years undisturbed by volcanic eruptions. The habitations of the natives generally appear in clusters at the opening of the valleys, or scattered over the face of the high land. The soil is fertile, and herbage abundant.
>
> The lofty Mouna-Kea, rising about the centre of this division, forms a conspicuous object in every view that can be taken of it. The base of the mountain on this side is covered with woods, which occasionally extend within five or six miles of the shore. . . rain is frequent in this and the adjoining division of Hamakua, which forms the centre of the windward coast, and is doubtless the source of their abundant fertility. The climate is warm. Our thermometer was usually 71° at sun-rise; 74° at noon; and 72° or 73° at sun-set. Notwithstanding these natural advantages, the inhabitants, excepting at Waiakea, did not appear better supplied with the necessaries of life than those of Kona, or the more barren parts of Hawai‘i. They had better houses, plenty of vegetables, some dogs, and a few hogs, but hardly any fish, a principle article of food with the natives in general. (ibid.:263-264)

Another early written account by Ellis describes the stretch of land between South Hilo and Laupāhoehoe, north of the current study area, as a fertile, verdant, and well-watered countryside with a sizeable population:

> The country, by which we sailed, was fertile, beautiful, and apparently populous. The numerous plantations on the eminences and sides of the deep ravines or valleys, by which it was intersected, with the streams meandering through them into the sea, presented altogether a most agreeable prospect. The cost was bold, and the rocks evidently volcanic. We frequently saw water gushing out of hollows in the face of the rocks, or running in cascades from the top to the bottom. (Ellis 1826:316)

In 1840, Lieutenant Charles Wilkes, head of the U.S. Exploring Expedition, traveled to northern Hilo and described the landscape of this region:

> The coast to the north of Hilo is slightly peculiar: it is a steep bluff, rising about two hundred feet; this is cut into small breaks here called "gulches," within which the villages are generally situated, and the natives grow banana and taro. In some places they cultivate small patches of sugar-cane, which succeed well.
>
> These gulches are ravines, from eight hundred to one thousand feet deep, which have apparently been worn by water-courses: they extend back into the woods, and have made the country impassable for either vehicles or riders on horseback, for no sooner is one passed than another one occurs. There is no landing for boats, for all along the shore the surf beats on the rocks with violence.

Journalist Henry Martyn Whitney published the very first guide book to the islands in 1875, entitled *The Hawaiian Guide Book, For Travelers: Containing A Brief Description of the Hawaiian Islands, Their Harbors, Agricultural Resources, Plantations, Scenery, Volcanoes, Climate, Population, and Commerce*. An excerpt from his book describes his treacherous trek from Laupāhoehoe to Hilo, passing through the vicinity of the study area:

> From Laupahoehoe on the north to Puna on the south extends this large and fertile district [Hilo], where the trade winds are neutralized by the mountains, and where the rain falls in such abundance as to keep the land perpetually green to the water's edge. Except at Hilo Bay, the coast is composed of bold bluff cliffs from a hundred to upwards of 1000 feet high; these are higher on the north and the pali, at Laupahoehoe, is a remarkable one. . .On the other cliff, one mile distant, you discern horsemen and decide that the road to Hilo lies over there, but how to get there. This wall extends inland for miles, a stream rolls down its precipitous valley, plainly one must go down before getting up the other side. At length the ribbon road wound downward on the shelving roof of the valley appears. From twenty minutes to half an hour will b occupied in the descent, according as you risk the neck of horse and rider. More than a score, some say fifty similar valleys, with twice this number of similar ribbon windings, miniature Alpine passes, lie between Laupahoehoe and Hilo village. (Whitney 1875:70-72)
>
> Mountain torrents rush through each of these passes, and one of the wonders of this volcanic country lies in these gulches, with their gothic steeps that disrupt the land for three score miles or less, piercing the land's centre. The number of waterfalls is beyond estimate, their height varies from tens to thousands of feet, and many of the streams literally *leap* into the sea. A mere sprinkle at the beach often increases, higher up the mountain, to a heavy rain, and the stream may rush in torrents for a mile and then resume the common course of a brook. It is not uncommon for the traveler to be detained by a swollen stream for half a day. In olden times the streams were crossed by stepping stones. "La Paz" says of this overland route: "As we rode along, the rain poured, rattling among the leaves, pattering among the impromptu pools and drains, the torrents tumbled from the hills or leaped through chasms, over frightful rocks, with a thundering sound that jarred the cavernous earth; the ocean waves came surging and groaning against the beetling cliffs like a wail of despair, and our horses kept tumbling over a corduroy road of mud ridges and holes of water, alternating with the regularity of rice rows; a succession of mud ridges and miniature hog wallows.
>
> "Before reaching the Scotchman's gulch, we passed a deep chasm, where some rough stone piers indicated where the apology for a bridge had formerly stood. Through this swept a mad and foaming torrent, near four feet deep, whirling and rushing past gigantic balsaltic bounders, a cataract above, a waterfall below; we passed between this Scylla and Charybdis, and came near being carried away by the foaming flood. We have crossed the Rocky Mountains six times, the Sierra Madre of Mexico often, the volcanic chain of Central America three times and the Andes twice; and we here most solemnly protest that we have never traveled a road that gave the traveler more ups and downs on a sliding scale than the pathway from Laupahoehoe to Hilo."

The road to Laupāhoehoe from South Hilo was also described in George Bowser's *Hawaiian Kingdom Statistical and Commercial Directory* (Bowser 1880:536) as a treacherous but beautiful journey, containing several adequate landings for boats, and prime agricultural land suited for the potential cultivation of commercial crops:

> On the way to Laupahoehoe the road is not first-rate, even in the fine weather I enjoyed on my trip, besides which there are a great number of deep gulches, the sides of which are very steep. The track is certainly very rugged and uneven; but, then, to make up for it, the scenery with a parallel in the world. All the way from Hakalau to Laupahoehoe, the country is as yet unsettled by the white man, although in that stretch of about fourteen miles of coast, by a width of a great many miles inland, the land is suitable for the culture of sugar, coffee, wheat, oats, barley and many minor crops, and only wants the presence of capital and industry to make it a veritable paradise. Good landing can be obtained about every two miles along the coast, places which only require the expenditure of from three to ten thousand dollars to make the landing facilities good in any weather and all times of the year. The only inhabitants of this wide tract are some thirty native[s], who own among them about 3,000 acres, of which they cultivate about 150. The rest of the land belongs principally to the King and to members of the royal family.

King David Kalākaua (1888:284) described the lands of the northern portion of Hilo as he recounted the tale of 'Umi-a-Līloa presented in his book, the *Legends and Myths of Hawai'i*. His description of the region is taken

from a time when North Hilo and Hāmakua were in the thick of the commercial sugar industry, but mentions the presence of scattered *lo‘i kalo* and bananas:

> The northeastern coast of the island of Hawaii presents an almost continuous succession of valleys, with intervening uplands rising gently for a few miles, and then more abruptly toward the snows of Mauna Kea and the clouds. The rains are abundant on that side of the island, and the fertile plateau, boldly fronting the sea with a line of cliffs from fifty to a hundred feet in height, is scored at intervals of one or two miles with deep almost impassable gulches, whose waters reach the ocean either through rocky channels worn to the level of the waves, or in cascades leaping from the cliffs and streaking the coast from Hilo to Waipio with lines which seem to be molten silver from the great crucible of Kilauea.
>
> In the time of Liloa, and later, this plateau was thickly populated, and requiring no irrigation, was cultivated from the sea upward to the line of frost. A few *kalo* patches are still seen, and bananas grow, as of old, in secluded spots and along the banks of the ravines; but the broad acres are green with cane, and the whistle of the sugar-mill is heard above the roar of the surf that beats against the rock-bound front of Hamakua.

Pīhā Ahupua‘a During the Late Nineteenth and Twentieth Centuries

Following the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Kingdom of Hawai‘i, which guaranteed a duty-free market for Hawaiian sugar in exchange for special economic privileges for the United States, a number of new sugar plantations incorporated in the Islands. In 1878, Claus Spreckels, with W.G. Irwin & Company as its agent, established the Hakalau Plantation Company on 9,000 acres of land located along the North Hilo coast, 16 miles from Hilo (Dorrance and Morgan 2000). The fields of the Hakalau Plantation Company ranged from 250 feet above sea level along the shoreline bluffs to 2,000 feet above sea level at their western (*mauka*) limits. The cane was flumed from the various fields to its mill site, where it was then processed. The Hakalau Mill, built in 1890 on the shore at the foot of a 200-foot bluff with Hakalau Gulch, produced 5,000 tons of sugar annually during its early years (Dorrance and Morgan 2000). Initially, and continuing until 1913 when a railroad connecting the plantation to the port at Hilo was built, the plantation shipped its product from the Hakalau Landing to Honolulu via inter-island vessels that anchored offshore. The lands of Pīhā Ahupua‘a (containing 4,250 acres) were leased to the Hakalau Plantation Co. on February 11, 1892 (see C.S.F. 449), and the *makai* lands were cleared and used for the cultivation of sugarcane.

