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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:RB

CDUA HA-3895

JUL 22 2022

To: Mary Alice Evans, OPSD Director
Environmental Review Program

From: Suzanne D. Case, Chairperson *Suzanne D. Case*
Department of Land and Natural Resources

Subject: Publication of the Final Environmental Assessment (FEA) for Conservation District Use Application (CDUA) HA-3895 for the Winterer Single Family Residence (SFR) and Related Improvements, and Landscaping located in Piha, North Hilo, Hawaii, Tax Map Key (TMK): (3) 3-2-004:037

This approximately 17.24-acre property is in the Resource Subzone of the State Land Use Conservation District. Proposed is a 1,693 single-story, post and pier, single-family residence (SFR) with a storage loft, two bathrooms, a living room and kitchen, front and rear stairways, and several covered lanai. Additional improvements will include a separate 2-car carport/utility storage structure, water catchment tank (10,000 gallons), propane gas tank, and raised garden planters. In total the SFR and improvements will be 2,620 sf.

The Department of Land and Natural Resources has reviewed the subject FEA for Conservation District Use Application (CDUA) HA-3895 and has determined a Finding of No Significant Impact (FONSI) in the context of §11-200.1-13 Significance Criteria. Please be advised that this finding does not constitute approval of the proposal.

The Draft Environmental Assessment (DEA) was published in the Environmental Review Program's May 23rd, 2022, edition of *The Environmental Notice*. Comments on the DEA were sought from relevant agencies as well as the public and were included in the FEA. The FEA has been prepared pursuant to Chapter 343 Hawai'i Revised Statutes and Chapter 11-200.1, Hawai'i Administrative Rules. Please publish notice of this FEA-FONSI in the August 8th, 2022, edition of *The Environmental Notice.*

If you have any questions, please contact Rachel Beasley at rachel.e.beasley@hawaii.gov or work cell at 808-798-6481.

cc: James Leonard, J M Leonard Planning, LLC

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Friday, July 22, 2022 2:37:33 PM

Action Name

Winterer Single-Family Residence in the Conservation District at Pīhā

Type of Document/Determination

Final environmental assessment and finding of no significant impact (FEA-FONSI)

HRS §343-5(a) Trigger(s)

- (2) Propose any use within any land classified as a conservation district

Judicial district

North Hilo, Hawaiʻi

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

(3) 3-2-004:037

Action type

Applicant

Other required permits and approvals

County of Hawaiʻi: Plan Approval and Grubbing, Grading, and Building Permits State of Hawaiʻi: Conservation District Use Permit Wastewater System Approval Chapter 6E SHPD Approval of Archaeological Survey

Discretionary consent required

Conservation District Use Permit

Approving agency

Hawaii Department of Land and Natural Resources

Agency contact name

Rachel Beasley

Agency contact email (for info about the action)

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Agency contact phone

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Agency address

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United States

Map It

Applicant

Sean Winterer

Applicant contact name

James Leonard

Applicant contact email

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Applicant contact phone

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Applicant address

56 Laukona Street
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United States
Map It

Was this submittal prepared by a consultant?

Yes

Consultant

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Consultant contact name

RON TERRY

Consultant contact email

rterry@hawaii.rr.com

Consultant contact phone

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Consultant address

10 Hina Street
Hilo, HI 96720
United States
Map It

Action summary

Applicant proposes a home on a 20,621-sf portion of his 17.24-acre old homestead property at 1,700 feet in elevation on an extension of Pīhā-Kahuku Road above Ninole Village. The 2-bdr/2-bath, 1-story home will have 958 sf of interior space, a fence and gate, and a carport and lanai. The off-grid home will have rooftop solar PV and water catchment. Within the small disturbance footprint, invasive species including strawberry guava and melastomes will be removed and prevented from re-establishing, and native, Polynesian and food-bearing species will be planted. The remaining 16.76 acres will remain untouched except adjacent to residence, where new ʻōhiʻa and other native trees will be planted. No threatened and endangered plants are present, and timing of clearing restrictions/seasonal surveys will help prevent impacts to endangered Hawaiian hoary bats and Hawaiian hawks. No archaeological sites or cultural sites are present and no cultural practices take place on the property.

Reasons supporting determination

Chapter 11-200.1-13, Hawai‘i Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

(a) In considering the significance of potential environmental effects, agencies shall consider and evaluate the sum of effects of the proposed action on the quality of the environment.

(b) In determining whether an action may have a significant effect on the environment, the agency shall consider every phase of a proposed action, the expected impacts, and the proposed mitigation measures. In most instances, an action shall be determined to have a significant effect on the environment if it may:

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 less than acre of disturbance on the 17.24-acre property. No adverse impact upon vegetation or endangered species should occur. An archaeological 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. Curtail the range of beneficial uses of the environment. No restriction of beneficial uses would occur by residential use on this lot.

3. Conflict with the State’s environmental policies or long-term environmental goals established by law. 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. Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and 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. Cultural practices would not be affected.

5. Have a substantial adverse effect on public health. The project would not affect public health and safety in any way. An individual wastewater system compliant with Department of Health regulations and adherence to Best Management Practices to minimize or completely avoid water pollution will ensure that the proposed single-family residence will not be detrimental to public health.

6. Involve adverse 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. Involve a substantial degradation of environmental quality. The project is minor and environmentally benign, and thus it would not contribute to environmental degradation.

8. Be individually limited but cumulatively have substantial adverse 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.

9. Have a substantial adverse effect on a rare, threatened, or endangered species, or its 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. Only very minor exterior lighting is planned, and it will be shielded and will consist of blue-deficient lighting such as filtered LED lights or amber LED lights, with a Correlated Color Temperature (CCT) of 2700 Kelvin. This will reduce the risk that transiting threatened or endangered seabirds may be attracted to and then disoriented by the lighting.

10. Have a substantial adverse effect on 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 few residences and no 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. Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters. 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. Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, 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. Only very minor shielded, low-blue exterior lighting is planned, which will protect dark skies reduce the risk that the threatened or endangered seabirds that may be attracted to and then disoriented by the lighting.

13. Require substantial energy consumption or emit substantial greenhouse gases. Negligible amounts of energy input and greenhouse gas emission would be required for construction and occupation of the residence. The residence is designed to support efficient use of energy and materials and facilitate natural ventilation and lighting. The home will also have roof-mounted photovoltaic panels, reducing energy use and greenhouse gas emissions. Energy-efficient appliances will be used throughout the house.

Attached documents (signed agency letter & EA/EIS)

- Final-EA-Winterer-sfh-in-CD-at-Ninole.pdf
- FONSI-DLNR-ERP_FEA-Letter-Winterer-SFR.pdf

Shapefile

- The location map for this Final EA is the same as the location map for the associated Draft EA.

Action location map

- Ninole-Winterer-Property.zip

Authorized individual

Ron Terry

Authorization

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

Final Environmental Assessment
Winterer Single-Family Residence
in the Conservation District at Pīhā

July 2022

TMK (3rd.): 3-2-004:037
Pīhā, North Hilo District, County of Hawai‘i, State of Hawai‘i

APPLICANT:

Sean Winterer
15-2735 Ono Street
Pahoa, Hawaii 96778

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
10 Hina Street
Hilo, Hawai‘i 96720

Final Environmental Assessment

Winterer Single-Family Residence in the Conservation District at Pīhā

TMK (3rd): 3-2-004:037
Pīhā, North Hilo District, County of Hawai‘i, State of Hawai‘i

APPLICANT:

Sean Winterer
15-2735 Ono Street
Pahoa, Hawaii 96778

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
10 Hina Street
Hilo, Hawai‘i 96720

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 200.1, Hawai‘i Department of Health Administrative Rules (HAR)

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APPENDIX 2 Archaeological Assessment Survey
APPENDIX 3 Cultural Impact Assessment

SUMMARY OF PROJECT, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Sean Winterer (the applicant) seeks a Conservation District Use Permit (CDUP) to build a single-family residence on a portion of his property near the *mauka* end of an extension of Pīhā-Kahuku Road in North Hilo at 1,700 feet in elevation. The plan for the home consists of a single-story home with a storage loft and two bedrooms, two baths, a living room and kitchen, front and rear stairways, and several covered lanai. The area around the house will include pig-proof hogwire perimeter fencing of the house and immediately surrounding area, a gated gravel driveway, 2-car carport and a turnaround pad/parking area. For utilities, the home will feature rooftop solar photovoltaic panels on the garage, a water catchment system with a 10,000 gallon tank, a satellite telecommunications dish, a propane water heater and storage tank, a back-up electrical generator and an individual wastewater system. The interior living space would be 958 square feet (sf), and the total developed area as defined under the Conservation District rules is 2,620 sf.

The location of structures has been planned within a compact, 20,621-sf graded disturbance footprint adjacent to the unpaved Pīhā-Kahuku Road extension in order to minimize forest clearing. The remainder of the mixed native/non-native forest scattered on the 17.24-acre property will not be disturbed, preserving native ʻōhiʻa, tree ferns and other species. Within the small disturbance footprint, invasive species including strawberry guava and various melastomes will be removed and prevented from re-establishing; native and Polynesian and food-bearing species will be planted; and a small area will be set aside for a garden of vegetables and fruit trees. Adjacent to the disturbance area, new ʻōhiʻa and other native species will also be planted. This will provide an attractive setting near the home and help preserve native species.

A botanical survey has determined that no threatened or endangered plant species are present. Clearing timing restrictions will help prevent impacts to Hawaiian hawks and endangered Hawaiian hoary bats, two species that are widely distributed throughout the island of Hawaiʻi. An archaeological survey found no sites. In the unlikely event that additional undocumented archaeological resources, including shell, bones, midden deposits, lava tubes, or similar finds, are encountered during construction, 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. A cultural impact assessment has determined that no cultural sites or practices would be affected. The surroundings are heavily forested and there are no public views of the building site. No scenic impacts would occur. Landclearing would be minimal and occur only in the 20,621-sf disturbance footprint, 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.

PART 1: PROJECT DESCRIPTION AND E.A. PROCESS

1.1 Project Description and Location

Sean Winterer (the applicant) seeks a Conservation District Use Permit (CDUP) to build a single-family residence on a portion of his property near the *mauka* end of an unpaved extension of Pīhā-Kahuku Road. The property is located at 1,700 feet in elevation, *mauka* of the village of Ninole in the North Hilo District of the Island of Hawai‘i (Figures 1-2).

The plan for the home consists of a single-story home with a storage loft and two bedrooms, two baths, a living room and kitchen, front and rear stairways, and several covered lanai. The area around the house will include pig-proof hogwire perimeter fencing of the house and immediately surrounding area, a gated gravel driveway, a 2-car carport and a turnaround pad/parking area. For utilities, the home will feature rooftop solar photovoltaic panels on the garage, a water catchment system with a 10,000 gallon storage tank, a satellite telecommunications dish, a propane water heater and storage tank, a back-up electrical generator and an individual wastewater system.

The interior living space would be 958 square feet (sf), and the total developed area as defined under the Conservation District rules is 2,620 sf, which includes the exterior stairways, lanai, carport, catchment and propane tanks, and raised garden planters (see Site Plan, Floor Plan and Elevation in Figure 3).

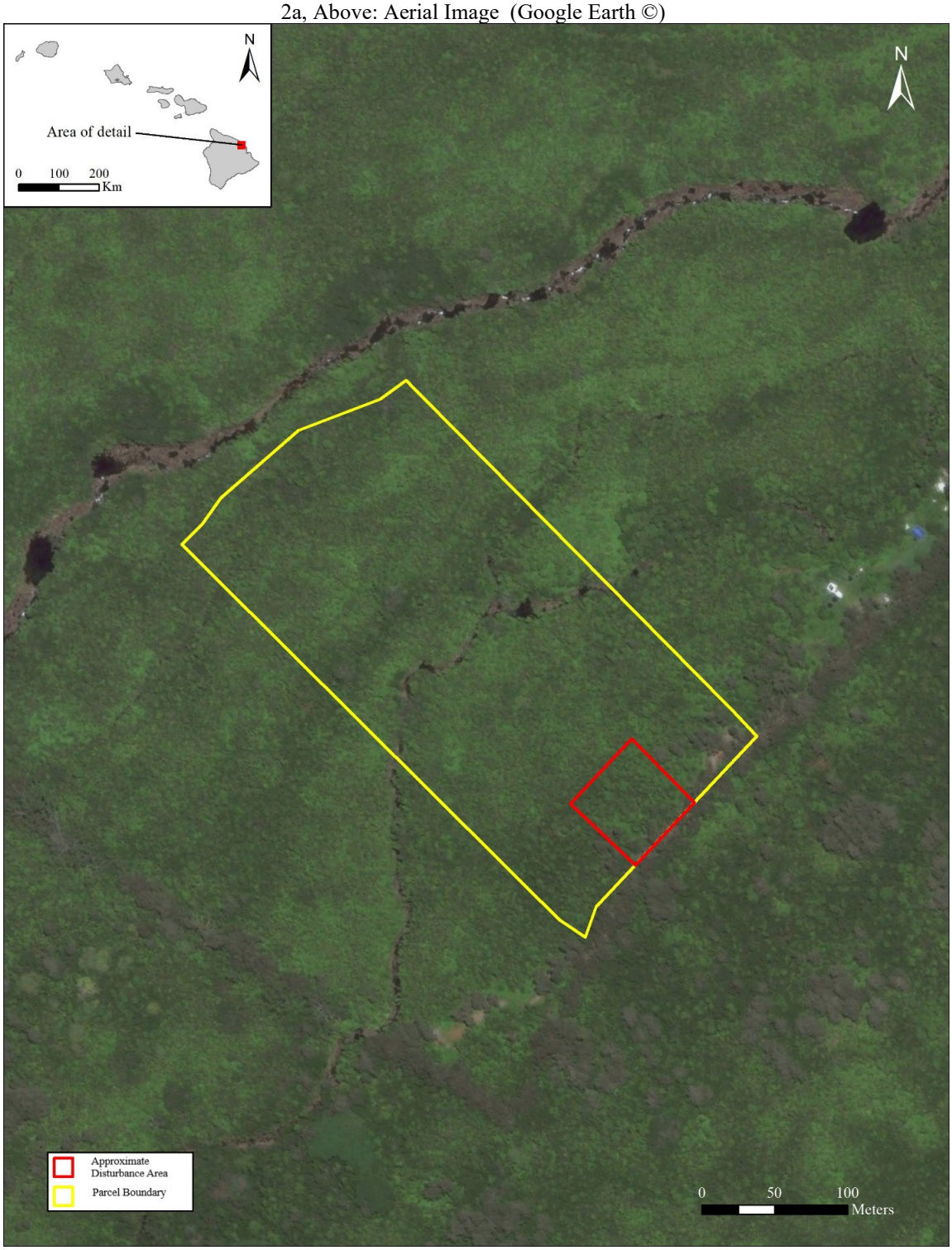
The location of structures has been planned within a compact, 20,621-sf disturbance footprint that will be graded adjacent to the unpaved Pīhā-Kahuku Road extension in order to minimize forest clearing. Grading would involve approximately 700 cubic yards of cut and would be balanced with fill, which would have a maximum thickness of four feet. The remainder of the mixed native/non-native forest scattered on the 17.24-acre property will not be disturbed, preserving native ‘ōhi‘a, tree ferns and other species.

Within the small disturbance footprint, invasive species including strawberry guava and various melastomes will be removed and prevented from re-establishing; native and Polynesian and food-bearing species will be planted; and a small area will be set aside for a garden of vegetables and fruit trees. Adjacent to the disturbance area, new ‘ōhi‘a and other native species will also be planted. This will provide an attractive setting near the home and help preserve native species.

Figure 1 Project Location Map

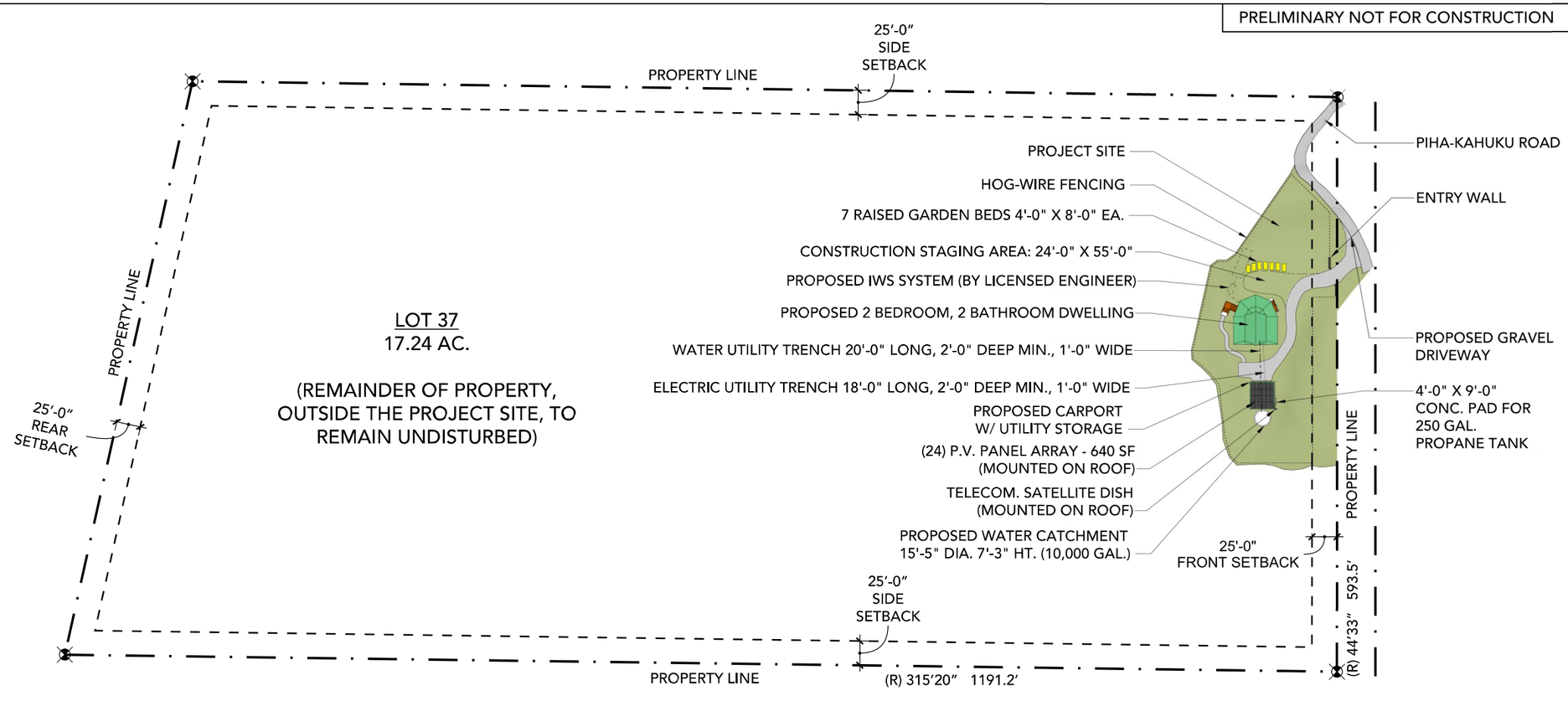
Figure 2 Site Photos

2a, Above: Aerial Image (Google Earth ©)



2b, Above: Area of House Pad
2c, Below: Unpaved Extension of Pīhā-Kahuku Road near Property

PRELIMINARY NOT FOR CONSTRUCTION



SETBACK & HEIGHT LIMITATIONS

FRONT SETBACK:	25 FEET
SIDE SETBACK:	25 FEET
REAR SETBACK:	25 FEET
MAXIMUM BUILDING HEIGHT FROM EXISTING GRADE:	25 FEET

COVERAGE CALCULATIONS

PROPERTY SIZE:	17.24 ACRES (750,974 SF)
DWELLING FOOTPRINT:	1603 SF
CARPORT/UTILITY STORAGE:	480 SF
PROPANE GAS TANK:	36 SF
RAISED GARDEN PLANTERS:	224 SF
GRAVEL DRIVEWAY:	1083 SF
GRAVEL WALKWAYS:	250 SF
TOTAL COVERAGE:	3,676 SF
PERCENTAGE:	3,676/750,974 = .4%

DEVELOPMENT AREA CALCUATIONS

FIRST FLOOR LIVING AREA:	868 SF
LOFT FLOOR LIVING AREA:	90 SF
COVERED LANAI:	502 SF
EXTERIOR STAIRS & LANDING:	233 SF
TOTAL AREA RESIDENCE:	1693 SF
CARPORT/UTILITY STORAGE:	480 SF
WATER CATCHMENT TANK:	187 SF
PROPANE GAS TANK:	36 SF
RAISED GARDEN PLANTERS:	224 SF
TOTAL DEVELOPMENT AREA:	2620 SF

PROJECT AREA CALCULATIONS

GRADING AREA:	21,400 SF
TOTAL PROJECT AREA:	35,500 SF

32 16 0 32 64FT
SCALE:1/32"=1'-0"

1 A01.1 SITE PLAN
SCALE: 1/32"=1'-0"

CIRO G. PODANY
LICENSED PROFESSIONAL ARCHITECT
No. 18310
HAWAII, U.S.A.

ARCHITECTURAL LICENSE
EXPIRATION DATE: APRIL 30, 2022
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATI ON OF CONSTRUCTION IS TO BE AS DEFINED IN CHAPTER 16-115, HAWAII ADMINISTRATIVE RULES, OF COMMERCE AND CONSUMER AFFAIRS, STATE OF HAWAII.

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SEAN WINTERER
PACIFIC QUEEN

32-620 PIHA KAHUKU ROAD
Ninole, HAWAII, 96773
(3)-3-2-004-037

DATE: 2/16/2022	DRAWN: BT
JOB:	21013-WINTERER
SCALE:	1/32"=1'-0"

REV.	DATE	REMARK	DRAWN

SITE PLAN

A01.1

PRELIMINARY NOT FOR CONSTRUCTION

MINIMUM BMP CHECKLIST FOR SMALL PROJECTS

(A) STABILIZED CONSTRUCTION ENTRANCE

ALL POINTS OF EGRESS AND INGRESS TO A SITE SHALL BE PROTECTED BY A STABILIZED CONSTRUCTION ENTRANCE.

(B) STOCKPILES AREA

STOCKPILES SHALL NOT BE LOCATED IN DRAINAGE WAYS OR OTHER AREAS OF CONCENTRATED FLOWS. SEDIMENT TRAPPING DEVICES SUCH AS FENCES, TRAPS, BASINS OR BARRIERS SHALL BE USED AROUND THE BASE OF ALL STOCKPILES.

(C) DUST CONTROL

DUST CONTROL SHOULD BE APPPLIED TO REDUCE DUST EMISSIONS. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES:
CHAPTER 11-60, "AIR POLLUTION CONTROL"

(D) SEDIMENT BARRIERS OR TRAPS

SEDIMENT TRAPPING DEVICES SUCH AS FENCES, TRAPS, BASINS OR BARRIERS SHALL BE USED DOWN SLOPE OF ALL DISTURBED AREAS AND AROUND THE BASE OF ALL MATERIAL STOCKPILES AND IN GENERAL FOLLOWS EXTENST OF GRADING PER PLAN

(E) SLOPE PROTECTION

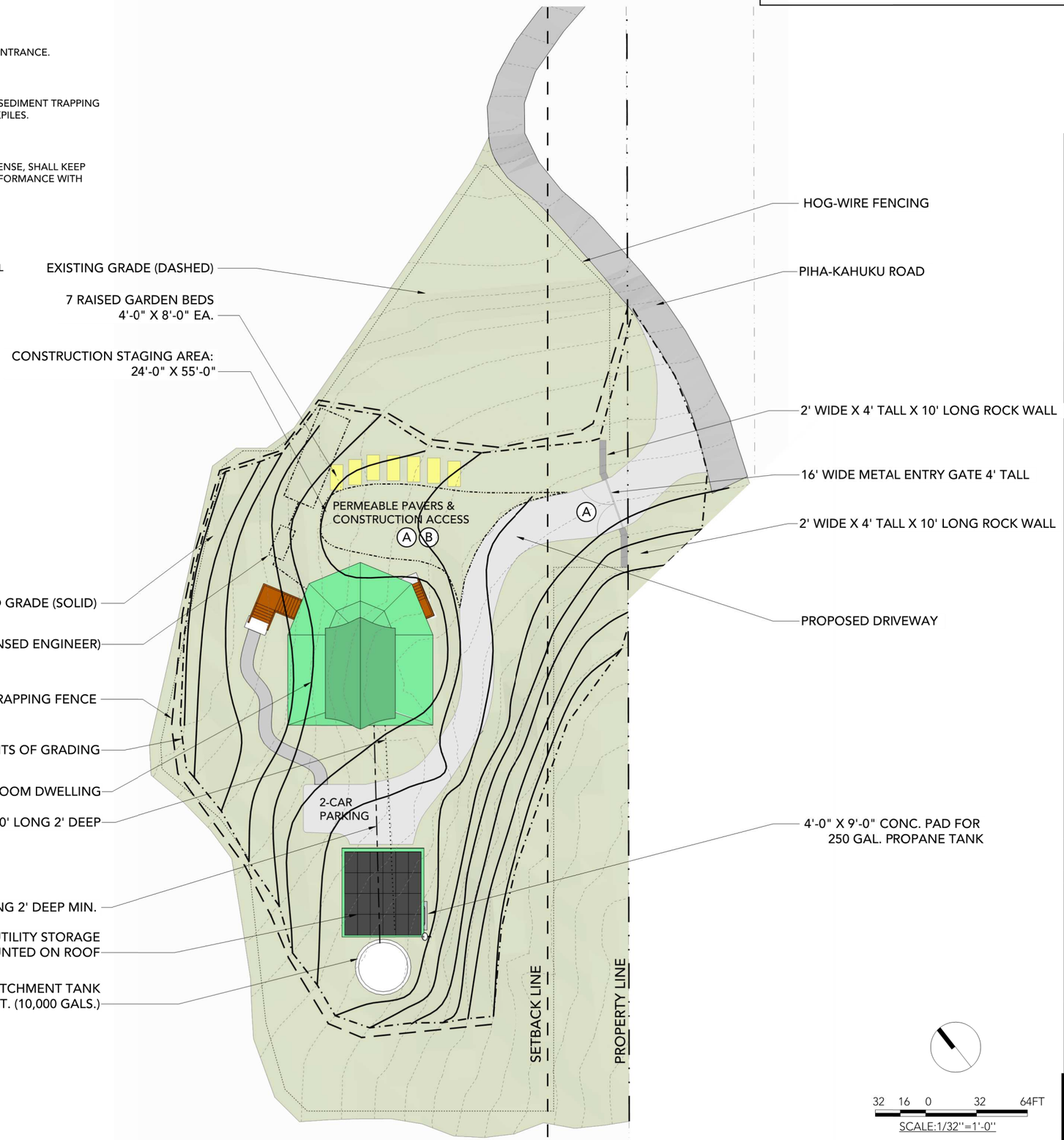
SURFACE FLOW FROM ABOVE AN EXPOSED AREA SHALL NOT BE ALLOWED TO FLOW OVER THE SLOPE WITHOUT PROTECTION. SLOPE PROTECTION SHALL BE USED ON AREAS WITH SLOPES GREATER THAN 50% AND ON AREAS OF MODERATE SLOPES THAT ARE PRONE TO EROSION.

(F) TEMPORARY STABILIZATION

IS NOT REQUIRED WHEN THE DISTURBED AREA WILL BE WORKED WITHIN A 14 DAY PERIOD. STABILIZATION IS REQUIREDFOR DISTURBED AREAS AT FINAL GRADE AND FOR THOSE AREAS THAT WILL NOT BE WORKED WITHIN A 14 DAY PERIOD.

(G) PERMANENT STABILIZATION

ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED PRIOR TO REMOVING EROSION AND SEDIMENT MEASURES. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILLIZATION OR AFTER THE TEMPORARY MEASURES ARE NO LONGER NEEDED. TRAPPED SEDIMENT AND AREAS OF DISTURBED SOIL WHICH RESULT FROM THE REMOVAL OF THE TEMPORARY MEASURES SHALL BE IMMEDIATELY PERMANENTLY STABILIZED.



GRADING TABLE

CUT: 700 CY, MAX HEIGHT = 5'
- TRENCHES: 6 CY
- ROAD WORK: 300
- STRUCTURES: 394

FILL: 700 CY, MAX HEIGHT = 4'
- ROAD WORK: 300
- STRUCTURES: 400

1 A01.2 GRADING SITE PLAN
SCALE: 1/32"=1'-0"

CIRO G. PODANI
LICENSED PROFESSIONAL ARCHITECT
No. 18310
HAWAII, U.S.A.

ARCHITECTURAL LICENSE EXPIRATION DATE: APRIL 30, 2022
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SEAN WINTERER
PACIFIC QUEEN

32-620 PIHA KAHUKU ROAD
Ninole, HAWAII, 96773
(3)-3-2-004-037

DATE: 2/16/2022	DRAWN: BT
JOB:	21013-WINTERER
SCALE:	1/32"=1'-0"

REV.	DATE	REMARK	DRAWN

GRADING SITE PLAN 2

A01.2

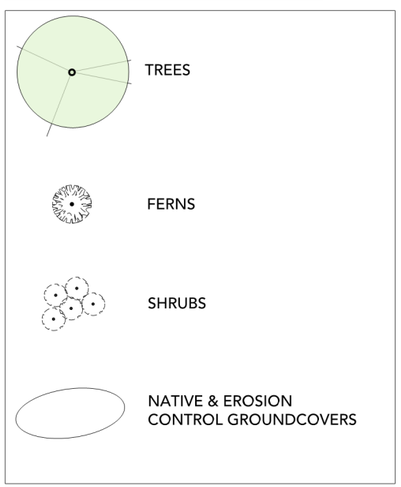
SHEET SIZE: 24X36

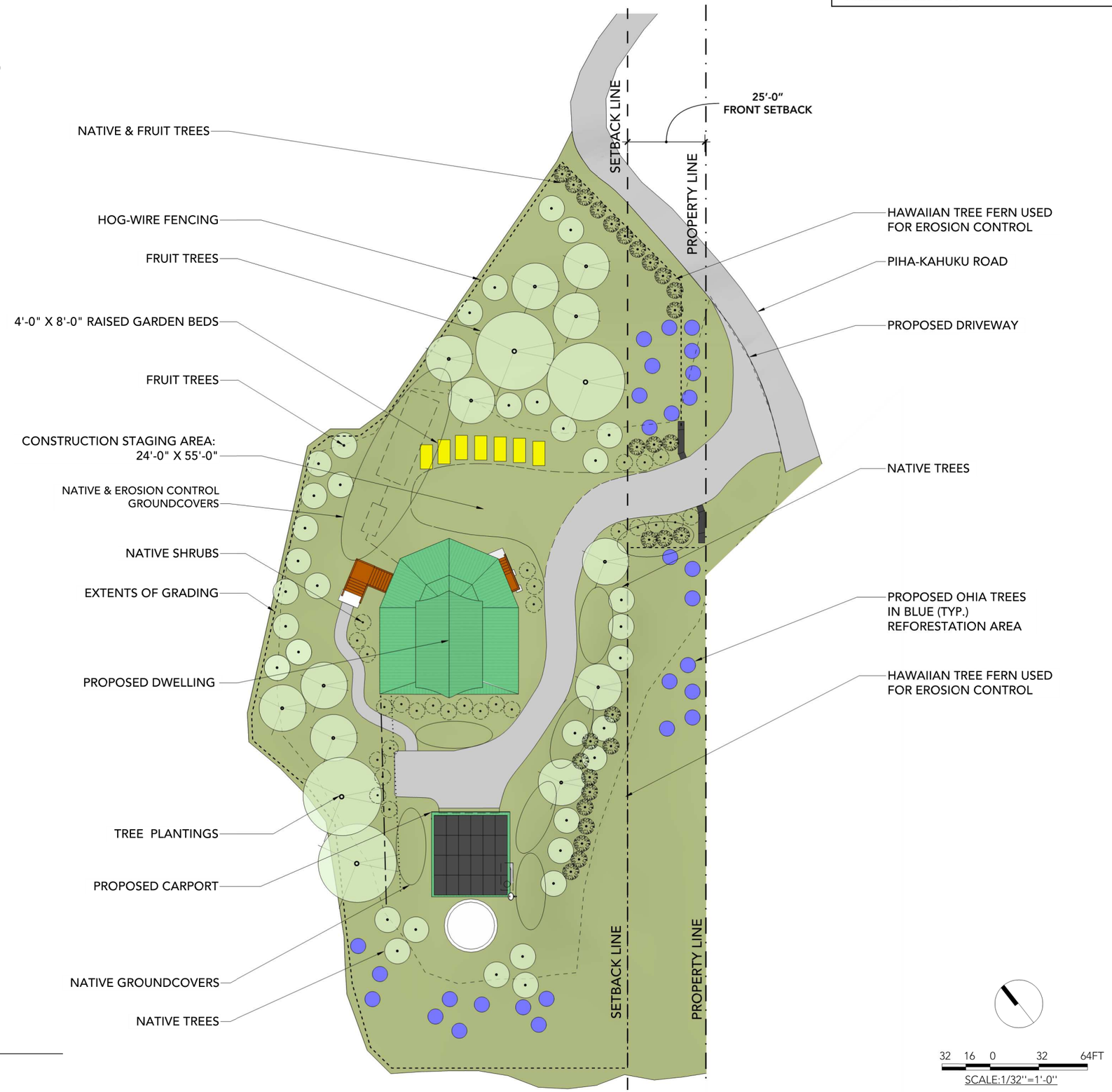
PRELIMINARY NOT FOR CONSTRUCTION

PLANT LIST

COMMON / HAWAIIAN NAME	BOTANICAL NAME
TREES:	
'OHI'A	(METROSIDEROS POLYMORPHA)
CITRUS	(CITRUS SPP.)
SHARWIL AVOCADO	(PERSEA AMERICANA)
BANANA	(MUSA X PARADISIACA)
PAPAYA	(CARICA PAPAYA)
COFFEE	(COFFEA ARABICA)
MACADAMIA	(MACADAMIA INTEGRIFOLIA)
KOA	(ACACIA KOA)
LOULU	(PRITCHARDIA BECCARIANA)
KOPIKO	(PSYCHOTRIA HAWAIIENSIS)
MAMAKI	(PIPTURUS ALBIDUS)
PILO	(COPROSMA SPP.)
FERNS:	
HAPU'U PULU	(CIBOTIUM GLAUCUM)
KUPUKUPU	(NEPHROLEPIS CORDIFOLIA)
SHRUBS:	
AIAKANENE	(COPROSMA ERNODEOIDES)
NAUPAKA	(SCAEVOLA GAUDICHAUDII)
KOLEA	(MYRSINE LESSERTIANA)
NATIVE & EROSION CONTROL GROUNDCOVERS:	
PEANUT GRASS	(ARACHIS PINTOS)
ULUHE	(DICRANAPTERIS LINEARIS)

LANDSCAPE PLANT LEGEND





1 A01.3 LANDSCAPE PLAN
SCALE: 1/32"=1'-0"

CIRO G. PODANI
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No. 18310
HAWAII, U.S.A.