The fields of the Hakalau Plantation Company never reached as far *mauka* as the current study area, however, and remained forest land throughout the late nineteenth century. The importance of the forest lands and their valuable watersheds for agricultural purposes and the well-being of the people in general was recognized quite early on by the Territorial Government of Hawai‘i, and by the burgeoning sugar industry in the islands. Consequently, a proclamation recommending that 110,000 acres of land in the Districts of North and South Hilo be reserved from development was signed by Lt. Governor A.L.C. Atkinson on July 24, 1905, and the Hilo Forest Reserve was created (Figure 6). The reserve, which abuts the southern and eastern boundaries of the current study area (Figure 7), encompasses roughly 64,000 acres overall, 4,574.11 of which are located in the Pīhā Section, one of nine internal reserve divisions (http://dlnr.hawaii.gov/forestry/frs/reserves/hawaii-island/hilo). The Hilo Forest Reserve was described by the Division of Forestry in 1906 as follows:

> The Hilo Forest Reserve embraces the area of heavy forest on the lower slopes of Mauna Kea, lying between the 1855 and 1881 Lava Flows back of Hilo Town and the Hamakua District line, and extending from a line varying in elevation from 1,750 to over 2,000 feet, drawn back of and above the sugar plantations to another line along the upper edge of the woods, at an elevation of approximately 6,000 feet. The water from this reserve is of great importance to all the plantations along the coast, being at present used for the most part for fluming cane to the mill. From the character of the country many of the streams could be utilized for the production of power. This will be an important consideration when the Hilo District comes to be developed, as it is sometime bound to be. The object of the Hilo Forest Reserve is to protect the sources of this important water supply. (Division of Forestry 1906:25)

Following the passage of the Land Act of 1895, which broadened the definition of public land, placed Hawai‘i’s Crown Lands (such as Pīhā) into the public domain. As a result, land was made available to family farmers through homesteading programs, and the clarifications to Hawai‘i’s land policies were set forth in the Organic Act, which went into effect on June 14, 1900.

Shortly after the creation of the Hilo Forest Reserve, as the plantation's lease on its Pīhā lands was set to expire, the Territorial Government began the process of subdividing the *makai* section of the *ahupua'a* into homesteads. Crown Lands such as Pīhā were made available to family farmers for homesteading purposes following the passage Land Act of 1895. The process for obtaining homestead lots was then clarified by the Organic Act of 1900, a law enacted at a time in the islands (and in the United States congress) when there was growing concern regarding the consolidation of land ownership within the plantation system, and its reliance on foreign labor (Horwitz et al. 1969). Survey of the Pīhā homestead tract began in 1912 and was completed by 1913 (Figure 8), when the Survey Department of the Territory of Hawai'i reported that "the land of Piha was subdivided into 28 lots, comprising 393.81 acres, 5 miles of roads containing 20.44 acres, and flumes and ditches and remnant covering 5.95 acres" (Department of Interior 1913:65). The Pīhā-Kahuku Homestead Road created as part of the Pīhā homestead subdivision appears to follow the route of the older road described along the boundary between those two *ahupua'a* during the Boundary Commission hearings of 1875.

Following the subdivision of the Pīhā homesteads, the Hakalau Plantation, now owned by C. Brewer & Co., brought up the question of the boundary between the homesteads and the adjoining lands owned or controlled by the company, which they felt had been encroached upon. Additional surveys of the Pīhā homestead tract, involving extensive triangulation work, were then made during the early part of 1914, until the matter was decided to the satisfaction of all parties involved (Department of the Interior 1914:521).

While many of the *makai* lots of the newly created Pīhā Homesteads (Lots 9-28) were sold at auction in June of 1914 to various homesteaders, the more *mauka* lots (Lots 1-8), perhaps because they were less accessible or less developed, and therefore less desirable, were not. Instead, a general 10-year lease (Lease No. 878; Figure 9) for Lots 1-8 of the Pīhā Homesteads (and Lots 13-16 of the adjoining Kahuku Homesteads) was purchased at public auction by the Hakalau Plantation Company on July 14, 1915 (Department of the Interior 1916:526).

This Hakalau Plantation Company's lease (see Figure 9), for unknown reasons, was never fully executed and Lots 1-8 were eventually sold to various homesteaders. Lot 1, which includes the current study area, was purchased (along with Lot 2) by William Breithaupt on August 23, 1916 as Grant No. 8584. Several other Breithaupt's purchased lands within the Pīhā Homesteads as well, including A. (August) K. Breithaupt (Lots 15-16; Grant No. 8328), Ella Breithaupt (Lots 7-8; Grant No. 7863), and Otto Breithaupt (Lots 5-6; Grant No. 7862). It appears that William Breithaupt once ran cattle on Lot 1 and that he was responsible for helping to construct a portion of the fence along the *makai* boundary of the Hilo Forest Reserve. In May of 1922, the Assistant Superintendent of Forestry reported that "…A stretch of about 1000 feet along the mauka boundary of Piha Lot 1, from Kalaiha Gulch to Waikaumalo Gulch, remains to be built. William Breithaupt, owner of the lot, was advised to finish the fence at once, and he expects to complete it during July" (Kraebel 1922:179). However, by September of 1922 the Superintendent of Forestry, reported that:

> It has been necessary to bring pressure to bear on Wm. Breithaupt, the owner of Lot 1 of the Piha Homesteads. We supplied wire to him last December and he built an excellent fence on the forest reserve boundary for a distance of .58 mile, but since April he has done little or no work. He has 900 feet more of fence to build and has been notified that unless this is completed by the end of August and all his cattle gathered in, we will proceed against him for cattle trespass. (Judd 1922:207)

This pressure appears to have been effective, as the Superintendent of Forestry reported in November of 1922 that Mr. Breithaupt had finally finished the 0.77-mile length fence along the forest reserve boundary of Pīhā Homesteads Lot 1 to his satisfaction.

Territory of Hawai'i tax records indicate that Grant No. 8584 was transferred from William Breithaupt to his son, A.K. Breithaupt on September 21, 1936. Subsequently, the property was transferred from A.K. Breithaupt's estate to his daughter, Ella Briethaupt Schmidth on January 1, 1952. Just eight months later, on September 10, 1953, the property was transferred to Ella's younger brother, Graven Breithaupt, who became trustee of the property.Subsequent to this final transfer, on September 20, 1957, the original grant parcel appears to have been consolidated and resubdivided into their current TMK parcels. Tax records from 1944 to 1956 indicate that Lot 1 remained as undeveloped forest land, while William Breithaupt's neighboring grant, Lot 2, was utilized as pasture land.

The Hakalau Plantation Company continued to operate on lands *makai* of the current study area throughout the first half of the twentieth century, but by the early 1940s, nearly 40 percent of the of the sugarcane on the plantation was grown by independent growers, some of whom had purchased Pīhā Homestead lots. In 1943, the neighboring Wailea Milling Company (also started by Claus Spreckels) was merged into the Hakalau Plantation Company,

expanding the operation, and by 1944 the plantation had reached its maximum production, producing 26,000 tons of sugar that year (Dorrance and Morgan 2000). On April 1, 1946, the Hakalau Mill and the railroad connecting the plantation to Hilo were severely damaged by a *tsunami* triggered by an earthquake in the Aleutian Islands. The mill was rebuilt, but the railroad shut down and the product was trucked to the docks at Hilo. In 1962, C. Brewer & Co. merged the Hakalau Plantation Company into the Pepeʻekeʻō Sugar Company, its southern neighbor, and the Hakalau Mill was shut down (Dorrance and Morgan 2000). In 1973, C. Brewer & Co. then merged the Pepeʻekeʻō Sugar Company into the Mauna Kea Sugar Company, combining under one corporate name what had once been five separate sugar plantations situated along the Hilo coast. This plantation, later named Mauna Kea Agribusiness Company, harvested its last crop in 1994 and then closed its doors for good.

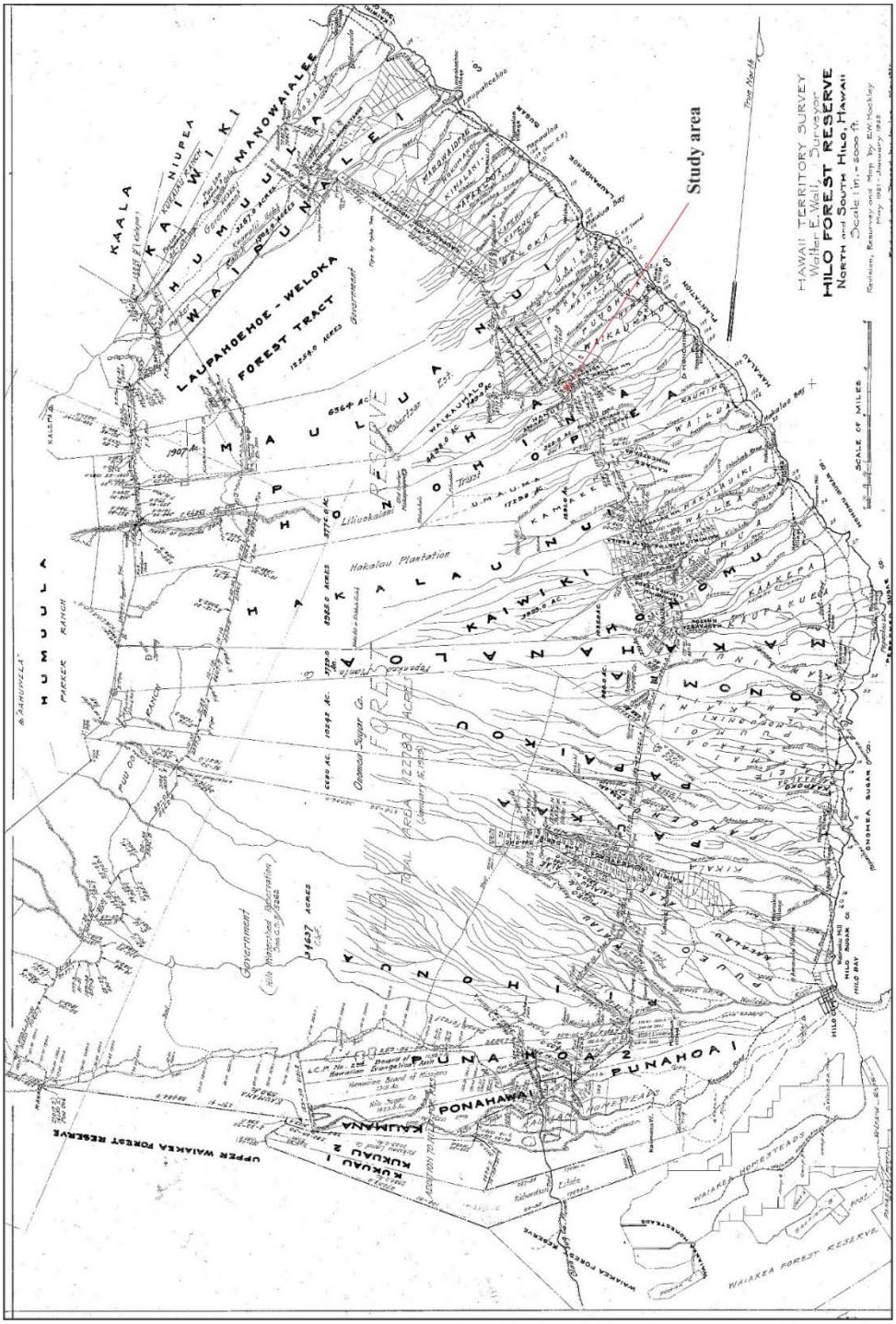

Figure 6. Map of the Hilo Forest Reserve (HTS Plat 799) with the location of the current study area indicated (Hockley 1922).

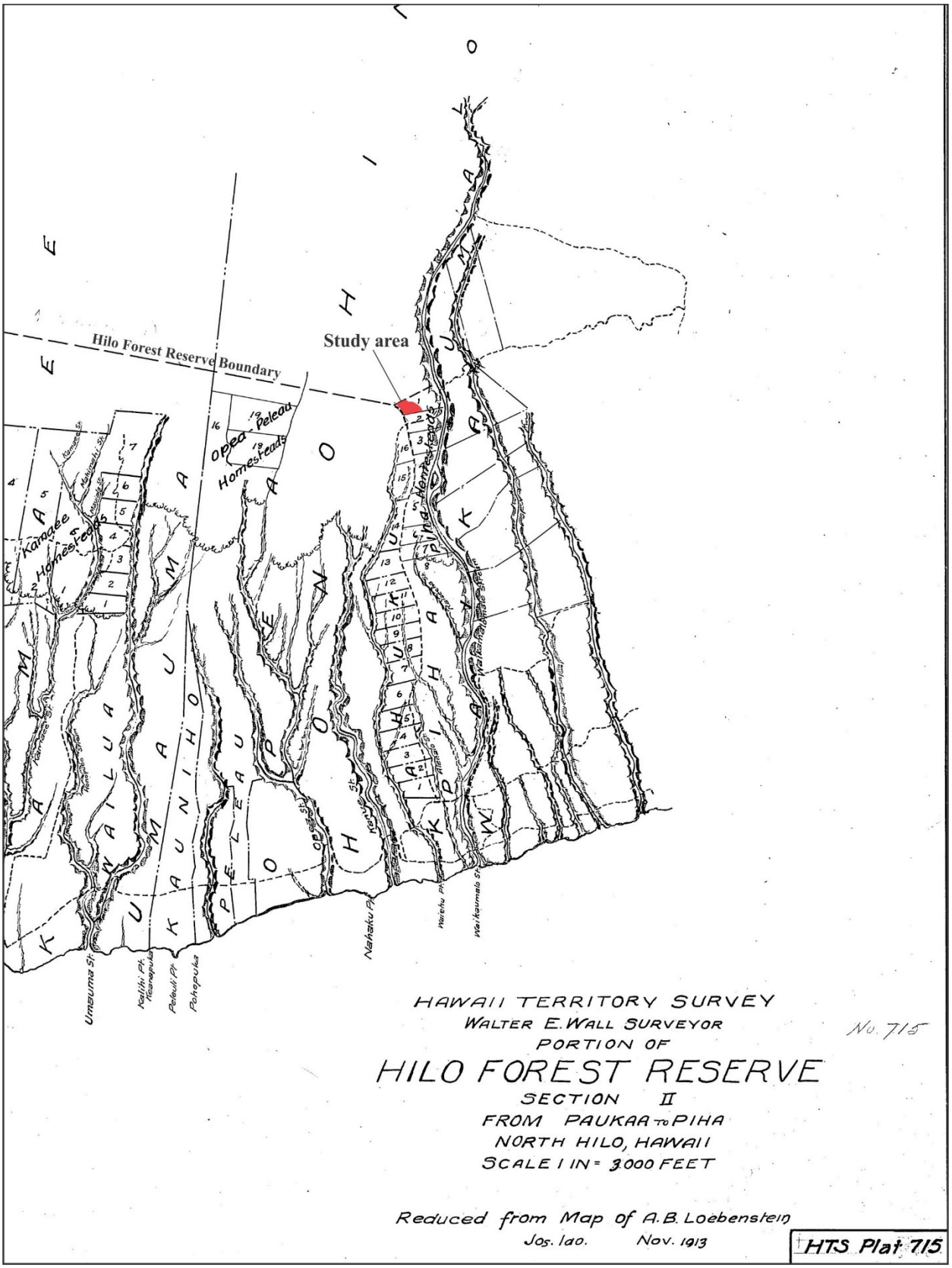

Figure 7. Portion of a 1913 map of Section II of the Hilo Forest Reserve (HTS Plat 715) with the location of the current study area indicated (Iao 1913).

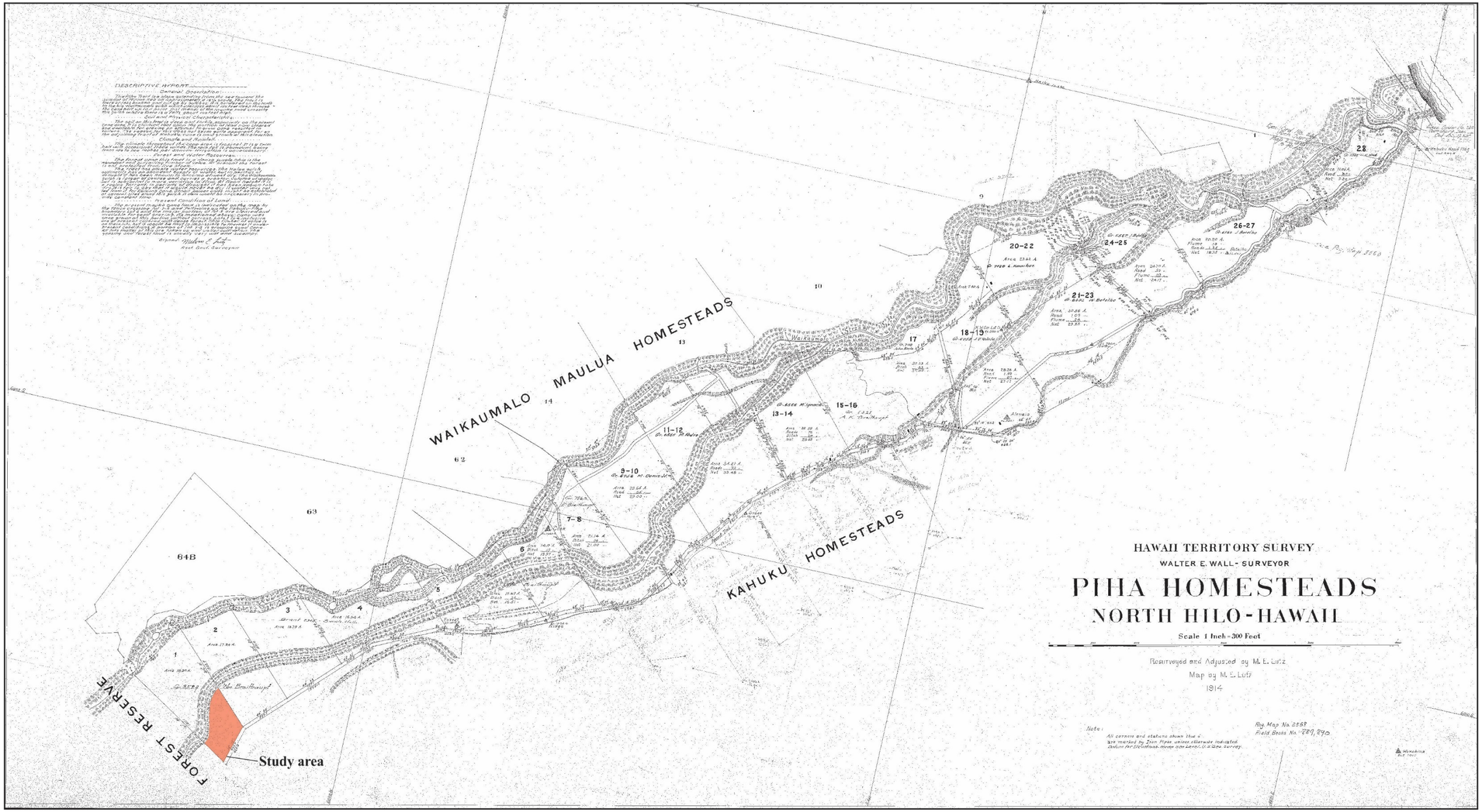

Figure 8. Map of the Pīhā Homesteads showing the location of the current study area (Lutz 1914).