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SEAN WINTERER
PACIFIC QUEEN

32-620 PIHA KAHUKU ROAD
Ninole, HAWAII, 96773
(3)-3-2-004-037

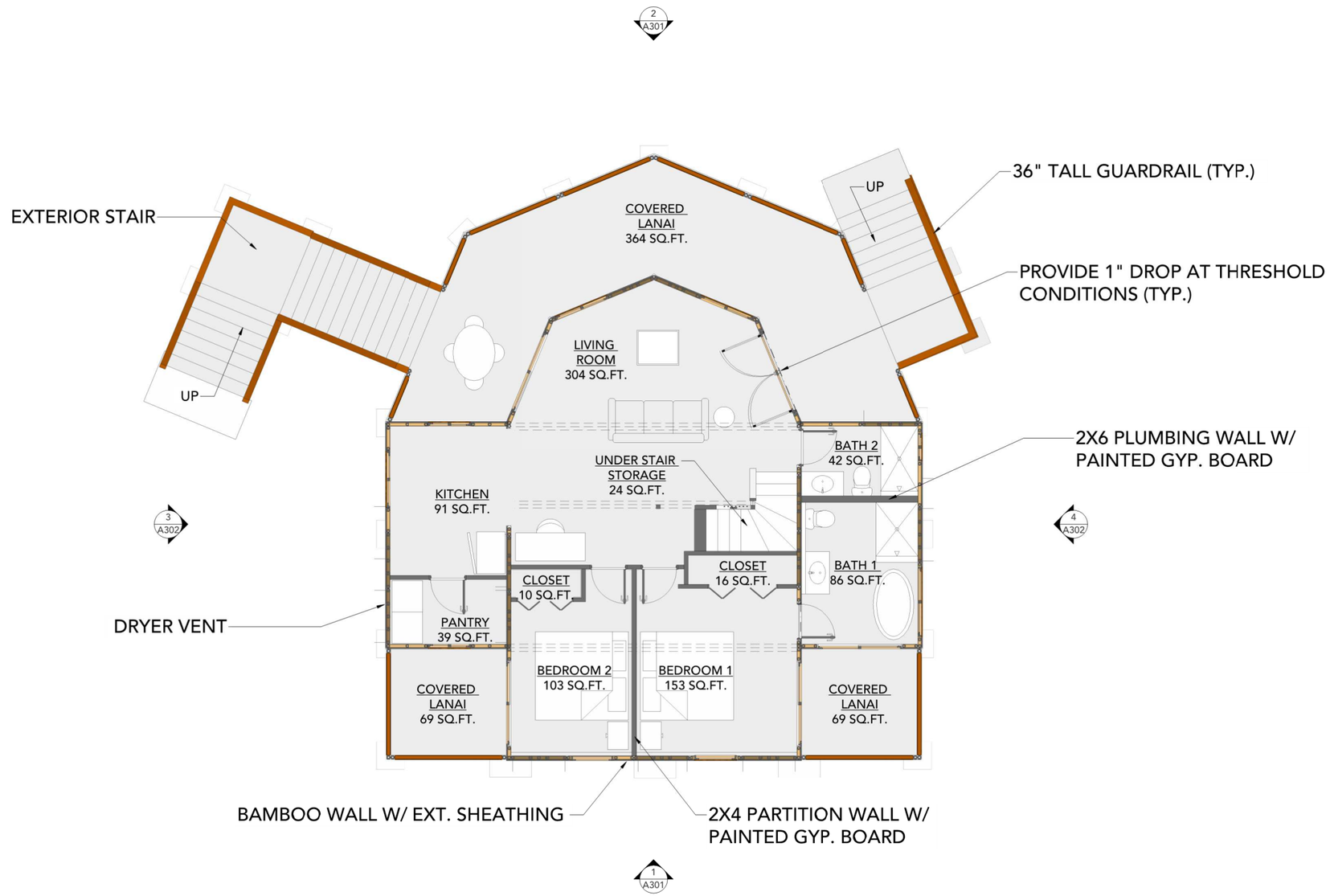
DATE: 2/16/2022		DRAWN:	BT
JOB:			21013-WINTERER
SCALE:			1/32"=1'-0"
REV. DATE	REMARK		DRAWN

LANDSCAPE PLAN

A01.3

SHEET SIZE: 24X36

PRELIMINARY NOT FOR CONSTRUCTION



1 A02.1 1st FLOOR PLAN
SCALE: 1/8" = 1'-0"

8 6 4 2 0 8 16FT
SCALE:1/8''=1'-0''

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NINOLE, HAWAII, 96773
(3)-3-2-004-037

DATE: 1/21/2022 DRAWN: BT
JOB: 21013-WINTERER
SCALE: 1/8" = 1'-0"

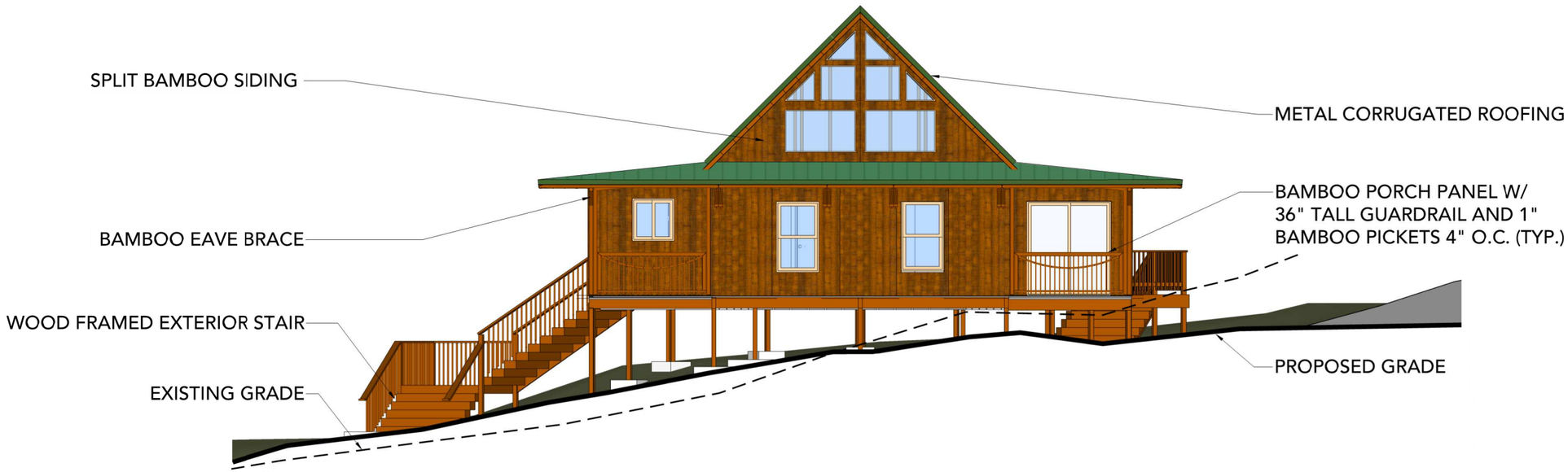
REV.	DATE	REMARK	DRAWN

1st FLOOR PLAN

A02.1

SHEET SIZE: 24X36

PRELIMINARY NOT FOR CONSTRUCTION



1 A03.1 SOUTH ELEVATION
SCALE: 1/8"=1'-0"

2 A03.1 EAST ELEVATION
SCALE: 1/8"=1'-0"

8 6 4 2 0 8 16FT
SCALE:1/8''=1'-0''

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(3)-3-2-004-037

DATE: 1/21/2022 DRAWN: BT
JOB: 21013-WINTERER
SCALE: 1/8"=1'-0"

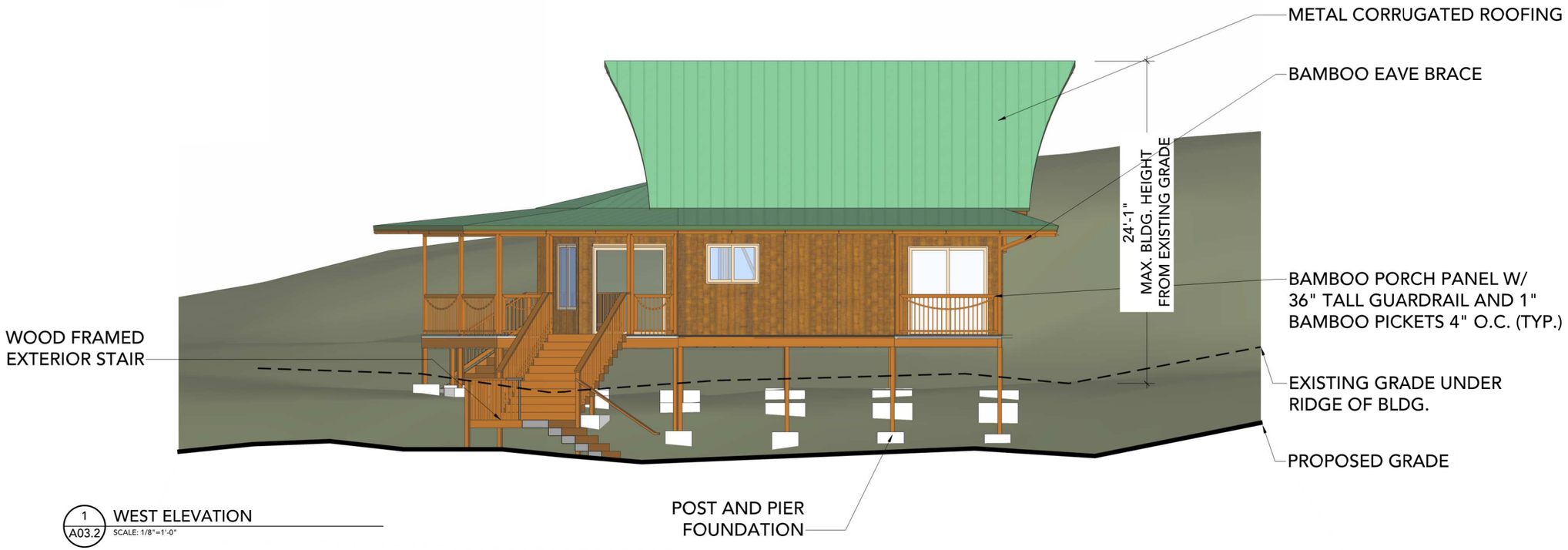
REV. DATE	REMARK	DRAWN

EXTERIOR ELEVATIONS

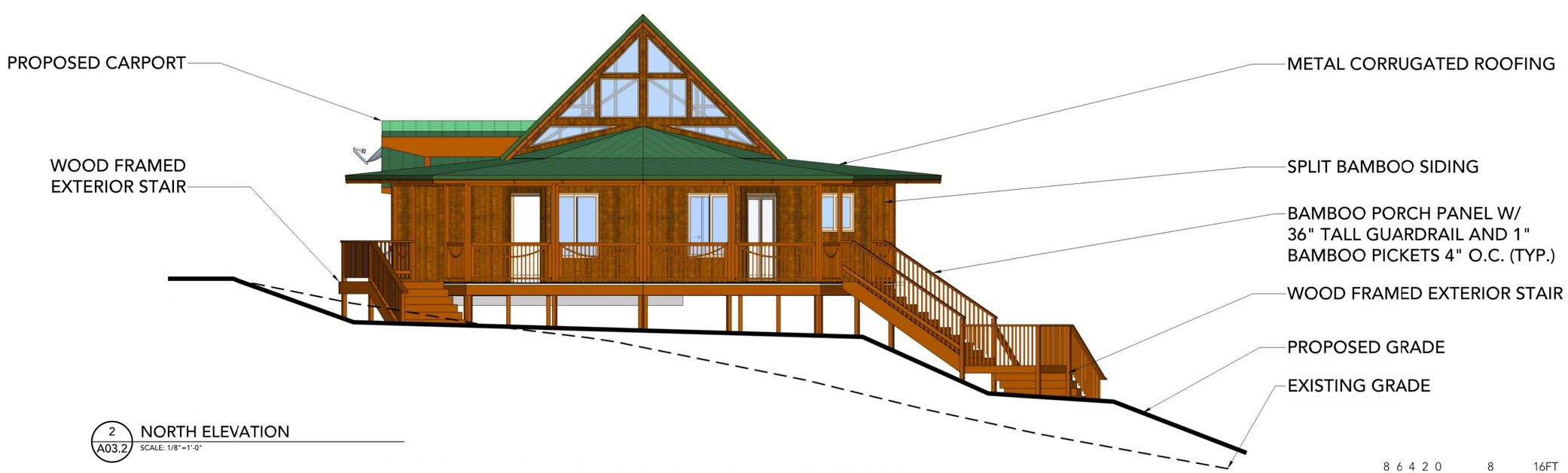
A03.1

SHEET SIZE: 24X36

PRELIMINARY NOT FOR CONSTRUCTION



1 A03.2 WEST ELEVATION
SCALE: 1/8"=1'-0"



2 A03.2 NORTH ELEVATION
SCALE: 1/8"=1'-0"

8 6 4 2 0 8 16FT
SCALE:1/8''=1'-0''

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(3)-3-2-004-037

DATE: 1/21/2022 DRAWN: BT
JOB: 21013-WINTERER
SCALE: 1/8"=1'-0"

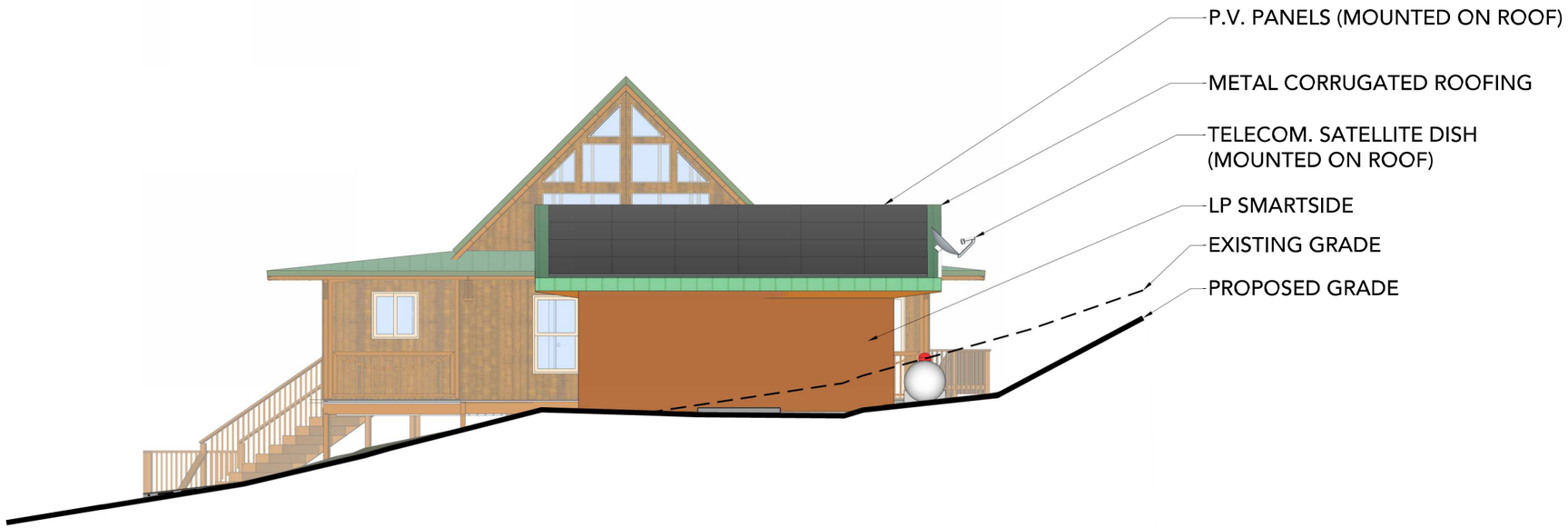
REV. DATE	REMARK	DRAWN

EXTERIOR ELEVATIONS

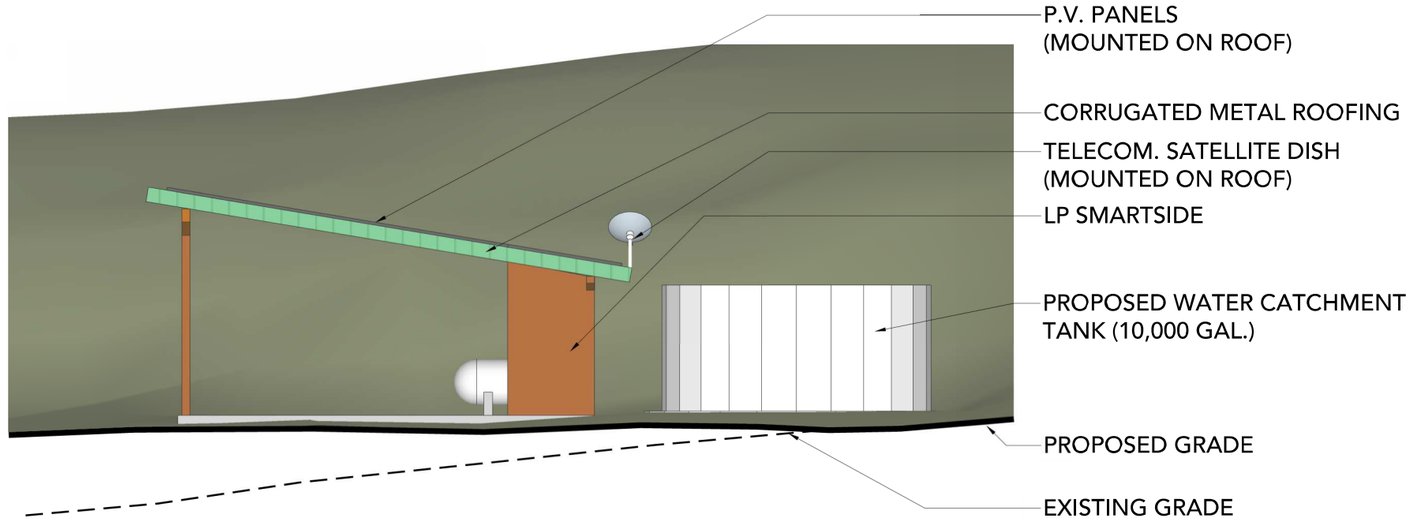
A03.2

SHEET SIZE: 24X36

PRELIMINARY NOT FOR CONSTRUCTION



1 / A03.3 SOUTH ELEVATION
SCALE: 1/8"=1'-0"



1 / A03.3 EAST ELEVATION
SCALE: 1/8"=1'-0"

8 6 4 2 0 8 16FT
SCALE:1/8"=1'-0"

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CUSTOM PORTE COCHERE

NINOLE, HAWAII, 96773
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(3)-3-2-004-037

DATE: 2/11/2022 DRAWN: BT
JOB: 21013-WINTERER
SCALE: 1/8"=1'-0"

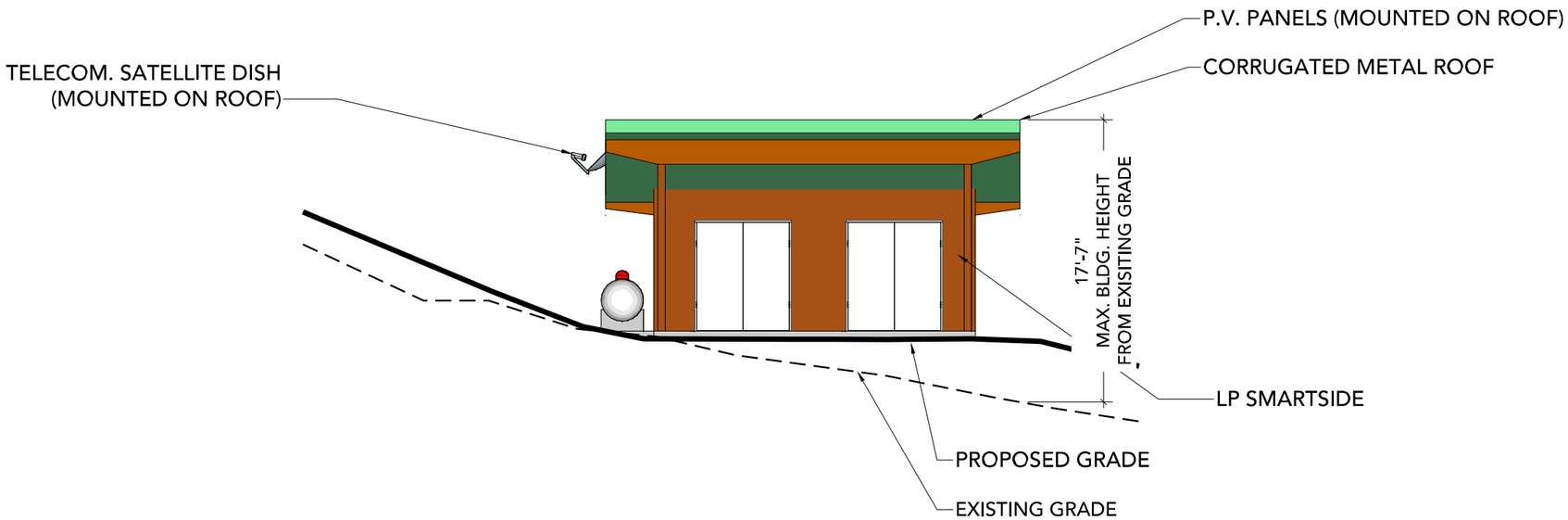
REV. DATE	REMARK	DRAWN

ELEVATIONS

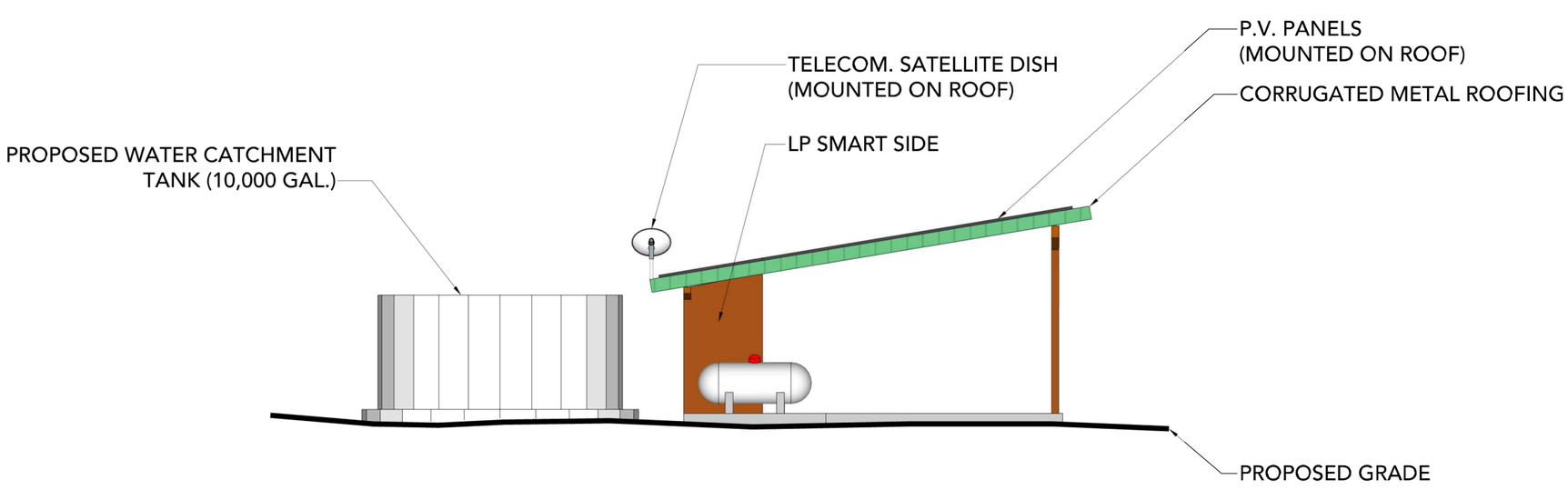
A03.3

SHEET SIZE: 24X36

PRELIMINARY NOT FOR CONSTRUCTION



2 A03.4 NORTH ELEVATION
SCALE: 1/8"=1'-0"



2 A03.4 WEST ELEVATION
SCALE: 1/8"=1'-0"

8 6 4 2 0 8 16FT
SCALE:1/8"=1'-0"

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(3)-3-2-004-037

DATE: 2/11/2022 DRAWN: BT
JOB: 21013-WINTERER
SCALE: 1/8"=1'-0"

REV. DATE	REMARK	DRAWN

ELEVATIONS

A03.4

SHEET SIZE: 24X36

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 200.1, 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 coordination 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 will occur, then the agency will issue a Finding of No Significant Impact (FONSI), and the action may 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
- Office of Hawaiian Affairs
- Department of Land and Natural Resource (DLNR), Land Division, DOFAW and OCCL

Private:
- Sierra Club
- Big Island Invasive Species Committee (BISC)
- Three Nearby Property Owners: Ramos, Storm, Hilinai Wailele Heritage

Copies of communications received during early consultation are contained in Appendix 1a. Notice of the availability of the Draft EA was published in the May 23, 2022 *Environmental Notice*. Appendix1b contains written comments on the Draft EA and the responses to these comments. Various places in the EA have been modified to reflect input received in the comment letters; additional or modified non-procedural text is denoted by double underlines, as in this paragraph.

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 footprint, just west of the extension of Pīhā-Kahuku Road, was chosen because it is the least sloping area adjacent to the already disturbed roadway, minimizing the total area of disturbance to topography and vegetation.

A number of other locations on the large, 17.24-acre 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 17.24-acre property is located near the *mauka* (southeastern, in this case) end of the extension of Pīhā-Kahuku Road, at 1,700 feet in elevation. A number of farms, residences, 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 and by private properties all other sides. 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 Rural South Hilo/North Hilo/Hāmākua Coast (hereinafter, the "Hāmākua Coast").

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. The project architect in consultation with an engineer has determined that 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 Winterer 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 unpaved Pīhā-Kahuku Road extension has been periodically maintained by various owners by stabilizing with gravel, removing fallen trees, etc., 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. 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 home has been designed to withstand hurricane force winds, and all trees with the potential to be fall on the home are planned for removal.

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, the risk of mass wasting has been evaluated and determined to be acceptable, 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 the evacuation zones for tsunami and all dams.

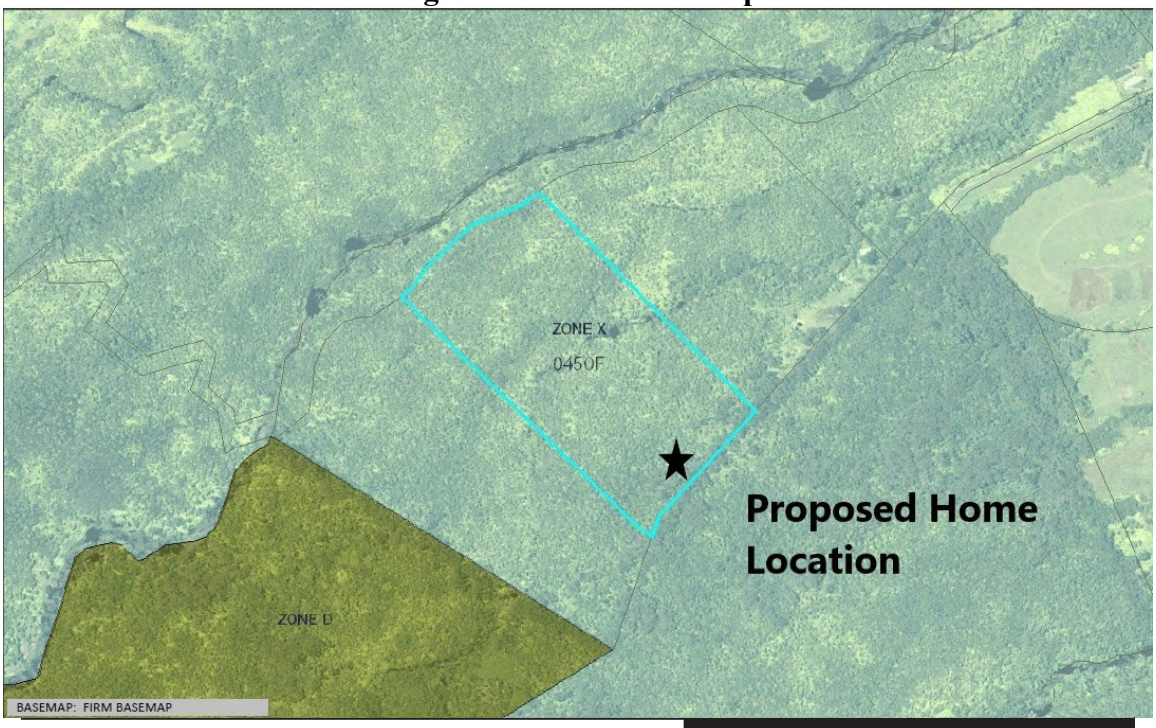
Notwithstanding the lack of a flood zone, the two steep stream channels and the lower portion of the stream banks on either side are subject to periodic stream flooding. Waikaumalo Stream is just outside the northwestern edge of the property, and Kalaeha Stream crosses lengthwise through the middle of 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 unpaved Pīhā-Kahuku Road extension 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, carport and utility area, garden, septic system, water catchment and construction staging area. The area of disturbance would be set back a minimum of 350 feet from Kalaeha Stream. No grading activities would occur in areas with the potential to cause erosion near the stream banks. Because of the steep slopes, high rainfall and muddy and lightly gullied slopes, grading operations must be done with extreme care. 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

Figure 4. Flood Zone Map



Flood Hazard Assessment Report

www.hawaiinfip.org

Property Information

COUNTY:	HAWAII
TMK NO:	(3) 3-2-004:037
WATERSHED:	WAIKAUMALO
PARCEL ADDRESS:	ADDRESS NOT DETERMINED 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/

Pollutant Discharge Elimination System (NPDES) permit. Initial calculations of the total graded area is 20,621 sf (0.4 acres), far less than the one-acre limit over which an NPDES permit is 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 total amount of land disturbance will be minimized. The construction contractor will be limited to the specific delineated construction work areas within the lot.
- All points of egress and ingress to a site shall be protected by a stabilized construction entrance.
- The disturbance area will be marked during construction with orange fencing on the west, south and north (and bounded by the unpaved Pīhā-Kahuku Road extension on the east) to avoid disturbance to the ground or vegetation beyond the disturbance area.
- Slope protection shall be used on areas with slopes greater than 50% and on areas of moderate slopes that are prone to erosion. The contractor will take special precautions, including use of a dual-layer sedimentation control 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, prior to removing erosion and sediment measures.
- Stockpiles shall not be located in drainage ways or other areas of concentrated flows. Sediment trapping shall be used around the base of all stockpiles.
- Dust control should be applied to reduce dust emissions to keep the surroundings free of dust.

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 ʻōhiʻa trees (*Metrosideros polymorpha*), uluhe (*Dicranopteris linearis*) and hapuʻu 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 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 Hawaiʻi 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 invasive plants and suppresses native plants.

The current vegetation of the project site is a mixed native-non-native forest dominated by ʻōhiʻa, strawberry guava (*Psidium cattleianum*) and paperbark (*Melaleuca quinquenervia*). There is a dense shrub layer dominated by the non-native *Melastoma candidum*, but also containing a significant cover of uluhe and hapuʻu. 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. The few native tree species other than ʻōhiʻa– e.g. kawau (*Ilex anomala*) – are found only in scattered locations and are remnants of a once diverse native forest. Among native plant groups, only ferns have retained much diversity in this hyper-wet environment, with 16 species, all but one of them native. The native plants found on the property are generally common in the region, on the island, and throughout the Hawaiian Islands. A list of species detected on the project site and immediately surrounding areas is provided in Table 1.

Environmental Setting: Fauna

During several visits in 2021 that included systematic timed bird observations, we detected very few individual birds on the property and only four bird species: Japanese white-eyes (*Zosterops japonicus*), northern cardinals (*Cardinalis cardinalis*), Japanese bush warblers (*Cettia diphone*), and red-billed leiothrix (*Leiothrix lutea*). Long-term observation would probably reveal a wider bird fauna.

[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.

Table 1. Plant Species Observed on Project Site

Scientific Name	Family	Common Name	Life Form	Status*
Adenophorus hymenophylloides	Grammitidaceae	Palani Huna	Fern	E
Adenophorus pinnatifidus var. pinnatifidus	Grammitidaceae	Wahine Noho Mauna	Fern	E
Adenophorus tamariscinus	Grammitidaceae	Wahine Noho Mauna	Fern	E
Ageratum conyzoides	Asteraceae	Ageratum	Herb	A
Arundina graminifolia	Orchidaceae	Bamboo Orchid	Herb	A
Andropogon virginicus	Poaceae	Broomsedge	Herb	A
Axonopus fissifolius	Poaceae	Carpet Grass	Herb	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	Koster’s Curse	Herb	A
Crotalaria pallida	Fabaceae	Smooth Rattle Pod	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
Elaphoglossum crassifolium	Lomariopsidaceae	Hoe a Maui	Fern	E
Erechtites valerianifolia	Asteraceae	Erechtites	Herb	A
Eucalyptus robusta	Myrtaceae	Eucalyptus	Tree	A
Falcataria moluccana	Fabaceae	Albizia	Tree	A
Fimbristylis dichotoma	Cyperaceae	Fimbristylis	Herb	I
Grammitis tenella	Grammitidaceae	Kolokolo	Fern	E
Heliocarpus popayanensis	Malvaceae	White Moho	Tree	A
Ilex anomala	Aquifoliaceae	Kawau	Tree	I
Lepisorus thunbergianus	Polypodiaceae	Pakahakaha	Fern	I
Ludwigia octovalvis	Onagraceae	Kamole	Herb	A
Melaleuca quinquenervia	Myrtaceae	Paperbark Tree	Tree	A
Melastoma candidum	Melastomataceae	Asian Melastome	Shrub	A
Mimosa pudica	Fabaceae	Sensitive Plant	Herb	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
Paspalum urvillei	Poaceae	Vasey Grass	Grass	A
Plantago major	Plantaginaceae	Common Plantain	Herb	A
Psidium cattleianum	Myrtaceae	Strawberry Guava	Tree	A
Persicaria capitata	Polygonaceae	Knotweed	Shrub	A
Psilotum nudum	Psilotaceae	Moa	Fern Ally	I
Schizachyrium condensatum	Poaceae	Tufted Beardgrass	Herb	A
Spermacoce assurgens	Rubiaceae	Buttonweed	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

The formerly federally endangered Hawaiian hawk (*Buteo solitarius*) (still listed by the State of Hawaiʻi) is a raptor that hunts in all parts of the Hāmākua Coast. Some of the tall trees on the property could theoretically provide nesting habitat. As the biological surveys occurred during the hawk nesting season (March 1-September 30), we conducted a hawk survey by scanning visually for nests and playing amplified hawk call playback in multiple locations. No hawks were seen or heard and no hawk nests were observed.

The relatively low elevation on the project site leads to warm temperatures that promote mosquitos, which are inimical to most small native forest birds. None were identified, but it is highly likely that the property is occasionally utilized by the Hawai'i ʻamakihi (*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 the island of Hawaiʻi, several threatened or endangered pelagic seabirds may overfly the Ninole area between the months of May and November, including the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the endangered band-rumped storm petrel (*Oceanodroma castro*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*). These seabirds hunt over the ocean during the day and fly to higher elevations at night to nest. The Hawaiian petrel was formerly common on the Island of Hawaiʻi, nesting in large numbers on the slopes of Mauna Loa, in the saddle between Mauna Loa and Mauna Kea, and at the mid-to-high elevations of Hualālai. In recent historic times it has been reduced to relict breeding colonies at high elevations on Mauna Loa, Kohala and, possibly, Hualālai. The Hawaiian petrel (as well as the band-rumped storm petrel) generally nest on the Big Island well above 5,000 feet in elevation. Some Hawaiian petrel nests have recently been found at lower elevations on Kohala volcano. Both the Newell's shearwater and Hawaiian petrel are known to burrow under ferns on forested mountain slopes. These burrows are used year after year, usually by the same pair of birds. Although capable of climbing shrubs and trees before taking flight, they need an open downhill flight path through which they can become airborne. Once abundant on all the main Hawaiian islands, most Newell's shearwater colonies today are found in the steep terrain between 500 to 2,300 feet on Kauaʻi. Band-rumped storm petrels have recently been discovered to be nesting on the Mauna Loa side of the saddle between this mountain and Mauna Kea. Each of these seabirds may fly over the Ninole area on their way to and from mountain nesting areas and the open ocean. Despite the presence of uluhe ferns at the project site, the dense strawberry guava and Asian melastome understory precludes an open downhill flight path and makes the habitat unsuitable for these seabirds.

The primary cause of mortality in these seabird species in Hawaiʻi is thought to be predation by alien mammals at the nesting colonies. Collision with man-made structures is another significant cause. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. Disoriented seabirds may collide with manmade structures and, if not killed outright, become easy targets of predatory mammals including cats and mongooses.

It is highly likely that the Hawaiian hoary bat (*Lasiurus cinereus semotus*), the only native Hawaiian land mammal, is sometimes present on the property. Bats have been found throughout the Hāmākua Coast and

in most areas on the island of Hawai‘i. They may forage for flying insects on the Winterer property on a seasonal basis and may also roost in trees and large shrubs. Bats are often visible while they are feeding on flying insects near dusk and dawn at various locations around the island of Hawai‘i. The presence of these bats can also be verified by ultrasound detectors or radar. If a bat is detected during a night's study, this merely indicates that they were present in the area. Conversely, the absence of bat detections does not indicate an absence of bats, which may have been absent for only a night, a week, or a season, or may have simply gone undetected. Actual determination of bat populations or usage patterns requires much more sophisticated, long term studies. No bats were observed in our survey, which took place in full daylight and did not use any detection equipment. For the purposes of this assessment, it is presumed that Hawaiian hoary bats are present at least some of the time, as they have frequently been seen or detected by ultrasound and radar in ‘ōhi‘a-uluhe-strawberry guava-Asian melastome forests. Hawaiian hoary bats are vulnerable to disturbance during the summer pupping season and require special mitigation measures.

Some native waterbirds might also be present in or near the property, particularly at Waikaumalo Stream, just beyond the far northwestern boundary. In the 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. The threatened Hawaiian goose or nēnē (*Branta sandwicensis*) has become very common on many Hawaiian islands and can be found at elevations ranging from sea level to sub-alpine areas above 7,000 feet. Historically, flocks moved between high-elevation feeding habitats and lowland nesting areas. Nests consist of a shallow scrape lined with plant material and down. Breeding pairs usually return to the previous year's nest site, typically in dense vegetation. Nēnē have an extended breeding season, and nesting may occur in all months except May, June, and July. Because of the lack of grassy areas or water bodies, the project site appeared to be very poor habitat for nēnē browsing and particularly for nesting. Surveys did not observe any signs of nēnē and they are very unlikely to be present.

Even less likely to be seen at the project site are two endangered waterbirds that are occasionally present at other locations in the Hāmākua coast: the Hawaiian duck or koloa maoli (*Anas wyvilliana*), and the Hawaiian coot or ‘alae ke‘oke‘o (*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. The proposed home site is over 1,000 feet from Waikaumalo Stream.

Aside from the Hawaiian hoary bat, all mammals in the project area are 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 *Hawai'i 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 square miles, indicating a long, narrow watershed with few tributaries – typical of streams in fairly young volcanic slopes. The maximum elevation of the watershed is 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 'o'opu alamo'o (*Lentipes concolor*), 'o'opu 'akupa (*Eleotris sandwicensis*), 'o'opu nākea (*Awaous guamensis*), (*Kuhlia xenura*), and 'o'opu nōpili (*Sicyopterus stimpsonis*), as well as the native shrimp or ōpaekala'ole (*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 1,000 feet of Waikaumalo Stream itself. Kalaeha Stream, one of three smaller tributary streams to Waikaumalo Stream, is 350 feet away and 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 by Geometrician Associates 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 graded footprint of 20,621 sf combined with its location in an area of the property with no highly sensitive flora or fauna resources limits the biological impacts to negligible levels. Based on an average density of about one mature ʻōhiʻa tree per every 200-300 sf, approximately 90-130 ʻōhiʻa trees would be removed in the graded area plus a 10-foot wide buffer area, to ensure that any ʻōhiʻa trees where roots could be damaged by adjacent grading are proactively removed. Twenty-six ʻōhiʻa trees obtained from air layering of existing onsite trees will be planted within or near the graded area. In the context of the 17.24-acre site, which is entirely composed of a mixed Asian melastome/ʻōhiʻa forest, the impact to the number of ʻōhiʻa trees is miniscule.

No rare, threatened or endangered plant species are present. Although there are a number of native plants, the area of impact is also heavily infested by invasive plants. The great majority of the property will not be disturbed, preserving the native forest, such as it is. The owner wishes to establish some native plants within the disturbance footprint and also remove and prevent re-establishment of weedy invasives species, as shown in Figure 3 (Landscape Plan Sheet). Plants that will be established include kolea (*Myrsine lessertiana*), kopiko (*Psychotria hawaiiensis*), kupukupu (*Nephrolepis cordifolia*), and loulu (*Pritchardia beccariana*). With minimal care and input, the native component of the vegetation could increase.

An issue for construction projects located in ʻōhiʻa forests has recently surfaced. A pair of related fungi called *Ceratocystis lukuohia* and *C. fimbriata* has led to a disease that is new to science and new to Hawaiʻi – Rapid ʻŌhiʼa Death (Hawaiʻi DOFAW 2017). This disease has killed hundreds of thousands of ʻōhiʻa trees across more than 34,000 acres of the Big Island. It was first discovered in Lower Puna. Projects that harm or relocate ʻōhiʻa trees can spread the disease, and mitigation measures are recommended, although it is important to recognize that treatment protocols are evolving. Recent discussions with the U.S. Forest Service as part of other EA consultation revealed that ōhiʻa posts or lumber from local trees may be utilized onsite or offsite for construction with proper inspection/treatment from certified specialists. As discussed above, ōhiʻa trees are planned for careful removal in the disturbance area and in a 10-foot wide zone immediately adjacent, where the trees are being removed to avoid root damage from adjacent grading, which could weaken the trees and make them more susceptible to ROD. The following mitigation is recommended:

- Prior to work, if desired, consult with DLNR-DOFAW on the possibility of inspection, treatment and beneficial re-use of logs onsite or offsite, and strictly follow protocol for re-use.
- Decontaminate boots and work tools prior to entering/after leaving the construction site.
- Identify any ʻōhiʻa trees that do not need to be removed or affected within or adjacent to the disturbance area and ensure that their trunks, branches or roots are not accidentally broken during site preparation and construction.
- When cutting ʻōhiʻa, stack all removed material once cut; dispose of all non re-used ʻōhiʻa material (logs, branches and twigs, etc.) by burying onsite (may chip first); do not remove any ʻōhiʻa material from project site.
- Treat any unavoidable scars to prevent infestation of the fungus.

The project avoids sensitive locations directly adjacent to streams, and in fact no activities whatsoever are proposed for the portion of the property traversed by Kalaeha and Waikaumalo Streams. 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 March 1 and September 30, 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.
- To avoid potential seabird downing through interaction with outdoor lighting, no construction or unshielded equipment lighting will be used after dark between the months of April and October. Minimal exterior lighting is planned, and it will be shielded in strict conformance with the Hawai‘i County Outdoor Lighting Ordinance (Hawai‘i County Code Chapter 9, Article 14). Lighting will be constrained to utilize only low light emitting fixtures using blue-deficient filtered LED lights with a Correlated Color Temperature (CCT) of 2700 Kelvin or less (as feasible given commercially available fixtures), and shielded to protect both transiting seabirds and dark skies.

The Hawai‘i Division of Forestry and Wildlife commented on the EA, recommending a survey for Hawaiian damselflies (see Appendix 1b). There are several somewhat common damselflies native to Hawai‘i Island, and two endangered ones: the Pacific damselfly (*Megalagrion pacificum*), with only one known population on the island, and orange-black damselfly (*M. xanthomelas*), a coastal wetlands species currently known only from various low-elevations on the Island of Hawai‘i. The IUCN red listing for this species (Polhemus 2020) lists the maximum elevation of the species at this time as 380 meters, about half of the elevation of the current property. The likelihood of spotting either species on the project site is extremely remote. Non-listed damselfly species could be very occasionally be present, but there is no reason to suspect that a single family residence located far away from stream banks would have any material effect on the health of such species. In the four visits by project biologists to the property, no damselflies were observed at the project site. This is in keeping with observations made as part of the Saddle Road project, where damselflies were only found near ponds, wetlands and streams and not in forest lacking such water bodies. To survey for damselflies at the species level requires a highly trained entomologist and a permit that is difficult and time-consuming to obtain, because of the potential to collect and harm a listed species. In any case, in the unlikely event that an individual of either of the two listed species was observed, the U.S. Fish and Wildlife Service (USFWS) recommends implementation of certain BMPs regarding work in aquatic environments to minimize the degradation of water quality and impacts to fish and wildlife resources. Most of these BMPs are related to work in and near streams. The project was specifically designed to stay away from streams. The proposed home is located a minimum of 325 feet from Kalaeha Stream, which is almost inaccessible due to dense uluhe. The remaining USFWS

BMPs are standard sedimentation and pollution BMPs that are already part of the project, as documented above in Section 3.1.2. It is extremely unlikely that a listed damselfly is present, and all reasonable mitigation to protect damselflies has already been included. For these reasons, the applicant believes that such a survey is not necessary.