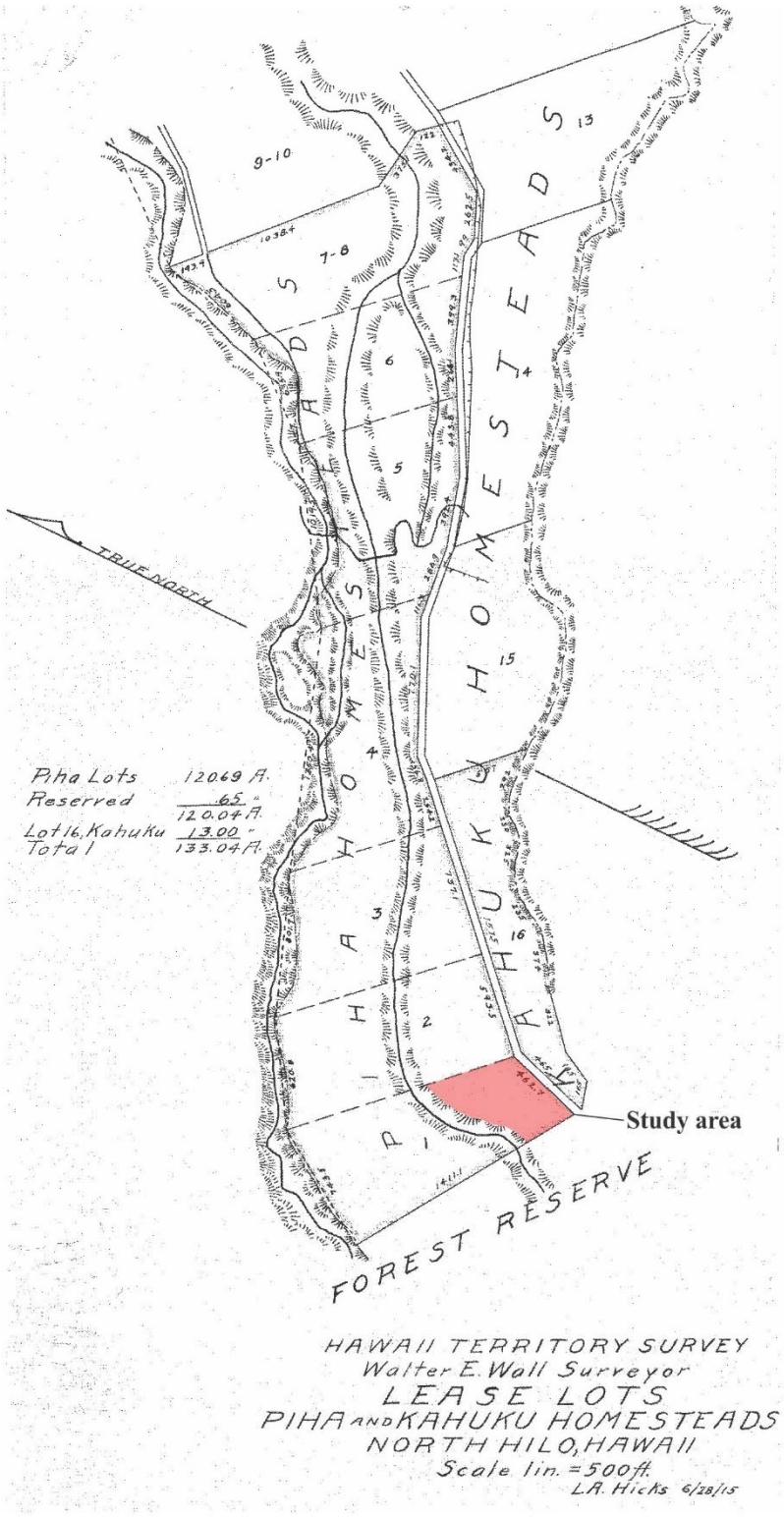

Figure 9. Map showing the Pīhā-Kahuku Homestead lands leased to the Hakalau Plantation Company on July 14, 1915 (Hicks 1915).

PRIOR STUDIES

A review of reports and correspondence on file at the SHPD office in Hilo indicates that no prior archaeological studies have been conducted in the vicinity of the current study area, but that SHPD has previously written "no effect" letters for at least eight parcels situated *makai* of the current study area within the Pīhā and Kahuku Homesteads. These "no effect" letters include a November 1, 1996 letter for TMK: (3) 3-2-004:025 (*Log No. 18344 Doc No. 9610ms04*), an April 24, 1998 letter for TMK: (3) 3-2-004:027 (*Log No. 21307 Doc No. 9804PM15*), a June 1, 1998 letter for TMK: (3) 3-2-004:039 (*Log No. 21050 Doc No. 9802PM03*), an August 18, 1998 letter for TMK: (3) 3-2-004:041 (*Log No. 22025 Doc No. 9807ms17*), a June 19, 2001 letter for TMK: (3) 3-2-004:043 and 044 (*Log No. 27706 Doc No. 0105ms08*), a December 31, 2010 letter for TMK: (3) 3-2-004:045 (*Log No. 28884 Doc No. 0112PM10*), and an April 17, 2013 letter for TMK: (3) 3-2-004:046 (*Log No. 2013.2304 Doc No. 1304SN05*) (see Figure 2). The reason generally given for SHPD's belief that the proposed development of these parcels would have "no effect" on significant historic sites, was that a review of aerial photographs revealed that intensive cultivation of sugarcane had already altered the land. No archaeological survey of the parcels listed above was undertaken by SHPD.

Very few archaeological studies have been conducted anywhere within the district of the North Hilo at elevations similar to the current study area. The first archaeological work conducted in East Hawai'i was that of the early twentieth century *heiau* researchers Thrum and Stokes (Thrum 1908, Stokes and Dye 1991). Neither investigator was able to identify *heiau* within Pīhā Ahupua'a or, for that matter, within the larger region between the town of Hilo and Laupāhoehoe Ahupua'a. In the early 1930s, A.E. Hudson, working under the aegis of the Bishop Museum, also conducted archaeological investigations in East Hawai'i, surveying primarily along the coast of the district (Hudson 1932). He found little in the region *makai* of the study area, although he did note the presence of a .25 mile square area of taro terraces in the upper part of Hakalau Gulch. According to Hudson (1932:218), there was formerly a kōnane board in the bottom of Hakalau Gulch, and the gulch was at one time a robber's stronghold.

More recently, Walker and Rosendahl (1994a, 1994b) conducted an archaeological study of some 595 acres of Hakalau Nui Ahupua'a, South Hilo District, situated between Hawaii Belt Road and the 1,500-foot elevation contour. Low-level aerial (helicopter) survey was conducted over some of the uncultivated, forested portions of that study area, and other uncultivated areas were inspected using "variable-coverage (partial to 100%) variable-intensity ground survey" (Walker and Rosendahl 1994b:2). Walker and Rosendahl reported that the study area had been extensively modified during the Historic Period for sugarcane cultivation, and that no archaeological sites or "significant cultural materials of any kind" were found (Walker and Rosendahl 1994b:2).

Tomonari-Tuggle (1996) prepared a cultural resource overview for the Hakalau National Wildlife Refuge that included lands *mauka* of the current study area (but not Pīhā Ahupua'a). Very little archaeological survey was undertaken as part of the study, but Tomonari-Tuggle (1996:67-72) does provide a predictive model for site distribution within the upland forests of Hilo. She notes that the forest areas were used primarily for the collection of special resources, and that:

> …Traditionally these resources would have been birds (for featherwork) and hardwoods (for tools and canoes). In historical times, birds and hardwoods would have continued as resources, with the addition of cattle for meat and hides. The upland forests may also have been transited by individuals going from the coast to the upper slopes or summit of Mauna Kea...
>
> These transitory activities would likely have left neither a substantial nor easily recognized archaeological record. Further, the density and rapid regrowth of vegetation in the rainforest would also make any remains virtually impossible to identify once abandoned. (Tomonari-Tuggle 1996:67)

Specific site types discussed by Tomonari-Tuggle (1996) that might be encountered within the upland forests of the Hilo District include temporary shelters used by bird catchers, canoe builders, bullock hunters, scientists, travelers, surveyors, shrines or other religious structures, ponds and waterholes, roads and trails, bullock pits, surveyor's marks and ranch structures. She describes the lowest forest zone, above the current study area as the "Wet *'Ōhi'a* Zone," an area that was largely used as a source of specialized forest resources such as hardwoods for crafts or construction, and forest birds for feathers.

3. CONSULTATION

When assessing potential cultural impacts to resources, practices, and beliefs; input gathered from community members with genealogical ties and/or long-standing residency relationships to the study area is vital. It is precisely these individuals who ascribe meaning and value to traditional resources and practices. Community members may also possess traditional knowledge and beliefs that are unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC Guidelines for Assessing Cultural Impacts, the goal of the oral interview process is to identify potential cultural resources, practices, and beliefs associated with the affected study area.

In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with the current subject property, a public notice was submitted to the Office of Hawaiian Affairs (OHA) for publication in their newspaper, *Ka Wai Ola* (Appendix B). The notice appeared in the Malaki (March) 2018 issue of the publication. As of the date of the current report, no responses have been received from the public notice. The OHA East Hawai‘i office was also contacted for guidance on individuals with genealogical or historical relationships with Pīhā, however, no response was received. Additionally, Lauren Tam Sing of ASM Affiliates also consulted with Ian Cole of the State of Hawai‘i Department of Forestry and Wildlife (DOFAW) division in Hilo. Joey Mello, the Hawai‘i Branch DOFAW Wildlife Program Manager for East Hawai‘i was also contacted, but time constraints prevented a more formal consultation. He did, however, indicate in a voicemail message that the access to the Unit C hunting area was restricted to the Mānā Road entry, situated 15.5 miles inland from the Mauna Kea Access Road. David Penn, the current Program Specialist for DOFAW’s Legacy Land Conservation/Native Ecosystems Protection & Management was also contacted, and subsequently forwarded our request for information to Clement Chang, a Trails and Access Specialist with DOFAW. Mr. Chang related that he was not familiar with any other access points to Unit C other than Mānā Road. Furthermore, eleven members of the Breithaupt family, a family with known historical ties to the current study area and other Pīhā Homestead parcels in the immediate vicinity, were contacted. The granddaughter of Ernest McComber Breithaupt, son of A.K. Breithaupt (Grant 7862), responded to our inquiry and indicated that her mother might be of assistance, but to date she has not contacted ASM. None of the other Breithaupt family members who were contacted have responded to our inquiry to date.

IAN COLE

On April 5, 2018, Lauren Tam Sing consulted with Mr. Ian Cole of DOFAW by telephone to discuss historical and modern access points to Unit C, an area utilized for hunting of feral pigs and wild sheep situated the upper reaches of Pīhā and nearby Laupāhoehoe within the Hilo Forest Reserve. According to Mr. Cole, the entrance into the Unit C hunting area is publically accessible by Mānā Road, where a hunter check station is present. He related that there is no formal *makai* access to Unit C through the Pīhā-Kahuku Road that extends to the southeastern corner of the current study area, however, he noted that informal access points in various locations have been and are utilized by individuals seeking to hunt within the forest reserve. There are several hunter check stations (e.g. in Laupāhoehoe and ‘Ō‘okala) which hunters use to access different hunting units, but Mr. Cole explained that in some cases hunters may enter through these various other check points and traverse to Unit C, bypassing the official checkpoint, thereby not leaving a paper trail. And as previously discussed, hunters enter the reserve independently at various locations, As such, assessing the number of hunters who utilize Unit C is not possible. He further indicated that DOFAW does maintain a presence in the Pīhā section of the reserve, particularly above Laupāhoehoe and in *mauka* Pīhā, and are especially concerned with the hunters who pass through different hunting units into Unit C with their canines, as hunters in Unit C are not permitted to hunt with the aid of dogs. According to Mr. Cole, the issue of hunter access into the forest reserve has been and remains as a particularly a troublesome issue in the Hāmākua District. He did not see how the construction of a single-family residence within the current study area would impact hunters, as there is techincally no formal access to Unit C through Pīhā-Kahuku road, and certainly not accessible through privately-owned property, including the current subject parcel.

4. IDENTIFICATION AND MITIGATION OF POTENTIAL CULTURAL IMPACTS

The OEQC guidelines identify several possible types of cultural practices and beliefs that are subject to assessment. These include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The guidelines also identify the types of potential cultural resources, associated with cultural practices and beliefs that are subject to assessment. Essentially these are natural features of the landscape and historic sites, including traditional cultural properties. A working definition of traditional cultural property is:

> "Traditional cultural property" means any historic property associated with the traditional practices and beliefs of an ethnic community or members of that community for more than fifty years. These traditions shall be founded in an ethnic community's history and contribute to maintaining the ethnic community's cultural identity. Traditional associations are those demonstrating a continuity of practice or belief until present or those documented in historical source materials, or both.

The origin of the concept of traditional cultural property is found in National Register Bulletin 38 published by the U.S. Department of Interior-National Park Service. "Traditional" as it is used, implies a time depth of at least 50 years, and a generalized mode of transmission of information from one generation to the next, either orally or by act. "Cultural" refers to the beliefs, practices, lifeways, and social institutions of a given community. The use of the term "Property" defines this category of resource as an identifiable place. Traditional cultural properties are not intangible, they must have some kind of boundary; and are subject to the same kind of evaluation as any other historic resource, with one very important exception. By definition, the significance of traditional cultural properties should be determined by the community that values them.

It is however with the definition of "Property" wherein there lies an inherent contradiction, and corresponding difficulty in the process of identification and evaluation of potential Hawaiian traditional cultural properties, because it is precisely the concept of boundaries that runs counter to the traditional Hawaiian belief system. The sacredness of a particular landscape feature is often cosmologically tied to the rest of the landscape as well as to other features on it. To limit a property to a specifically defined area may actually partition it from what makes it significant in the first place. However offensive the concept of boundaries may be, it is nonetheless the regulatory benchmark for defining and assessing traditional cultural properties.

As the OEQC guidelines do not contain criteria for assessing the significance for traditional cultural properties, this study will adopt the state criteria for evaluating the significance of historic properties, of which traditional cultural properties are a subset. To be significant the potential historic property or traditional cultural property must possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet one or more of the following criteria:

a Be associated with events that have made an important contribution to the broad patterns of our history;

b Be associated with the lives of persons important in our past;

c Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

d Have yielded, or is likely to yield, information important for research on prehistory or history;

e Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

While it is the practice of DLNR-SHPD to consider most historic properties significant under Criterion d at a minimum, it is clear that traditional cultural properties by definition would also be significant under Criterion e. A further analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities resulted from the *Ka Pa'akai O Ka'āina* v Land Use Commission court case. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired; and third, specify any mitigative actions to be taken to reasonably protect native Hawaiian rights if they are found to exist.

A review of the culture-historical background material reveals that traditionally, the rich upland forested areas of Pīhā, preserve within them the sacredness of an ancient landscape. The presence and transition between the various traditional inland environmental and social-ecological systems including but not limited to the *wao kānaka*, *wao lāʻau*, *wao nāhele*, *wao kele*, and the *wao akua*, exist within Pīhā's sacred landscape, and protected within are the sacrosanct memories of traditional ancient customs and natural and cultural resources. These inland zones, or *wao*, are stratified by variations in elevation and rainfall, and are considered as a region all their own. Handy et al. (1991:56) further elaborates:

> *Wao* means the wild—a place distant and not often penetrated by man. The *wao laʻau* is the inland forested region, often a veritable jungle, which surmounts the upland *kula* slopes on every major island of the chain, reaching up to very high elevations especially on Kauai, Maui, and Hawaii. The Hawaiians recognized and named many divisions or aspects of the *wao*: first, the *wao kanaka*, the reaches most accessible, and most valuable, to man (*kanaka*); and above that, denser and at higher elevations, the *wao akua*, forest of the gods, remote, awesome, seldom penetrated, source of supernatural influences, both evil and beneficent. The *wao kele*, or *wao maʻu kele*, was the rain forest. Here grew giant trees and tree ferns (*ʻamaʻu*) under almost perpetual cloud and rain.
>
> The *wao kanaka* and the *wao laʻau* provided man with the hard wood of the *koa* for spears, utensils, and logs for boat hulls; pandanus leaves (*lau hala*) for thatch and mats; bark of the *mamaki* tree for making tapa cloth; candlenuts (*kukui*) for oil and lights; wild yams and roots for famine time; sandalwood, prized when shaved or ground as a sweet scent for bedding and stored garments. These and innumerable other materials were sought and found and worked by man in or from the wao.

Historical documentation reveals that the *wao* of Pīhā were used for the procurement of special resources and were specifically utilized for bird-catching and the hewing and carving of *koa* wood for canoes. Although the traditional cultural practices and craft specialization associated with these traditions are no longer actively practiced in Pīhā, the recognition of their practice and importance reinforces the importance of the *mauka* Pīhā lands to the Hawaiian people. Boundary commission testimonies for Pīhā in 1875 revealed that an old trail utilized by bird catchers extended along the boundary of Pīhā and Kahuku Ahupuaʻa, which is coterminous with the eastern boundary of the current study area. According to the testimony, a canoe road in Nanue, the *ahupuaʻa* that begins only slightly to the northeast of the current study area where Kahuku terminates, extended *mauka* and lead to a place named Kaʻahina where canoes were made. The presence of these trails and their association with known traditional customs and practices in the area emphasize Pīhā's significance as a cultural landscape and its value to the Hawaiian people's cultural identity.

The forested lands immediately *mauka* of the current study area have been protected under conservation as the Hilo Forest Reserve since 1905. Its lands and watersheds, the protection of which were the primary reason for the establishment of the reserve, remained virtually untouched by the flourishing sugar industry that dominated the more *makai* lands of Pīhā and adjacent areas. Protected within these forests are many of the same natural resources that were extant during the Precontact and early Historic Periods. Prior to the establishment of the Hilo Forest Reserve, large populations of feral animals, particularly pigs, have wreaked havoc on the health of the forest. While the creation of the reserve focused primarily on the protection of the forest watersheds, it provided the added benefit of controlling the feral pig population through the subsequent establishment of DOFAW, who manages various natural area, forest, and game management reserves, wildlife sanctuaries, and public bird/mammal hunting areas throughout the State of Hawaiʻi.

While the recreational hunting of introduced species of feral pigs is not recognized as a traditional Hawaiian cultural practice, it is a long-standing tradition practiced in the islands for over a century and a half (Maly et al. n.d.). The pigs originally introduced by the Polynesians were for the most part domesticated, and were an important food product and cultural resource in ancient Hawaiʻi, but they were not recreationally hunted (ibid.). As the *wao* were considered sacred, particularly the *wao akua*, great care was taken by the Hawaiians as they passed through. Entry into the depths of the *wao* was conducted with focused intention for the collection of very special natural resources including feathers, wood, foliage, and medicine. It is within the custom of exercising profound respect for the spiritual and physical entities that inhabit the *wao akua*, that these resources were protected in the ancient days. As noted by Maly et al. (n.d.), "*Puaʻa* were valuable cultural resources, but in ancient times were kept away from the *wao akua*, which held so much more value to Hawaiians than a single species such as a pig."