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 is occasionally blown into this part of the North Hilo Coast when the volcano is erupting. Noise on the site is very low, and what sounds exist are mostly natural, primarily birdsong and wind in trees. The occasional helicopter overflight causes some noise.

This densely 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 to the public. 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. There are no sensitive noise or visual receptors in the vicinity –no houses or other structures within 600 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 new 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 measures:

- 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 DLNR;
- Should spills occur, spill prevention procedures 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 Winterer property is located near the *mauka* end of the extension of Pīhā-Kahuku Road, about three 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 U.S. Post Office box building still remains. Since the demise of sugar cane, the area at first lost population but then began to regain it, mostly from new residents to Hawai'i, many attracted by large lots in the uplands on which they could farm or ranch, host a vacation rental, enjoy as a peaceful hideaway, or commute to Hilo. More and more residents tele-commute to jobs around the globe, a phenomenon that increased with the worldwide Covid-19 pandemic.

Ninole is too small to be measured as a discrete unit by the U.S. Census Bureau, but 2,114 residents were counted in the North Hilo District of which Ninole is a part in the 2020 U.S. Census (https://www.census.gov/library/visualizations/2021/geo/demographicmapviewer.html). This least populous of all judicial districts on the island has seen small but steady growth since the figure of 1,541 in 1990 and 2,041 in 2010.

Impacts and Mitigation Measures

No adverse socioeconomic impacts are expected to result from building or occupying the residence. The

project will have a very small positive economic impact for the County of Hawai‘i. The residence will not adversely affect population or demand for services. A discussion of the socio-cultural issue of forest access for hunting and gathering is contained in the next section of this EA.

3.2.2 Cultural and Historic Resources

An archaeological assessment survey and a cultural impact assessment for the less than 0.45-acre portion of the Winterer property that encompasses all of the potential disturbance associated with the project are attached as Appendices 2 and 3, respectively. 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. Research for these reports included primary fieldwork; research in archaeological and ethnographical studies and primary documents including maps and Mahele testimony; results of a recent consultation for a single-family residence (Geometrician Associates 2019) on the adjacent property that included descendants of original grantees and several hunting program officials of the Division of Forestry and Wildlife (DOFAW); and new consultation with some of the same informants as in 2019 and also several other individuals. Separately, the Office of Hawaiian Affairs, Councilperson Heather Kimball, the Sierra Club, DOFAW officials and three 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 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, 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 had their allegiance to a territorial chief or *mo‘i* (literally translated as king) (Hommon 1986). The Winterer 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 Winterer 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 about Hilo Palikū in their translation of the legendary account "*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'ele*.
> 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 in his book *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 he 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 North Hilo's lower forests and along stream margins.

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 elevational bands of Pīhā comprised various social-ecological zones that differed not only in resources but also sacredness. 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*.

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 the explorer's death on the shores of the bay.

During the early 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 sugar cane, 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 *'aumakua* 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 Hawai'i 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 'Aina* took place in 1848, placing all land in Hawai'i 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 Ahupua'a is not listed in the Buke Māhele. According to the DLNR, Division of Forestry and Wildlife's Na Ala Hele Program (Geometrician Associates 2019, Appendix 1b, letter of December 14, 2018), in Appendix 1b):

> The land of Piha 1 &2 was never assigned or awarded at the time of the Mahele of 1848. Controversy arose over the ownership of this land when the Trustees of the Estate of Bernice Pauahi Bishop claimed this land as an heir to certain lands which had been continuously held and claimed by her ancestors. In order to settle the controversy a compromise was proposed whereby the Minister of the Interior conveyed other lands to the Trustees who in tum conveyed the land of Piha (besides other lands) to the Kingdom of Hawaii on December 20, 1890. Thus the land of Piha was made a part of the Government land of the Kingdom of Hawaii.

J. Dominis, agent of the Crown Lands, would later apply for the settlement of Pīhā Ahupuaʻa's boundaries. 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 Winterer 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.

Starting around 1870, sugar cane cultivation began to dominate the economy and transform land use in many parts 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 100 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 the mill site, where it was then processed. The Hakalau Mill, built in 1890 at the foot of a 200-foot sea cliff at the edge of 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 sugar cane.

The fields of the Hakalau Plantation Company never reached as far *mauka* as what is now the Winterer property, which remained forested 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 next property *mauka* of the Winterer 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., questioned the boundary between the homesteads and the adjoining lands owned or controlled by the company, which it 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 Winterer 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).

This lease was never fully executed and Lots 1-8 were eventually sold to various homesteaders. Lot 2, the Winterer property, was purchased (along with Lot 1) 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 Winterer property throughout the first half of the twentieth century, but by the early 1940s, nearly 40 percent of the sugar cane 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 basis 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 coffee to mushrooms to tea have occupied some of the lands and employ growing numbers of workers. Tourism based on the attractions in and near Honoka‘a and Honomū 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.

Many cultural experts focused on Hawaiian traditions prior to Western contact do not consider hunting of feral pigs a traditional Hawaiian cultural practice (Maly et al n.d.), despite it being a cherished tradition in the islands for over a century and a half. The pigs the Polynesians originally introduced were for the most part domesticated. While an important food product and cultural resource in ancient Hawai‘i, they were not recreationally hunted (Ibid.). As the *wao* was 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 sub-species, which

thrived on a seemingly endless supply of forest forage, every layer of the *wao* has been infiltrated, contributing to the continual degradation of other flora and fauna in Hawaiian forests. The 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.

Despite all the change, there is a feeling of continuity and heritage in this community. In the words of the draft Hāmākua Community Development Plan (Hawai‘i 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 Waipi‘o 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 Hawai‘i 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 ‘ohana-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 Winterer property was facilitated by a bird catcher's trail that followed the boundary between Kahuku and Pīhā ahupua‘a, passing near the eastern boundary of the Winterer property. This trail once intersected with a canoe maker's trail from Nanue Ahupua‘a near the *mauka* boundary of Kahuku Ahupua'a, southwest of the Winterer 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 unpaved extension of the Pīhā-Kahuku Homestead Road. Historic use of the property in Pīhā Homesteads, which was purchased by William Breithaupt in 1916, could 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 1-acre portion of the property where all ground disturbance will take place. It was conducted on July 27, 2021 by Lauren Kepaʻa, B.A. and Johnny Dudoit, B.A. under the direct supervision of Matthew R. Clark, M.A. (Principal Investigator). During the survey, fieldworkers walked northwest/southeast-oriented pedestrian transects spaced at 10-meter intervals across the entire project site. At the time of the survey, the project site was fully accessible, the boundaries were clearly identifiable in the field, and vegetation cover only moderately limited ground visibility. The team of archaeologists identified no archaeological remains.

By DLNR, State Historic Preservation Division (SHPD) policy, archaeological surveys may not be submitted to SHPD or reviewed by this agency prior to the processing of a permit that requires consideration of archaeological resources. DLNR-OCCL requires that the EA be submitted as part of the permit application. As such, it has not been possible for the applicant to submit the survey to SHPD as of the date of preparation of the EA. The survey report was provided to SHPD for their review and comment on site identification, significance and treatment recommendations as part of the EA and CDUA review process. An SHPD letter of May 31, 2022 stated that the survey was reviewed and approved by SHPD, which concurred with OCCL's project effect determination of "no historic properties affected," pursuant to HAR § 13-284-7(a)(1) (see Appendix 1b), which concludes the HRS 6E historic preservation review process. 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 will be halted and SHPD contacted in compliance with Hawaiʻi Administrative Rules 13§13-280.

Cultural Resources and Practices

Research on the historical and cultural context of the area provided a broad basis for understanding potential cultural sites and practices that could be affected by home development on the project site. The area was at the limits of the *wao kanaka* and *wao laʻau*. These areas of Pīhā were traditionally used for the procurement of special resources, especially 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 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 was probably on or near the route of the Pīhā-Kahuku Road extension that provides access to the Winterer property, the property *mauka* and the forest reserve. Review of these testimonies showed that a canoe road in Nanue, the *ahupuaʻa* just northeast of the Winterer property where the *ahupuaʻa* of Kahuku terminates, extended *mauka* to 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 located 200 feet *mauka* of the Winterer 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 Hawai'i. 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.

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. The project team sought to actively consult with individuals who had knowledge of cultural practices and sites in the general area, and if possible, on the project site itself.

Consultation was sought in various ways. A notice describing the action and location and inviting consultation was published in the Office of Hawaiian Affairs (OHA) newspaper *Ka Wai Ola* (August 2021). The descendants of former landowners from the homestead era were also contacted. Finally, equipped with the knowledge from a previous consultation for a home for Pedro Ramos adjacent to the Winterer property (Geometrician Associates 2019) that the primary regional resources are associated with forest use, the cultural team at ASM Affiliates consulted with officials and individuals with expertise in the management or use of these resources.

To date, there has been no response to the *Ka Wai Ola* notice. As part of the 2019 consultation, 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. In 2019, in addition to consultation within the cultural impact assessment, the EA project team discussed hunting access with Victor Souza, a resident of Pīhā-Kahuku Road who hunts locally. Mr. Souza was born and

raised in Pīhā on a property at the *makai* end of the homestead originally obtained by his grandmother located. In 2021, Mr. Souza again provided additional information to the cultural impact assessment team, who also contacted hunters Keola Medeiros and Drean Barley but did not receive any responses.

As part of the previous consultation, contact was made with the following DLNR-DOFAW officials: Joey Mello, at that time the Hawai‘i Branch Wildlife Program Manager for East Hawai‘i; Steve Bergfeld, DOFAW Branch Manager; David Penn, the Program Specialist for the Land Conservation/Native Ecosystems Protection & Management; and Clement Chang, at the time the Nā Ala Hele Trails and Access Specialist. The 2021 consultation contacted some of the same individuals, and also Jackson Bauer, the current Nā Ala Hele Trails and Access specialist; and Ian Cole, current Wildlife Program Manager.

The full record of the consultation is detailed in Appendix 3. The summary below weaves together the current effort and the 2019 consultation in the interest of brevity. A key finding during both efforts was that consultees were interested in the game present of the Hilo Forest Reserve as well as plant resources. Access to the Hilo Forest Reserve was thus a concern.

Accurate information concerning historical and modern access points to Unit C of the Hilo Forest Reserve (which begins 200 feet *mauka* of the Winterer property) was obtained during the 2019 interviews with Ian Cole. This area is utilized to hunt feral pigs and wild sheep, particularly in the upper reaches of Pīhā and nearby Laupāhoehoe within the Hilo Forest Reserve. He indicated that DOFAW does maintain a presence in the Pīhā section of the reserve, particularly above Laupāhoehoe and in *mauka* Pīhā. DOFAW is 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 decreasing hunter access into the forest reserve has been and remains as a particularly a troublesome issue in the Hāmākua Coast. However, he did not have concern that 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 Unit C is certainly not accessible through privately-owned property, including the Winterer property. According to Mr. Cole, in 2019 the only truly publicly accessible entrance into the Unit C hunting area was far *mauka* on Mānā Road, where a hunter check station is present. He related that there was at that time no formal *makai* access to Unit C through the Pīhā-Kahuku Road that extends to the northeastern corner of the Winterer property (despite the presence of an old DOFAW sign on the road stating “Hilo Forest Reserve Piha Section Right of Way Trail”). He noted that a number of informal access points exist in various locations in North Hilo and have been and are still utilized by individuals seeking to hunt within the reserve. There are several hunter check stations (e.g. in Laupāhoehoe and ‘Ō‘okala) which hunters use to access different hunting units. 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 was not possible in 2019.

Since 2019 there has been progress in improving hunter access in this area. DLNR recently installed a hunter check-in station near the Coast Guard telecommunications facility at the top of the public portion of Pīhā-Kahuku Road, promoting sanctioned access of the Hilo Forest Reserve from the *makai* side in the

Ninole area. Mr. Cole noted in 2021 that he was not sure how frequently hunters utilize this area, but since they have installed the hunter check-in station, the DLNR has begun to collect data regarding its use. Mr. Bergfeld stated that it is important for landowners who live in the vicinity of the forest reserve to know that even though they may not see a lot of hunters, hikers, cultural gatherers or other forest users and activity regularly, , ensuring unobstructed access to the forest reserve is vital.

Jackson Bauer, the DLNR Nā Ala Hele Trails and Access Specialist, spoke with ASM personnel on September 2, 2021. Mr. Bauer explained that historically many trails that extended into the forest, appear to have followed the *ahupua'a* boundaries. Because of the local substrate and vegetation, finding physical evidence of the trail is often difficult. He noted that prior to the plantation and homesteads, the subject parcel was likely intact native forest, and access to the uplands of Pīhā would have been for specific cultural practices including bird hunting and *koa* harvesting. He also suspects that those who came into this forested area did so periodically and likely stayed for short durations, leaving little to no evidence of their time there. He added that development of homesteads in the early 20th century altered land use. He noted that Nā Ala Hele prepared an abstract for TMK: (3) 3-2-004:038) (located just *mauka* of the Winterer property) in 2018. The abstract found that in 1941, the original Pīhā-Kahuku Road was realigned to its current location and that this road (which provides access to the Winterer property) is the agreed-upon public access road to the forest reserve. Mr. Bauer emphasized that although this portion of the road is not paved, it is a public County road and that any development must not impede upon its boundaries or block access into the forest reserve. It should be noted that the County of Hawai'i Department of Public Works appears to disagree, as it has stated that the public portion of the road ends at the end of the pavement and the County has no obligation to maintain the portion of the road above here.

In a 2018 interview with the author of this EA concerning building of a home by Pedro Ramos on the most *mauka* lot, resident and hunter Victor Souza recalled 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 (which is now the DOFAW hunter access trail), and a secondary route up the unpaved Pīhā-Kahuku Road extension. The latter route was formerly in such bad shape that it was usually walked rather than driven. When he was informed of Mr. Ramos' understanding of the access situation and plans to accommodate it, he said that a home appeared acceptable.

In the subsequent interview with Mr. Souza in 2021 by ASM staff, he shared memories of growing up in Pīhā and hunting in the forest reserve. He recalled the Winterer property always being forested. He used old trails, some of which followed the streams or plantation ditches and flumes to enter the forest. The streams provided drinking water during their hunting trips. When asked about other uses of the streams, he shared that they used to gather 'ōpae (shrimp) and watercress that were planted in patches along the stream. He recalled the 'ōpae being prepared "poke" style or fried. He noted that today, he no longer sees 'ōpae and that the streams have become filled with algae. He shared that his family would hunt between from Hakalau all the way to 'O'okala and that one of the practices of the hunters was to maintain the trails. Mr. Souza spoke specifically about a trail known as "Paperbark Trail." In describing the route of this trail, Mr. Souza stated that the trail went along Waikaumalo stream to the hunting area which was marked by a paperbark tree and orchids and anthuriums, the latter two of which were planted by his

family members. He shared that while growing up, hunting was a particularly important activity, especially during the mid-1940s (~1946) when the plantation workers went on strike. He described that during the strike, the community members would rotate their hunting expeditions and that they had set up a camp in an area further *mauka* with a "lake" surrounded by Alexander palm trees. The pigs they caught were brought down from the mountains and taken to the local "soup kitchen," where they were prepared into a meal and distributed to the community. He said that in this way, "the whole community had food." He commented that during the plantation era, there was always access to the forest, but after the closure of the plantation, access became limited. He described the Pīhā forest as "being so much more beautiful" then than today, with hāpuʻu ferns instead of strawberry guava and other invasive species.

To summarize, forest resources in the area are culturally important, both as the site of traditional cultural practices which may not necessarily be occurring today but should not be foreclosed, and also for current practices, particularly hunting by local residents for subsistence and recreation. The key to these resources is access to the Hilo Forest Reserve, which is public land set aside for watershed protection but also actively managed for recreation, gathering and hunting. Investigations of the property and its history did not reveal any cultural resources or practices on the project site itself, which is less than half an acre of moderately degraded forest. No consulted individuals with ties to and history with the area had any specific information concerning this area, and no archaeological features are present. No gathering of plant or animal material is noted from the project site. The streams on the property area located far from the proposed home and other improvements and would not be affected by any aspect of the proposed action.

Impacts to and Mitigation for Cultural Resources and Practices

The proposed single-family residence would utilize only a tiny portion of the property and all forest resources elsewhere would remain untouched. In former times, the *wao* of Pīhā was used for forest medicinal plants, bird-catching and the hewing and carving of koa wood for canoes. While these activities may be uncommon in the area today, they may someday be revived, as long as the forest remains. The forest reserve is also important for the historic-era tradition of pig hunting and the communing with the *wao* this practice affords. The primary impact to such practices occurs when access is constricted, which is an ongoing trend since the closure of the plantations and the purchase of tracts of land by private individuals, who are often from out of state and may not understand or respect Hawai'i's traditions. Access to the Hilo Forest Reserve in this area is particularly important because there are so few access routes from the *makai* parts of Pīhā and adjacent *ahupuaʻa*. Because of this, DOFAW recently developed a hunter check-in station that is located at the top of the paved portion of Pīhā-Kahuku Road. This helped formalize the trailhead for the most common access route to the forest reserve, which runs south of and parallel to the unpaved portion of Pīhā-Kahuku Road that is the site of the Winterer home. Although it is likely that most hunters will increasingly prefer this well-used and marked trail, consultation with neighbors, DLNR officials and others through the EA for the both the Ramos and Winterer homes indicated that hunters sometimes drive to the end of the rough 4WD extension of Pīhā-Kahuku Road beyond the Winterer property and access the forest reserve from there. Development of the Winterer

property will not interfere with those who choose this alternate route to the Hilo Forest Reserve, and Mr. Winterer acknowledges and supports this access.

As such, the proposed construction of a single-family residence on the Winterer 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, 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 that has been encroached upon and slowly overrun by invasive species. The cultural impact assessment concluded that the proposed development of a single-family residence on the Winterer 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. No party reviewing the Draft EA supplied any cultural information.

3.3 Public Roads, Services and Utilities

3.3.1 Roads and Access

Existing Environment, Impacts and Mitigation Measures

The single-lane, unpaved road providing access to the property is an extension of the paved Pīhā-Kahuku Road constructed perhaps a century ago to serve the Pīhā-Kahuku Homesteads. The road winds in and out of the access corridor designated when these lots were subdivided. According to the Hawaiʻi County Real Property Tax Office map information, the County's jurisdiction ends near the southern corner of TMK (3) 3-2-4:06, about 1,000 feet *makai* of the subject property. The Hawaiʻi County Department of Public Works has stated that the extension of Pīhā-Kahuku Road is beyond its jurisdiction, and maintenance is the responsibility of the property owners of the lot owners. As discussed in the previous section, the DLNR Na Ala Hele program considers the road public, with permitted public access that should not be blocked. In any case, the construction of the Winterer home will not interfere in any way with access.

3.3.2 Public Utilities and Services

Environmental Setting, Impacts and Mitigation Measures

Rooftop-mounted solar photovoltaic panels together with a backup generator would provide electricity, and cellular service along with 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 adjacent to the home (see Figure 3 for location). The proposed 10,000-gallon 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 tank.

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. Winterer 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 the paved section of Pīhā-Kahuku Road located *makai* of the Winterer lot. 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

(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 and areas for accessory uses 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 Hawaiʻi.

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 nearly every resident of the island would occur.

HĀMĀKUA COMMUNITY DEVELOPMENT PLAN

The Hāmākua Community Development Plan (CDP) planning area encompasses the judicial districts of Hāmākua and North Hilo as well as a portion of the South Hilo district commonly referred to as Rural South Hilo (Wainaku to Hakalau). It was developed under the framework of the February 2005 County of Hawai‘i General Plan and was adopted in 2018 per Ordinance 2018-078. (https://www.hawaiicounty.gov/our-county/legislative/office-of-the-county-clerk/records).

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 Winterer 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 has been made fully aware of the need 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, Hawai‘i Revised Statutes (HRS), entitled *Coastal Zone Management*. It would not affect public access to recreational areas, historic resources, scenic and open space resources, coastal ecosystems, economic uses, or coastal hazards, and would not result in any substantial adverse impact on the surrounding environment. No threatened or endangered species or valuable coastal flora or fauna would be affected. Standard clearing, lighting and seasonal survey mitigation will be employed to ensure no adverse impacts to threatened or endangered animals. There will be no adverse effect on the economy. The property is not situated over any natural drainage system or water feature that would flow into coastal ecosystem. No floodplains are present in the affected area. No beaches or other shoreline resources would be affected in any way. No historic sites or cultural resources and practices would be affected, and access to the Hilo Forest Reserve would be preserved.

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 single-story with a storage loft, 2-bedroom/2-bath, 2,620 square feet in size (including lanais, stairways, carport and utility structures such as propane and water tanks), and outside the flood zone. It will be in an 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.

An individual wastewater system compliant with Department of Health regulations and adherence to Best Management Practices to minimize or completely avoid water pollution will ensure that 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

Based on the findings below, and upon consideration of comments to the Draft EA, the applicant expects that the State of Hawaiʻi, 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).

4.2 Findings and Supporting Reasons

Chapter 11-200.1-13, Hawaiʻi Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

(a) In considering the significance of potential environmental effects, agencies shall consider and evaluate the sum of effects of the proposed action on the quality of the environment.

(b) In determining whether an action may have a significant effect on the environment, the agency shall consider every phase of a proposed action, the expected impacts, and the proposed mitigation measures. In most instances, an action shall be determined to have a significant effect on the environment if it may:

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 less than acre of disturbance on the 17.24-acre property. No adverse impact upon vegetation or endangered species should occur. An archaeological 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. *Curtail the range of beneficial uses of the environment.* No restriction of beneficial uses would occur by residential use on this lot.

3. *Conflict with the State's environmental policies or long-term environmental goals established by law*. The State's long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policies are to conserve natural resources and enhance the quality of life. The project is environmentally benign and minor, and it is thus consistent with these policies.

4. *Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and 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. Cultural practices would not be affected.

5. *Have a substantial adverse effect on public health.* The project would not affect public health and safety in any way. An individual wastewater system compliant with Department of Health regulations and adherence to Best Management Practices to minimize or completely avoid water pollution will ensure that the proposed single-family residence will not be detrimental to public health.

6. *Involve adverse 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. *Involve a substantial degradation of environmental quality*. The project is minor and environmentally benign, and thus it would not contribute to environmental degradation.

8. *Be individually limited but cumulatively have substantial adverse 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.

9. *Have a substantial adverse effect on a rare, threatened, or endangered species, or its 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. Only very minor exterior lighting is planned, and it will be shielded and will consist of blue-deficient lighting such as filtered LED lights or amber LED lights, with a Correlated Color Temperature (CCT) of 2700 Kelvin. This will reduce the risk that transiting threatened or endangered seabirds may be attracted to and then disoriented by the lighting.

10. *Have a substantial adverse effect on 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 few residences and no parks or other sensitive uses nearby, will help avoid noise impacts. Best Management Practices during grading, which will occur in a very limited area, will prevent erosion and sedimentation impacts.

11. *Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.* 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. *Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, 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. Only very minor shielded, low-blue exterior lighting is planned, which will protect dark skies reduce the risk that the threatened or endangered seabirds that may be attracted to and then disoriented by the lighting.

13. *Require substantial energy consumption or emit substantial greenhouse gases*. Negligible amounts of energy input and greenhouse gas emission would be required for construction and occupation of the residence. The residence is designed to support efficient use of energy and materials and facilitate natural ventilation and lighting. The home will also have roof-mounted photovoltaic panels, reducing energy use and greenhouse gas emissions. Energy-efficient appliances will be used throughout the house.

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

APPENDIX 1a
Comments in Response to Early Consultation

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geometrician
ASSOCIATES, LLC
integrating geographic science and planning

phone: (808) 969-7090 10 Hina Street Hilo Hawai'i 96720 rterry@hawaii.rr.com

October 21, 2021

Dear Neighbor or Agency/Organization Official:

Subject: Early Consultation for Environmental Assessment for Sean Winterer Proposed Single-Family Residence in the Conservation District, North Hilo District, Island of Hawai‘i, TMK (3rd.) 3-2-004:037

I have been contracted by property owner Sean Winterer to prepare an Environmental Assessment (EA) in compliance with Chapter 343, Hawai‘i Revised Statutes and Title 11, Chapter 201.1, Hawai‘i Administrative Rules. Mr. Winterer plans to build a home and conduct associated improvements on an approximately 1-acre portion of his 17.24-acre property in Piha Homesteads. The remainder of the property would not be developed. The property is located near the mauka end of Piha-Kahuku Road, at 1,700 feet in elevation, in the North Hilo District of the Island of Hawai‘i (see map below).

The conceptual plan for the home, which is under development, currently consists of a single-story home with a storage loft and two bedrooms, two baths, a living room and kitchen, and several lanai. The home will feature solar photovoltaic electricity, a water catchment system, and an individual wastewater system. In addition to the house pad, a driveway, 2-car carport and a turnaround pad will be built. The EA will include detailed descriptions and illustrations of the final design. The great majority of the native ‘ōhi‘a and tree ferns scattered in the area will be conserved, and invasive plants, including strawberry guava, eucalyptus and various melastomes, will be removed to make way for landscaping utilizing native and Polynesian species meant to provide an attractive setting near the home and restore native forest surrounding it. A small area will be set aside for a garden of vegetables and fruit trees. A landscaping plan will be included in the EA.

A botanical survey has determined that no threatened or endangered plant species are present. Clearing timing restrictions will help prevent impacts to Hawaiian hawks and endangered Hawaiian hoary bats, which are present throughout most of the island of Hawai‘i. An archaeological survey found no archaeological sites, and a cultural impact assessment is currently underway.

An EA is necessary because the property is within the State Land Use Conservation District, and the EA will accompany a Conservation District Use Application. The areas of investigation in the EA will include but not be limited to the following: water quality assurance; wastewater treatment; flora, fauna, and ecosystems; traffic impacts; geology, soils, and hazards; flooding and drainage impacts; social, cultural and community impacts; and historic sites. This letter is to share information about the project and request your input on site conditions, issues that you wish to be addressed in the EA, and any other concerns you may have.

Please contact me at (808) 969-7090 or by email at rterry@hawaii.rr.com if you have any questions or require clarification. Kindly indicate whether you wish to receive notice of the availability of the Draft EA when it is completed.

Sincerely,

Ron Terry, Principal
Geometrician Associates

Property Location Map

© Google Earth

Mitchell D. Roth
Mayor

Paul K. Ferreira
Police Chief

Kenneth Bugado Jr.
Deputy Police Chief

County of Hawai`i
POLICE DEPARTMENT
349 Kapi'olani Street • Hilo, Hawai'i 96720-3998
(808) 935-3311 • Fax (808) 961-2389

October 26, 2021

Mr. Ron Terry, Principal
Geometrician Associates, LLC
10 Hina Street, Hilo, HI 96720
rterry@hawaii.rr.com

Dear Mr. Terry

SUBJECT: EARLY CONSULTATION FOR ENVIRONMENTAL ASSESSMENT

Staff has reviewed your request for comments regarding your proposed project.

The Hawai'i Police Department has no concerns as it relates to traffic and public safety on this project.

If you need further assistance, please contact Captain Reynold Kahalewai, Hamakua District Commander, at (808)775-7533 or via email at reynold.kahalewai@hawaiicounty.gov.

Sincerely,

JAMES B. O'CONNOR
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

RK:lli/21HQ1101

Mitchell D. Roth
Mayor

Lee E. Lord
Managing Director

Kazuo S.K.L. Todd
Fire Chief

Eric H. Moller
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

October 29, 2021

Ron Terry, Principal
Geometrical Associate
10 Hina Street
Hilo, Hawai'i 96720
Email: rterry@hawaii.rr.com

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Sean Winterer Proposed Single-Family Residence in the Conservation District, North Hilo District TMK (3) 3-2-004:037

We are in receipt of your letter dated October 21, 2021 in regards to a Early Consultation Environmental Assessment finding of no significant Impact for the above listed subject. The Hawai'i Fire Department has no comments or issues.

If you should have any questions, please feel free to contact my office at (808) 932-2911.

Mahalo,

KAZUO S.K.L TODD
Fire Chief

KV/ds

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

M. KALEO MANUEL
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:RB

Correspondence HA-22-68

NOV 10 2021

Ron Terry, Principal
Geometrician Associates
10 Hina Street
Hilo, Hawaii 96720

SUBJECT: Pre-Consultation for the Preparation of a Draft Environmental Assessment (EA) for the Proposed Construction of a Single-Family Residence (SFR) Located at North Hilo District, Island of Hawaii
TMK: (3) 3-2-004:037

Dear Mr. Terry,

Thank you for your pre-consultation correspondence regarding the preparation of the draft EA. The rules and regulations regarding Environmental Impact Statement Rules are noted as Hawaii Administrative Rules, §11-200.1. The subject property lies in 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 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 and the filing of an HRS, 6E Intake Form for historic compliance. To allow, modify or deny the proposed land use would be at the discretion of the Board of Land and Natural Resources.

The subject property is approximately 17.2 acres and not an ocean front lot. Pursuant to the HAR §13-5, Exhibit 4, "for lots larger than one (1) acre, the maximum developable area is 5,000 square feet." For lots over one acre the minimum setbacks for the front, sides, and back are 25 feet. Refer to the HAR §13-5 Exhibit 4 for additional single-family residential standards.

The draft Environmental Assessment (EA) should site and describe all improvements for the proposal. This would include the proposed residence, access, utilities, landscaping and any other proposed work including trenching and grading. Alternatives that may include other possible sites for the residence or other alternatives should be included with the draft. Proposed mitigation and best management practices before, during and after the proposed construction should be described. For all proposed landscaping, preference shall be given to native, indigenous, and endemic species. The introduction of invasive plant species is prohibited in the Conservation District.

The HAR, Chapter 13-5 known as the rules and regulations of the Conservation District is available on our website at dlnr.hawaii/occl.com. Should you have any questions, please feel free to contact Rachel Beasley at Rachel.e.beasley@hawaii.gov or 798-6481 (work cell) or email at rachel.e.beasley@hawaii.gov.

Sincerely,

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

cc: County of Hawaii, 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

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

Nov 17, 2021

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 District, Island of Hawaii; TMK: (3) 3-2-004:037 on behalf of Sean **Winterer**

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

At this time, enclosed are comments from the (a) Engineering Division, (b) Commission on Water Resource Management, (c) Office of Conservation & Coastal Lands, and (d) Land Division-Hawaii District on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosures
cc: Central Files

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

October 28, 2021

MEMORANDUM

FROM:

~~TO:~~ **DLNR Agencies:**
___Div. of Aquatic Resources
___Div. of Boating & Ocean Recreation
_X_Engineering Division (DLNR.ENGR@hawaii.gov)
_X_Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___Div. of State Parks
_X_Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
_X_Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
_X_Land Division – Hawaii District (gordon.c.heit@hawaii.gov)

TO:

~~FROM:~~ Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District
LOCATION: North Hilo District, Island of Hawaii; TMK: (3) 3-2-004:037
APPLICANT: Geometrician Associates, LLC on behalf of Sean **Winterer**

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **November 17, 2021.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

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

Signed: *CSChang*
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Nov 9, 2021

Attachments
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
Location: North Hilo District, Island of Hawaii
TMK(s): (3) 3-2-004:037
Applicant: Geometrician Associates, LLC on behalf of Sean Winterer

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). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 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 zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT) could also be used to research flood hazard information.

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) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: Nov 9, 2021

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON

MICHAEL G. BUCK
ELIZABETH A. CHAR, M.D.
NEIL J. HANNAHS
AURORA KAGAWA-VIVIANI, PH.D.
WAYNE K. KATAYAMA
PAUL J. MEYER

M. KALEO MANUEL
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

November 16, 2021

REF: RFD.5826.8

TO: Mr. Russell Tsuji, Administrator
Land Division

FROM: M. Kaleo Manuel, Deputy Director
Commission on Water Resource Management

SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District

FILE NO.: RFD.5826.8
TMK NO.: (3) 3-2-004:037

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://dlnr.hawaii.gov/cwrm.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EAP as having high water efficiency can be found at http://www.epa.gov/watersense.

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://planning.hawaii.gov/czm/initiatives/low-impact-development/

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at http://energy.hawaii.gov/green-business-program.

☐ 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at

http://www.hawaiiscape.com/wp-content/uploads/2013/04/LICH_Irrigation_Conservation_BMPs.pdf.

☐ 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

☐ 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.

☐ 11. The Hawaii Water Plan is directed toward the achievement of the utilization of reclaimed water for uses other than drinking and for potable water needs in one hundred per cent of State and County facilities by December 31, 2045 (§174C-31(g)(6), Hawaii Revised Statutes). We strongly recommend that this project consider using reclaimed water for its non-potable water needs, such as irrigation. Reclaimed water may include, but is not limited to, recycled wastewater, gray water, and captured rainwater/stormwater. Please contact the Hawai'i Department of Health, Wastewater Branch, for more information on their reuse guidelines and the availability of reclaimed water in the project area.

☐ 12. A Well Construction Permit(s) is (are) are required before the commencement of any well construction work.

☐ 13. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 14. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 15. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☒ 16. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a steam channel.

☒ 17. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

☐ 18. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 19. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☐ OTHER:

If you have any questions, please contact Dean Uyeno of the Commission staff at 587-0234.

R Correspondence HA 22 68

DAVID Y. IGE
GOVERNOR OF HAWAII

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

2021 OCT 28 P 12: 10

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 28, 2021

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources
___Div. of Boating & Ocean Recreation
X Engineering Division (DLNR.ENGR@hawaii.gov)
X Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___Div. of State Parks
X Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
X Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
X Land Division – Hawaii District (gordon.c.heit@hawaii.gov)

2021 NOV 16 AM 11: 03
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
RECEIVED LAND DIVISION

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District
LOCATION: North Hilo District, Island of Hawaii; TMK: (3) 3-2-004:037
APPLICANT: Geometrician Associates, LLC on behalf of Sean **Winterer**

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **November 17, 2021.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

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

Signed: R B
Print Name: Rachel Beasley
Division: OCCL
Date: 11/12/21

Attachments
cc: Central Files

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

October 28, 2021

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources
___Div. of Boating & Ocean Recreation
_X_Engineering Division (DLNR.ENGR@hawaii.gov)
_X_Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___Div. of State Parks
_X_Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
_X_Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
_X_Land Division – Hawaii District (gordon.c.heit@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District
LOCATION: North Hilo District, Island of Hawaii; TMK: (3) 3-2-004:037
APPLICANT: Geometrician Associates, LLC on behalf of Sean **Winterer**

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **November 17, 2021.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

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

Signed: _____
Print Name: GORDON C. HEIT
Division: Land Division
Date: 11/08/21

Attachments
cc: Central Files

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

Nov 18, 2021

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 District, Island of Hawaii; TMK: (3) 3-2-004:037 on behalf of Sean **Winterer**

Thank you for the opportunity to review and comment on the subject matter. In addition to our previous comments dated November 17, 2021, enclosed are comments from the Division of Forestry & Wildlife on the subject matter. Should you have any questions, please feel free to contact Darlene Nakamura at (808) 587-0417 or email: darlene.k.nakamura@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosure
cc: Central Files

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

October 28, 2021

MEMORANDUM

TO: **DLNR Agencies:**
___Div. of Aquatic Resources
___Div. of Boating & Ocean Recreation
_X_Engineering Division (DLNR.ENGR@hawaii.gov)
_X_Div. of Forestry & Wildlife (rubyrosa.t.terrago@hawaii.gov)
___Div. of State Parks
_X_Commission on Water Resource Management (DLNR.CWRM@hawaii.gov)
_X_Office of Conservation & Coastal Lands (sharleen.k.kuba@hawaii.gov)
_X_Land Division – Hawaii District (gordon.c.heit@hawaii.gov)

FROM: Russell Y. Tsuji, Land Administrator *Russell Tsuji*
SUBJECT: Early Consultation for Environmental Assessment for Proposed Single-Family Residence in the Conservation District
LOCATION: North Hilo District, Island of Hawaii; TMK: (3) 3-2-004:037
APPLICANT: Geometrician Associates, LLC on behalf of Sean **Winterer**

Transmitted for your review and comment is information on the above-referenced subject matter. Please submit comments by **November 17, 2021.**

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Darlene Nakamura at darlene.k.nakamura@hawaii.gov. Thank you.

BRIEF COMMENTS:

( ) We have no objections.
( ) We have no comments.
( ) We have no additional comments.
(☑) Comments are included/attached.

Signed: DGS
Print Name: DAVID G. SMITH, Administrator
Division: Division of Forestry and Wildlife
Date: Nov 18, 2021

Attachments
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

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

November 17, 2021

MEMORANDUM *Log no. 3399*

TO: RUSSELL Y. TSUJI, Administrator
Land Division

FROM: DAVID G. SMITH, Administrator
Division of Forestry and Wildlife

SUBJECT: **Division of Forestry and Wildlife Comments for Early Consultation for an Environmental Assessment (EA) Regarding a Proposed Single-Family Residence in the Conservation District in the North Hilo area, Hawai'i.**

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for early consultation for an EA regarding Sean Winterer's proposed single-family residence on a1-acre portion of his 17.24-acre property in Piha Homesteads, North Hilo District, Island of Hawai'i, TMK: (3) 3-2-004:037. The proposed project consists of building a single-story two-bedroom home with photovoltaic electricity, a water catchment system, an individual wastewater system, a driveway, 2-car carport, a turnaround pad, native landscaping, and a garden of vegetables and fruit trees.

We appreciate the inclusion of mitigation measures in the cover letter from Geometrician Associates, LLC., intended to avoid construction and operational impacts to State listed Hawaiian Hoary Bat or 'Ōpe'ape'a (*Lasiurus cinereus semotus*), and Hawaiian Hawk or 'Io (*Buteo solitarius*). We also appreciate the measures outlined in the permit application to use native plant species. DOFAW provides the following additional comments on the potential of the proposed work to affect listed species in the vicinity of the project area.

As noted, the Hawaiian Hoary Bat could potentially occur in the vicinity of the project area and may roost in nearby trees. Any required site clearing should be timed to avoid disturbance to bats during their birthing and pup rearing season (June 1 through September 15). During this period woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed. Barbed wire should be avoided for any construction because bat mortalities have been documented as a result of becoming ensnared by barbed wire during flight.

State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*), Hawaiian Goose or Nēnē (*Branta sandvicensis*), and Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*) may potentially occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, all activities within 100 feet (30 meters) should cease and the bird should not be approached. Work may

continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the Hawai'i Island Branch DOFAW Office at (808) 974-4221.

Artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade structures or grounding of birds. For nighttime work that might be required, DOFAW recommends that all lights used be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens (e.g., Rapid 'Ōhi'a Death), vertebrate and invertebrate pests (e.g., Little Fire Ants), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the Big Island Invasive Species Committee (BISC) at (808) 933-3340 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species. Gear that may contain soil, such as work boots and vehicles, should be thoroughly cleaned with water and sprayed with 70% alcohol solution to prevent the spread of Rapid 'Ōhi'a Death and other harmful fungal pathogens.

To prevent the spread of Rapid 'Ōhi'a Death (ROD), if 'ōhi'a trees are present and will be removed, trimmed, or potentially injured DOFAW requests that the information and guidance at the following website be reviewed and followed: https://cms.ctahr.hawaii.edu/rod.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Paul Radley, Protected Species Habitat Conservation Planning Coordinator at (808) 295-1123 or paul.m.radley@hawaii.gov.

Sincerely,

DAVID G. SMITH
Administrator

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

APPENDIX 1b
Comments to Draft EA and Responses

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DAVID Y. IGE
GOVERNOR OF
HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

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

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

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

REF:OCCL:RB

CDUA: HA-3895
Acceptance Date: 5/9/22
180-day Exp. Date: 11/5/22

Jun 24, 2022

James M. Leonard
J M Leonard Planning, LLC
56 Laukona Street
Hilo, HI 96720

SUBJECT: Conservation District Use Application (CDUA) HA-3895 for a single-family residence (SFR) Located at Piha, North Hilo, Hawaii, Tax Map Key (TMK) (3) 3-2-004:037

Dear Mr. Leonard:

This letter is regarding the processing of CDUA HA-3895 and associated Environmental Assessment (EA). The public and agency comment period on this application has closed (6/22/22). Attached to this letter are copies of the comments received by the Office of Conservation and Coastal Lands (OCCL) regarding the CDUA/EA.