Following the demise of the Polynesian-introduced pig and the population influx of Western-introduced pig

species, who thrived on a seemingly endless supply of forest forage, every layer of the *wao* has been infiltrated and the state of native Hawaiian forests are in continual degradation as a result. The recreational hunting program managed by DOFAW serves to mitigate decimation to native vegetation caused by feral pigs by allowing the public to hunt within designated hunting units within the reserve. Thus, the continuation of pig hunting within the Pīhā Section of the Hilo Forest Reserve will aid in restoring the *mauka* lands to a more natural state. The proposed construction of a single-family residence on the subject property will not impede access to the forest for pig hunting activities, nor will it impact any potential cultural utilization of forest resouces.

Should individuals with genealogical and/or historical relationships with Pīhā wish to re-utilize its forest lands for the gathering of traditional cultural resources such as *koa* and *ʻōhiʻa* for timbers, or various other plants for medicinal and/or ceremonial purposes, this use should be encouraged. It is likely that restoring access to those with ties to the land who wish to access it and rejuvenate traditional resource procurement will aid in the rehabilitation of the forest. As such, this will only aid in the restoration of native vegetation which has been encroached upon and slowly overrun by invasive species.

Given the above consultation and assessment, it is our conclusion that the proposed development of a single-family residence on TMK: (3) 3-2-004:038 will not result in impacts to any traditionally valued cultural or historical resources nor will it impact any traditional cultural practices or beliefs.

REFERENCES CITED

Chinen, J.

1958 The Great Mahele: Hawaii's Land Division of 1848. Honolulu: University of Hawaii Press.

1961 1961 *Original Land Titles in Hawaii.* Honolulu, Hawaiʻi: privately published.

Cordy, R.

1994 A Regional Synthesis of Hāmākua District, Island of Hawaiʻi. Historic Preservation Division, Department of Land and Natural Resources, State of Hawaiʻi.

Department of the Interior

1914 "Report of the Governor of Hawaiʻi." In Reports of the Department of the Interior For the Fiscal Year ended June 30, 1914, Volume II, Indian Affairs and Territories, pps. 479-544. Government Printing Office, Washington D.C.

1916 "Report of the Governor of Hawaiʻi." In Reports of the Department of the Interior For the Fiscal Year ended June 30, 1916, Volume II, Indian Affairs and Territories, pps. 483-548. Government Printing Office, Washington D.C.

Division of Forestry

1906 Report of the Division of Forestry for the year ending December 31, 1905. Territory of Hawaiʻi board of agriculture and Forestry. Hawaiian Gazette Co. Ltd., Honolulu.

Donn, J. M.

1901 *Hawaii, Hawaiian Islands. Hawaii* Territorial Survey Map. Registered Map 2060. http://hdl.handle.net/10524/49272, accessed August 9, 2017.

Dorrance, W., and F. Morgan

2000 *Sugar Islands: The 165-Year Story of Sugar in Hawaii*. Mutual Publishing Co., Honolulu.

Ellis, W.

1826 Narrative of a Tour Through Hawaiʻi, or, Owhyhee; With Remarks on the History, Traditions, Manners, Customs, and Language of the Inhabitants of the Sandwich Islands. H. Fisher, Son, and P. Jackson, London.

2004 Journal of William Ellis, A Narrative of an 1823 Tour Through Hawaiʻi. Mutual Publishing.

Fornander, A.

1880

1969 An Account of the Polynesian Race: Its Origins and Migrations. Tokyo: Charles E. Tuttle Co., Inc.

Giambelluca, T., Q. Chen, A. Frazier, J. Price, Y. Chen, P. Chu, J. Eischeid, and D. Delparte

2013 Online Rainfall Atlas of Hawaiʻi. *Bull. Amer. Meteor*. Soc. 94, 313-316, doi: 10.1175/BAMS-D-11-00228.1.

Giambelluca, T., X. Shuai, M. Barnes, R. Alliss, R. Longman, T. Miura, Q. Chen, A. Frazier, R. Mudd, L. Cuo, and A. Businger.

2014 Evapotranspiration of Hawaiʻi. Final report submitted to the U.S. Army Corps of Engineers—Honolulu District, and the Commission on Water Resource Management, State of Hawai

Handy, E.S.C., E.G. Handy (with M. Pukui)

1991 *Native Planters in Old Hawaii: Their Life, Lore and Environment. B.P. Bishop Museum Bulletin* 223. Honolulu: Department of Anthropology, Bishop Museum Press. (Revised Edition).

Hitchcock, D. H.

n.d. *Piha, Hilo Hawaiʻi.* Hawaiʻi Registered Map No. 670. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Hicks, L. A.

1915 *Lease Lots Piha and Kahuku Homesteads North Hilo Hawai'i.* Copy of Survey Furnished (C.S.F.) Map No. 2597. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Hockley, E. W.
1922 *Hilo Forest Reserve North and South Hilo, Hawai'i.* Hawai'i Territory Survey Plat 799, revision, resurvey, and map by E.W. Hockley May 1921—January 1922, reduced and traced by Jos. Iao—May 1922. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Hommon, R.
1976

1986 Social Evolution in Ancient Hawai'i. IN Kirch, P.V. (ed.), Island Societies: Archaeological Approaches to Evolution and Trans-formation: 55-88. Cambridge: University Press.

Horwitz, R., J. Finn, L. Vargha, and J. Ceaser
1969 Public Land Policy in Hawai'i: An Historical Analysis. Report No. 5, 1969. Legislative Reference Bureau. University of Hawai'i, Honolulu.

Iao, J.
1913 *Hilo Forest Reserve Section II From Paukaa to Piha North Hilo, Hawai'i.* Hawai'i Territory Survey Plat 715, reduced from map of A. B. Loebenstein by Jos. Iao Nov. 1913. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Judd, C.S.
1922 "Report of Superintendent of Forestry, July, 1922." Letter dated August 19, 1922 in the *Forester and Agriculturalist,* Vol. XIX, No. 9, pps. 204-210. September, 1922, Honolulu.

Kalākaua, His Majesty
1888 *The Legends and Myths of Hawai'i. The Fables and Folk-Lore of a Strange People.* Charles L. Webster & Company, New York.

Kamakau, S.
1992 *Ruling Chiefs of Hawaii*. The Kamehameha Schools Press, Honolulu (revised edition).

Kent, N.
1983 *Hawaii: Islands Under Influence*. University of Hawai'i Press, Honolulu.

Kirch, P.
1984 *Evolution of the Polynesian Chiefdoms*. Cambridge University Press, New York.

1985 Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory. Honolulu: University of Hawaii Press.

2011 When did the Polynesians Settle Hawai'i? A Review of 150 Years of Scholarly Inquiry and a Tentative Answer. Hawaiian Archaeology Vol. 12:3-26.

Kraebel, C.J.
1922 "Report of Assistant Superintendent of Forestry, June, 1922." Letter dated July 24, 1922 in the *Forester and Agriculturalist,* Vol. XIX, No. 8, pps. 177-179. August, 1922, Honolulu.

Kuykendall, R.
1938 *The Hawaiian Kingdom 1778–1854. Foundation and Transformation*. Honolulu: University Press of Hawaii.

Lutz, M. E.
1914 *Piha Homesteads North Hilo-Hawai'i.* Hawai'i Territory Survey Registered Map No. 2568, resurveyed and adjusted by M.E. Lutz. http://ags.hawaii.gov/survey/map-search/, accessed March 28, 2018.

Maly, K., and O. Maly
2006 HILO PALIKŪ–HILO OF THE UPRIGHT CLIFFS: A Study of Cultural-Historical Resources of Lands in the Laupāhoehoe Forest Section, Ahupua'a of the Waipunalei-Mauluanui Region, North Hilo District, Island of Hawai'i. Kumu Pono Associates Study HiHETF116-Laupāhoehoe

(120506a). Prepared for United States Department of Agriculture Forest Service – Institute of Pacific Islands Forestry, Hilo.

Maly, K., B. Pang, and C. Burrows
n.d. Pigs in Hawai‘i, from Traditional to Modern. http://www.eastmauiwatershed.org/wp-content/uploads/2013/01/Puaa-cultural-fact-sheet-04.03.pdf. Accessed April 5, 2018.

Pogue, J.
1978 *Moolelo Hawaii*. Hale Paipalapala Aupuni, Honolulu (Revised Edition).

Pukui, M.
1983 *‘Ōlelo No‘eau, Hawaiian Proverbs & Poetical Sayings.*

Pukui, M. and S. Elbert
1986 *Hawaiian Dictionary, Hawaiian-English, English-Hawaiian*. University of Hawaii Press, Honolulu.

Pukui, M., S. Elbert, and E. Mo‘okini
1974 *Place Names of Hawaii*. *Revised and Expanded Edition.* Honolulu: University of Hawaii Press, Honolulu.

Sherrod, D. R., J. M. Sinton, S. E. Watkins, and K. M. Brunt
2007 Geologic Map of the State of Hawai`i. Open-File Report 2007-1089. U.S. Department of the Interior, U.S. Geological Survey. http://pubs.usgs.gov/of/2007/1089/.

Schilt, R., and A. Sinoto
1980 Limited Phase I Archaeological Survey of Mahukona Properties, North Kohala, Island of Hawai‘i. B.P. Bishop Museum, Honolulu. Prepared for Belt, Collins and Associates.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture
2018 Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/, accessed February 12, 2018.

Stokes, J.F.G., and T. Dye
1991 Heiau of the Island of Hawai‘i. *Bishop Museum Bulletin in Anthropology 2*. Bishop Museum Press, Honolulu.

Thrum, T.G.
1908 Heiaus and Heiau Site Throughout the Hawaiian Islands. Island of Hawaii. *Hawaiian Almanac and Annual 1909*:38-47. Honolulu.

Tomonari-Tuggle, M.
1996 Bird Catchers and Bullock Hunters in the Upland Mauna Kea Forest: A Cultural Resource Overview of the Hakalau Forest National Wildlife Refuge, Island of Hawai‘i. North and South Hilo District, Island of Hawai‘i. International Archaeological Research Institute, Inc., Honolulu, Hawai‘i. Prepared for U.S. Fish and Wildlife Service, Hilo, Hawai‘i.

Walker, A., and P. Rosendahl
1994a Interim Report: Archaeological Inventory Survey, Chin Chuck Road Project Area, Land of Hakalau Nui, South Hilo District, Island of Hawai‘i (TMK:2-9-02:23 and 2-9-04-:56). PHRI Report 1563-102894. Prepared for Mr. Eben Dale, C. Brewer Homes, Inc. c/o PBR Hawaii.

1994b Archaeological Inventory Survey, Chin Chuck Road Project Area, Land of Hakalau Nui, South Hilo District, Island of Hawaii (TMK:2-9-02:23 and 2-9-04:56). PHRI Report 1563-111194. Prepared for Mr. Eben Dale, C. Brewer Homes, Inc. c/o PBR Hawaii.

Wilkes, C.
1845 *Narrative of the United States Exploring Expedition During the Years 1838–1842, Under the Command of C. Wilkes, U.S.N.,* Volume 4. Philadelphia: Loa and Blanchard.

APPENDIX A

BOUNDARY COMMISSION TESTIMONY FOR PĪHĀ AHUPUA‘A

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For Testimony of Piha, Hilo,
See Folio 325 Book B.

X

Land Boundary Commission } No. 64.
Hawaii 3rd J.C.

Certificate of the Boundaries of Piha District of Hilo Island of Hawaii 3rd J.C.

Upon the Application of "J. O. Dominis Administrator of the Estate of M. Kekuanaoa", and by virtue of the authority vested in me by law as Sole Commissioner of Land Boundaries for the Island of Hawaii 3rd J.C. I hereby decide and certify the Boundaries of the Ahupuaa of Piha, situated in the District of Hilo, Island of Hawaii, to be as hereinafter set forth.

Given under my hand at Hilo, Hawaii,
This Second day of March A.D. 1875.

R. A. Lyman
Commissioner of Boundaries 3rd J.C.

Boundaries of Piha.

Commencing at the falls of the Waikaumalo stream at the sea-coast, and running along the coast to the Alenaio gulch, the boundary of

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the land of Kahuku;

1. South 54°00' East 6.00 Chains; (thence) along the Alenaio gulch to Government Road on the land of Kahuku;
2. South 31°30' West 32.00 Chains;
3. South 34°00' West 72.00 Chains, along Alenaio gulch 42.00 Chains, (Here the gulch ends); thence along the road between Kahuku & Piha 30.00 Chains.
4. South 51°00' West 34.00 Chains, along said road;
5. South 53°30' West 27.00 " " " " ;
6. South 58°00' West 22.00 " " " " ; to Ohia tree marked X;
7. South 62°00' West 24.00 Chains along said road;
8. South 35°30' West 31.00 " " " " ; to where Kahuku ends and the Nanue road joins in.
9. South 31°30' West 28.00 Chains along Nanue;
10. South 70°00' West 16.00 Chains " " ; to the Nuku.
11. Still along the road between Nanue and Piha to within 6.00 Chains of the Waikahoehoe Stream, bearing, South 55°30' West 44.00 Chains;
12. Thence following the Nanue road, (The Piha road here branches off), and going to a place called Kaahina, at the junction of the Kaahina and Painiu streams which form the Nanue Stream;
    South 28°30' West 51.00 Chains;
13. South 28°30' West 33.00 Chains along the Painiu stream and land of Honohina;

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14. South 58°00' West 124.00 Chains to where the Painiu stream peters out;
15. South 66°00' West 350. Chains, to and along Nauhi gulch to a koa tree marked "x" on its South bank, to the land of Humuula.
16. Thence along the land of Humuula to an old "Ahu" in the midst of a sand flat to the North of the "Lapa Ohelo", (Old Ku, my kamaaina, after an absence of forty years went directly to the old Ahu and pointed it out as the boundary between Piha & Maulua) to land of Maulua; Bearing,
North 16°00' West 66°00 Chains;
17. North 68°00' East 320.00 Chains along the land of Maulua and to the commencement of Waikaumalo stream.
18. North 52°00' East 170.00 Chains along Puuohua and Waikaumalo gulch;
19. North 73°00' East 98.00 Chains along Puuohua and Waikaumalo gulch; Here the land of Waikaumalo begins.
20. North 44°30' East 29.00 Chains along Waikaumalo gulch;
21. North 46°00' East 26.00 Chains along Waikaumalo gulch;
22. North 43°00' East 27.00 Chains along Waikaumalo stream and land;
23. North 44°30' East 34.00 Chains along Waikaumalo stream and land to Piina falls;
24. North 58°00' East 26.00 Chains along

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the Waikaumalo stream and land;
25. North 25°00' East 20.00 Chains along
the Waikaumalo stream and land;
26. North 46°00' East 23.00 Chains along
the Waikaumalo stream and land;
27. North 68°30' East 24.00 Chains along the
Waikaumalo stream and land to bridge;
28. North 43°00' East 39.00 Chains along
the Waikaumalo stream and land to
the Sea-coast at point of Commencement.
Containing an Area of 4.250 Acres.
As surveyed by D. H. Hitchcock.
R A Lyman R A Lyman
Commissioner of Boundaries 3rd J.C.

Costs paid in full Mar. 3. 1875.
1 day hearing 10.- 33 folio testimony 8.25 Certificate 2.- Stamp 5 description Con. 10 folio 5 26.25

The Ahupuaa of Piha, District of Hilo, Island of Hawaii 3rd J.C. 325.

On this the 8th day of February A.D. 1875, the commission of Boundaries for the Island of Hawaii 3rd J.C, met at the Court house, Hilo, Hawaii, on the application of J.C. Dominis Adm'tr Est. M. Kekuanaoa, for the settlement of the boundaries of Piha, Situated in District of Hilo, Island of Hawaii. Due notice of hearing personally served on all owners or agents of adjoining lands as far as known.

Present – E.G. Hitchcock on part of applicant, Agent of Crown Lands J.C. Dominis, and R. Keelikolani, D. Kamai for Hawaiian Government, Alapai, for self.

Maps and notes of survey filed.

For Petition see Folio 242 Book A

– Testimony –

Ku x Sworn. (An old man)

I was born at Honohina, Hilo, at time of Okolehao during reign of Kamehameha I. Was old enough to cook at time of Oku. my kupuna-kane Hue and my father Mahiai bird catchers told me boundaries. My Grandfather made the road on Honohina to Moohalohalo, and I made the road to Hopuwai, Kahuku bounds Piha on Hilo side at shore, there is a small gulch there called Alanaio on boundary, thence runs up gulch to a short distance above road to head of it, thence up old trail to Kaawau, thence bounded by Nanue, up old trail to Nenelu old, Kauhale, thence up trail to Waipahoehoe a Kahawai and Kauhale, the old trail does not reach to the gulch but turns to the left, the old boundary between lands running to Ohiapuha, till time Hapai made cabocs, then boundary was carried up to Kaahina, where Piha-iki and Nanue end, and Honohina and Piha-nui join. There are three gulches

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join about this place, thence boundary between Honohina and Piha runs up the Painiu gulch to the head of the gulch, thence up through the woods to Nauki gulch, and to Kalapaohelo on Hamakua boundary. Hummula bounds it on the mauka side above the woods. There is a pile of stones at Kalapaohelo, that my older brother Koia put up when he was Konohiki of land. Waikaumalo bounds Piha at shore on Hamakua side, there is a gulch there, the water belongs to Waikaumalo, thence the boundary between these two lands runs up stream to place called Halepaei, thence up gulch bounded by Puuohua to Kumuohia, there gulch ends and Piha is bounded by Mauka Nui to Kalapaohelo a straight boundary. The bird catchers used to go back and forth in old times on Piha and Maulua. Koia pointed out boundaries to me. I went with D. H. Hitchcock a short time since, and pointed out boundaries to him from shore to above woods, I told him where Mamani grew was Hummula. The Ahu was built in time of Kamehameha I. I saw it built. I never saw mamani there in olden times at this place, but now I see there are some young mamani trees there. Kalanaloha, Alapai, and Kaiahua were along with us. I made the road up through the woods at time of (Kuakini's) killing cattle by Kuakini.

(Sd.) by D. Kamai.

by Alapai, Piha and Nanue join at Kawaa cutting off Kahuku. I have stated that the mauka boundary of Nanue is at Kaahina not at Nahuina of Waipahoehoe. There is an old Kaehale Kalairwaa at this place, this is the boundary I have always known. Nanue had no old road. The birds in olden times belonged to Piha and not to Nanue.

Hemahema Sworn. (Quite old man) - I was born

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in Hamakua, moved to Hilo to Puuohua when quite young and went over these lands with Waiwai my father. He was konohiki of these lands to Pohakupuka. Went with my kupunakane bird catching. Waikaumalo bounds Piha on Hamakua side at shore, boundary runs up gulch to Kaalaiki at Haleopai where Puuohua bounds it, boundary runs up gulch to Niuka where Puuohua ends, and Maelua bounds it to the mountain. Bird catchers from these two lands used to catch in common. The mauka boundary is at Kalapaohelo above the woods at old Ahu. There are several Ahus there now. Hummula bounds it on mauka side to Nauki gulch. Kahuku bounds Piha at shore at Hilo side, a small gulch, boundary runs up gulch to head, and up old trail to Nahuina where Piha and Nanue join and Kahuku ends, thence boundary runs up trail to Kaahina near Waipahoehoe, this is as far as I ever knew about Nanue, then bounded by Honohina, do not know as Honohina runs through woods, but know that Piha runs up to Nauki gulch. I do not know what gulch it is makai now.