Please send copies of your responses to the questions and comments raised in these letters directly to the authoring agency as well as to the OCCL. The final copy of your EA must include your responses to the queries raised in these letters pursuant to Hawaii Administrative Rules (HAR) 11-200.1-20 (c). These responses can be attached to the end of the Final EA document.

Please send 2 hard copies and an electronic format of the Final EA to the OCCL by July 27, 2022. The OCCL will send you notice of determination regarding the EA and actions to be taken.

Early submittal of your response to comments will expedite the review process. Should you have any questions regarding matters pertaining to CDUA HA-3895, contact Rachel Beasley at (808) 798-6481or email rachel.e.beasley@hawaii.gov.

Sincerely,

S Michael Cain

Michael Cain, Administrator
Office of Conservation and Coastal Land

Attachments

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

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
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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: RB

CDUA: HA-3895
Acceptance Date: 5/9/22
180-Day Exp. Date: 11/5/22
SUSPENSE DATE: 21 Days from stamped date

MEMORANDUM

MAY 10 2022

FROM: ~~TO:~~

STATE AGENCIES

x DLNR-Resource Enforcement

____ DLNR-Aquatic Resources (brian.j.nelson@hawaii.gov)

x DLNR-Engineering Division (DLNR.ENG@hawaii.gov)

x DLNR-Hawaii District Land Office

x DLNR-Forestry and Wildlife (rubyrosa.r.terrago@hawaii.gov)

x DLNR-Na Ala Hele

x DLNR- Commission on Water Resource Management

x Office of Hawaiian Affairs

'22 MAY 11 AM 10:10 ENGINEERING

FEDERAL AGENCIES

x U.S. Fish and Wildlife

COUNTY AGENCIES

x Planning Department

x Fire Department

____ Public Works Department

TO: ~~FROM:~~ K. Tiger Mills, Acting Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application (CDUA) HA-3895
Single Family Residence

APPLICANT: Sean Winterer

LOCATION: Piha, North Hilo, Hawaii
TMK: (3) 3-2-004:037

Please review the Draft Environmental Assessment along with our Department's notice to the applicant found on our website, https://dlnr.hawaii.gov/occl/current-applications/. We would appreciate your agency's review and comment on this application. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

Contact Rachel Beasley at work cell (808) 798-6481 should you have any questions on this matter.

(✓) Comments Attached

( ) No Comments

Carty S. Chang, Chief Engineer

Signature/ Print your Name and Title

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

OCCL/K. Tiger Mills
Ref: REQUEST FOR COMMENTS
Conservation District Use Application (CDUA) HA-3895
Single Family Residence
Location: Piha, North Hilo, Hawaii
TMK(s): (3) 3-2-004:037
Applicant: Sean Winterer

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). Be advised that 44CFR, Chapter 1, Subchapter B, Part 60 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 zones subject to NFIP requirements are identified on FEMA's Flood Insurance Rate Maps (FIRM). The official FIRMs can be accessed through FEMA's Map Service Center (msc.fema.gov). Our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT) could also be used to research flood hazard information.

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) 270-7139.
- Kauai: County of Kauai, Department of Public Works (808) 241-4849.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: May 23, 2022

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

M. KALEO MANUEL
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

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD., STE 555
KAPOLEI, HI 96707

May 31, 2022

IN REPLY REFER TO:
Project No. 2022PR00605
Doc. No. 2205SN12
Archaeology

Michael Cain, Acting Administrator
Office of Conservation and Coastal Lands
P. O. Box 621
Honolulu, Hawaii 96809
c/o: rachel.e.beasley@hawaii.gov

Dear Ms. Mills:

SUBJECT: **Chapter 6E-42 Historic Preservation Review –**
Request for Concurrence for the Winterer Residence
Conservation District Use Application
Archaeological Inventory Survey
Pīhā Ahupua'a, North Hilo District, Island of Hawai'i
TMK: (3) 3-2-004:037 por.

This letter provides the State Historic Preservation Division's (SHPD's) review of the Office of Conservation and Coastal Lands (OCCL) request for the SHPD's concurrence with the OCCL determination of "no historic properties affected" for the proposed construction of a single-family residence. The submittal includes a OCCL cover letter requesting SHPD's concurrence with the effect determination, a TMK map, a SHPD Chapter 6E Form and construction drawings. The submittal also includes a draft report titled, *An Archaeological Assessment of a Portion of Lot 2 of the Pīhā Homesteads TMK: (3) 3-2-004:037 (por.) Pīhā Ahupua'a North Hilo District Island of Hawai'i* (ASM Affiliates, 2021). SHPD received the submittal on May 10, 2022.

The applicant proposes to construct a single-family residence and related improvements on a 0.81-acre portion of the 17.24-acre parcel located at 32-620 Pīhā-Kahukui Road in Ninole. The planned improvements for the property include a single-family residence, carport, driveway, water storage and propane gas tanks, utilities and landscaping. Hog-wire fencing is planned at the perimeter of the house site, together with a rock-wall entry feature and constructed metal gate at the project entry. Ground disturbance related to the project would be limited to the areas of the house site and carport and their related utilities, and the access driveway. Trenching for the transmission of water, power, and telecommunication lines from the area of the carport to the residence and for the septic system that would be adjacent to the house site, excavations would encompass a total area of about 466 sq. ft. x 2 feet deep with the exception of the excavation for the septic tank, which would be approximately 6 feet deep and cover an area of approximately 40 sq. ft.

ASM Affiliates conducted the archaeological inventory survey (ASM Affiliates 2021) in anticipation of a Conservation District Use Application (CDUA) and an associated Environmental Assessment (EA) to support a project effect determination. ASM completed the pedestrian survey on July 27, 2021. Fieldwork consisted of a 100% pedestrian survey consisting of systematic transects spaced 10 meters apart. Ground visibility was good at the time of the survey. The survey identified no historic properties within the current project area.

Due to the negative findings of significant historic properties during the AIS, this report was prepared as an Archaeological Assessment (AA) report in accordance with HAR 13§13-275-5(b)(5)(A). The report meets the minimum requirements of HAR §13-276-5. **It is accepted**. Please send two hard copies of the report, clearly marked FINAL, along with a text-searchable PDF version, and a copy of this acceptance letter to the Kapolei SHPD office,

attention SHPD Library. Additionally, please upload a text-searchable PDF version of the document to HICRIS Project No. 2022PR00605 using the Project Supplement option and send a PDF copy to lehua.k.soares@hawaii.gov.

Based on the information provided, **SHPD concurs** with the OCCL's project effect determination of "No historic properties affected" for the project. Pursuant to HAR §13-284-7(e), when the SHPD agrees that the action will not affect any significant historic properties, SHPD hereby notifies the OCCL that the HRS 6E historic preservation review process is ended. Project initiation may proceed.

In the unlikely event that subsurface historic resources, including human skeletal remains, structural remains, cultural deposits, sand deposits, or sink holes are identified during the demolition and/or construction work, cease work in the immediate vicinity of the find, protect the find from additional disturbance, and contact the State Historic Preservation Division at (808) 933-7651.

Please contact Sean Nāleimaile at (808) 933-7651 or at Sean.P.Naleimaile@hawaii.gov if you have any questions or concerns regarding this letter

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Sean Winterer, sean_ca2000@yahoo.com
Benjamin Barna, HICRIS@asmaffiliates.com

DAVID Y. IGE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
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M. KALEO MANUEL
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AQUATIC RESOURCES
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LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

May 31, 2022

MEMORANDUM *Log no. 3656*

TO: K. TIGER MILLS, Acting Administrator
Office of Conservation and Coastal Lands

FROM: DAVID G. SMITH, Administrator
Division of Forestry and Wildlife

SUBJECT: **Division of Forestry and Wildlife Comments for the Conservation District Use Application (CDUA) HA-3895 for the Winterer Single-Family Residence (SFR) on Hawai'i Island**

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your request for comments for CDUA (HA-3895) regarding the proposed Winterer's SFR and related improvements project located at 32-620 Piha-Kahuku Road, Piha, North Hilo, on the island of Hawai'i; TMK: (3) 3-2-004:037. The proposed project consists of developing a 1,693 square-foot single-story, post and pier, SFR with a storage loft, two bathrooms, a living room and kitchen, front and rear stairways, and several covered lanais. Additional improvements will include a separate two-car carport and utility storage structure, water catchment tank (10,000 gallons), propane gas tank, raised garden planters, a solar photovoltaic system, a satellite telecommunications dish, a backup electrical generator, and an individual wastewater system. The total SFR and improvements will be 2,620 square feet.

We appreciate and concur with mitigation measures included in the CDUA and Draft Environmental Assessment (DEA) intended to avoid construction and operational impacts to State-listed species including the Hawaiian Hoary bat or 'Ōpe'ape'a (*Lasiurus cinereus semotus*), Hawaiian Hawk or 'Io (*Buteo solitarius*), and seabirds. For illustrations and further guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf. We also appreciate the measures outlined to minimize the movement of plant and soil material to prevent the spread of invasive species such as Rapid 'Ōhi'a Death and for the use of native plant species for landscaping. DOFAW provides the following additional comments regarding the potential for the proposed work to affect listed species in the vicinity of the project area.

As recognized in the DEA, native Hawaiian damselflies (*Megalagrion* spp.) may be present at Kaleaha Stream. Project work near Kalaeha Stream could potentially affect endangered species of native Hawaiian damselflies. Therefore, DOFAW recommends that a survey be conducted by a qualified entomologist to determine if listed damselflies are present in the project area and to assess any potential impacts to those species.

The Piha-Kahuku Road is a County-owned road (per Hawai'i Revised Statues 264-1 (a) and (a).2) that runs along the subject property's southern boundary. This is a public road, and the road corridor should be kept open at all times.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Paul Radley, Protected Species Habitat Conservation Planning Coordinator at (808) 295-1123 or paul.m.radley@hawaii.gov.

Sincerely,

DAVID G. SMITH
Administrator

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

M. KALEO MANUEL
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:RB

CDUA HA-3895
Acceptance Date: 5/9/22
180 Day Expiration Date: 11/5/22

MAY 10 2022

James Leonard
J M Leonard Planning, LLC
56 Laukona Street
Hilo, HI 96720

Dear Mr. Leonard,

NOTICE OF ACCEPTANCE AND PRELIMINARY ENVIRONMENTAL DETERMINATION
Conservation District Use Application (CDUA) HA-3895
(Board Permit)

This acknowledges the receipt and acceptance for the processing of your client's CDUA for a Single-Family Residence (SFR) and related improvements located at 32-620 Piha-Kahuku Road, Piha, North Hilo, Island of Hawai'i, TMK (3) 3-2-004:037. The approximately 17.24-acre property is in the Resource Subzone of the State Land Use Conservation District. The property is accessed from an unpaved extension of Piha-Kahuku Road. The property is described as Lot 2 of the Piha Homestead Subdivision and is located at a 1,700 feet elevation. The Hilo Forest Reserve extends mauka of the Piha Homestead Subdivision.

The applicant proposes to construct a 1,693 single-story, post and pier, single-family residence (SFR) with a storage loft, two bathrooms, a living room and kitchen, front and rear stairways, and several covered lanai. Additional improvements will include a separate 2-car carport/utility storage structure, water catchment tank (10,000 gallons), propane gas tank, and raised garden planters. In total the SFR and improvements will be 2,620 sf. The proposed SFR will additionally include solar photovoltaic panels on the garage, a satellite telecommunications dish, a back-up electrical generator, and an individual wastewater system.

The structure will be set back a minimum of 25-feet from the property boundary. The SFR and improvements are proposed within a 20,621-sf graded disturbance footprint, near the property's southeast boundary, and adjacent to the unpaved Piha-Kahuku Road extension. A pig-proof hog wire perimeter fence will enclose the developed footprint which will include a rock wall entry feature and a metal gate at the project entry. Trenching is proposed for the septic system, water

lines, and electrical power lines; total proposed area to be trenched is 466 sf. Grading for the project area will involve approximately 700 cubic yards of cut and would be balanced with fill.

Landscaping is proposed within the disturbance footprint and will include removing invasive species and replanting with native trees and ground covers such as ohia, uluhe and hapuu ferns. A home garden is also planned which would consist of raised bed planters.

Two streams are located near or within the property's boundaries: Waikaumalo and Kalaeha. Waikaumalo stream is just outside the northwestern edge of the property and Kalaeha stream crosses lengthwise through the property's middle section. The proposed SFR and improvements would be over 325 feet from Kalaeha stream and would be over 1,000 feet from Waikaumalo stream.

After reviewing the application, the department finds that:

1. The proposed use is an identified land use in the Resource subzone of the Conservation District, pursuant to the Hawaii Administrative Rules (HAR), 13-5. Please be advised, however, that this finding does not constitute approval of the proposal.
    - HAR, §13-5-24, R-7, **SINGLE FAMILY RESIDENCE**, (D-1) A single family residence that conforms to design standards as outlined in HAR, §13-5.
    - HAR, §13-5-23, L-2, **LANDSCAPING** (D-1) Landscaping (including clearing, grubbing, grading, and tree removal), including chemical and mechanical control methods, in accordance with state and federal laws and regulations, in an area of or more than 10,000 square feet. Any replanting shall be appropriate to the site location and shall give preference to plant materials that are endemic or indigenous to Hawaii. The introduction of invasive plant species is prohibited.
    - HAR, §13-5-22, P-2, **STRUCTURES, ACCESSORY**, (B-1) Construction or placement of structures accessory to existing facilities or uses.
2. Pursuant to HAR, §13-5-40 (a) a public hearing will not be required;
3. In conformance with Hawaii Revised Statutes (HRS), 343, as amended, and HAR, 11-200.1, a finding of no significant impact to the environment (FONSI) is anticipated for the proposed project; and
4. Please be informed that your responsibility includes complying with the provisions of Hawaii's Coastal Zone Management law (Chapter 205A, HRS) that pertain to the Special Management Area (SMA) requirements administered by the various counties.

Additionally, pursuant to Hawaii Administrative Rules (HAR) §13-5 Exhibit 4, all structures are to be connected, or the best alternative. You state, "the carport is separated from the house, to best fit this structure to the site and, thus, minimize the grading required for its foundation and driveway approach." Please elaborate on this statement, is this the best alternative? Were alternatives considered? Why is the carport located where it is?

Upon completion of the application review process, the subject CDUA will be reviewed by the Board of Land and Natural Resources (Board) for consideration. The Board has the final authority to modify, grant, or deny permits. Should you have any questions, please feel free to contact Rachel Beasley at rachel.e.beasley@hawaii.gov or work cell (808) 798-6481.

Sincerely,

Suzanne D. Case

SUZANNE D. CASE, Chairperson
Board of Land and Natural Resources

cc: Hawaii Board Member
HDLO/CWRM/SHPD/DOFAW/DOCARE
OHA/USFWS/Na Ala Hele/Eng
County of Hawaii, Planning Department
County of Hawaii, Fire Department
Laupahoehoe Library
State Library

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phone: (808) 969-7090 10 Hina Street Hilo Hawaii 96720 rterry@hawaii.rr.com
geometricianassociates.com

July 1, 2022

Suzanne D. Case, Chairperson
Board of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Ms. Case:

Subject: **Comments on Draft Environmental Assessment (DEA)/Conservation District Use Application (CDUA) HA-3895 for Winterer Single-family residence (SFR) Located at Piha, North Hilo, Hawai'i, Tax Map Key (TMK) (3) 3-2-004:037**

I am in receipt of Office of Conservation and Coastal Lands' (OCCL) Administrator Michael Cain's letter to project planner James Leonard of June 24, 2022, which provided information and instructions regarding the processing of the CDUA and Final EA and also provided copies of comments to the EA/CDUA. This letter responds to your letter and comments from all DLNR agencies, which are also being provided to the agencies. We have also copied your office in the attachment to this letter with our response letter to non-DLNR entities (in this case, only the **Department of Health, Clean Air Branch**), which was sent directly to that agency.

Concerning the memo from the **Engineering Division** indicating a need for the property owner to research the flood hazard designation for the property. This information, including an exhibit (Figure 4, Flood Zone Map) showing the Flood Hazard Assessment Report, is found in Section 3.1.2 of the EA.

The EA has been updated to reflect the May 31, 2022 letter from the **State Historic Preservation Division** providing concurrence with the OCCL project effect determination of "no historic properties affected," pursuant to HAR §13-284-7(a)(1) and conclusion of the HRS 6E historic preservation review process.

We appreciate the acknowledgment in the memo from the **Division of Forestry and Wildlife** about the extensive BMPs that are built into the home's design and construction plans, including mitigation measures related to Rapid 'Ōhi'a Death, Hawaiian hoary bats, Hawaiian hawks, and listed seabirds. Concerning potential impacts to listed Hawaiian damselflies, according to the information we have been able to access, the only species that have any potential to be on the island are the Pacific damselfly (*Megalagrion pacificum*), with only one known population on the island, and the orange-black damselfly (*M. xanthomelas*), which is a coastal wetlands species that is currently only known from low-elevations on the Island of Hawai'i. (It is important to note that Dr. Polhemus lists the maximum elevation of the species at this time as 380 meters, about half of the elevation of the current property; Polhemus, D.A. 2020. *Megalagrion pacificum*. The IUCN Red List of Threatened Species 2020: e.T12959A510946. https://dx.doi.org/10.2305/IUCN.UK.2020-1.RLTS.T12959A510946.en. Accessed on 28 June 2022). The likelihood of spotting either species on the project site is extremely remote. Non-listed damselfly species could very occasionally be present, but there is no reason to suspect that a single family residence located far away from stream banks would have any material effect on the health of such species. In the four visits our team (Dr. Patrick Hart and myself) paid to the property to assess plants and birds, we did not observe any damselflies in the action area. This is in keeping with

observations made as part of the Saddle Road project, where damselflies were only found near ponds, wetlands and streams, and not in forest lacking such water bodies. In a previous biological survey of the lot just mauka, I was able to follow a hunter trail to Kalaeha Stream, where I did observe a damselfly. To survey for damselflies at the species level requires a highly trained entomologist and a permit that is difficult and time-consuming to obtain, because of the potential to collect and harm a listed species. In any case, in the unlikely event that an individual of either of the two listed species was observed, the U.S. Fish and Wildlife Service (USFWS) recommends implementation of certain BMPs regarding work in aquatic environments in order to minimize the degradation of water quality and impacts to fish and wildlife resources. Most of these BMPs are related to work in and near streams. The project was specifically designed to stay very far away from streams. The proposed home is located a minimum of 325 feet from Kalaeha Stream, which is almost inaccessible due to dense uluhe. The remaining USFWS BMPs are standard sedimentation and pollution BMPs that are already part of the project, as described in Section 3.1.2 of the EA. It is extremely unlikely that a listed damselfly is present in the area, and all reasonable mitigation measures to protect any damselflies have already been included. For these reasons, the applicant believes that such a survey is not necessary. We have included this rationale in the Final EA and will respectfully request that BLNR not make it a requirement of the Conservation District Use Permit. Furthermore, as stated in the EA, the project will not involve any closure of Piha-Kahuku Road.

The **Office of Conservation and Coastal Lands** letter of May 9, 2022 asked several questions of the applicant concerning the carport/house separation:

> You state, "the carport is separated from the house, to best fit this structure to the site and, thus, minimize the grading required for its foundation and driveway approach." Please elaborate on this statement, is this the best alternative? Were alternatives considered? Why is the carport located where it is?

In siting the carport and the driveway on the property, the designer in consultation with the planner and biologist (myself) considered several alternatives on the sloping site. The house has been designed using a post and pier type construction in order to best fit the house to the site and minimize the amount of grading required. The ʻōhiʻa trees were surveyed and mapped so as to fully understand the implications of various design layouts. Our specific aim in siting the carport and driveway was to find the best way to meet several competing standards and compatibility provisions for building in the Conservation District. We wanted to minimize the area of ground disturbance, the quantity of excavation, the height of structures, and the number of ʻōhiʻa trees that needed to be removed. We looked initially at an area under the house, which partially met these goals but resulted in either a substantial area of grading for the house footprint and driveway approach or an increase in the structure height that exceeded the maximum permissible building height of 25 feet. The final proposed arrangement shown on the Site Plan, separating the carport from house structure, would be considered the best alternative in terms of seeking to fit the structures to the existing site while minimizing the amount of land alteration, structure height and impact to the existing native trees.

Thank you for your staff's review of the Draft EA and for circulating the EA and CDUA for review by DLNR and other agencies. If you have any questions about the EA, please contact me at (808) 969-7090; for questions about the project or CDUA, please contact James Leonard at (808) 896-3459.

Sincerely,

Ron Terry

Ron Terry, Principal
Geometrician Associates

Cc: James Leonard, Sean Winterer
DLNR DOFAW, Engineering, SHPD and OCCL

From: Cab General <Cab.General@doh.hawaii.gov>
Subject: Winterer Single-Family Residence in Piha -- Draft EA (AFNSI)
Date: June 8, 2022 at 3:22:39 PM HST
To: "Beasley, Rachel E" <rachel.e.beasley@hawaii.gov>, "jmleonard@mac.com" <jmleonard@mac.com>

Aloha,

Thank you for the opportunity to provide comments on the subject project. Based on review of the *Winterer Single-Family Residence in Piha Draft EA*, CAB has no further comments at this time. Please see our standard comments at:

https://health.hawaii.gov/cab/files/2022/05/Standard-Comments-for-Land-Use-Reviews-Clean-Air-Branch-2022-1.pdf

Please let me know if you have any questions or concerns.

Kristen Caskey, EHS
Kristen.caskey@doh.hawaii.gov
Clean Air Branch
Hawaii State Department of Health

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

- You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.
- Permit application forms can be found here: https://health.hawaii.gov/cab/permit-application-forms/

Includes construction, demolition, or renovation activities that involve potential asbestos and lead containing materials:

- Asbestos may be present in any existing structure. Prior to demolition, you must contact the Indoor and Radiological Health Branch, Asbestos-Lead Section. Testing may be required to determine if building materials may contain asbestos, such as: drywall, vinyl floor tile, mastic, caulking, roofing materials, insulation, special coatings, etc.
- Structures built prior to 1980 may also contain lead paint. Prior to demolition, contact the Indoor and Radiological Health Branch, Asbestos-Lead Section. Testing may need to be conducted to determine if building materials contain lead.
- Some construction activities have the potential to create excessive noise and may require noise permits. For DOH Noise Permits and/or Variances and for more information on the Indoor and Radiological Health Branch, please visit: https://health.hawaii.gov/irhb/

Includes demolition of structures or land clearing

- Department of Health, Administrative Rule: Title 11, Chapter 26, Vector Control, Section 11-26-35, Rodents; Demolition of Structures and Clearing of Sites and Vacant Lots, requires that:
    - No person, firm or corporation shall demolish or clear any structure, site, or vacant lot without first ascertaining the presence or absence of rodents which may endanger the public health by dispersal from such premises.
    - Should such inspection reveal the presence of rodents, the person, firm, or corporation shall eradicate the rodents before demolishing or clearing the structure, site, or vacant lot.
    - The Department may conduct an independent inspection to monitor compliance, or request a written report.
- The purpose of this rule is to prevent rodents from dispersing into adjacent areas from infested buildings or vacant lands during demolition or land clearing.
- Contractors may either hire a pest control firm or do the job themselves with a qualified employee. Rodenticides must be inspected daily and replenished as necessary to provide a continuous supply for at least one week prior to the start of any work.

- To submit notifications or for more information, contract the Vector Control Branch: https://health.hawaii.gov/vcb/

Has the potential to generate fugitive dust

- You must reasonably control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, businesses, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.
- Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.
- You must provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:
    - Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
    - Providing an adequate water source at the site prior to start-up of construction activities; Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
    - Minimizing airborne, visible fugitive dust from shoulders and access roads;
    - Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
    - Controlling airborne, visible fugitive dust from debris being hauled away from the project site.
- If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Increases the population and potential number of vehicles in an area:

- The creation of apartment buildings, complexes, and residential communities may increase the overall population in an area. Increasing the population in an area may inadvertently lead to more air pollution via vehicle exhaust. Vehicle exhaust releases molecules in the air that negatively impact human health and air quality, as they are known lung irritants, carcinogens, and greenhouse gases.
- Ensure that residents keep their vehicle idling time to three (3) minutes or less.
- Provide bike racks and/or electric vehicle charging stations for residents.
- Ensure that there are sufficient and safe pedestrian walkways and crosswalks throughout and around the development.
- Conduct a traffic study to ensure that the new development does not significantly impact traffic in the area.

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700	Vector Control Branch (808) 586-4400

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July 1, 2022

Kristen Caskey, EHS
Kristen.caskey@doh.hawaii.gov
Clean Air Branch
Hawai'i State Department of Health

Dear Ms. Caskey:

Subject: **Comments on Draft Environmental Assessment (DEA)/Conservation District Use Application (CDUA) HA-3895 for Winterer Single-family residence (SFR) Located at Piha, North Hilo, Hawai'i, Tax Map Key (TMK) (3) 3-2-004:037**

Thank you for your email of June 8, 2022, to planner Rachel Beasley of the Department of Land and Natural Resources, Office of Conservation and Coastal Lands, sharing your agency's standard comments and that you had no further comments at this time. The project is a single-family residence in an existing homestead subdivision and has extremely minor impacts. No existing structures are present and it does not require an Air Pollution Control Permit. The home is not part a large development that would increase population or produce air quality impacts. The project is semi-native forest in its natural condition and no infestations of rodents are known to exist on the property. As stated on page 18 of the EA, the project includes various measures to control airborne, visible fugitive dust from the construction, which will be limited to a very small footprint in an area that is not highly subject to dust.

Thank you for your review of the Draft EA. If you have any questions about the EA, please contact me at rterry@hawaii.rr.com or (808) 969-7090.

Sincerely,

Ron Terry

Ron Terry, Principal
Geometrician Associates

Cc: DLNR-OCCL, James Leonard, Sean Winterer

Environmental Assessment
Winterer 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 2 of the Pīhā Homesteads

TMK: (3) 3-2-004:037 (por.)

Pīhā Ahupuaʻa
North Hilo District
Island of Hawaiʻi

DRAFT VERSION

Prepared By:

Lauren M. U. Kepaʻa, B.A.,
and
Matthew R. Clark, M.A.

Prepared For:

Sean Winterer
250 Walnut Village Ln.
Henderson, NV 89012

January 2022

ASM affiliates
Archaeology • History • Anthropology • Architectural History

Hilo Office: (808) 969-6066 Fax: (808) 443-0065
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820 Mililani Street, Suite 700, Honolulu, HI 96813

ASM Project Number 37470.00

An Archaeological Assessment of a Portion of Lot 2 of the Pīhā Homesteads

TMK: (3) 3-2-004:037 (por.)

Pīhā Ahupuaʻa
North Hilo District
Island of Hawaiʻi

ASM affiliates

EXECUTIVE SUMMARY

At the request of Mr. Sean Winterer (landowner), ASM Affiliates conducted an Archaeological Inventory Survey of a roughly 1-acre portion of the conservation zoned Lot 2 of the Pīhā Homesteads (TMK: (3) 3-2-004:037) located in Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (Figures 1, 2, and 3). Due to the parcel's zoning status, a Conservation District Use Application (CDUA) is being prepared along with an associated Environmental Assessment (EA) in accordance in Hawaiʻi Revised Statues (HRS) Chapter 343 for the proposed development of a single-family dwelling, and this document is intended to inform that application process. This study was undertaken in accordance with Hawaiʻi Administrative Rules (HAR) §13-284, and complies with the *Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports* as contained in HAR §13–276. Fieldwork for the current study was conducted on July 27, 2021, by Lauren Kepaʻa, B.A. and Johnny Dudoit, B.A. under the direct supervision of Matthew R. Clark, M.A. (Principal Investigator). No historic properties were identified within the current project area; thus, with respect to the HRS Chapter 6E-42 historic preservation review process, it is the conclusion of this study that the development of a single-family dwelling within the current project area on a portion of TMK: (3) 3-2-004:037 will have no effect on historic properties. It is our recommendation that no further historic preservation work needs to be conducted prior to or during project implementation. In the unlikely event that significant archaeological resources are discovered during the proposed development activities, work shall cease in the area of the discovery and the DLNR-SHPD shall be contacted pursuant to HAR 13§13-280-3.

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1. INTRODUCTION

At the request of Mr. Sean Winterer (landowner), ASM Affiliates conducted an Archaeological Inventory Survey (AIS) of a roughly 1-acre portion of the conservation zoned Lot 2 of the Pīhā Homesteads (TMK: (3) 3-2-004:037) located in Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (Figures 1, 2, and 3). Due to the parcel's zoning status, a Conservation District Use Application (CDUA) is being prepared along with an associated Environmental Assessment (EA) in accordance with Hawaiʻi Revised Statues (HRS) Chapter 343 for the proposed development of a single-family dwelling (Figure 4), and this document is intended to inform that application process. This study was undertaken in accordance with Hawaiʻi Administrative Rules (HAR) §13-284 and complies with the *Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports* as contained in HAR §13-276. 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. According to HAR §13-284-5(b)(5)(A), when no archaeological sites are found during an AIS, the results of the AIS shall be reported as an Archaeological Assessment. This report contains background information outlining the project area's physical and cultural contexts, a presentation of previous archaeological work in the vicinity of the project area, and current survey expectations based on that previous work. Also presented is an explanation of the project's methods and a description of the findings, followed by recommendations and a determination of effect for the proposed project.

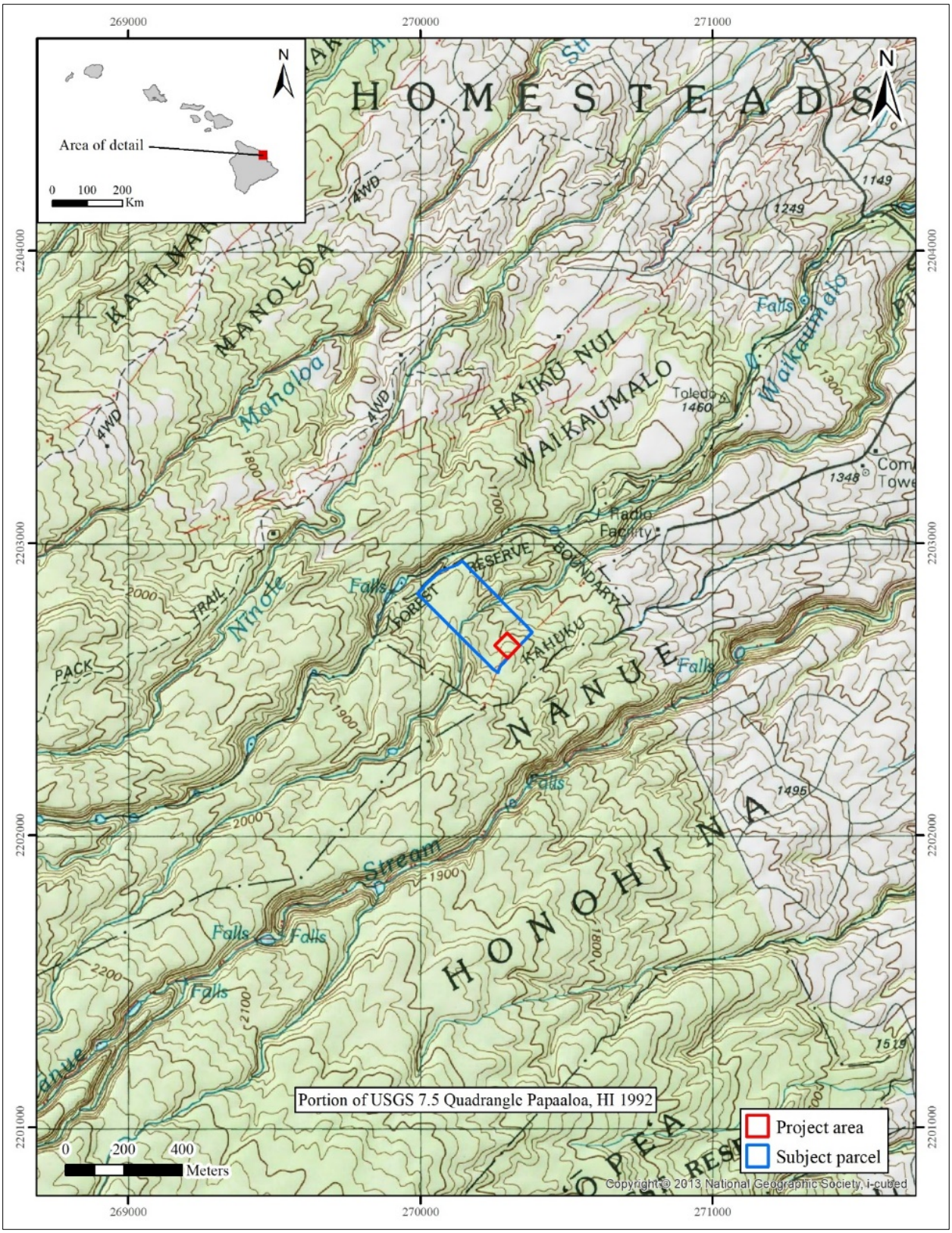

Figure 1. Project area location.

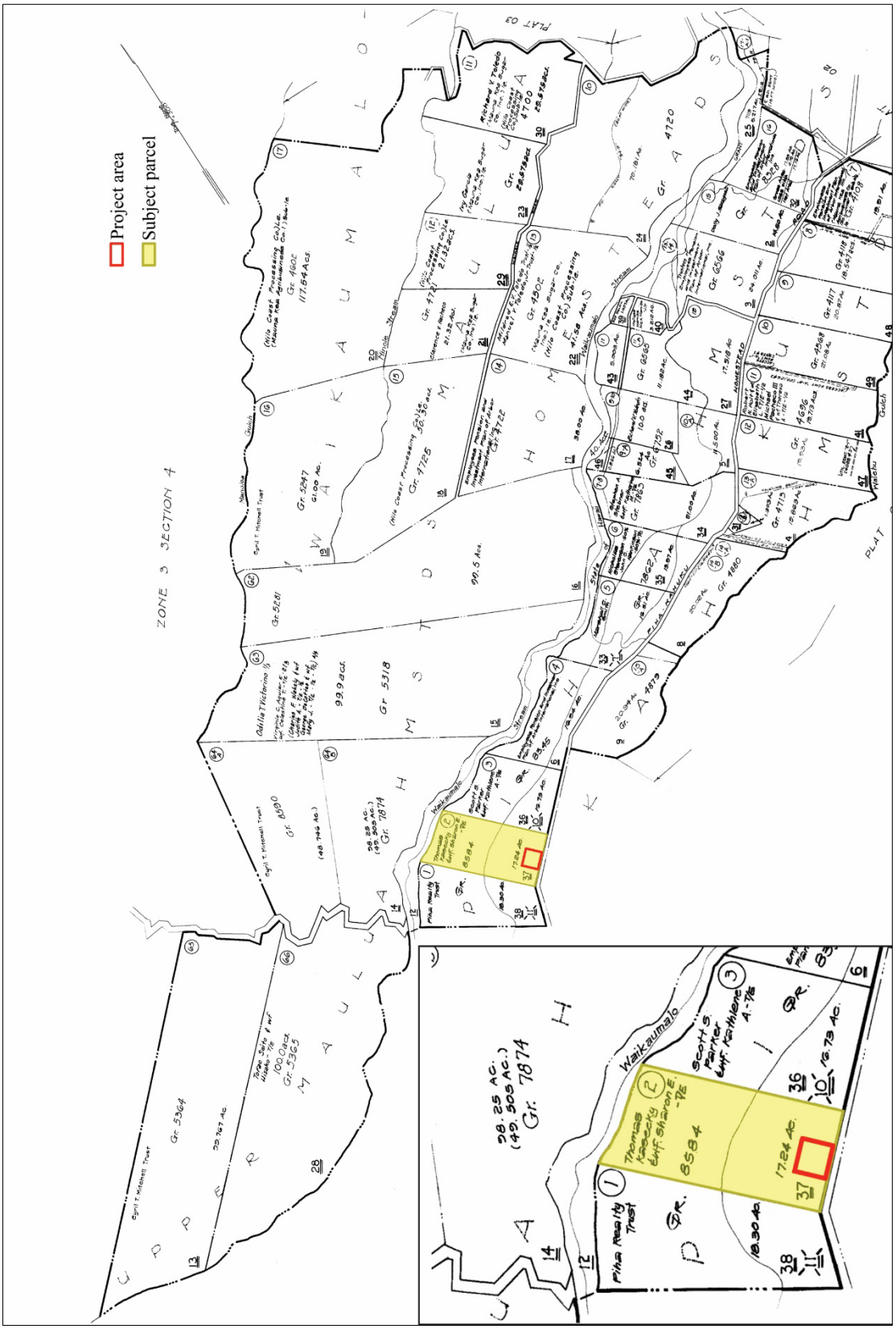

Figure 2. Tax Map Key plat (3) 3-2-004 showing location of current project area within Parcel 037.

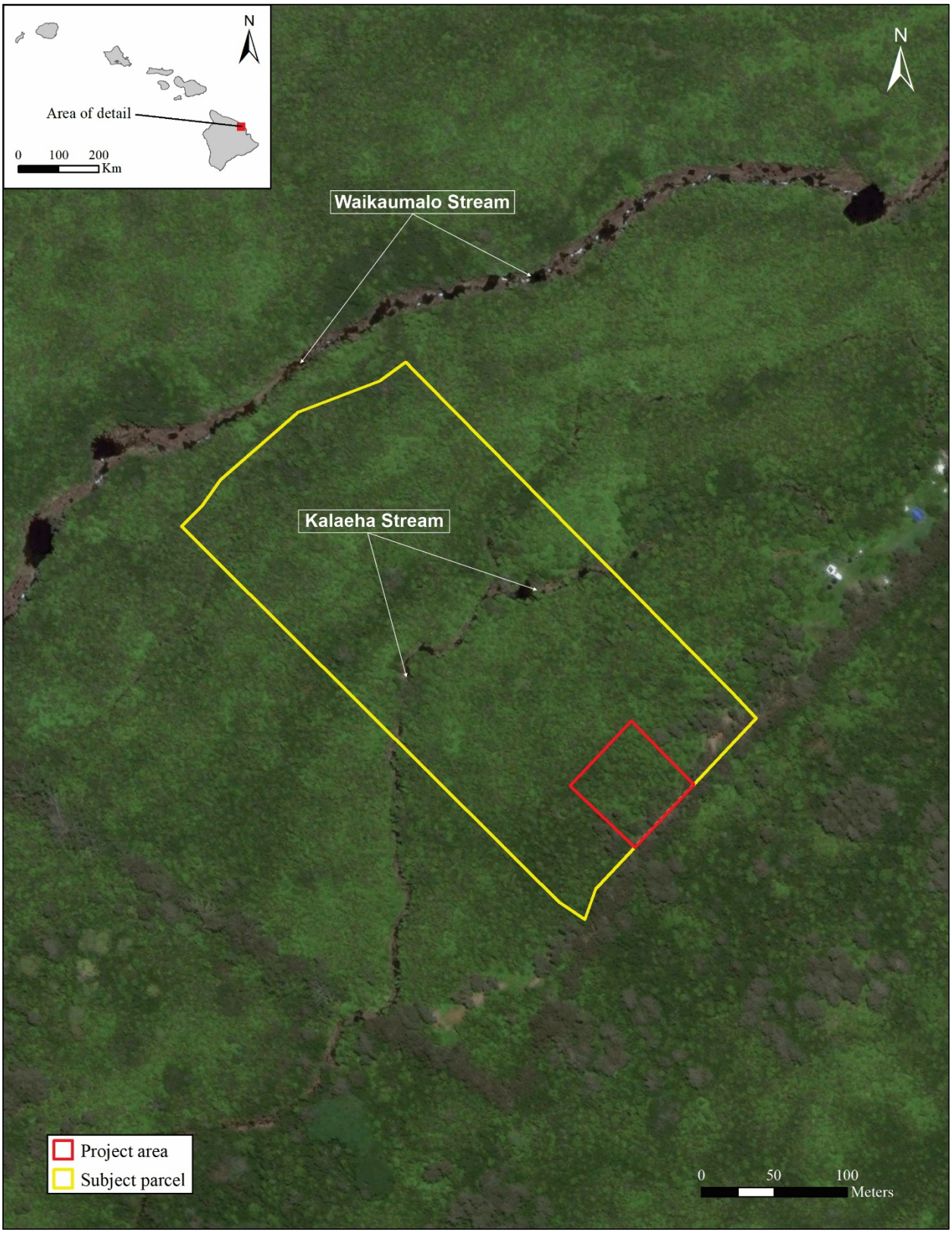

Figure 3. Google Earth™ satellite image showing project area location (outlined in red).

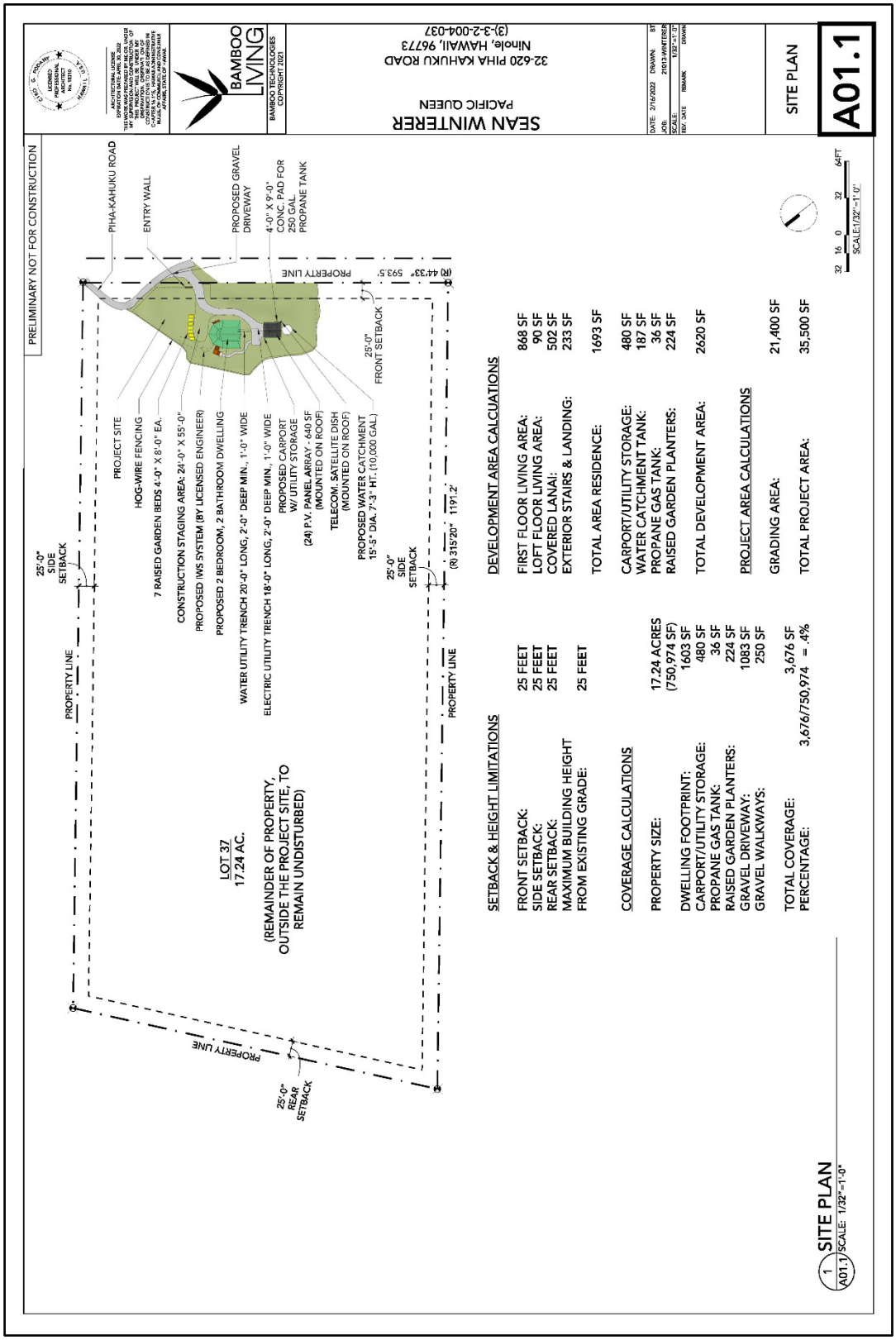

Figure 4. Proposed development plan.

PROJECT AREA DESCRIPTION

The project area consists of a roughly 1-acre portion of Lot 2 of the Pīhā Homesteads (TMK: (3) 3-2-004:037), Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (see Figures 1, 2, and 3). The overall subject parcel comprises 17.24 acres and is situated within the southwestern portion of the subdivision. It is bounded to the northeast and southwest by properties that are designated within the State Conservation District. The parcel (036) to the northeast is developed with a single-family residence and assorted out-buildings and the southwest parcel (038) is partially improved with an access driveway and has approval of a Conservation District User Permit for the construction of a single-family residence and related utility and landscape improvements (see Figure 2). The subject parcel is bounded on the south by the Pīhā-Kahuku Road, which provides access to the project area (Figure 5), and to the north by Waikaumalo Stream situated within a thin, 40-acre conservation-zoned parcel (012) owned by the State of Hawaiʻi (see Figure 2). The project area is located along the central section of the southeastern boundary adjacent to the northwestern edge of Pīhā-Kahuku Road, roughly 4.6 kilometers (2.85 miles) inland of the coast at an elevation of roughly 525 meters (1,722 feet) above sea level.

The underlying geology of this portion of North Hilo is formed of mixed *ʻaʻā* and *pāhoehoe* basaltic substage lava flows, mapped as Hāmākua Volcanic Series (Sherrod et al. 2007), that originated from Mauna Kea Volcano between 64,000 and 300,000 years ago during the Pleistocene epoch (labeled Qhm in Figure 6). Soils that have formed on these lava flows are classified as Kaiwiki highly organic hydrous silty clay loam on 6 to 20 percent slopes (Figure 7). These deep, well-drained Andisol soils are formed of weathered volcanic ash overlying bedrock (Soil Survey Staff 2020). The terrain within the majority of the project area is characterized by a moderate northwest slope that extends to a narrow gully with intermittent water flow (flowing at the time of the current study) that meanders along portions of the northern project area boundary (Figure 8).

The climate at this elevation in North Hilo is generally cool, with temperatures averaging between 55° to 68° Fahrenheit throughout the year (Giambelluca et al. 2014). The lands in the vicinity of the project area receive a mean annual rainfall of approximately 5,285 millimeters (208 inches), with the highest rainfall occurring during the autumn and spring months of November and March, and the least amount of rainfall occurring during the summer month of June. Trade winds often blow from east to west across this region, except when *kona* winds are blowing (typically during the summer months), and the wind pattern is reversed.

The project area is currently undeveloped and is thickly vegetated primarily with an overstory of strawberry guava (*Psidium cattleianum*) interspersed with *ʻōhiʻa* (*Metrosideros polymorpha*) and paperbark (*Melaleuca quinquenervia*) trees. Ground cover consists predominantly of eastern gamagrass (*Tripsacum dactyloides*), malabar melastome (*Melastoma malabathricum*), soapbush (*Melastoma candidum*), and *uluhe* (false staghorn; *Dicranopteris linearis*) (Figures 9 and 10) mixed with decaying, moss covered, logs that cover the underlying ground surface. The northeastern corner of the project area is covered with a thick growth of *uluhe* and has significantly less tree cover (Figure 11). To facilitate a topographic survey of the project area, prior to the current arcaeological survey fieldwork, land surveyors had performed partial vegetation clearing by hand within the project area across several roughly linear transect lines (Figure 12). That vegetation clearing allowed for easier access to the project area and improved the ground visibility within the cleared areas.

Figure 5. Southern boundary of project area along the edge of Pīhā-Kahuku Road, view to the southwest.

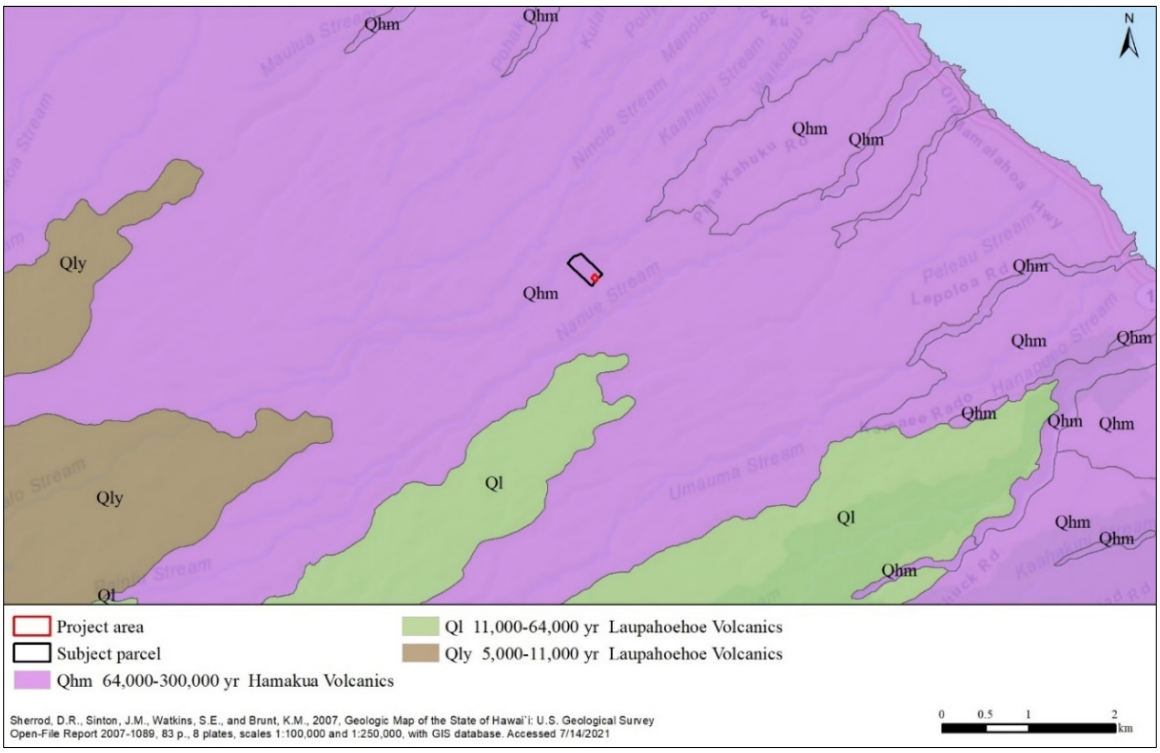

Figure 6. Geological units in the current project area (Sherrod et al. 2007).

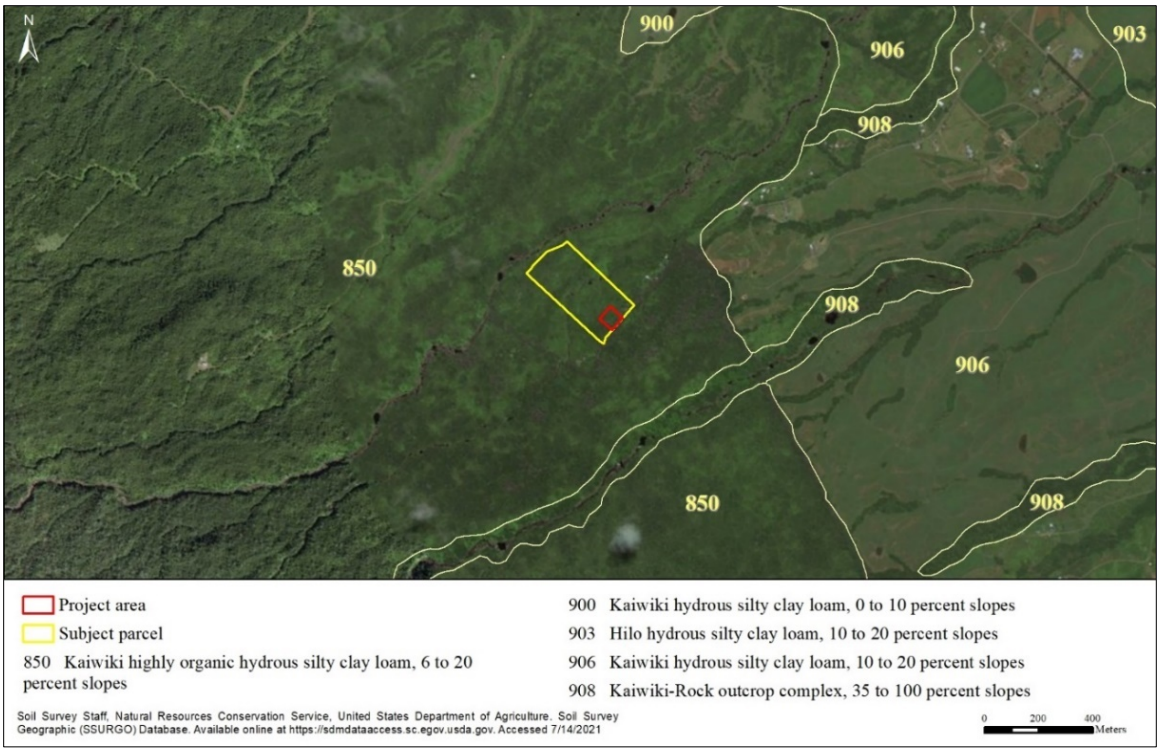

Figure 7. Soils within the project area (Soil Survey Staff 2019).

Figure 8. Gully along the northern project area boundary, view to the southwest.

Figure 9. Vegetation pattern in central portion of the project area, view to the south.

Figure 10. Standard vegetation pattern in northwestern portion of the project area, view to the southwest.

Figure 11. Typical vegetation pattern in northeastern corner of the project area, view to the west.

Figure 12. Typical landscape in surveyor-cleared areas, view to the west.

2. BACKGROUND

To generate a set of expectations regarding the nature of archaeological resources that might be encountered within the current project area, and to establish an environment within which to assess the significance of any such resources, a general culture-historical context for the North Hilo region that includes specific information regarding the known history of Pīhā Ahupuaʻa and the project area is presented. This is followed by a discussion of relevant prior archaeological studies conducted in the vicinity of the project area.

CULTURE-HISTORICAL CONTEXT

The chronological summary presented below begins with the peopling of the Hawaiian Islands and includes a presentation of a generalized model of Hawaiian Prehistory containing legendary references to and a discussion of the general settlement patterns for North Hilo. The discussion of prehistory is followed by a summary of historical events in the district that begins with the arrival of foreigners in the islands and then continues with the history of land use in North Hilo in the vicinity of Pīhā after contact. The summary includes a discussion of the changing lifeways and population decline during the Early Historic Period, a review of land tenure in the study *ahupuaʻa* during the *Māhele ʻĀina* of 1848, and the subsequent transition into a residential subdivision in the last half of the twentieth century.

A Generalized Model of Hawaiian Prehistory

While the question of the timing of the first settlement of Hawaiʻi by Polynesians remains unanswered, the current archaeological consensus derives from various sources of information (i.e., archaeological, genealogical, mythological, oral-historical, radiometric). With data from advances in palynology and radiocarbon dating techniques, Kirch (2011) and others (Athens et al. 2014; Wilmshurst et al. 2011) have argued that Polynesians arrived in the Hawaiian Islands, sometime between A.D. 1000 and A.D. 1200 and expanded rapidly thereafter. Other versions of the peopling of the islands, including various native Hawaiian traditions, place the event earlier in time—and as early as the creation of the world (e.g., Beckwith 1951; Liliuokalani 1978; Malo 1951). 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 establishing a uniquely Hawaiian culture. The initial migration to Hawaiʻi is believed to have occurred from Kahiki (the ancestral homelands of Hawaiian gods and people) with long-distance voyages occurring fairly regularly through at least the thirteenth century. It has been generally reported that the sources of the early Hawaiian populations originated from the southern Marquesas Islands (Emory in Tatar 1982). In these early times, Hawaiʻi's inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy et al. 1991). This was a period of widespread 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). According to Fornander (1969), the Hawaiians brought from their homeland certain Polynesian customs and belief: the major gods Kāne, Kū, Lono, and Kanaloa; the *kapu* system of law and order; and the concepts of *puʻuhonua* (places of refuge), *ʻaumakua* (ancestral deity), and *mana* (divine power).

As currently understood, the settlement of the islands involved a gradual shift in residential patterns from seasonal, temporary habitation to the permanent dispersed habitation of both coastal and upland areas. Following the initial settlement period, areas with the richest natural resources became populated and perhaps crowded, and the population began expanding to the Kona (leeward side) and more remote areas of the island (Cordy 2000). As the population grew, 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 eventually 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 the seasonal, recurrent occupation in which coastal sites were occupied in the summer to exploit marine resources, and upland sites focused on agriculture were occupied during the winter months. An increasing reliance on agricultural products may have caused a shift in social networks as well, which increasingly supported the exchange of upland agricultural products for marine resources. Hommon (1976) argues that kinship links among coastal settlements became less important than those with the *mauka-makai* (upland-coastal) settlements. 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.

Pīhā Ahupuaʻa and the Greater *ʻOkana* of Hilo Palikū

The current project area is situated in Pīhā Ahupuaʻa on the windward slopes of Mauna Kea Volcano within the traditional *moku* of Hilo, one of six *moku* of Hawaiʻi Island (Figure 13). Pīhā, which literally translates as "flotsam" (Pukui et al. 1974:184), meaning any floating material carried by flood waters or the sea, is within an area traditionally referred to as Hilo Palikū, or "Hilo of the upright cliff" (Pukui et al. 1974:46). Pīhā is one of many *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. Pīhā is bounded to the south by Kahuku, Nanue, and Honohina *ahupuaʻa*, to the west by Humuʻula Ahupuaʻa, to the north by Mauluanui, Waikaumalo, and Puaʻakuloa *ahupuaʻa*, and to the east by the Pacific Ocean (see Figure 13). The Hawaiian proverb, "*Hilo, mai Mawae a ka pali o Maulua*" details the extent of the district spanning from Mawae, the southernmost boundary, to Maulua as the northernmost boundary (Pukui 1983:108). Handy et al. (1991:538) further describe the *moku* of Hilo:

> 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. As previously mentioned, the location of the current project area coincides with the *ʻokana* of Hilo Palikū (Hilo of the upright cliffs), which extends north from the Wailuku River to Kaʻula Gulch (Maly and Maly 2006). This region is characterized by its rugged and steep coastline, with its sheer cliffs broken only by a string of narrow steam-cut gulches that pour down from the slopes of Mauna Kea. 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.

A unique aspect of the Hilo Palikū region, which mirrors that of the adjacent district of East Hāmākua, is the presence of numerous, narrow *ahupuaʻa* that extend from the coast to about the 3,000-foot elevation. These *ahupuaʻa* are characterized by their sloping *kula* lands with their boundaries following the natural contours or ridgelines of the gulches (Cordy 1994). Several *ahupuaʻa* extended further inland, essentially cutting off the lower *ahupuaʻa* at their *mauka* most end. 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 project 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. (1915:32-33)

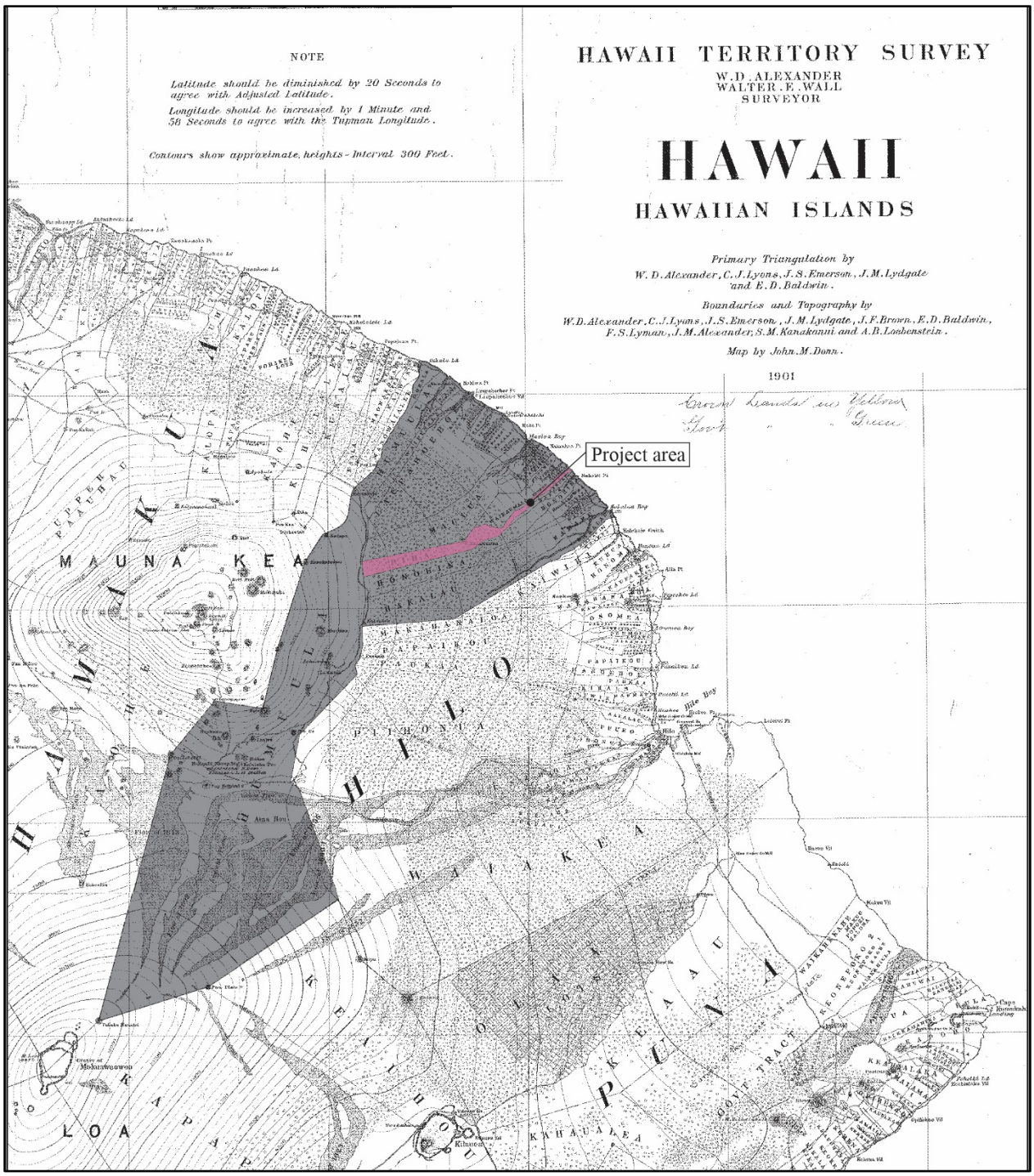

Figure 13. Hawai‘i Registered Map No. 2060 (shaded gray; Donn 1901) showing the location of the project area within Pīhā Ahupua‘a (shaded pink) and the *moku* of North Hilo (shaded gray).

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 "*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)

The other two ancient land divisions are located to the south of the current project area. Hilo-one, or sandy Hilo, extends along the shoreline of Hilo Bay between the Wailoa and Wailuku rivers (Edith Kanaka'ole Foundation 2012); while Hilo Hanakahi, "Hilo, [land of] chief Hanakahi" (Pukui and Elbert 1986:129), extends from the Wailoa River and includes Keaukaha.

The *ahupua'a* was traditionally the principal land division that functioned for both taxation purposes and furnished its residents with nearly all of the fundamental necessities. *Ahupua'a* are land divisions that typically incorporated all of the ecozones from the mountains to the sea and for several hundred yards beyond the shore, assuring a diverse subsistence resource base (Hommon 1986). Although the *ahupua'a* land division typically incorporated all of the ecozones, their size and shape varied greatly (Cannelora 1974). Hawaiian scholar and historian Samuel Kamakau (1976:8-9) summarized the types of ecozones that could be found in a given *ahupua'a*:

> Here are some names for [the zones of] the mountains—the *mauna* or *kuahiwi*. A mountain is called a *kuahiwi*, but *mauna* is the overall term for the whole mountain, and there are many names applied to one, according to its delineations (*'ano*). The part directly in back and in front of the summit proper is called the *kuamauna*, mountaintop; below the *kuamauna* is the *kuahea*, and makai of the *kuahea* is the *kuahiwi* proper. This is where small trees begin to grow; it is the *wao nahele*. Makai of this region the trees are tall, and this is the *wao lipo*. Makai of the *wao lipo* is the *wao 'eiwa*, and makai of that the *wao ma'ukele*. Makai of the *wao ma'ukele* is the *wao akua*, and makai of there is the *wao kanaka*, the area that people cultivate. Makai of the *wao kanaka* is the *'ama'u*, fern belt, and makai of the *'ama'u* the *'apa'a*, grasslands.
>
> A solitary group of trees is a *moku la'au* (a "stand" of trees) or an *ulu la'au*, grove. Thickets that extend to the *kuahiwi* are *ulunahele*, wild growth. An area where *koa* trees suitable for canoes (*koa wa'a*) grow is a *wao koa* and *mauka* of there is a *wao la'au*, timber land. These are dry forest growths from the *'apa'a* up to the *kuahiwi*. The places that are "spongy" (*naele*) are found in the *wao ma'ukele*, the wet forest.
>
> Makai of the *'apa'a* are the *pahe'e* [*pili* grass] and *'ilima* growths and makai of them the *kula*, open country, and the *'apoho* hollows near to the habitations of men. Then comes the *kahakai*, coast, the *kahaone*, sandy beach, and the *kalawa*, the curve of the seashore—right down to the *'ae kai*, the water's edge.
>
> That is the way *ka po'e kahiko* [the ancient people] named the land from mountain peak to sea.

Within Pīhā, and all other *ahupua'a*, the *maka'āinana* (commoners; *Lit*. people that attend the land) who lived on the land had rights to gather resources for subsistence and tribute (Jokiel et al. 2011). As part of these rights, the *ahupua'a* residents were also required to supply resources and labor that supported the royal communities of regional and/or island kingdoms. The *ahupua'a* became the equivalent of a local community, with its own social, economic, and political significance, and served as the taxable land division during the annual *Makahiki* procession (Kelly 1956). During this annual procession, the highest chief of the land sent select members of his retinue to collect *ho'okupu* (tribute and offerings) in the form of goods from each *ahupua'a*. The *maka'āinana* who resided in the *ahupua'a* brought their share of *ho'okupu* to an *ahu* (altar) that was symbolically marked with the image of a *pua'a* (pig). *Ahupua'a* boundaries, in most instances, were established along rational lines, following mountain ridges, hill, rivers or ravines, however, Chinen (1958:1) reports that "oftentimes only a line of growth of a certain type of tree or grass marked a boundary; and sometimes only a stone determined the corner of a division." *Ahupua'a* were ruled by *ali'i 'ai ahupua'a* or chiefs who controlled the *ahupua'a* resources; who, for the most part, had complete autonomy over this generally economically self-supporting piece of land (Malo 1951). *Ahupua'a* residents were not bound to the land nor were they considered the property of the *ali'i*. If the living conditions under a particular *ahupua'a* chief were deemed unsuitable, the residents could move freely in pursuit of more favorable conditions (Lam 1985). This structure safeguarded the well-being of the people and the overall productivity of the land, lest the chief loses the principal

support and loyalty of his or her supporters. *Ahupuaʻa* lands were in turn, managed by an appointed *konohiki* or lesser chief-landlord, who oversaw and coordinated stewardship of an area's natural resources (Lam 1985). In some places, the *poʻo lawaiʻa* (head fisherman) held the same responsibilities as the *konohiki* (Jokiel et al. 2011). When necessary, the *konohiki* took the liberty of implementing *kapu* (restrictions and prohibitions) to protect the *mana* of the area's resources from physical and spiritual depletion.

Many *ahupuaʻa* were further divided into smaller land units termed *ʻili* and *ʻili kūpono* (often shortened to *ʻili kū*). *ʻIli* were created for the convenience of the *ahupuaʻa* chief and served as the basic land unit, which *hoaʻāina* (native tenants) often retained for multiple generations (Jokiel et al. 2011; MacKenzie 2015). As the *ʻili* themselves were typically passed down in families, so too were the *kuleana* (responsibilities, privileges) that were associated with it. The right to use and cultivate *ʻili* was maintained within the *ʻohana*, regardless of any change in title of the *ahupuaʻa* chief (Handy et al. 1991). Malo (1951) recorded several types of *ʻili*: the *ʻili paʻa,* a single intact parcel and the *ʻili lele*, a discontinuous parcel dispersed across an area. Whether dispersed or wholly intact, the *ʻili* land division required a cross-section of available resources, and for the *hoaʻāina*, this generally included access to agriculturally fertile lands and coastal fisheries. While much of the same resource principles applied to the *ʻili kūpono*, these land units were politically independent of the *ahupuaʻa* chief. This designation was applied to specific areas containing resources that were highly valued by the ruling chiefs, such as fishponds (Handy et al. 1991).

The *aliʻi* who presided over the *ahupuaʻa* (*aliʻi-ʻai-ahupuaʻa*), in turn, answered to an *aliʻi ʻai moku*, or chief who claimed the abundance of the entire *moku or* district (Malo 1951). On Hawaiʻi Island, there are six traditional *moku*: Kona, Kaʻū, Puna, Hilo, Hāmākua, and Kohala. Although each respective *moku* contained multiple *ahupuaʻa*, they were considered geographical subdivisions with no explicit reference to rights in the land (Cannelora 1974). Other land units were also used. In what is now South Kohala, for example, the *kalana* was a division of land that was smaller than a *moku* but composed of several *ahupuaʻa* and *ʻili ʻāina*. The term *ʻokana* was also sometimes used interchangeably with *kalana* (Lucas 1995; Pukui and Elbert 1986), but Kamakau (1976), equates a *kalana* to a *moku* and stated that *ʻokana* was merely a subdistrict.

This form of district subdividing was integral to Hawaiian life and structurally supported the resource management planning by *aliʻi* and *konohiki*. As knowledge of place developed over the centuries and was passed down intergenerationally by direct teaching and experience, detailed information of an area's natural cycles and resources were retained and well-understood. Decisions were based on generations worth of highly informed knowledge and sustainably adapted to meet the needs of a growing population. This highly complex land management system mirrors the unique Hawaiian culture that coevolved with these islands.

As Pīhā encompasses both *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 while also supporting the ruling *aliʻi* of the *moku*. The windward district of Hilo provided an abundance of the most basic life-giving element *wai* from which life could be sustained. Maly and Maly (2006:7) noted that during the Precontact and even into the early Historic periods, the area from the shoreline to about the 3,000-foot elevation "supported residential and agricultural activities"…while the "upper forest regions…were frequented by travelers, collectors of natural resources, and for a wide range of cultural practices…" and add that:

> A system of trails, running *mauka-makai* (between mountains and shore), a near-shore trail (the ala loa), and trails skirting the upper forest region were established as well. All of the large *ahupuaʻa* supported *mauka-makai* trails, while smaller *ahupuaʻa*, shared trails, and access to the larger upland regions.

Over time, as the populations of desirable coastal locations increased, early Hawaiians expanded their settlements into upland regions and more marginal areas. As competition for resources intensified, so too did political competition that resulted in conflict and further expansion into upland areas as political exiles sought asylum in remote places and hidden lava tubes (Burtchard and Moblo 1994). Although the boundaries of the Hilo District are strictly political, the lands encompassed by it possess a unique environment that played a large role in determining the boundaries and shaping its history from the time of Polynesian settlement to the modern day.

Early Historic Accounts of Pīhā and the Greater *ʻOkana* of Hilo Palikū

Following the death of Kamehameha I in 1819, the Hawaiian religious and political systems underwent a radical transformation; Kaʻahumanu proclaimed herself "*Kuhina nui*" (Prime Minister), and within six months the ancient *kapu* system was overthrown. In October of 1819, seventeen Protestant missionaries had set sail from Boston to Hawaiʻi. They arrived in Kailua-Kona on March 30, 1820 to a society whose spiritual system has just been overturned.

Many of the *ali‘i*, who were already exposed to western material culture, welcomed the opportunity to become educated in a western-style and adopted their dress and religion. As missionaries began to introduce Christian concepts and beliefs they also set forth the process of rendering a once purely oral language into written form and literacy was quickly taken up as a national endeavor (Nogelmeier 2010). Soon, many *ali‘i* were rewarding these early missionaries with land and positions in the Hawaiian government. During this period, the demands of the *ali‘i* to cut sandalwood overburdened the *maka‘āinana*, who were weakening with the heavy production, exposure, and famine just to fill the coffers of the *ali‘i* who were no longer under any traditional constraints (Kuykendall and Day 1976; Oliver 1961). The lack of control of the sandalwood trade soon led to the first Hawaiian national debt, as promissory notes and levies were initiated by American traders and enforced by American warships (Oliver 1961). The Hawaiian culture was well on its way towards Western assimilation as industry in Hawai‘i went from the sandalwood trade, to a short-lived whaling industry, to the more lucrative, but environmentally destructive sugar industry.

Some of the earliest written descriptions of Hilo come from the accounts of the first Protestant Missionaries to visit the island These 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 Hilo Palikū. Such accounts describe the *‘okana* of Hilo Palikū as incredibly verdant and rich in fresh, flowing water, which was frequently noted as carving through mountain streams and emptying into the sea. Also mentioned in these accounts was the surprisingly large population that lived along the coast from South Hilo to Laupāhoehoe, north of Pīhā, particularly in the vicinity of the many steep-sided 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 *kalo*, *mai‘a* (banana), and occasionally, *kō* (sugarcane).

In 1823, British missionary William Ellis and 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 in the *‘okana* of Hilo One (ibid.). Ellis described the residential and land use practices he observed while in the Hilo ("Hiro") District, which is applicable to the project 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. (1827:353-354)

Another early written account by Ellis describes the stretch of land between South Hilo and Laupāhoehoe, north of the current project 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. (1827:343)

One year after Ellis' tour, the ABCFM established a base church in Hilo. From that church (Hāili), the missionaries traveled to the more remote areas of the Hilo and Puna Districts. David Lyman, who came to Hawai'i in 1832, and the Reverend Titus Coan who arrived in 1835 were two of the most influential Congregational missionaries in the *moku* of Puna and Hilo. As part of their duties, they compiled census data for the areas within their missions. In 1836, Coan traveled to Hilo and recorded the following observations of the overall district with its lush uplands dissected by steep precipices carved by formidable torrents of rain:

> HILO, the northern wing of this field, is a district including about thirty miles of its shore line. It is covered with a deep rich soil, clothed with perennial green of every shade, watered with the rain of heaven and grooved by about eighty water channels that run on an angle of some three degrees, leaping over hundreds of precipices of varied heights, from three or four feet to 500, and plunging into the sea over a cliff rising in height, from the sand beach of the town, to 700 or 800 feet along the northern coast-line.
>
> 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. . . In passing through the district of Hilo, the weather was sometimes fine and the rivers low, so that there was little difficulty in traveling. The path was a simple trail, winding in a serpentine line, going down and up precipices, some of which could only be descended and ascended by grasping the shrubs and grasses, and with no little weariness and difficulty and some danger.
>
> But the streams were the most formidable obstacles. In great rains, which often occurred on my tours, when the winds rolled in the heavy clouds from the sea, and massed them in dark banks on the side of the mountain, the waters would fall in torrents at the head of the streams and along their channels, and the rush and the roar as the floods came down were like the thunder of an army charging upon the foe. (1882:31-32)

Coan (1882) continued his observations of the Hilo countryside and remarked upon the expansion of agricultural pursuits in the region to include commercial sugar cultivation with the development of mills and plantation houses which could be seen from along the coastline:

> We have foliage of every shade of green, all intermingled; the plumes of the lofty cocoa and royal palms waving, and the leaves of the mango, the bread-fruit, the alligator-pear, the rose apple, the tamarind, the loquot, the plum, the pride of India, the eucalyptus, and trailing and climbing vines, with many-tinted flowers, all glistening and fluttering in the bright sun and the soft breezes of our tropical abode.
>
> Formerly, all our streams were crossed as best they might be, or suffered to run and roar, to sparkle and foam, to leap their precipices, and to plunge undisturbed into the sea. Over these brooks and rivers, in town, and through the district of Hilo, more than fifty bridges have been built, some of them costing four thousand dollars.
>
> Once our fertile soil produced very little except kalo and the sweet potato, with a few indigenous fruits; now fruits and vegetables have increased ten-fold in variety and value. But the great staple product of the district is sugar.
>
> During our residence here there have been erected seventeen sugar mills with their feeding plantations, whose total value would probably be more than one million of dollars, and whose products might be more than two millions.
>
> If our Government would take hold earnestly of road-making, with the aid of private enterprise, the value of Hilo soil and of our industries might be increased more than four-fold in as many years.
>
> Sailing along the emerald coast of Hilo, one sees the smoke-stacks of the sugar mills, the fields of waving canes almost touching one another, and the little white villages attached to each plantation, lending the charm of beauty and variety to the scenery. (1882:122-123)

In 1840, Lieutenant Charles Wilkes, head of the U.S. Exploring Expedition, traveled through Hilo Palikū and described the landscape of this *'okana*:

> 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. (1845:206)

Another missionary named Hiram Bingham spent over twenty years in the Hawaiian Islands and wrote a memoir in 1847 which recounted his experiences as well as those reported to him by his colleagues. Of Hilo, Bingham wrote:

> "Hilo is one of the most picturesque and verdant districts in the Sandwich Islands. . . the land rises rapidly from the sea, to the centre of the island, where it is crowned by the lofty Mauna Kea, which is usually mantled in snow. Travelling in Hilo is very difficult and dangerous, on account of the numerous ravines and precipices, by which the land is everywhere broken. All these ravines form channels for so many rivers or torrents, which come leaping and foaming along their rocky beds, dashing down innumerable precipices, and urging their noisy way to the ocean. In times of great rains, these streams run rapidly, and rush along with such maddening energy, as to prevent swimming or fording them. When there is less rain, they are shallow, and can be forded, at certain places, or passed by leaping from rock to rock, with which their beds are filled. While passing through the district, for thirty or thirty-five miles, I took occasion to number the principal ravines over which I passed; and without measuring, or pretending to accuracy, I reduced them, according to the best of my judgement, to the following classifications; 14 were from 200 to 1000 feet deep; 16 were from 50 to 100; and 22 were from 20 to 50. All these 63 ravines are the channels of streams of water. In many places, the banks of the ravines are perpendicular, and can only be ascended by climbing with the utmost care, and descended only by letting one's self down, from crag to crag, by the hands. In times of rain, these precipices are very slippery and dangerous, and in many places the traveller is obliged to wind his way along the sides of a giddy steep, where one step, of four inches from the track, would precipitate him to a fearful depth below." (1848:488-489)

These early nineteenth century historical accounts describe traditional settlement locations appearing in clusters at the opening of the valleys or scattered over the *kula* lands amongst a well-cultivated countryside. By the mid-1830s, it becomes evident that although still relatively intact, traditional lifeways in at least the southern portion of Hilo were on the verge of change particularly with the introduction of commercialized sugar agriculture and development of early plantation infrastructure. With respect to Hilo Palikū, early accounts illustrate a stark contrast between the landscape of this *'okana* compared to the other *'okana* belonging to Hilo; primarily the result of the abundant, raging stream channels meandering through the many sheer cliffsides that characterized the rugged, remote uplands. This relative inaccessibility, at least up until the last quarter of the nineteenth century, served to preserve the *'okana* of Hilo Palikū from drastic changes relating to rapid, non-native population influx and destructive commercial development activities which were actively occurring in the southern portion of the *moku* during this time.

The Legacy of the *Māhele 'Āina* 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 King (Kamehameha III) and his high-ranking chiefs decided to separate and define the ownership of all lands in the Kingdom (King n.d.). This change was further promoted by missionaries and Western businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be taken 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 Hawai'i: the King, the chiefs and *konohiki*, and their tenants (the *maka'āinana* or common people). In 1845 the legislature created the "Board of Commissioners to Quiet Land Titles" (more commonly known as the Land Commission. All land claims, whether by chiefs for entire *ahupua'a* or by tenants for their house lots and gardens, had to be filed with the Land Commission within two years of the February 14, 1846, but the deadline was extended several times for chiefs and *konohiki* (Soehren 2005).