Qd. by D. Kamai, Niuka is at mauka end of Puuohua, Kumuohia is on Piha. place Nahuina and Kumuhawau are the same.

" by Alapai, From Kawau boundary between Nanue and Piha runs up old trail to Kaahina, this is as far as I ever knew Nanue to run. It is where Hapai made a canoe. I heard from Kiliili, Napihe and Kuaipahu that this was the mauka end of Nanue. Hapai ma said the same thing.

D. H. Hitchcock. Sworn. I surveyed Piha last October. Ku was my kamaaina. Kalauaioha went along on part of Nanue. I had already talked with Hemahema, and as he agreed with Ku, I did not take him, but surveyed the land as Ku pointed it out, commencing at shore on Hilo side went to Nahuina where both kamaainas said that

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Kahuku ended. I then went up to below Waipahoehoe where Kalauaoha said that boundary went on to gulch, Waipahoehoe and up stream, Nanue, ran through woods, but Ku and Hemahema said that the boundary ran up trail to Kaahiwa. The other two men said it (Nanue) ended at Kaahuia. I found, that most of the gulches, ended at Niuika, and gulches from mauka ended at swamp. When I got to Nauhi gulch at upper edge of woods both, Kalauaoha and Ku said that it was the upper corner of Piha. Ku said Piha was bounded there by Honohina, and Kalauaoha that it was bounded by Nanue. They both went to a sandy place and pointed out an old pile of stone at Kalapaoheio and said that was boundary between Piha and Mauka, it is in the upper edge of woods, with a few young mamani below it. I think it is about 25 chains makai of Kumaia road. I surveyed the Waikaumalo side, giving the general courses, and distances of gulches, and marked trees. This map and notes of survey, filed today, are the ones I made out from my field notes.

C.J.P.

Kalauaoha x̄ Sworn, (old man).

I live at Nanue, was born at Honohina, know boundaries of Piha, Kulamahiai, Koia, and Waikaue now dead told me boundaries. Piha and Nanue join each other at Kawau on old trail into woods, thence boundary runs up this trail to Waipahoehoe, thence boundary runs up this stream to Mahuia Kauhale on Piha, thence boundary runs up to Koapololei, thence up old trail to upper edge of woods to Kalapaoheio, to a place called Kalupaalu about as far on the Puna side of Kalapaoheio as from here to Waikuku gulch. Nanue reaches to Kalupaalu. Nauhi gulch is in the middle of Nanue. Nauhi gulch only runs a short distance into woods and there spreads out all around —

C.J.P.

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In older times the birdcatchers used to go up the Honohina and Piha roads, they could not go up Nanue as the road was so bad. The canoe road of Nanue ran to mauka of Kaahina, there it ended. But the roads on Honohina and Piha ran way mauka. Alapai now owns Nanue. I and his father in law. I did not tell Hitchcock that Naushi was the boundary of Piha. I was a witness on boundary of Nanue and Humuula.

Kuipahu sworn. (Quite an old man).

Was born at time of Pelelea, in Kona, moved to Hilo with parents to Punohua, afterwards moved to Nanue. I am uncle to Alapai. Know a little about boundaries of Piha. Went up road to Kalapaohelo after beef. Koia was our guide and told us boundaries. Piha is bounded by Nanue from shore Kahuku between. Kahuku ends at Nahuina, and there Nanue and Piha join, Kumukawai is one name of this place, thence boundary runs up to Naipahoehoe gulch across gulch up road to upper edge of woods to place called Kalapaohelo at Puua base of Kualapaohelo.

Cross Exd, Know places called Pahau & Mahuia, there the boundary is at road. Know Kumuohia. It is on the boundary between Nanue and Piha, Know Kukai &c, (Places Hitchcock states are on boundary between Mauhua and Piha).

Testimony Closed.

E.S. Hitchcock moved that testimony given by Kalauaoha as to boundaries between Humuula and Piha and Nanue be introduced as evidence — Granted —

Alapai states that he accepts Kaahina as the mauka boundary of Nanue.

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Decision

Boundaries of Piha decided to be as given in evidence of Ku, and Notes of Survey filed. Certificate to be issued accordingly.—

R. A. Lyman
Com of Boundaries 3rd J. C.

Copied by J. B. Castle.

The above is a true copy of the evidence, and decision of Boundaries of Piha, Hilo Hawaii, Given Feb. 11th 1875.
For Certificate of Boundaries see No. 64. Folio 124, 125, 126, & 127. Liber I.

R. A. Lyman
Commissioner of Boundaries 3rd J. C.

Costs see Folio 127. about 23.50 Liber I.

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Hon R. A. Lyman
Boundary Commissioner
Island of Hawaii

The undersigned would herewith make application for the Settlement of the Boundaries of the following Ahupuaas & Lands, belonging to Her Ex Dr Keliikolani; viz

Kikala Hilo. Hawaii.
Bounded by Maunan. J H Hanis
Pauka, C C Hanis Kaiwiki - Govt

Haiku Hilo Hawaii
Bounding lands unknown

Kaumiho Hilo Hawaii
Bounding lands unknown

Waikaumalo Hilo Hawaii
Bounding lands unknown

Lepoloa Hilo Hawaii " " "

Piha Hilo Hawaii " " "

Kaulakaiki Hilo Hawaii " " "

Kaiwiki Hamakua Hawaii " " "

Kalakalaula Hamakua Hawaii
Humoula & other lands

Kapoaula Hamakua Hawaii
Bounds unknown

Keniau Hamakua Haw
adjoining lands unknown

Pohakuhaku Hamakua Haw
adjoining lands unknown

Waikalua Hamakua Haw " " "

Paalaea Hamakua Haw " " "

Kaala Hamakua Haw " " "

Manowaialii Hamakua Haw " " "

Kealoa Hamakua Haw
adjoining lands Humoula &c

Kana Hamakua Haw
adjoining land not known

Kapaaula Hamakua Haw " " "

Waialeale Hamakua Haw " " "

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Niulii. Kohala Haw
adjoining lands not known
Puamiloiloe Kohala Haw
Puamii Kohala Haw
Kamanamana Kona Haw
Opea Kona Haw
Koopu 3rd Kona Haw
Kailua Kona Haw
Kulihee Kona Haw
Kaipuhi Kona Haw
Niumalii Kona Haw
Naheana Kona Haw
Kalehanaole Kona Haw
Puuloa Kona " or Kohala
Kapauta Kona " or Kohala
Honokahauike Kona "
Hono kahaumui & Kealakekua
Govt lands adjoining
Moeauoa Kona Haw
Lanihaumui & Moeauoa,
belonging to Govt, adjoining
Kaumalumalu Kona Haw
adjoining lands Hohualoa &
Pahoehoe. Govt
Laaloa 1st Kona Hawaii
adjoining lands Laaloa
& Pahoehoe Govt
Kealia 2nd Kona Hawaii
adjoining lands Kealia & Hookena
Keokea Kona Hawaii
adjoining lands Koonauman
C R Bishop & Kulae G Green
Hookena Kona Hawaii
adjoining lands Kealia &
Kaukaako Govt

Piiohe 2. Hilo Hawaii

244.

Pahoghog Kona Hawaii
adjoining lands Pahoghog Goot-
Haukalua Kona Hawaii
adjoining lands Haukalua & Akae Goot-
Kapwaleiholaike Kona Hawaii
adjoining lands Akog-Kau
lana manna Goot & Keauhou
Got-Kau
Hinalole Kona Hawaii
adjoining lands Homaula
and Hinalole lilii
Kohilipalinui Kau Hawaii
adjoining lands unknown
Hilea (-nui) Kau Hawaii
Kawgla Kau Hawaii " "
Hionomoa I Kau Hawaii " "
Hionomoa II Kau Hawaii " "
Mohokea (Nui) Kau Hawaii " "
Kauhukuala Kau Hawaii " "
Paakea Puna Hawaii " "
Kaeka Puna Hawaii " "
Kuhumanog Puna Hawaii " "
~~Kamaa~~ Puna Hawaii " "
~~Hakuu~~
Maghuiki Hilo " " "

Your Honor will therefore please appoint a day for hearing the above application & Grant a Certificate in accordance therewith

(signed) R. Kelikolani
per F. H. Hayes
Atty at Law

Hilo August 16 A.D. 1873.

APPENDIX B

KA WAI OLA PUBLIC NOTICE

HOʻOLAHA LEHULEHU

PUBLIC NOTICE

CULTURAL IMPACT ASSESSMENT

ASM Affiliates is preparing a Cultural Impact Assessment (CIA) in support of HRS Chapter 343 Environmental Assessment of TMK: (3) 3-2-004:038 in Pīha Ahupuaʻa, North Hilo, District, Island of Hawaiʻi. We are seeking consultation with any community members that might have knowledge of traditional cultural uses of the proposed project area; or who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject property, which may be impacted by the proposed project. If you have and can share any such information please contact Bob Rechtman brechtman@asmaffiliates.com, or Lauren Tam Sing ltamsing@asmaffiliates.com, phone (808) 969-6066, mailing address ASM Affiliates 507A E. Lanikāula Street, Hilo, HI 96720.