The King and some 245 chiefs (Kuykendall 1938) spent nearly two years trying unsuccessfully to divide all the lands of Hawai'i amongst themselves before the whole matter was referred to the Privy Council on December 18,

1847 (King n.d.). Once the King and his chiefs accepted the principles of the Privy Council, the *Māhele ʻĀina* (Land Division) was completed in just forty days (on March 7, 1848). The names of all of the *ahupuaʻa* and *ʻili kūpono* (nearly independent *ʻili* land division within an *ahupuaʻa*, that paid tribute to the ruling chief and not to the chief of the *ahupuaʻa*) of the Hawaiian Islands and the chiefs who claimed them, were recorded in the *Māhele* Book (Soehren 2005). As this process unfolded, King Kamehameha III, 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 with the last chief was recorded in the *Buke Māhele* (*Māhele* Book), King Kamehameha III commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike the King, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive their awards. The chiefs who participated in the *Māhele* were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as "Government Land," while the lands retained by Kamehameha III became known as "Crown Land," and the lands received by the chiefs became known as "*Konohiki* Land" (Chinen 1958:vii; 1961:13). 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 surveyed. This process expedited the work of the Land Commission. Pīhā Ahupuaʻa does not appear in the *Buke Māhele* and was never assigned or awarded during the 1848 division of lands. However, the ownership of Pīhā was the center of controversy when the trustees of Bishop Estate claimed that *ahupuaʻa* (along with other lands) had been continuously held and claimed by Bernice Pauahi Bishop's ancestors (Rowland 2018). To settle this dispute a compromise was reached by which the Minister of the Interior conveyed certain other lands to the Trustees, and they, in turn, conveyed the land of Pīhā (and other lands) to the Hawaiian Kingdom government. Thus, it was not until December 20, 1890, that Pīhā was included as Government Land.

Native tenants of the lands that had been distributed among the Crown, the various *Konohiki*, and the Government could claim and acquire title to parcels that they actively lived on or farmed. The Board of Commissioners oversaw the program and administered these *kuleana* parcels as Land Commission Awards. Claims for *kuleana* had to be submitted during a two-year period that expired on February 14, 1848 to be considered. All of the land claimants were required to provide proof of land use and occupation, which took the form of volumes of native registry and testimony. The claims and awards were numbered, and the LCAw. numbers, in conjunction with the volumes of documentation, remain in use today to identify the original owners and their use of the *kuleana* lands. The work of hearing, adjudicating, and surveying the claims required more than the two-year term, and the deadline was extended several times for the Land Commission to finish its work (Maly 2000). In the meantime, as the new owners of the lands on which the *kuleana* were located began selling parcels to foreigners, questions arose concerning the rights of the native tenants and their ability to access and collect the resources necessary for sustaining life. The "Enabling" or "*Kuleana* Act," passed by the King and Privy Council on December 21, 1849, clarified the native tenants' rights to the land and resources, and the process by which they could apply for fee-simple interest in their *kuleana*. The work of the Land Commission was completed on March 31, 1855. A total of 13,514 *kuleana* were claimed by native tenants throughout the islands, of which 9,337 were awarded (Maly 2000). No *kuleana* parcels were awarded within Pīhā Ahupuaʻa, thus, there are none situated within the current project area.

Boundary Commission Testimony (1862-1876)

In 1862, the Commission of Boundaries (Boundary Commission) was established in the Hawaiian Kingdom to legally set the boundaries of all the *ahupuaʻa* that had been awarded as a part of 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 lands, many of which had also been claimants for *kuleana* during the *Māhele*. This information was collected primarily between 1873 and 1885 and was usually given in Hawaiian and transcribed in 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*. 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 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 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 1875:325-330). Several older residents of the area provided testimony at the hearing including Ku, Hemahema, Kalaualoha, and Kupahu, as well as D.H. Hitchcock, the Government Surveyor who surveyed the Pīhā boundaries (Figure 14). 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 while surveying a portion of the Nanue boundary, and talked with Hemahema prior to the survey, but found that the recollections of Hemahema and Ku were generally agreeable regarding the boundaries, so only took Ku with him. From the testimony we learn that the boundary delineating Kahuku and Pīhā *ahupuaʻa* (forming the southeastern boundary of the current project 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 14. The following summary of the 1875 Boundary Commission testimony for Pīhā forcuses on the Kahuku boundary of the *ahupuaʻa*, which is adjacent to the southeastern boundary of the current project 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 indicated 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 (italicization and bolding added for emphasis):

> . . . 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. . .

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**.

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 (italicization and bolding added for emphasis):

> . . . **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**. . .

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.

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 14). Kalaualoha testified that (italicization and bolding added for emphasis):

> . . . **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*. . .

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", 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…" 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, and that the notes of the survey be filed (see Figure 14) and the Certificate of Boundaries be issued accordingly.

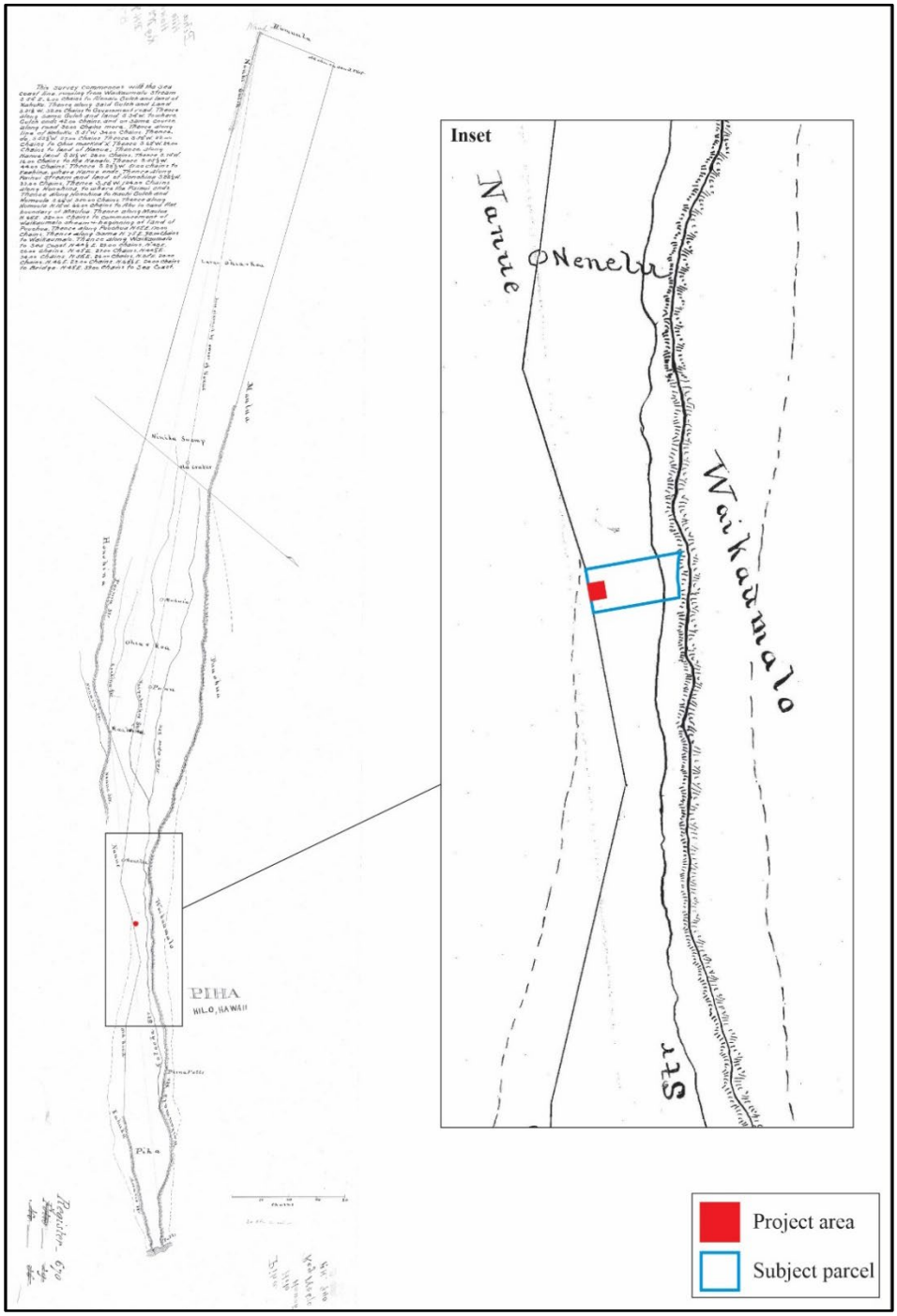

Figure 14. Hawaiʻi Registered Map No. 670 prepared by Hitchcock in 1874 showing approximate location of the project area within Pīhā Ahupuaʻa (Hitchcock 1874).

Later Historic Accounts of Pīhā and the Greater *'Okana* of Hilo Palikū

The decades that followed the *Māhele 'Āina* of 1848 are characterized by a growing detraction to traditional subsistence activities, undoubtedly the result of the relatively swift expansion of the non-native population in southern portions of Hilo that occurred throughout the nineteenth century. Rapid growth of the overall Hilo District, fueled by the development of landing wharves in South Hilo, further expanded the district's collective legacy as a focal point of intensive trade and commerce, particularly in the vicinity of Hilo Bay which was ranked as the third most frequented port for whaling vessels in need of repair and reprovisioning. With an increasing population and popularity, historical accounts from the end of the nineteenth century were no longer largely limited to the missionary population who had established a religious stronghold in the district. Rather, accounts from this time derive from the increasing number of curious travelers who recounted their experiences during a time when traditional lifeways were being transmuted by increasing modernization and urbanization.

Despite the rapid development of South Hilo, accounts from the latter part of the nineteenth century portray the *'okana* of Hilo Palikū in the stretch between Hakalau and Laupāhoehoe, and in the general vicinity of the project area, as an area still largely immune from the swift effects of urbanization with barely a population to speak of. Travelers to Hilo Palikū often remarked upon the rain-plundered landscape dissected by deeply cut ravines and gulches. Access through this portion of Hilo was provided only by a narrow trail suitable only for foot or travel by horseback which offered many a traveler nothing less than a harrowing experience. Isabella Bird visited Hilo in 1873 and published her experiences in *The Hawaiian Archipelago: Six Months Among the Palm Groves, Coral Reefs, & Volcanoes of the Sandwich Islands*. In the following excerpt, Bird provided a colorful depiction of an adventure along the treacherous precipices spanning between Laupāhoehoe and Hakalau *ahupua'a*:

> We crossed one gulch in which the water was strong, and up to our horses' bodies, and came upon the incorrigible Kaluna, who, instead of catching his horse, was recounting his adventures to a circle of natives, but promised to follow us soon. D. then said that the next gulch was a rather bad one, and that we must not wait for Kaluna, but ride fast, and try to get through it. When we reached the *pali* above it, we heard the roaring of a torrent, and when we descended to its brink it looked truly bad, but D. rode in, and I waited on the margin. She got safely across, but when she was near the opposite side her horse plunged, slipped, and scrambled in a most unpleasant way, and she screamed something to me which I could not hear. . . but the brave animal struggled through, with the water up to the top of her back, till she reached the place where D.'s horse had looked so insecure. In another moment she and I rolled backwards into deep water, as if she had slipped from a submerged rock. I saw her fore feet pawing the air, and then only her head was above water. I struck her hard with my spurs, she snorted, clawed, made a desperate struggle, regained her footing, got into shallow water, and landed safely. It was a small but not an agreeable adventure.
>
> We went on again, the track now really dangerous from denudation and slipperiness. The rain came down, if possible, yet more heavily, and coursed fiercely down each pali track. Hundreds of cascades leapt from the cliffs, bringing down stones with a rattling sound. We crossed a bridge over one gulch, where the water was thundering down in such volume that it seemed as if it must rend the hard basalt of the palis. Then we reached the lofty top of the great Hakalau gulch, the largest of all, with the double river, and the ocean close to the ford. . . (1880:107-108)

Two years later, a journalist by the name of Henry Martyn Whitney published the very first guidebook 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 through Hilo Palikū from Laupāhoehoe, passing *makai* of the project 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 be 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.
>
> 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." (1875:70-72)

As illustrated in nearly every accounting regarding Hilo Palikū, the *'okana*'s abundance of streams, valleys, and gulches made for a difficult and treacherous pass. In "Ka Huakaihele ike i na Makaainana o Hilo" (A Sightseeing Tour to Visit the Common Folk of Hilo), an account authored by G.K. Mahoe (1876) and serialized in the Hawaiian language newspaper *Ka Lahui Hawaii*, Mahoe recounted his travels through the region:

> *...ua pale ae au i ka loa o ke alahele, ua manao ole ae hoi i na pali hauliuli o Hilo paliku, na piina, na ihona, na alu, na kahawai, na kualono, a me na pupu, ua hele hookahi ia no e a'u, me ka manao ole i ka luhi a me ka inea o ka hele ana, oiai, ma ka hoomaopopo ana i ka loa mai Hilo one a hiki i Laupahoehoe, me he mea la, ua aneane no i ke kanakolu mile. A mai kuhihewa hoi ka poe heluhelu, he papu a he laumania hoi ke ano o ka waiho ana o ka aina, aole, aka, he puu kinikini, he alu, he kapekepeke ke alanui.*
>
> . . . I am protected from the long path ahead, I did not think twice of the dark cliffs of Hilo Palikū, the inclines, the descents, the ravines, the streams, the mountaintops, and the cleared fields, I moved alone, without thinking much of the strain and discomfort of traveling, although, when I recalled the length between Hilo One and Laupāhoehoe, those thirty miles came and went. The reader should not be mistaken, the lands that are passed along the way are not clear and smooth, rather, there are many hills, gulches, and twisting roads. (1876:1)

The road extending from Hilo One towards Laupāhoehoe in Hilo Palikū was described in George Bowser's *Hawaiian Kingdom Statistical and Commercial Directory* (Bowser 1880) as a treacherous but beautiful journey, containing several adequate landings for boats, and prime agricultural land suited for the potential cultivation of commercial crops. Bowser further remarked upon the sparse native population of this region:

> 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. (1880:536)

It is evident from Bowser's (1880) account that Hilo Palikū remained largely untouched by foreign lifeways until the latter part of the nineteenth century. Despite this, the region's fertile, largely unmodified, expansive landscape and promising economical enterprises did not go unnoticed. As noted by Henry Whaley Nicholson (1881:194) who was affiliated with the Royal Planter's Association, "this tract of land has fine grazing qualities, and is well adapted to the cultivation of cane and coffee: but the few roads are execrable, and means of transport laborious." It wasn't long before the region's landscape and abundant waters would integrate into a profitable, burgeoning enterprise propelled forward by envisioned entrepreneurs.

Pīhā Ahupuaʻa During the Late Nineteenth and Early Twentieth Centuries and a Concise History of the Pīhā Homesteads and the Current Project Area

Following the signing of the 1875 Treaty of Reciprocity, a free-trade agreement between the United States and the Hawaiian Kingdom, 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 Hakalau Mill, built in 1890 on the shore at the foot of a 200-foot bluff of Hakalau Gulch, produced 5,000 tons of sugar annually during its early years (ibid.). The cane was flumed from the various fields to the mill site, where it was then processed. Initially, 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 contained within Pīhā Ahupuaʻa, totaling 4,250 acres, were leased to the Hakalau Plantation Company on February 11, 1892 (see C.S.F. 449). The *makai* lands of the *ahupuaʻa* were cleared and used for the cultivation of sugarcane, but the fields of the Hakalau Plantation Company never extended as far *mauka* as the current project area, which remained as forest land into the present-day. The degradation of native forests were a catalyst for change in Hilo, and effects related to deforestation had been ongoing since the early 1800s. As a result, efforts were made to restore the upland forests to a natural, healthy habitat and preserve Hilo's valuable stream-fed watersheds in order to facilitate and sustain both agricultural pursuits and the well-being of the mounting population. 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 encompasses lands *mauka* of the current project area, 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)

Shortly after the creation of the Hilo Forest Reserve, and just as the plantation's lease on its Pīhā lands was set to expire, large tracts of land were set aside within government lands like Pīhā (and other parts of Hilo) by the newly formed Territory of Hawaiʻi (formed in 1900) to create homesteads. The process for obtaining homestead lots was 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 anticipated Pīhā homestead tract commenced in 1912 and was completed by 1913, 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 the Interior 1914a:679) (Figure 15). The Pīhā-Kahuku Homestead Road,

created as part of the Pīhā Homesteads subdivision and situated along the southeastern boundary of the project area separating it from the Kahuku Homesteads subdivision (see Figure 15), appears to follow the route of the older trail delineating the Pīhā and Kahuku *ahupuaʻa* boundary as indicated during Boundary Commission testimony proceedings provided for Pīhā during the late nineteenth century.

Not long after the formal subdivision of the Pīhā Homesteads, the Hakalau Plantation, now owned by C. Brewer & Co., questioned the legitimacy of the boundary between the homesteads and 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 1914b). Later that year, in June 1914, fifteen lots (Lots 9 through 28) within the *makai* third of the newly created Pihā Homesteads subdivision were made available for homesteading and sold at auction. The eight additional lots (Lots 1 through 8) situated in the more *mauka* remainder of the homesteads (Figure 16), were not applied for despite the claim that the Pīhā Homestead lots were available for homesteading in 1912 and were not set for 10-year lease at public auction until the following year in June 1915 (Honolulu Star-Bulletin 1916). One month later, on July 14, 1915, a general ten-year lease for Lots 1 through 8 was purchased at auction by the Hakalau Plantation Company who also purchased 10-year leases on four additional lots (Lots 13 through 16) of the adjoining Kahuku Homesteads (Department of the Interior 1916). Collectively, all of the Pīhā Homestead lots were to be taken only by Special Homestead Agreement, which had stipulations for an annual lease payment of $50 as well as a requirement to fence all lot boundaries (Herald 1915).

The Hakalau Plantation Company's lease, for unknown reasons, was never fully executed and Lots 1 through 8 were eventually sold off to various homesteaders. The current project area is situated within a portion of Lot 2 of the Pīhā Homesteads (see Figure 16; Figure 17). Lot 2, a 17.24-acre parcel, was sold jointly with Lot 1 (an 18.3-acre parcel adjacent to Lot 2 to the west) to William Breithaupt on August 23, 1916, as Grant No. 8584 for $324.00. Several other members of the Breithaupt family purchased lands within Pīhā Homesteads as well, including Otto Breithaupt (Lots 5 and 6; Grant 7862), Ella Breithaupt (Lots 7 and 8, Grant No. 7863), and August K. Breithaupt (Grant No. 8328; Lots 15 and 16). It appears that less than a month after William Breithaupt's purchase, on September 8, 1916, Lots 1 and 2 were leased to Mike Lehuanui under Special Homestead Agreement No. 1252 but later transferred back to Breithaupt's possession three years later on September 10, 1919 (Rivenburgh 1917). Territory of Hawaiʻi tax records indicate that Lots 1 and 2 (and thus the current project area) were initially identified as belonging to TMK: (3) 3-2-004:011 and were transferred from William Breithaupt to August Breithaupt on September 21, 1936.

Around this time and until the first half of the twentieth century, the Hakalau Plantation Company continued to operate on lands situated *makai* of the current project area. By the early 1940s, nearly 40 percent of the of the sugarcane on the plantation was being cultivated by independent growers, some of whom had purchased various 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 eventually rebuilt, but the railroad was shut down indefinitely and the product was then trucked to the docks at Hilo.

Six years following the *tsunami* in January 1952, Lots 1 and 2 were transferred from August Breithaupt's estate to Ella Breithaupt and eventually fell under the care of her own respective estate. By January 1953, six months prior to Ella Breithaupt's death (Honolulu Star-Bulletin 1953), a number of lots also presumably within the Pīhā Homesteads subdivision (including Lots 1 and 2) were being managed by her son and estate trustee, Graven Breithaupt, and collectively amassed under TMK: (3) 3-2-004:001. During this time, C. Brewer & Co. merged the Hakalau Plantation Company into the Pepeʻekeʻō Sugar Company (Dorrance and Morgan 2000), and sugar continued to serve as the dominant commercial industry in this portion of Hilo, although the project area remained uncultivated (Figure 18). In 1963, Lots 1 and 2 were part of 120.69-acres of land subsequently dropped into TMK: (3) 3-2-004:006 (along with Lots 3 through 8). Tax records are somewhat ambiguous but do indicate that 113.19 of the 120.69 acres were leased by Graven Breithaupt to Yoshinobu and his wife Tsutayo Yamada (Figure 19) along with their son, Bob Takeshi Yamada, for a period of 80 years beginning on July 1, 1963, while the remaining 7.5-acres was reserved for another lessee by the name of Makoto Tawara. It appears that during this year, most of the lands encompassed by Parcel 006 were classified as undeveloped forest (totaling 52.21 acres), while 38.18 acres of the parcel consisted of gulch lands (presumably Kalaeha Stream/Gulch, which bisects the subject parcel). Twenty-five acres was listed as pasture, while the remaining 5.3 acres was identified as cane land.

Although Yoshinobu Yamada had previous experience as a cane planter prior to his lease of the lands presumably encompassing, or in the immediate vicinity, of the project area, and later worked for and retired from Mauna Kea Sugar Company as a service truck helper(Hawaii Tribune-Herald 1985; Hilo Tribune-Herald 1934), it appears that the lands within and surrounding the current project area were never utilized for the cultivation of sugarcane by the Yamada family. However, Makoto Tawara, the additional lessee who received the remaining 7.5-acres of land within Parcel 006, is listed as a sugarcane grower in tax records spanning between 1953 and 1961 for Lots 7 and 8. Based upon these records, it is likely that the 7.5-acres of land leased to Tawara were not for lands within the project area, but rather for lands within Lot 8 which he likely continued leasing for an indeterminate period as an independent grower for the plantation. It can thereby be suggested that from 1963 until at least 1968, the only utilization of the remainder of the lands encompassed within Parcel 006 (Lots 1 through 7) were for pastoral use or were left fallow as undeveloped forest and gulch lands. A USGS topographic map from 1966 depicts the project area within a forest, indicating that it remained undeveloped until this time (Figure 20).

Land use for the current project area is vague in the years following, and it appears that by 1970 the current project area was removed from the Parcel 006 designation, which by this time details land use for just 30 acres of land. Despite the continued expansion and operation of the sugarcane growing operation in *makai* lands and with the merging of Pepeʻekeʻō Sugar Company into the Mauna Kea Sugar Company by C. Brewer & Co. into the Mauna Kea Agribusiness Company in 1973, it appears that the project area lands remained out of reach for the industry and sustained as an undeveloped, forested landscape until the present day (Figures 21 and 22).

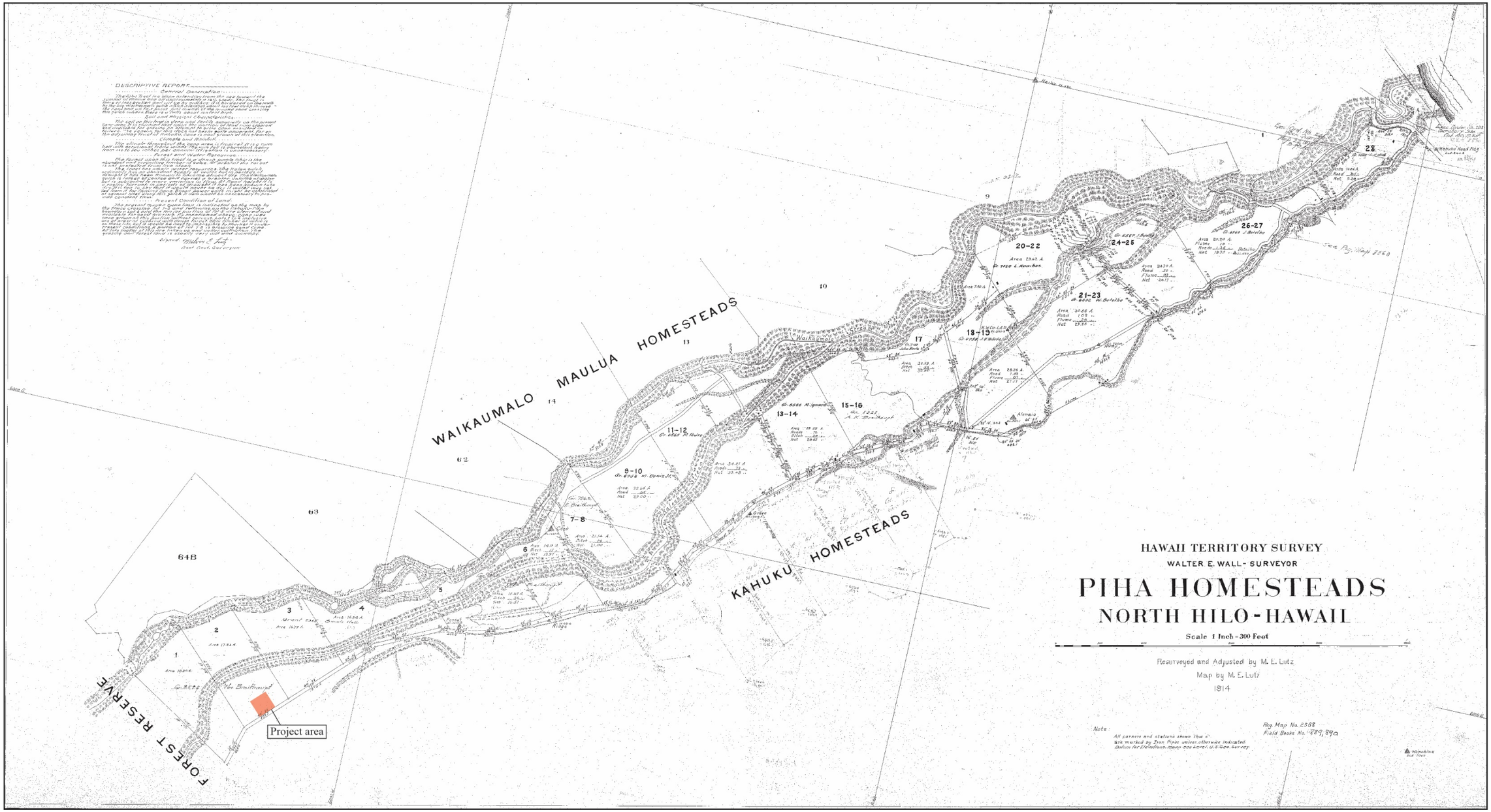

Figure 15. Hawai‘i Registered Map No. 2568 prepared in 1914 by M.E. Lutz showing the location of the current project area within Pīhā Homesteads (Lutz 1914).

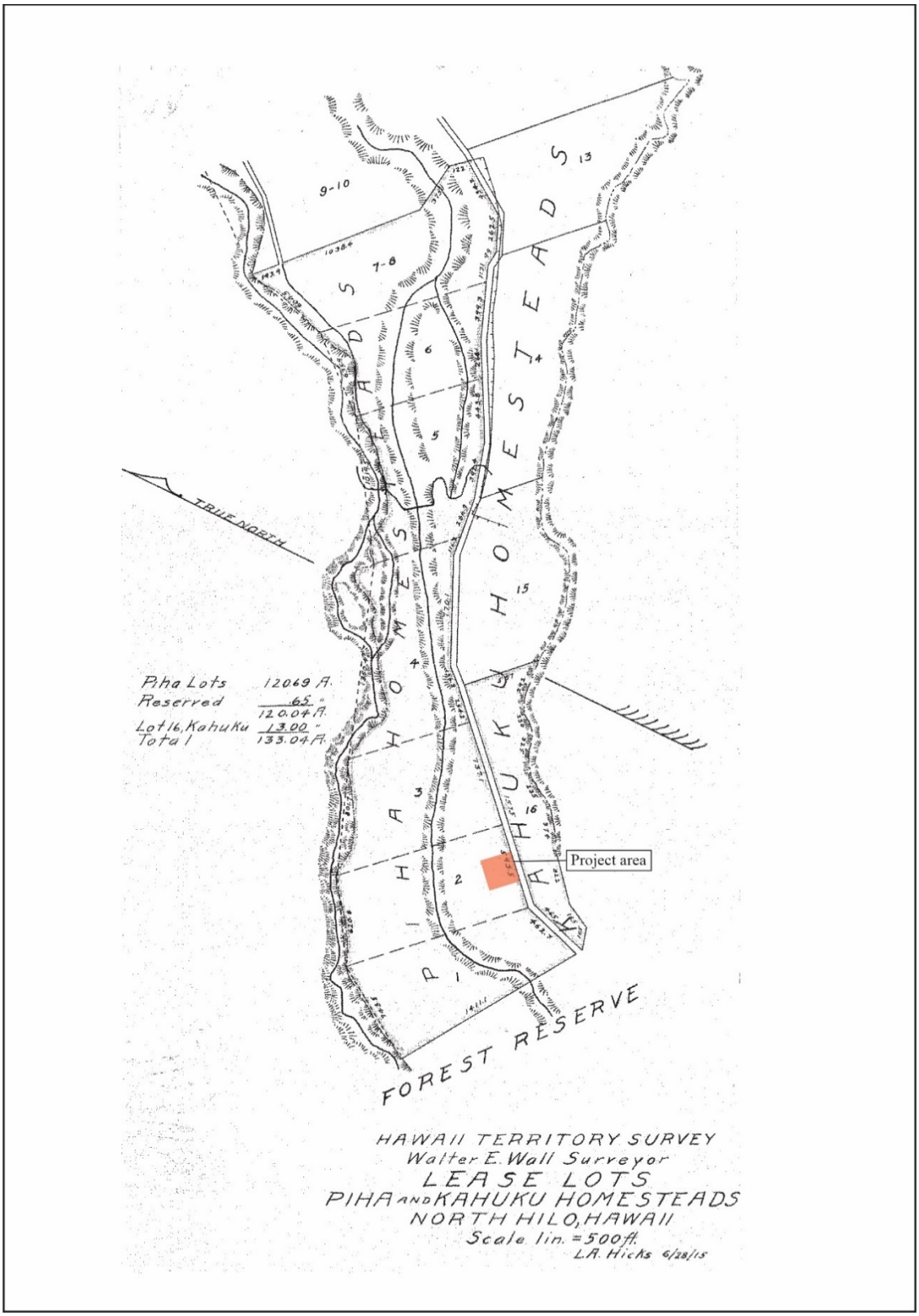

Figure 16. Map prepared on June 28, 1915 by L.A. Hicks showing the project area within Lot 2 of the Pīhā-Kahuku Homesteads (Hicks 1915).

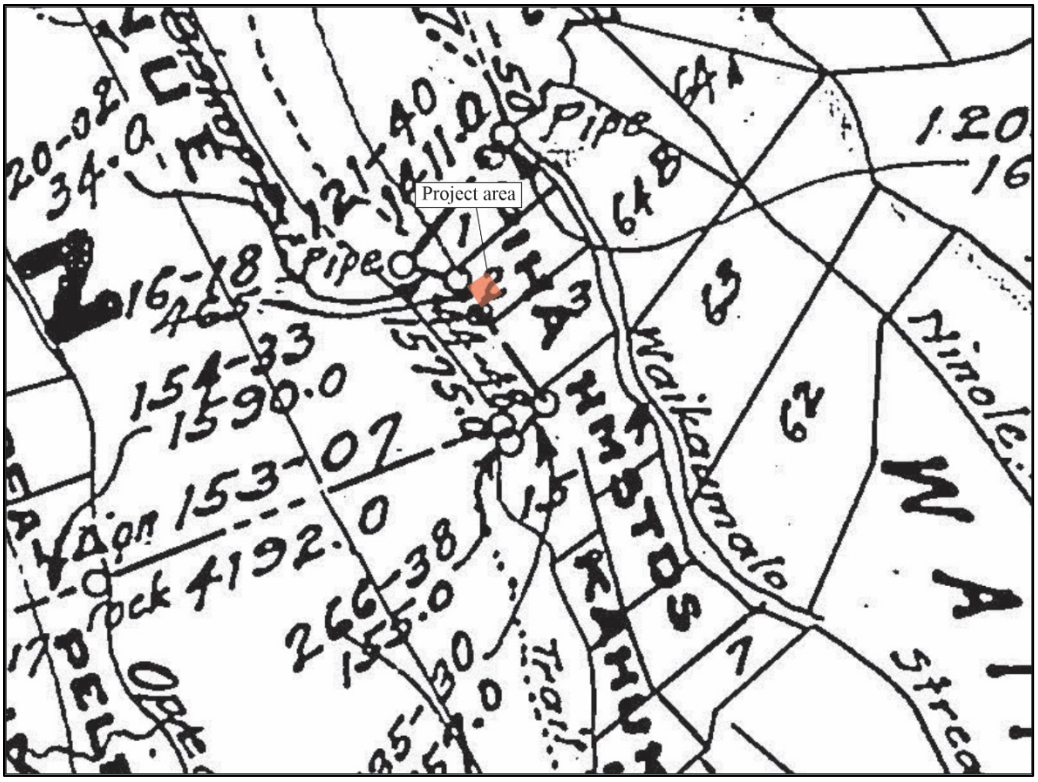

Figure 17. Portion of HTS Plat Map No. 799 prepared in 1922 by Jos. Iao showing the project area within Pīhā Homesteads (Hockley 1922).

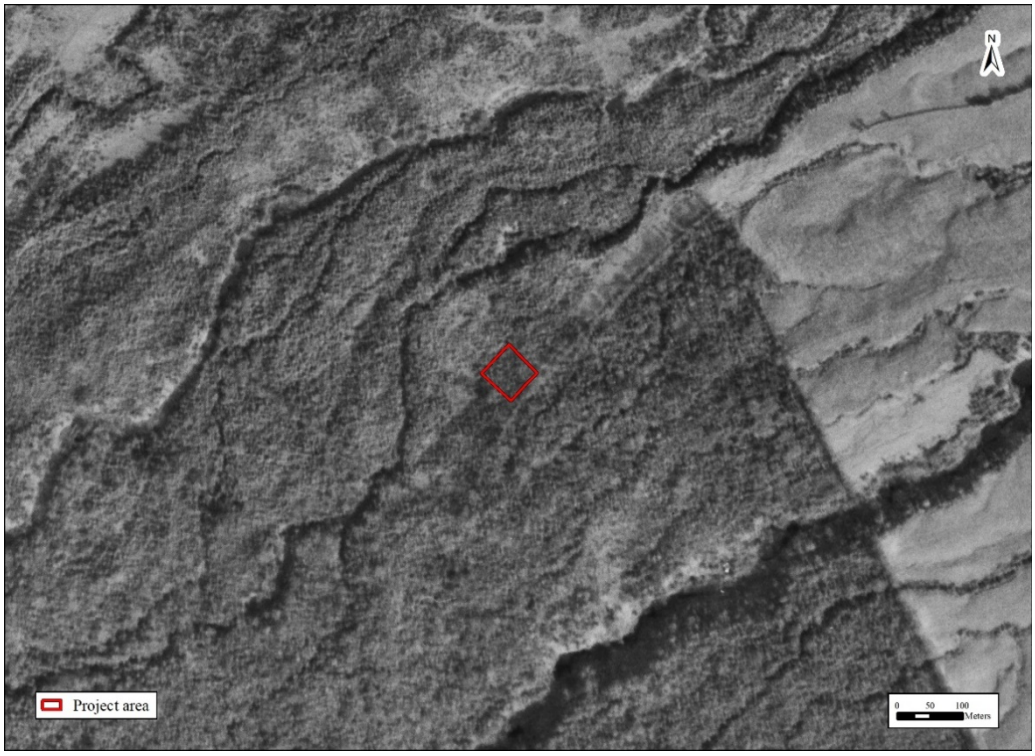

Figure 18. 1954 USGS aerial photograph showing the location of the project area.

Figure 19. Photograph of Yoshinobu and Tsutayo Yamada (Hawaii Tribune-Herald 1976).

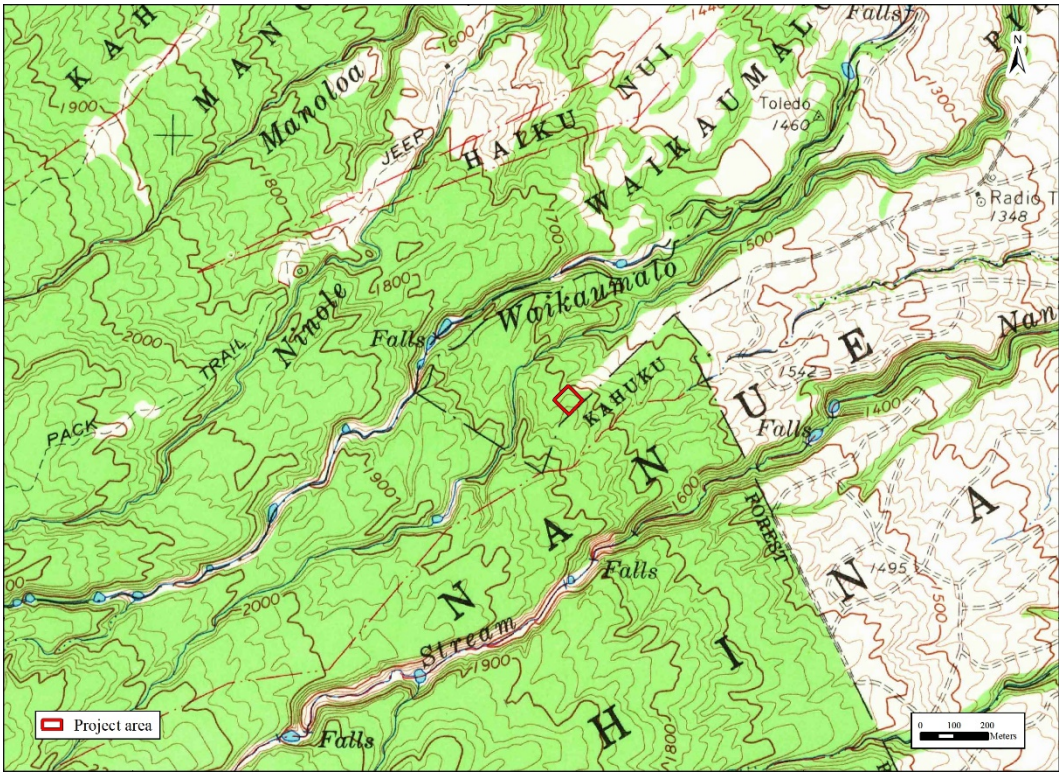

Figure 20. Portion of 1966 USGS Papaaloa quadrangle showing the location of the project area.

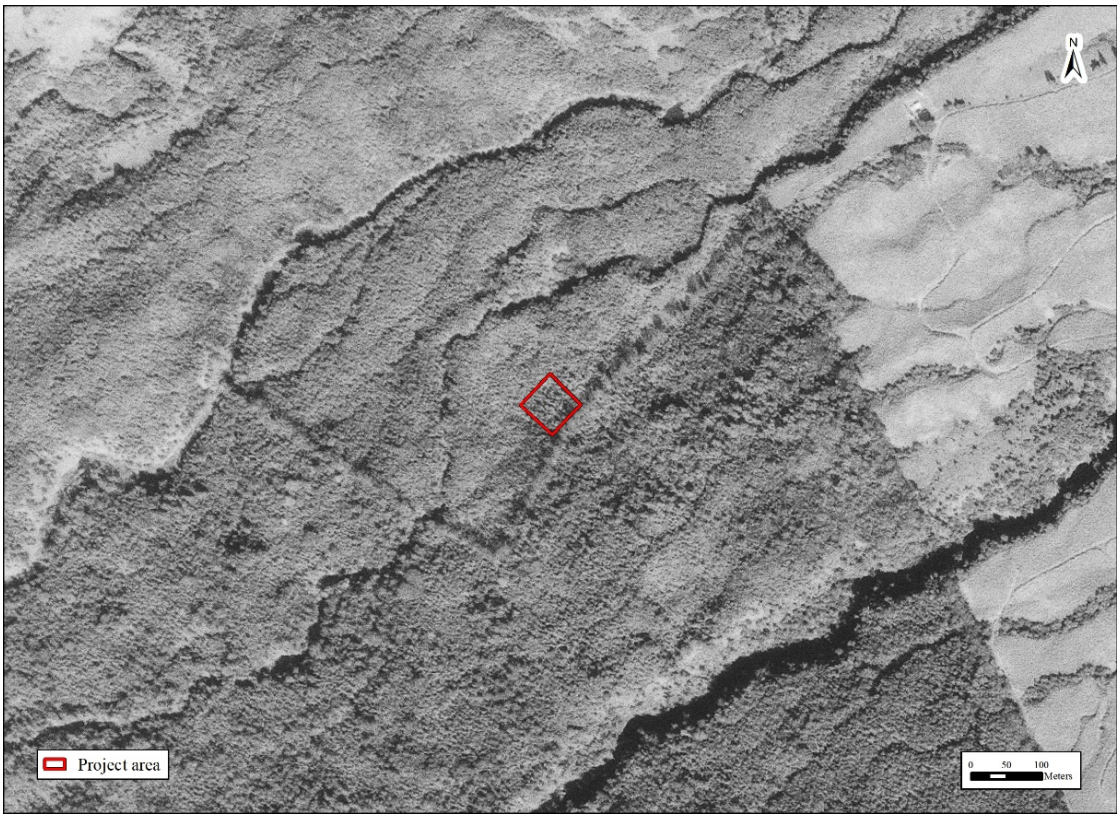

Figure 21. 1977 USGS aerial photograph showing the location of the project area.

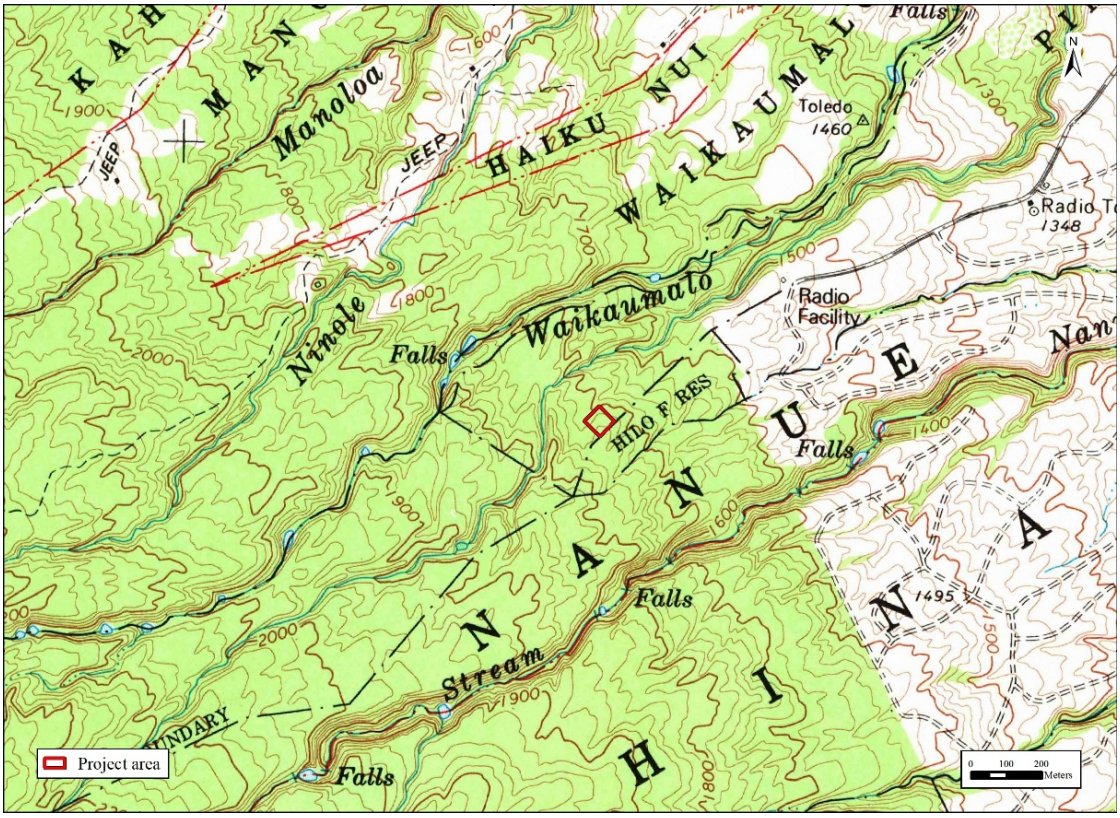

Figure 22. Portion of 1980 USGS Papaaloa quadrangle showing the location of the project area.

PREVIOUS ARCHAEOLOGICAL STUDIES

There have been no previous archaeological studies conducted within the current project area and very few studies conducted anywhere within the district of the North Hilo at similar elevations. The first archaeological work conducted in East Hawai‘i was that of the early twentieth-century *heiau* researchers Thrum and Stokes (Stokes and Dye 1991; Thrum 1908). Neither investigator was able to identify *heiau* within Pīhā Ahupua‘a or, for that matter, within the broader region between Hilo One and Hilo Palikū in the vicinity of 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 project area, although he did note the presence of a .25 mile square area of *kalo* terracing in the upper reaches of Hakalau Gulch situated east of the current project area. According to Hudson (ibid.:218), there was formerly a *papamū* (*kōnane* game board) in the bottom of Hakalau Gulch, and the gulch was at one time identified as a robber's stronghold.

More recently, Walker and Rosendahl (Walker and Rosendahl 1994a, 1994b) conducted an archaeological study of approximately 595 acres of land within Hakalau Nui Ahupua‘a in the South Hilo District, situated between Hawai‘i 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 1994a). Walker and Rosendahl reported that the study area had been extensively modified during the Historic Period for sugarcane cultivation, and that no archaeological sites resources were identified during the study.

In 1996, International Archaeological Research Institute, Inc. (IARII; Tomonari-Tuggle 1996) prepared a cultural resource overview for the Hakalau National Wildlife Refuge that included lands *mauka* of the current project area and outside of Pīhā Ahupua‘a. Very little archaeological work was undertaken during the study; however, Tomonari-Tuggle did provide a predictive model for site distribution within the upland forests of Hilo and indicated that such forested areas were utilized primarily for the collection of special resources:

> . . . 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. (ibid.:67)

Specific site types discussed by Tomonari-Tuggle (1996) that were surmised to have been encountered within the upland forests of the Hilo included 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. Tomonari-Tuggle (ibid.) described the lowest forest zone, in which the current project area is situated, as the wet *‘ōhi‘a* zone. This zone, characterized primarily by *‘ōhi‘a* forest and bog lands extending up to 4,000 feet in elevation, was indicated to have been an area largely used as a source of specialized forest resources such as hardwoods for crafts or construction, and forest birds for feathers.

A review of reports and correspondence on file at the DLNR-SHPD office in Hilo indicates that only two archaeological studies have been conducted in the vicinity of the current project area, but that DLNR-SHPD has previously written "no effect" letters for at least seven parcels within the Pīhā and Kahuku Homesteads (Figure 23). These "no effect" letters include a:

1. November 1, 1996 letter for TMK: (3) 3-2-004:025 (*Log No. 18344 Doc No. 9610ms04*); an
2. April 24, 1998 letter for TMK: (3) 3-2-004:027 (*Log No. 21307 Doc No. 9804PM15*); a
3. June 1, 1998 letter for TMK: (3) 3-2-004:039 (*Log No. 21050 Doc No. 9802PM03*); an
4. August 18, 1998 letter for TMK: (3) 3-2-004:041 (*Log No. 22025 Doc No. 9807ms17*); a
5. June 19, 2001 letter for TMK: (3) 3-2-004:043 and 044 (*Log No. 27706 Doc No. 0105ms08*); a
6. December 31, 2010 letter for TMK: (3) 3-2-004:045 (*Log No. 28884 Doc No. 0112PM10*); and an
7. April 17, 2013 letter for TMK: (3) 3-2-004:046 (*Log No. 2013.2304 Doc No. 1304SN05*)

The reason generally given for DLNR-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 significantly altered the landscape. DLNR-SHPD undertook no archaeological survey of the parcels listed above.

In 2018, ASM Affiliates (Clark 2018) conducted an archaeological survey of a roughly 5-acre portion of Lot 1 of the Pīhā Homesteads located west of the current project area (see Figure 23). While no archaeological resources were identified within the project area as a result of the study, Clark (ibid.) did note that the alignment of the Pīhā-Kahuku Road was identified adjacent to the eastern boundary of the project area.

Most recently, in 2019, ASM Affiliates (Ka‘uhane and Clark 2019) conducted an archaeological survey of a roughly 3.2-acre portion of Lots 13-14 of the Pīhā Homesteads located to the northeast of the current project area (see Figure 23). As a result of the study, no archaeological resources were identified within the project area, and it was determined that the proposed development would not affect historic properties.

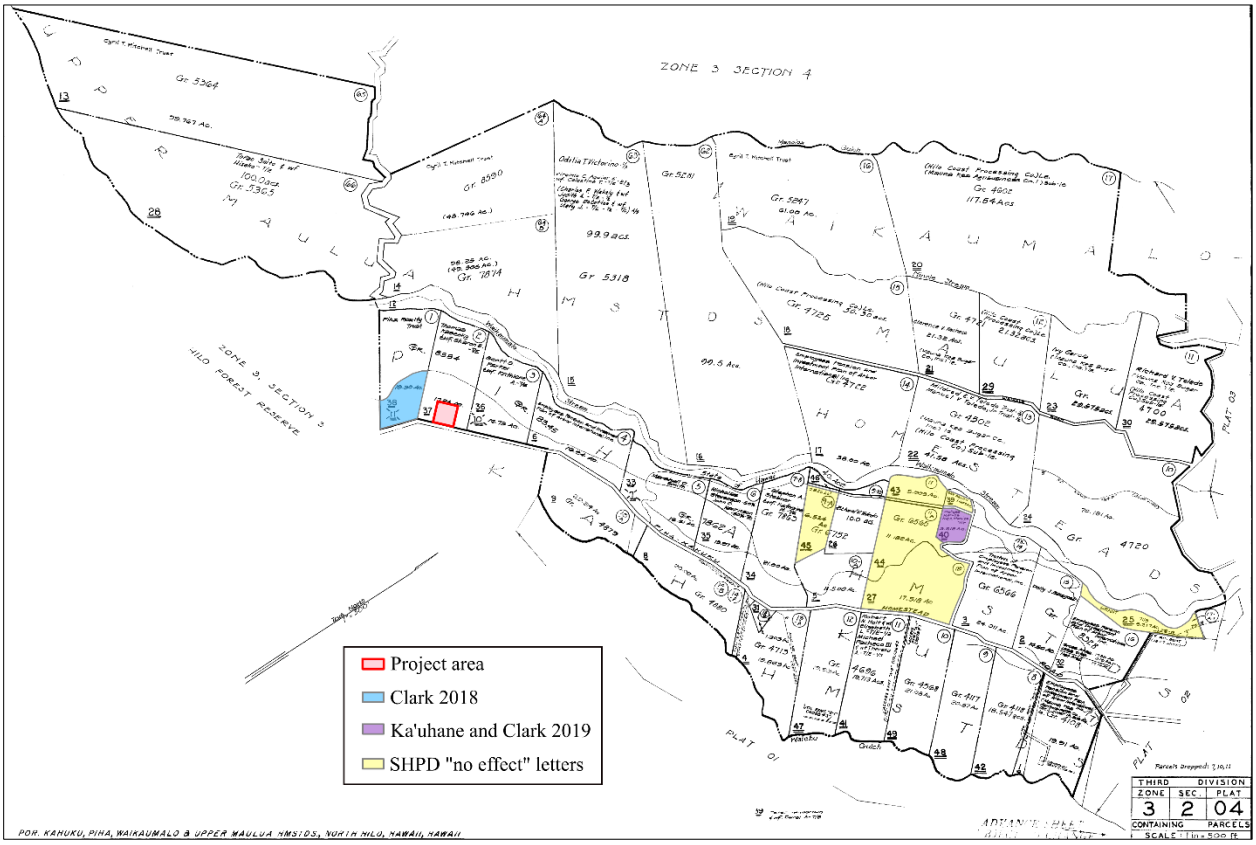

Figure 23. Previous archaeological studies conducted in the vicinity of the project area.

3. PROJECT 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 project 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 Ahupua‘a, access to the forest lands was facilitated by a bird catcher’s trail that followed the boundary between Kahuku and Pīhā *ahupua‘a* immediately adjacent to the southeastern boundary of the project area (approximating the route of the existing Pīhā-Kahuku Homestead Road, which remains a public right-of-way). This trail once intersected with a canoe maker’s trail from Nanue Ahupua‘a near the *mauka* boundary of Kahuku Ahupua‘a, southwest of the current project area. While the actual Precontact/early Historic trail routes, if they ever entered the project area at all, are likely to be difficult to identify archaeologically given the thickly vegetated terrain and disturbance resulting from the development of the Pīhā-Kahuku Homestead Road, rock constructions once built adjacent to the trails, such as temporary shelters or cairns, may be encountered. An examination of historical records indicates that the project area likely remained entirely undeveloped despite ongoing commercial cultivation of sugarcane in lands *makai* of the project area. However, Historic use of Lot 2 of the Pīhā Homesteads, which was originally purchased by William Breithaupt in 1916 as Grant No. 8584 before being

subsequently transferred to various other family members and leased to four additional individuals during the mid-twentieth century, may be marked by archaeological features related to ranching, habitation, or other early twentieth-century homesteading activities.

4. FIELDWORK, CONCLUSION, AND RECOMMENDATIONS

Fieldwork for the current study was conducted on July 27, 2021, by Lauren Kepaʻa, B.A. and Johnny Dudoit, B.A. under the direct supervision of Matthew R. Clark, M.A. (Principal Investigator). Fieldwork consisted of an intensive (100%) coverage survey of the entire surface of the project area utilizing systematic southeast to northwest oriented pedestrian transects with fieldworkers spaced at 10-meter intervals. The entire project area was accessible at the time of the survey, and the boundaries of the parcel were clearly identifiable in the field, and vegetation cover only moderately limited ground visibility.

No historic properties were identified within the current project area; thus, with respect to the HRS Chapter 6E-42 historic preservation review process, it is the conclusion of this study that the development of a single-family dwelling within the current project area on a portion of TMK: (3) 3-2-004:037 will have no effect on historic properties. It is our recommendation that no further historic preservation work needs to be conducted prior to or during project implementation. In the unlikely event that significant archaeological resources are discovered during the proposed development activities, work shall cease in the area of the discovery and the DLNR-SHPD shall be contacted pursuant to HAR 13§13-280-3.

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

APPENDIX 3
Cultural Impact Assessment

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A Cultural Impact Assessment for the Single-Family Residential Development of Lot 2 within the Pīhā Homesteads

TMK: (3) 3-2-004:037

Pīhā Ahupuaʻa
North Hilo District
Island of Hawaiʻi

FINAL VERSION

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ASM Project Number 37470.00

A Cultural Impact Assessment for the Single-Family Residential Development of Lot 2 within the Pīhā Homesteads

TMK: (3) 3-2-004:037

Pīhā Ahupuaʻa
North Hilo District
Island of Hawaiʻi

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1. INTRODUCTION

At the request of Mr. Sean Winterer (landowner), ASM Affiliates (ASM) has prepared this Cultural Impact Assessment (CIA) for the development of a single-family residence on a roughly 1-acre portion of a 17.2-acre conservation zoned parcel, identified as Tax Map Key (TMK) (3) 3-2-004:037, located in *mauka* (upland) section of the Pīhā Homesteads, Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (Figures 1, 2, and 3). Due to the parcel's zoning status, a Conservation District Use Application (CDUA) is being prepared for the proposed single-family residential development (Figure 4) in accordance with Hawaiʻi Revised Statutes (HRS) Chapter 343 and this CIA is intended to inform the application process.

This CIA report has been prepared according to the standard specified in the Office of Environmental Quality Control (OEQC) *Guidelines for Assessing Cultural Impacts*, adopted by the Environmental Council, State of Hawaiʻi, on November 19, 1997 (OEQC 1997). Act 50, which was proposed and passed as Hawaiʻi State House Representatives Bill No. 2895 and signed into law by the Governor on April 26, 2000, specifically acknowledges the State's responsibility to protect native Hawaiian cultural practices. Act 50 further states that "environmental assessments…should identify and address effects on Hawaii's culture, and traditional and customary rights" and that "native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the 'aloha spirit' in Hawaiʻi. Furthermore, Articles IX and XII of the State's 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.

This report is divided into four main chapters, beginning with an introduction that includes a description of the proposed project area. To provide a physical and cultural context, section two of this report includes a cultural and historical background for the general study area, which includes background information for Pīhā Ahupuaʻa and the greater district of North Hilo. This section also includes a presentation of prior studies conducted within the vicinity of the proposed development activity. The results of the consultation process are presented in section three of this report and section four concludes with a discussion of potential cultural impacts as well as appropriate actions and strategies that may help to mitigate any such impacts.

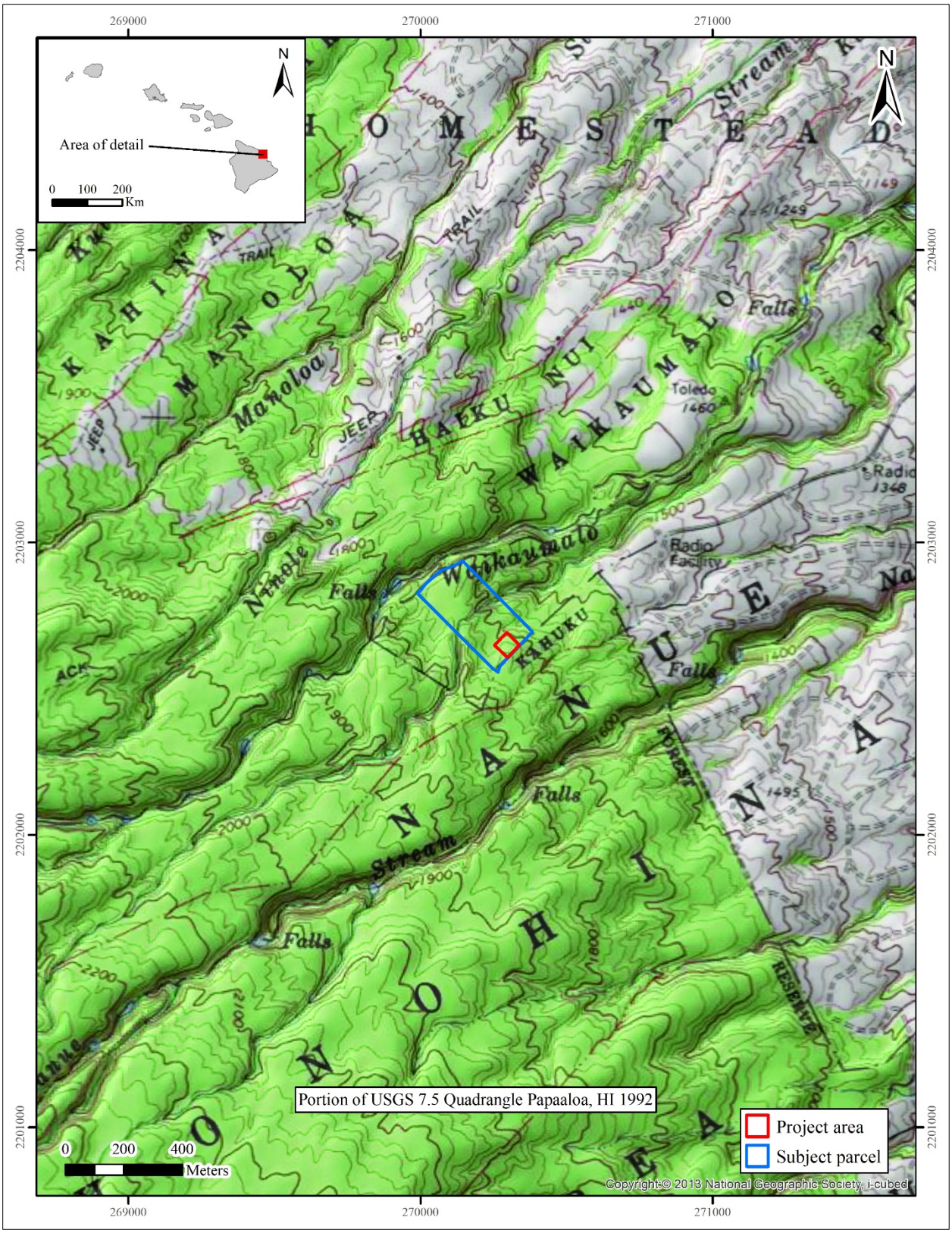

Figure 1. Regional location map showing project area and subject parcel.

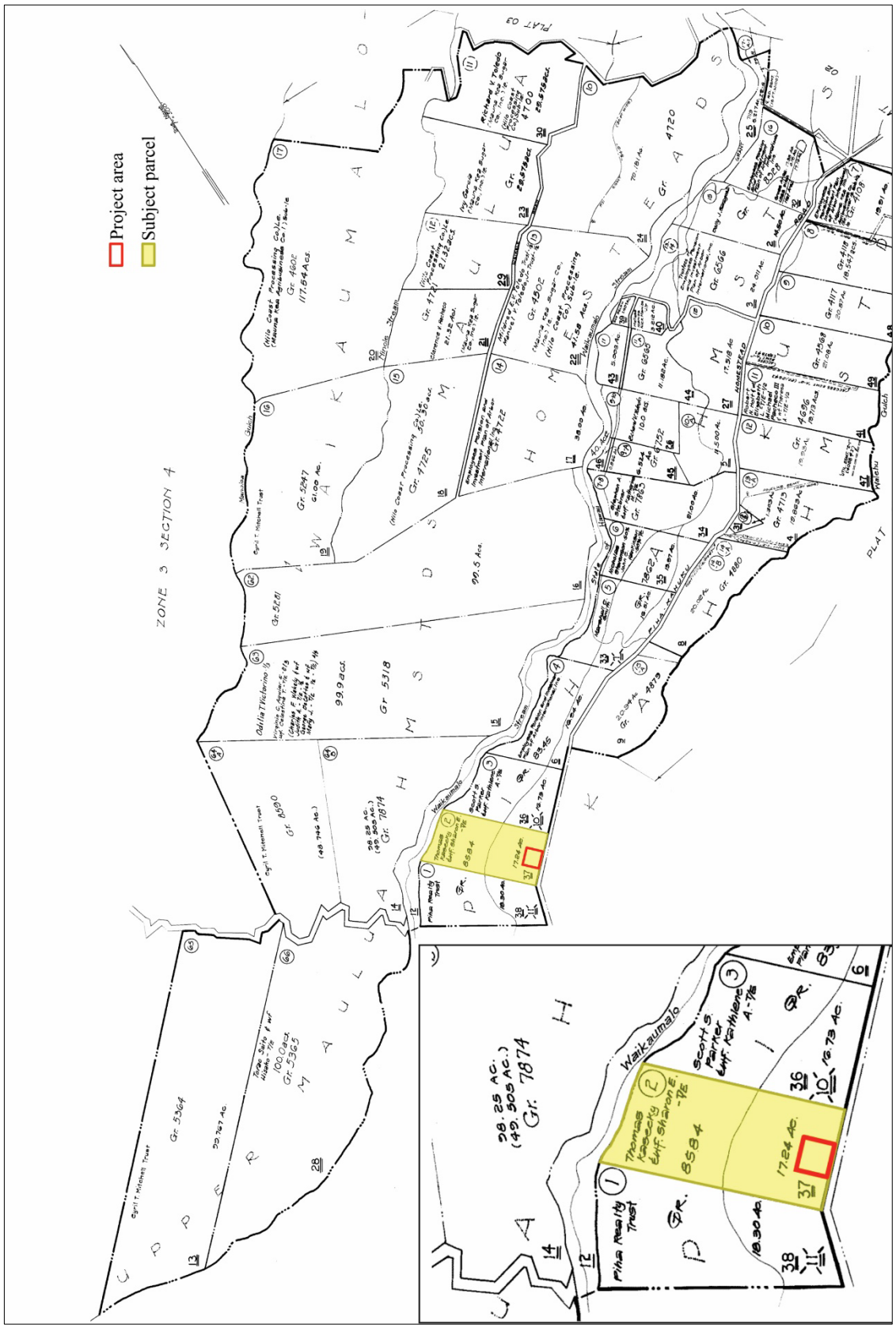

Figure 2. Tax Map (3) 3-2-04 showing the subject parcel (037) and project area.

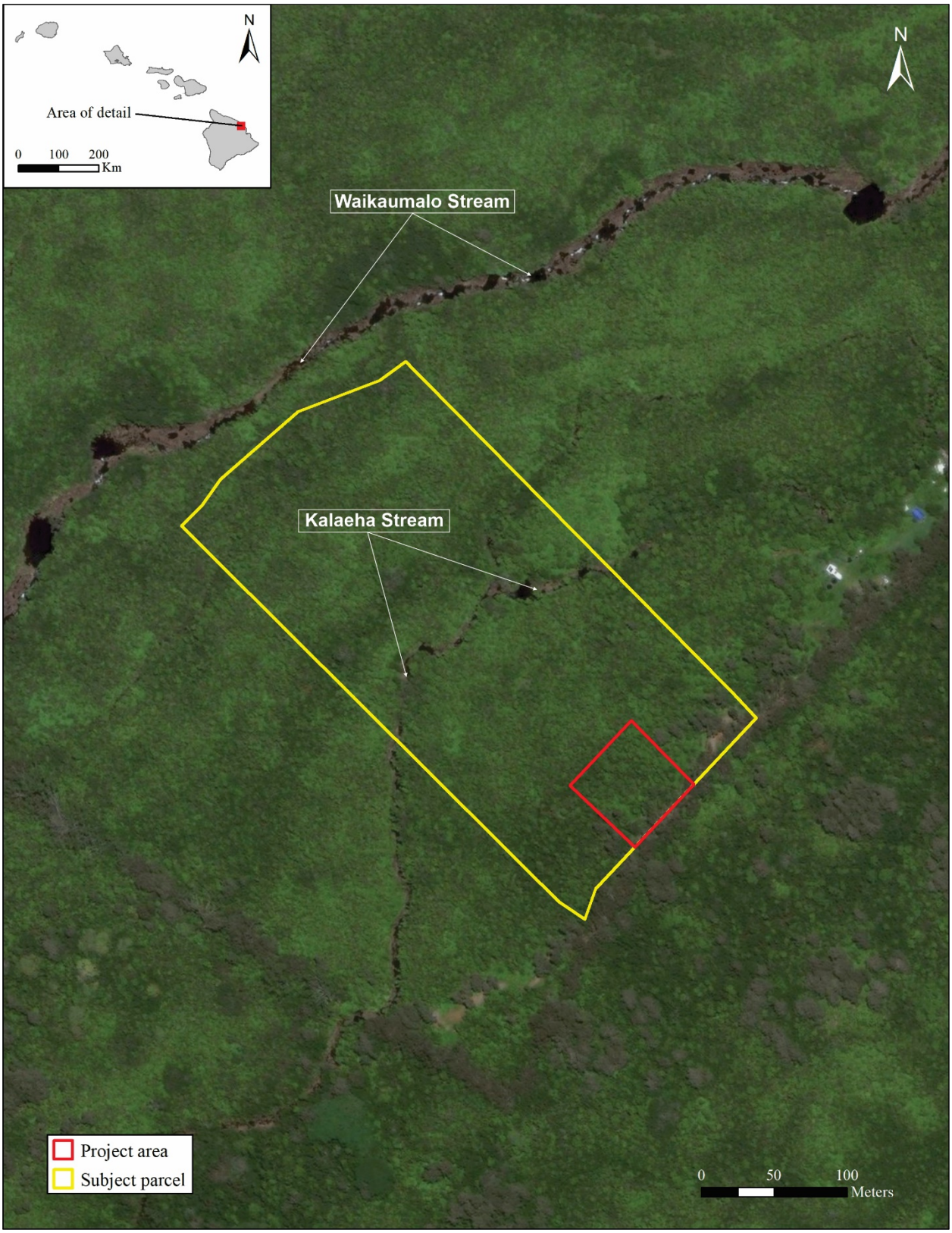

Figure 3. Google Earth™ aerial image showing subject parcel and project area.

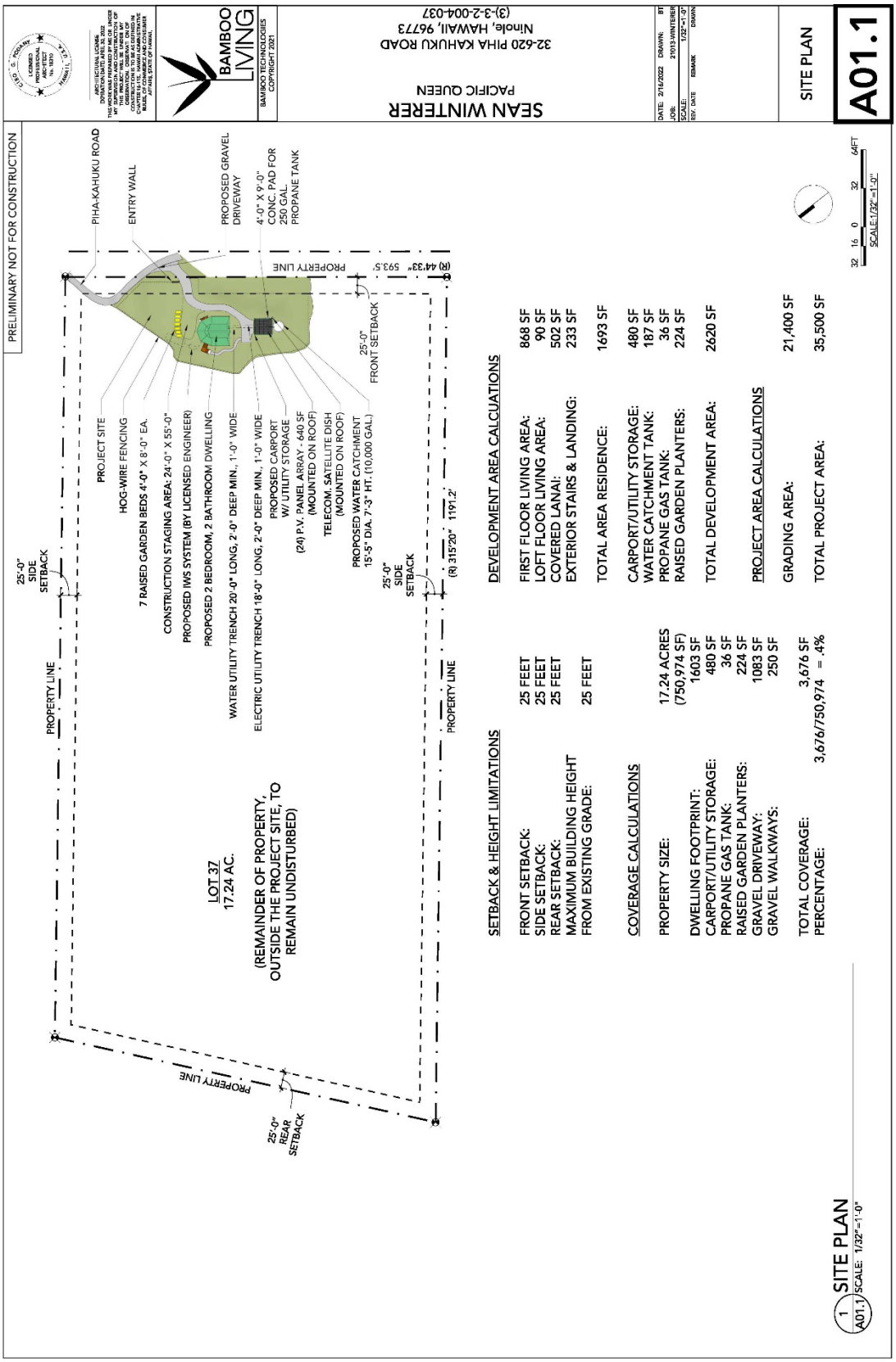

Figure 4. Proposed development plans.

PROJECT AREA DESCRIPTION

The project area consists of a roughly 1-acre portion of Lot 2 of the historic Pīhā Homesteads (TMK: (3) 3-2-004:037), located in Pīhā Ahupuaʻa, North Hilo District, Island of Hawaiʻi (see Figures 1, 2, and 3). The overall subject parcel comprises 17.24 acres and is situated within the southwestern (*mauka*) portion of the Pīhā Homesteads subdivision. It is bounded to the northeast and southwest by properties that are designated within the State Conservation District. The parcel (036) to the northeast is developed with a single-family residence and assorted out-buildings and the southwest parcel (038) is partially improved with an access driveway and has approval of a Conservation District User Permit for the construction of a single-family residence and related utility and landscape improvements (see Figure 2); the construction of which is expected to begin by the end of the year 2021. The subject parcel is bounded on the south by the unimproved portion of the Pīhā-Kahuku Road, which provides access to the project area (Figure 5), and to the north by Waikaumalo Stream (see Figure 3) situated within a thin, 40-acre conservation-zoned parcel (012) owned by the State of Hawaiʻi (see Figure 2). The project area is located along the central section of the southeastern boundary adjacent to the northwestern edge of Pīhā-Kahuku Road (see Figure 2), roughly 4.6 kilometers (2.85 miles) inland of the coast at an elevation of roughly 525 meters (1,722 feet) above sea level.

The geology of this portion of North Hilo is formed of mixed *ʻaʻā* and *pāhoehoe* basaltic substage lava flows, mapped as Hāmākua Volcanic Series (Sherrod et al. 2007), that originated from Mauna Kea Volcano between 64,000 and 300,000 years ago during the Pleistocene Epoch (labeled Qhm in Figure 6). Soils that have formed on these lava flows are classified as Kaiwiki highly organic hydrous silty clay loam on 6 to 20 percent slopes (Figure 7). These deep, well-drained Andisol soils are formed of weathered volcanic ash overlying bedrock (Soil Survey Staff 2020). Terrain within the majority of the project area is characterized by a moderate northwest slope that extends to a narrow gully with intermittent water flow that meanders along portions of the northern project area boundary. This gully delineates the project area from the remainder of the subject parcel to the northwest (Figure 8).

The climate at this elevation in North Hilo is generally cool, with temperatures averaging between 55° to 68° Fahrenheit throughout the year (Giambelluca et al. 2014). The lands in the vicinity of the project area receive a mean annual rainfall of approximately 5,285 millimeters (208 inches), with the highest rainfall occurring between the months of November and March, and the least amount of rainfall occurring in June. Trade winds often blow from east to west across this region, except when *kona* winds are blowing (typically during the summer months), and the wind pattern is reversed.

Terrain within much of the project area is generally characterized by a gentle to moderate slope towards the northwest although the topography in the northeastern corner of the project area slopes moderately to the northeast. The project area is currently undeveloped and is thickly vegetated primarily in an overstory of strawberry guava (*Psidium cattleianum*) stands interspersed with *ʻōhiʻa* (*Metrosideros polymorpha*) and paperbark (*Melaleuca quinquenervia*) trees. Ground cover beneath the overstory consists predominantly of decaying logs as well as eastern gamagrass (*Tripsacum dactyloides*), malabar melastome (*Melastoma malabathricum*), soapbush (*Melastoma candidum*), and *uluhe* (false staghorn; *Dicranopteris linearis*) (Figures 9 and 10) that largely obscure the underlying ground surface, while the northeastern corner of the project area is predominantly shrouded by a thick overgrowth of *uluhe* and significantly less tree cover.

Figure 5. Pīhā-Kahuku Road marking the southern project area boundary, view to the southwest.

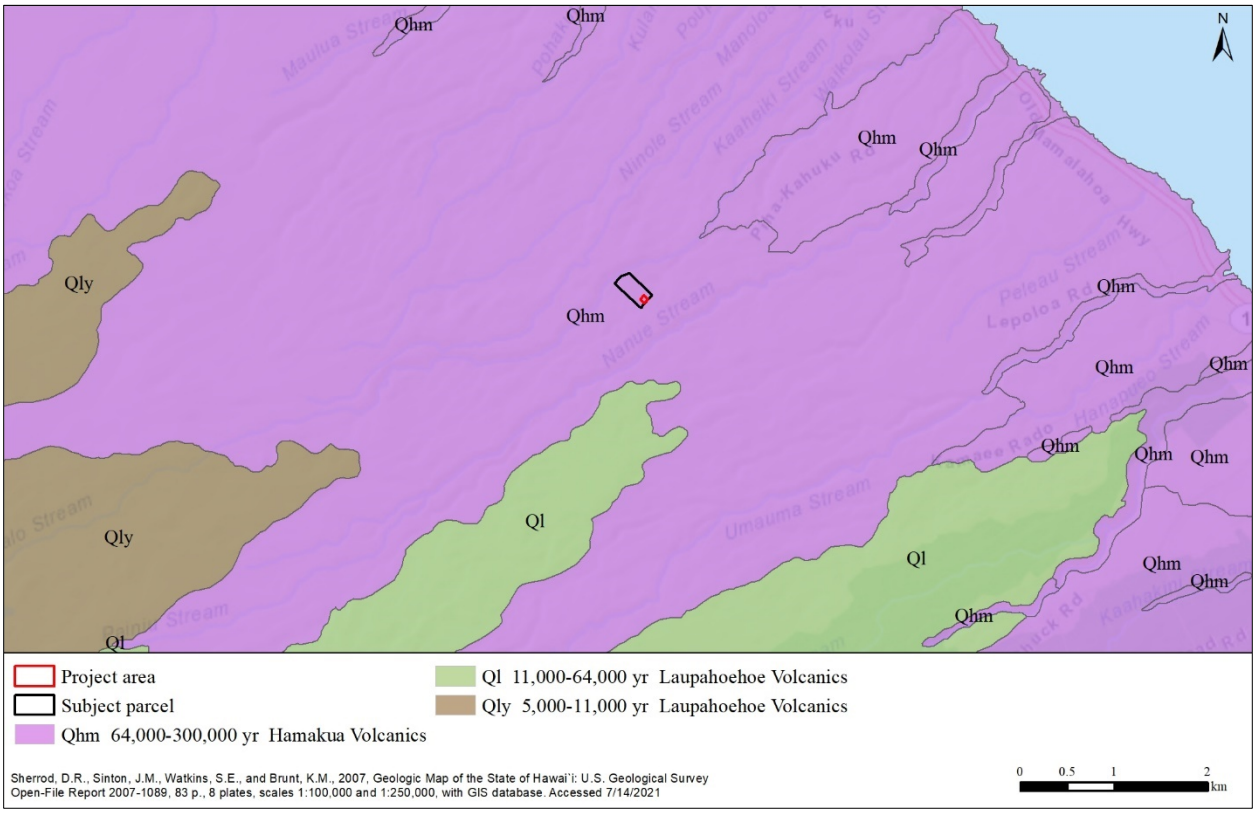

Figure 6. Geology underlying the project area.

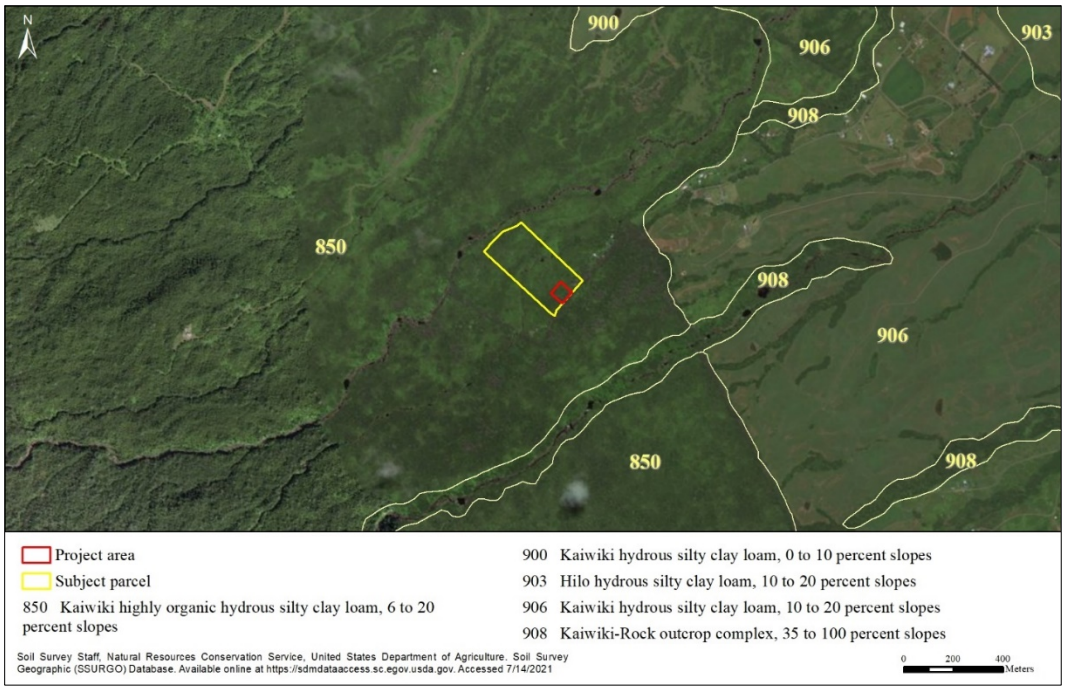

Figure 7. Soils in the project area.

Figure 8. Gully located to the north of the project area boundary, view to the southwest.

Figure 9. Typical vegetation pattern in the central portion of the project area, view to the south.

Figure 10. Typical vegetation in the northeast corner of the project area, view to the southeast.

2. BACKGROUND

As specified in the OEQC (1997) *Guidelines for Assessing Cultural Impacts*, "…the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment." For this cultural impact assessment, the *ahupuaʻa* of Pīhāis considered the study area, while the entirety of TMK: (3) 3-2-004:037 is referred to as the subject parcel and proposed 1-acre development footprint is referred to as the project area.

To generate a set of expectations regarding the nature of cultural resources that might be encountered within the current project area and to establish a context within which to assess the significance of such resources, the background section begins with a general culture-historical context. This is followed by culture-historical background information concerning the history of Pīhā. A background of Hilo Palikū, the broader regional designation in which Pīhā is situated, also falls within the parameters of the OEQC guidelines and ensures that a broader set of cultural practices and histories are considered. Following this background section is a discussion of relevant prior archaeological studies that have been conducted in the vicinity of the project area.

RESEARCH METHODS

The culture-historical context and summary of previously conducted archaeological and cultural research presented below are based on research conducted by ASM Affiliates at various physical and digital repositories. Primary English language and Hawaiian language resources were found at various state agencies, including the State Historic Preservation Division, Hawaiʻi State Archives, and the Department of Accounting and General Services Land Survey Division. Digital collections provided through the Office of Hawaiian Affairs Papakilo and Kīpuka databases, Waihona ʻĀina, the Ulukau Hawaiian Electronic Library Ulukau, the Hawaiʻi Genealogical Indexes, and Newspapers.com provide further historical context and information. Lastly, secondary resources curated at ASM's Hilo office offer general information regarding the history of land use, politics, and culture change in Hawaiʻi, enhances the broad sampling of primary source materials that are cited throughout this CIA.

CULTURE-HISTORICAL CONTEXT

The following subsections are intended to provide a general overview of Hawaiian origins, settlement, expansion, and describes some of the broad sociopolitical and cultural transformations that developed over time. The discussion continues with a summary of traditional ideologies associated with the land and the evolution of uniquely Hawaiian land stewardship practices. It is within this context that the history specific to the lands of Pīhā is developed.

Generalized Model of Hawaiian Origins and Settlement

While the question of when Hawaiʻi was first settled by Polynesians remains contested, scholars working in the fields of archaeology, folklore, Hawaiian studies, and linguistics have offered several theories. With advances in palynology and radiocarbon dating techniques, Kirch (2011), Athens et al. (2014), and Wilmshurst et al. (2011) have argued that Polynesians arrived in the Hawaiian Islands sometime between A.D. 1000 and A.D. 1200. This initial migration on intricately crafted *waʻa kaulua* (double-hulled canoes) to Hawaiʻi from Kahiki, the ancestral homelands of Hawaiian deities and peoples from southern Pacific Islands, occurred at least from initial settlement to the 13th century. According to Fornander (1969), Hawaiians brought from their homeland certain Polynesian customs and beliefs: the major gods Kāne, Kū, Lono, and Kanaloa (who have cognates in other Pacific cultures); the *kapu* system of political and religious governance; and the concepts of *puʻuhonua* (places of refuge), *ʻaumakua* (ancestral deity), and *mana* (divine power). Archaeologist Kenneth Emory who worked in the early to mid-20th century reported that the sources of early Hawaiian populations originated from the southern Marquesas Islands (Emory in Tatar 1982). However, Emory's theory is not universally accepted, as Hawaiian scholars in the past and present have argued for a pluralistic outlook on ancestral Hawaiian origins from Kahiki (Case 2015; Fornander 1916-1917; Kamakau 1866; Kikiloi 2010; Nakaa 1893; Poepoe 1906).

While stories of episodic migrations were widely published in the Hawaiian language by knowledgeable and skilled *kūʻauhau* (individuals trained in the discipline of remembering genealogies and associated ancestral stories), the cultural belief that living organisms were *hānau ʻia* (born) out of a time of eternal darkness (*pō*) and chaos (*kahuli*) were brought and adapted by ancestral Hawaiian populations to reflect their deep connection to their environment. As an example, the *Kumulipo*, Hawaiʻi's most famed *koʻihonua* (a cosmogonic genealogical chant), establishes a birth-rank genealogical order for all living beings (Beckwith 1951; Liliuokalani 1978). One such genealogical relationship

that remains widely accepted in Hawai‘i is the belief that *kalo* (taro) plants (in addition to all other plants, land animals, and sea creatures), are elder siblings to humans (Beckwith 1951). This concept of hierarchical creation enforces the belief that all life forms are intimately connected, evidencing the cultural transformations that occurred in the islands through intensive interaction with their local environment to form a uniquely Hawaiian culture.

In Hawai‘i’s ancient past, inhabitants were primarily engaged in subsistence-level agriculture and fishing (Handy et al. 1991). Following the initial settlement period, communities clustered in the *ko‘olau* (windward) shores of the Hawaiian Islands where fresh water was abundant. Sheltered bays allowed for nearshore fisheries (enriched by numerous estuaries) and deep-sea fisheries to be easily accessed (McEldowney 1979). Widespread environmental modification on land also occurred as early Hawaiian *kanaka mahi‘ai* (farmers) developed new subsistence strategies, adapting their familiar patterns and traditional tools to work efficiently in their new home (Kirch 1985; Pogue 1978). Areas with the richest natural resources became heavily populated overtime, resulting in the population’s expansion to the *kona* (leeward) side of the islands and to more remote areas (Cordy 2000).

As populations expanded, major socioeconomic changes occurred, such as the development of complex social stratification systems and intensive land modification. During this expansion period, additional migrations to Hawai‘i occurred from the islands of Tahiti. Rosendahl (1972) proposed that settlement at this time was seasonally recurrent, in which coastal sites were occupied in the summer to exploit marine resources and upland agricultural sites were maintained during the winter months. An increasing reliance on agricultural products may have caused a shift in social networks as noted by Hommon (1976), who argued that kinship links between coastal settlements disintegrated as those links within the *mauka-makai* (upland-coastal) settlements expanded to accommodate the exchange of agricultural products for marine resources. This shift is believed to have resulted in the establishment of the *ahupua‘a* system sometime during the 15th century (Kirch 1985). The implications of this model include a shift in residential patterns from seasonal, temporary habitation, to the permanent dispersed habitation of both coastal and upland areas.

Overview of Traditional Hawaiian Land Management Strategies

Adding to an already complex society was the development of traditional land stewardship systems, including the *ahupua‘a.* The *ahupua‘a* was the principal land division that functioned for both taxation purposes and furnished its residents with nearly all subsistence and household necessities. *Ahupua‘a* are land divisions that typically include multiple ecozones from *ma uka* (upland mountainous regions) to *ma kai* (shore and near shore regions), assuring a diverse subsistence resource base (Hommon 1986). Although the *ahupua‘a* land division typically incorporated all of the eco-zones, their size and shape varied greatly (Cannelora 1974). Noted Hawaiian historian and scholar Samuel Kamakau summarized the ecozones that could be found in a given *ahupua‘a*:

> Here are some names for [the zones of] the mountains—the *mauna* or *kuahiwi*. A mountain is called a *kuahiwi*, but *mauna* is the overall term for the whole mountain, and there are many names applied to one, according to its delineations (*‘ano*). The part directly in back and in front of the summit proper is called the *kuamauna*, mountaintop; below the *kuamauna* is the *kuahea*, and makai of the *kuahea* is the *kuahiwi* proper. This is where small trees begin to grow; it is the *wao nahele*. Makai of this region the trees are tall, and this is the *wao lipo*. Makai of the *wao lipo* is the *wao ‘eiwa*, and makai of that the *wao ma‘ukele*. Makai of the *wao ma‘ukele* is the *wao akua*, and makai of there is the *wao kanaka*, the area that people cultivate. Makai of the *wao kanaka* is the *‘ama‘u*, fern belt, and makai of the *‘ama‘u* the *‘apa‘a*, grasslands.
>
> A solitary group of trees is a *moku la‘au* (a “stand” of trees) or an *ulu la‘au*, grove. Thickets that extend to the *kuahiwi* are *ulunahele*, wild growth. An area where *koa* trees suitable for canoes (*koa wa‘a*) grow is a *wao koa* and mauka of there is a *wao la‘au*, timber land. These are dry forest growths from the *‘apa‘a* up to the *kuahiwi*. The places that are “spongy” (*naele*) are found in the *wao ma‘ukele*, the wet forest.
>
> Makai of the *‘apa‘a* are the *pahe‘e* [*pili* grass] and *‘ilima* growths and makai of them the *kula*, open country, and the *‘apoho* hollows near to the habitations of men. Then comes the *kahakai*, coast, the *kahaone*, sandy beach, and the *kalawa*, the curve of the seashore—right down to the *‘ae kai*, the water’s edge.
>
> That is the way *ka po‘e kahiko* [the ancient people] named the land from mountain peak to sea. (Kamakau 1976:8-9)

The *maka‘āinana* (commoners, literally the “people that attend the land”) who lived on the land had rights to gather resources for subsistence and tribute within their *ahupua‘a* (Jokiel et al. 2011). As part of these rights, residents

were required to supply resources and labor to *ali‘i* (chiefs) of local, regional, and island chiefdoms. The *ahupua‘a* became the equivalent of a local community with its own social, economic, and political significance and served as the taxable land division during the annual *Makahiki* procession (Kelly 1956). During the time of *Makahiki*, the paramount *ali‘i* sent select members of his/her retinue to collect *ho‘okupu* (tribute and offerings) in the form of goods from each *ahupua‘a*. The *maka‘āinana* brought their share of *ho‘okupu* to an *ahu* (altar) that was marked with the image of a *pua‘a* (pig), serving as a physical visual marker of *ahupua‘a* boundaries. In most instances, these boundaries followed mountain ridges, hill, rivers, or ravines (Alexander 1890). However, Chinen (1958:1) reports that "oftentimes only a line of growth of a certain type of tree or grass marked a boundary; and sometimes only a stone determined the corner of a division." These ephemeral markers, as well as their more permanent counterparts, were oftentimes named as evidenced in the thousands of boundary markers names that are listed in Soehren (2005).

Ahupua‘a were ruled by *ali‘i ‘ai ahupua‘a* or chiefs who controlled the *ahupua‘a* resources. Generally speaking, *ali‘i ‘ai ahupua‘a* had complete autonomy over the *ahupua‘a* they oversaw (Malo 1951). *Ahupua‘a* residents were not bound to the land nor were they considered property of the *ali‘i*. If the living conditions under a particular *ahupua‘a* chief were deemed unsuitable, the residents could move freely in pursuit of more favorable conditions (Lam 1985). This structure safeguarded the well-being of the people and the overall productivity of the land, lest the chief loses the principal support and loyalty of his or her supporters. In turn, *ahupua‘a* lands were managed by an appointed *konohiki*, oftentimes a chief of lower rank, who oversaw and coordinated stewardship of an area's natural resources (Lam 1985). In some places, the *po‘o lawai‘a* (head fisherman) held the same responsibilities as the *konohiki* (Jokiel et al. 2011). When necessary, the *konohiki* took the liberty of implementing *kapu* (restrictions and prohibitions) to protect the *mana* of an area's resources from environmental and spiritual depletion.

Many *ahupua‘a* were divided into smaller land units termed *‘ili* and *‘ili kūpono* (often shortened to *‘ili kū*). *‘Ili* were created for the convenience of the *ahupua‘a* chief and served as the basic land unit which *hoa‘āina* (caretakers of particular lands) often retained for multiple generations (Jokiel et al. 2011; MacKenzie 2015). As *‘ili* were typically passed down in families, so too were the *kuleana* (responsibilities, privileges) that were associated with it. The right to use and cultivate *‘ili* was maintained within the *‘ohana*, regardless of the succession of *ali‘i ‘ai ahupua‘a* (Handy et al. 1991). Malo (1951) recorded several types of *‘ili*, including the *‘ili pa‘a* (a single intact parcel) and *‘ili lele* (a discontinuous parcel dispersed across an area). Whether dispersed or wholly intact, *‘ili* required a cross-section of available resources, and for the *hoa‘āina*, this generally included access to agriculturally fertile lands and coastal fisheries. *‘Ili kūpono* differed from other *‘ili* lands because they did not fall under the jurisdiction of the *ahupua‘a* chief. Rather, they were specific areas containing resources that were highly valued by the ruling paramount chiefs, such as fishponds (Handy et al. 1991).

Ali‘i ‘ai ahupua‘a, in turn, answered to an *ali‘i ‘ai moku* (chief who claimed the abundance of the entire *moku or* district) (Malo 1951). Hawai‘i Island is comprised of six *moku* (districts) that include Kona, Ka‘ū, Puna, Hilo, Hāmākua, and Kohala. Although a *moku* comprises multiple *ahupua‘a*, *moku* were considered geographical subdivisions with no explicit reference to rights in the land (Cannelora 1974). While the *ahupua‘a* was the most common and fundamental land division unit within the traditional Hawaiian land management structure, variances occurred, such as the existence of the *kalana*. By definition, a *kalana* is a division of land that is smaller than a *moku. Kalana* was sometimes used interchangeably with the term *‘okana* (Lucas 1995; Pukui and Elbert 1986), but Kamakau (Kamakau 1976) equates a *kalana* to a *moku* and states that *‘okana* is merely a subdistrict. Despite these contending and sometimes conflicting definitions, what is clear is that *kalana* consisted of several *ahupua‘a* and *‘ili ‘āina*.

This form of district subdividing was integral to Hawaiian life and the product of advanced natural resource management systems. As populations resided in an area over centuries, direct-teaching and extensive observations of an area's natural cycles and resources were retained, well-understood, and passed down orally over the generations. This knowledge informed management decisions that aimed to sustainably adapt subsistence practices to meet the needs of growing populations. The *ahupua‘a* system and the highly complex land management system that developed in the islands are but one example of the unique Hawaiian culture that developed in these islands.

Intensification and Development of Hawaiian Land Stewardship Practices

Hawaiian philosophies of life in relation to the environment helped to maintain both natural, spiritual, and social order. In describing the intimate relationship that exists between Hawaiians and *‘āina* (land), Kepā Maly writes:

> In the Hawaiian context, these values—the "sense of place"—have developed over hundreds of generations of evolving "cultural attachment" to the natural, physical, and spiritual environments. In any culturally sensitive discussion on land use in Hawai‘i, one must understand that Hawaiian

> culture evolved in close partnership with its' natural environment. Thus, Hawaiian culture does not have a clear dividing line of where culture and and nature begins.
>
> In a traditional Hawaiian context, nature and culture are one in the same, there is no division between the two. The wealth and limitations of the land and ocean resources gave birth to, and shaped the Hawaiian world view. The *'āina* (land), *wai* (water), *kai* (ocean), and *lewa* (sky) were the foundation of life and the source of the spiritual relationship between people and their environs. (Maly 2001)

The *'ōlelo no'eau* (proverbial saying) "*hānau ka 'āina, hānau ke ali'i, hānau ke kanaka*" (born was the land, born were the chiefs, born were the commoners), conveys the belief that all things of the land, including *kanaka* (humans), are connected through kinship links that extend beyond the immediate family (Pukui 1983:57). *'Āina* or land, was perhaps most revered, as noted in the *'ōlelo no'eau* "*he ali'i ka 'āina; he kauwā ke kanaka,*" which Pukui (Pukui 1983:62) translated as "[t]he land is a chief; man is its servant." The lifeways of early Hawaiians, which were dependent entirely from the finite natural resources of these islands, necessitated the development of sustainable resource management practices. Over time, what developed was an ecologically responsive management system that integrated the care of watersheds, natural freshwater systems, and nearshore fisheries (Jokiel et al. 2011).

Disciplined and astute observation of the natural world became one of the most fundamental stewardship tools used by Hawaiians of the ancient past. The vast knowledge acquired through direct observation enabled them to detect and record the subtlest of changes, distinctions, and correlations in the natural world. Examples of their keen observations are evident in the development of Hawaiian nomenclature to describe various rains, clouds, winds, stones, environments, flora, and fauna. Many of these names are geographically unique or island-specific, and have been recorded in *oli* (chants), *mele* (songs), *pule* (prayers), *inoa 'āina* (place names), and *'ōlelo no'eau* (proverbial sayings). Other Hawaiian arts and practices such as *hula* (traditional dance), *lapa'au* (traditional healing), *lawai'a* (fishing), *mahi'ai* (farming) further aided in the practice of knowing the rhythms and cycles of the natural world.

Comprehensive systems of observing and stewarding the land were coupled by the strict adherence to practices that maintained and enhanced the *kapu* and *mana* of all things in the Hawaiian world. In Hawaiian belief, all things natural, places, and even people, especially those of high rank, possessed *mana* or "divine power" (Pukui and Elbert 1986:235; Pukui et al. 1972). *Mana* was believed to be derived from the plethora of Hawaiian gods (*kini akua*) who were embodied in elemental forces, land, natural resources, and certain material objects and persons (Crabbe et al. 2017). Buck (1993) expanded on this concept noting that *mana* was associated with "the well-being of a community, in human knowledge and skills (canoe building, harvesting) and in nature (crop fertility, weather etc.)" (c.f. Else 2004:244).

To ensure the *mana* of certain resources, places, and people, *kapu* of various kinds were implemented and strictly enforced to limit over-exploitation and defilement. Elbert and Pukui (1986:132) defined *kapu* as "taboo, prohibitions; special privilege or exemption." Kepelino noted that *kapu* associated with *akua* (deities) applied to all social classes, while *kapu* associated with *ali'i* were applied to the people (in Beckwith 1932). As *kapu* dictated social relationships, they also provided "environmental rules and controls that were essential for a subsistence economy" (Else 2004:246). The companion to *kapu* was *noa*, translated as "freed of taboo, released from restrictions, profane, freedom" (Pukui and Elbert 1986:268). Some *kapu*, particularly those associated with maintaining social hierarchy and gender differentiation were unremitting, while those *kapu* placed on natural resources were applied and enforced according to seasonal changes. The application of *kapu* to natural resources ensured that such resources remained available for future use. When the *ali'i* or the lesser chiefs (including *konohiki* and *po'o lawai'a*) determined that a particular resource was to be made available to the people, a decree was proclaimed indicating that *kapu* had been lifted, thereby making it *noa*. Although transitioning a resource from a state of *kapu* to *noa* allowed for its use, people were expected to practice sustainable harvesting methods and pay tribute to the paramount chief and the *akua* associated with that resource. *Kapu* were strictly enforced and violators faced serious consequences including death (Jokiel et al. 2011). Violators who escaped execution sought refuge at a *pu'uhonua*, a designated place of refuge or an individual who could pardon the accused (Kamakau 1992). After completing the proper rituals, the violator was absolved of his or her crime and allowed to reintegrate back into society.

In summary, the layering and interweaving of beliefs, land stewardship practices, and the socio-political system forms the basis of the relationship shared between the Hawaiian people and the land. It is through the analysis of these dynamic elements that we develop an understanding of the complexity of place.

PĪHĀ AHUPUAʻA AND THE GREATER ʻOKANA OF HILO PALIKŪ

The project area is located within the *ahupuaʻa* of Pīhā, in the *moku* (district) of North Hilo (Figure 11), on the windward coast of Hawaiʻi Island in a region traditionally known as Hilo Palikū (Hilo of the upright cliffs). Hilo Palikū describes the rugged and steep coastline, with its sheer cliffs broken only by a string of narrow steam-cut gulches 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 floodwaters or the sea, is one of many land divisions (*ahupuaʻa*) extending inland from the coast of North Hilo with boundaries that generally follow the meandering gulches, and encompass the tablelands in between. Pīhā Ahupuaʻa is bounded on the southeast end by Nanue Ahupuaʻa and at its southwest end by Honohina Ahupuaʻa. Pīhā is cut off at its *mauka* (west) end by the expansive Humuʻula Ahupuaʻa. Along its northern boundary, Pīhā is bounded by three *ahupuaʻa*; they are, from east to west, Puaʻakuloa, Waikaumalo and Mauluanui.

Pīhā Ahupuaʻa is situated 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 its northernmost boundary (Pukui 1983:108). Handy and Handy (1991:538) provides a general description of the Hilo 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.
>
> The light and fertile soil is formed by decomposing lava, with a considerable portion of vegetable mould. The whole is covered with luxuriant vegetation, and the greater part of it formed into plantations, where plantains, bananas, sugar-cane, taro, potatoes and melons, come to the greatest perfection. Groves of cocoa-nut and bread-fruit trees are seen in every direction, loaded with fruit, or clothed with luxuriant foliage. (Ellis in Handy and Handy 1972:539)

Traditionally, the *moku* of Hilo was divided into three *ʻokana* (sub-districts). Beginning in the north is Hilo Palikū, an area that extends north of the Wailuku River to Kaʻula Gulch, oftentimes characterized by its upright and densely vegetated cliffs and broad *kula* (plains) lands (Figure 12). The second *ʻokana* is Hilo One, or "sandy Hilo," famed for its black sand beach that extends along Hilo Bay between the Wailoa and Wailuku Rivers. The final *ʻokana* is Hilo Hanakahi, which extends south of Wailoa River to include Keaukaha (Edith Kanakaʻole Foundation 2012).

The low-lying coastal area and *kula* lands of North Hilo thrived with traditional Hawaiian habitation and cultivation. Within the larger gulches and *kula* (broad plateaus) regions, were lush, fertile lands well suited for agriculture. The staple traditional crop, *kalo* (taro), was cultivated in irrigated terraces along the stream edges while *ʻuala* (sweet potato), *maiʻa* (banana) and *kō* (sugarcane) were grown in the wet *kula* lands of the lower forest zone (Handy et al. 1991). The region had an abundance of *kukui* (candlenut), *ʻulu* (breadfruit), and *niu* (coconut) groves and was also rich in marine resources. Handy and Handy (1972), in drawing from a description given by early missionary William Ellis, provide yet another description of the fertile landscapes of Hilo:

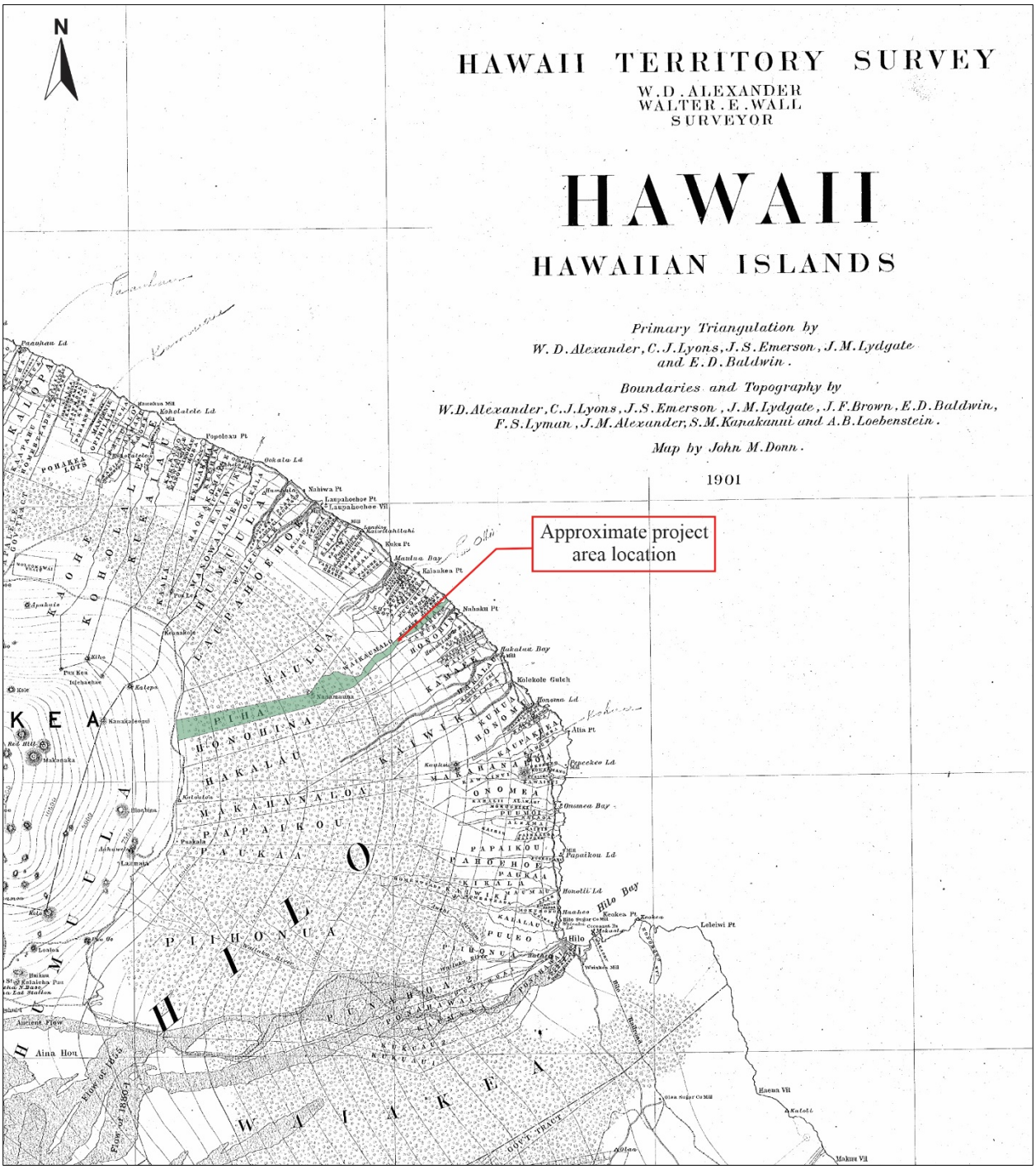

Figure 11. Portion of Hawai‘i Registered Map No. 2060 by J. M Donn (1901) from 1901 showing the approximate project area location in Pīhā Ahupua‘a.

Figure 12. Aerial image showing the landscape of Hilo Palikū with cliffs, expansive *kula* lands, and project area, view to the southwest (photo by L. Brandt).

The abundance of streams, valleys, and gulches in the Hilo Palikū region made for a difficult and treacherous pass. In *Ka Huakaihele ike i na Makaainana o Hilo* (A Sightseeing Tour to Visit the Common Folk of Hilo), an account by G.K. Mahoe (1876) of his travels throughout Hilo that was serialized in the Hawaiian language newspaper *Ka Lahui Hawaii*, he described Hilo Palikū as such:

> *...ua pale ae au i ka loa o ke alahele, ua manao ole ae hoi i na pali hauliuli o Hilo paliku, na piina, na ihona, na alu, na kahawai, na kualono, a me na pupu, ua hele hookahi ia no e a'u, me ka manao ole i ka luhi a me ka inea o ka hele ana, oiai, ma ka hoomaopopo ana i ka loa mai Hilo one a hiki i Laupahoehoe, me he mea la, ua aneane no i ke kanakolu mile. A mai kuhihewa hoi ka poe heluhelu, he papu a he laumania hoi ke ano o ka waiho ana o ka aina, aole, aka, he puu kinikini, he alu, he kapekepeke ke alanui.*
>
> ...I am protected from the long path ahead, I did not think twice of the dark cliffs of Hilo Palikū, the inclines, the descents, the ravines, the streams, the mountaintops, and the cleared fields, I moved alone, without thinking much of the strain and discomfort of traveling, although, when I recalled the length between Hilo One and Laupāhoehoe, those thirty miles came and went. The reader should not be mistaken, the lands that are passed along the way are not clear and smooth, rather, there are many hills, gulches, and twisting roads. (Mahoe 1876:1)

A similar sentiment of Hilo Palikū's rugged terrain and countless streams is expressed in the account titled *Kaao Hooniua Puuwai no Ka-Miki* (The Heart Stirring Story of Ka-Miki) (in Maly and Maly 2006). The authors, Kihe and Wise play on an old numerical expression to emphasize the many hills, descents, and waterways:

> *O Hilo Palikū kāhi i ʻōlelo ʻia ai; Pau ke aho i ka hele o Hilo he lau ka puʻu, he mano ka ihona, he kini nā kahawai, a e ʻau no hoʻi i ka wai o Hilo a pau ke aho, aʻohe e pau ka wai!*
>
> Of Hilo Palikū 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!

King David Kalākaua provided a concise description of this region's geography, but also included a description regarding the density of the population there in his book *The Legends and Myths of Hawaii* (Kalākaua 1888):

> 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 that 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. (Kalākaua 1888:284)

A unique aspect of the Hilo Palikū region, which mirrors that of the adjacent district of East Hāmākua, is its numerous narrow *ahupuaʻa* that extend from the coast to about the 3,000-foot elevation. These *ahupuaʻa* are characterized by their sloping *kula* lands with their boundaries following the natural contours or ridgelines of the gulches (Cordy 1994). A few *ahupuaʻa* extended further inland, essentially cutting off the lower *ahupuaʻa* at their *mauka* most end. There are three very large *ahupuaʻa* in the Hilo District, namely Humuʻula, Piʻihonua, and Waiākea that comprises the interior portion of the district (see Figure 11) extending along the slopes of both Mauna Kea and Mauna Loa (Lyons 1875). The practice of subdividing the land into carefully managed sections provided its inhabitants with a variety of nearshore marine and upland forest resources. As Maly and Maly (2006:9) note, "in this system, the people learned to live within the wealth and limitations of their natural environment, and were able to sustain themselves on the land and ocean."

Traditional Place Names, Rains, and Winds for Pīhā Ahupuaʻa and Hilo Palikū

The *inoa* (names) of *wahi* (places), *ua* (rains), and *makani* (winds) within a particular *ahupuaʻa* or broader region evidence the long-term relationship of various communities to their immediate environment. Geographer Katrina-Ann R. Kapāʻanaokalāokeola Nākoa Oliveira offers a concise description regarding the natural environment as it was understood by Native Hawaiians of the past:

> Ancestral Kānaka recognized the connection between the heavens, lands, and oceans and how all three were interconnected and interdependent upon one another. In spite of the interwoven nature of the sky, land, and sea, however, Kānaka of ancestral times did not have a term that directly translates to what we have come to know today as "environment." Rather, the *Hawaiian Dictionary* offers two phrases that approximate the notion of environment: (1) "ʻano o ka nohona" and (2) "nā mea e hoʻopuni ana." ʻAno o ka nohona refers to the nature of one's relationship to one's surroundings or places. Nā mea e hoʻopuni ana relates to everything that surrounds or encircles a person. (Oliveira 2014:64)

Reacquainting ourselves with these *inoa ʻāina* (place names)*, inoa ua* (rain names)*, and inoa makani* (wind names) allow us to appreciate the environment as it was once observed by ancestral Hawaiian populations. In Pīhā, a few *inoa ʻāina* are listed by Soehren (2005) as markers for the boundaries of these *ahupuaʻa*. The *inoa ʻāina* documented for Pīhā sheds light on the area's native flora, stream and geologic resources, and other cultural features. The *inoa ʻāina* for Pīhā are listed below in Table 1:

Table 1. Place Names in Pīhā Ahupuaʻa

Place Name	*Translation and Notes*
ʻAlanaio	Translated as "the naio (*Myoporum sandwicense*) path."A gulch that serves as the boundary between Pīhā and Kahuku.
Haleʻōpae	Translated as "shrimp house." A stream that served as a boundary between Pīhā and Puʻuʻōhua.
Kaʻahina	Translated as "to fall down and tumble." A stream marking the boundary of Pīhā and Nanue.
Kaʻalāiki	Translated as "small lava stones." A place located in the area of Haleʻōpae.

Table 1 continues on next page.

Table 1. continued.

Place Name	*Translation and Notes*
Kāwaʻu	Translated as "kāwaʻu (*Zanthoxylum dipetalum*) tree." A boundary point between Pīhā, Nanue, and Kahuku ahupuaʻa.
Kumuʻōhiʻa	Translated as "ʻōhiʻa (*Metrosideros polymorpha*) tree." A boundary point between Pīhā and Puʻuʻōhua.
Nāhuina	Translated as "the junction." A boundary point between Pīhā, Nanue, and Kahuku.
Nenelu	Translated as "boggy swamp." A boundary point and old village site betwen Pīhā and Nanue.
Nīnika	Translated as "nīnika (*Lythrum maritimum*) bush." A boundary point near Puʻuʻōhua between Pīhā and Maulua.
ʻŌhiʻapuka	Translated as ʻōhiʻa (*Metrosideros polymorpha*) opening. A boundary between Pīhā and Nanue.
Paʻiniu	Translated as "paʻiniu (*Astelia spp.*) bush." A stream that served as the boundary between Pīhā and Honohina.
Pīhā	Translates as "flotsam." Name of the subject *ahupuaʻa*.
Waikaumalo	Translated as "waters where loin cloths are suspended." A stream that serves as the boundary between Pīhā and Waikaumalo.
Waipāhoehoe	Translated as "smooth lava water." A stream and former village site that served as the boundary between Pīhā and Nanue.

End of Table 1.

In terms of *inoa ua*, Hilo Palikū and the larger *moku* of Hilo is renowned in oral expressions such as *mele* (song), *oli* (chants), and *ʻōlelo noʻeau* (proverbs and poetical expressions) for its abundance of rain and fresh water. Akana and Gonzalez (2015) in *Hānau Ka Ua*, a collection of Hawaiian rain names, describe the cultural significance of rain:

> Our kūpuna [ancestors] had an intimate relationship with the elements. They were keen observers of their environment, with all of its life-giving and life-taking forces. They had a nuanced understanding of the rains of their home. They knew that one place could have several different rains, and that each rain was distinguishable from another. They knew when a particular rain would fall, its color, duration, intensity, the path it would take, the sound it made on the trees, the scent it carried, and the effect it had on people. (Akana and Gonzalez 2015:xv)

Numerous *ʻōlelo noʻeau* found in Pukui (1983) describe the characteristics of Hilo's many rains which are listed below in Table 2. Pukui's (1983) proverbial sayings are complimented by specific rain names documented by Akana and Gonzalez (2015), which are listed in Table 3. As shown in Table 3, the rain names for Hilo Palikū are descriptive in that they point out nuances and in some instances served as seasonal predictive indicators to mark changes or availability of certain marine resources.

Table 2. *ʻŌlelo Noʻeau* associated with Hilo's rains from Pukui (1983)

ʻŌlelo Noʻeau	*Literal/Figurative Translation*
ʻEleʻele Hilo, panopano i ka ua.	Dark is Hilo, clouded with the rain (Pukui 1983:40)
Halulu me he kapuaʻi kanaka la ka ua o Hilo.	The rain of Hilo makes a rumbling sound like the treading of feet. (ibid.:53)
Hana Hilo i ka poʻi a ka ua.	Hilo works on the lid of the rain. Refers to the constant showers typical of Hilo district on Hawaiʻi. (ibid.:54)
Hilo ʻāina ua lokuloku.	Hilo of the pouring rain. (ibid.:107)
Hilo i ka ua kinakinai, ka ua mao ʻole.	Hilo of the constant rain, where it never clears up. (ibid.)
ʻAu 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. (ibid. 28)
Pau ke aho 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 Hiʻiaka in a chant when she found herself weary after a battle with the lizard god Panaʻewa. (ibid.:287)

Table 3. Rain names associated with Hilo Palikū from Akana and Gonzalez (2015)

Rain Name	*Literal/Figurative Translation*
ʻAwaʻawa	Translates as "bitter." Refers to a cold and dark rain or mist.
Heʻenehu	Translates as "sliding anchovy." Refers to a misty rain in the early morning off the coastline at a time when nehu fish are in abundance.
Hoʻolua	Translates as "to do twice." Refers to heavy rains that fall during strong northerly winds (which are also known as hoʻolua).
Kinai	Translates as "to quench or extinguish." Refers to a constant rain that continues for long hours.
Kualua	Translates as "repeating twice." Refers to rain over the sea that is accompanied by wind.
Lanipili	Translates as "clinging sky." Refers to cloudbursts or heavy rain that lasts for days.
Lanipōlua	Translates as "very dark sky." Refers to misty rain that falls when forests are obscured by low-lying clouds.
Lauhīnano	Translates as "bracts of the hīnano flower." Refers to a rain associated with the area of Honomū.
Lokuloku	Translates as "pouring rain." A generic term referring to heavy showers accompanied by wind. (Lila 1872:3)
Nāulu	Translated as "vexed." Refers to sudden heavy showers.
Ulumano	Translated as "growing exponentially." A rain that travels inland from the sea that is an indicator of the abundance of *ʻōhua* (juvenile fish).

Of the rains that are listed above, the Nāulu is explicitly associated with Hilo Palikū, as expressed in a *mele kūʻauhau,* or genealogical chant, written for Queen Emma Kaleleonālani:

Hāneʻe mai Liloa me he Uluaunui lā	Liloa sags like an Uluaunui
Me he kuāua Nāulu nui i pano Hilo Pali Kū	Like a heavy Nāulu shower that obscured Hilo Pali Kū.
	(Nogelmeier in Akana and Gonzalez 2015:187)

Whereas *Hānau Ka Ua* provides us with a comprehensive listing of rain names across the Hawaiian Islands, there is no comparable publication for wind names to date. Similar to the rain names, wind names are often descriptive in that they reflect subtle distinctions such as direction, temperature, and intensity. Listed in Table 4 are wind names that can be found in an array of Hawaiian and English language primary sources:

Table 4. Wind names associated with Hilo Palikū

Wind Name	*Literal/Figurative Translation*
ʻAʻalahonua	Translates as "fragrant earth." A wind that carries the fragrance of soil and foliage after the rain. (Alvarado 2005)
Kēpia	Translates as "dandruff." A wind associated with Hilo Palikū. (Nawaa 1904)
Kolonahe	Translates as "crawling slowly." A generic term for a gentle breeze (Lila 1872).
Uluaunui	Translates as "to grow increasingly." a strong northerly wind that makes landing by boat difficult.
Uluau	Translates as "to grow increasingly." Associated with Hilo Palikū in the *moʻolelo* of Kuapakaʻa. (Kuapuu 1861:24)
Hoʻolua	Translates as "to do twice." Refers to strong northerly winds that may include rain. (Malo 1903:35)
Hau	Translates as "ice." A wind that blows downward from the mountains (Malo 1903:35)
Māluakiʻiwai	"Translate as "water-collecting seabreeze." A sea breeze accompanied by showers. (Alvarado 2005:5).

Traditional Accounts

Traditional *moʻolelo* (accounts) offer a rich resource for understanding the cultural landscape, land use, and practices of an area and informs our understanding of how peoples of the past expressed their relationships to their lands and environment. An exhaustive search through published resources and historical Hawaiian language newspapers resulted in no *moʻolelo* or *mele* that directly named the *ahupuaʻa* of Pīhā. However, there are several *moʻolelo* that speak of events that take place in the neighboring *ahupuaʻa* and the greater *ʻokana* of Hilo Palikū and some of these *moʻolelo* have been summarized below.

Ke Kaʻao Hoʻoniua Puʻuwai no Ka-miki- The Heart Stirring Story of Ka-Miki

The adjacent *ahupuaʻa* of Maulua, located to the north of Pīhā, is noted in the account titled *Ke Kaʻao Hoʻoniua Puʻuwai no Ka-miki* (The Heart Stirring Story of Ka-Miki), which was a series published in the Hawaiian language newspaper *Ka Hōkū o Hawaiʻi* between 1914 and 1917. *Ka-Miki* was likely authored during the late 1800s through the early 1900s by noted Hawaiian scholars John Wise and J.W.H.I. Kihe. Although the account is not considered to be from time immemorial, Maly (1997), who translated the *moʻolelo* from Hawaiian into English, states the following regarding the value of the information contained therein:

> ...the authors used a mixture of local legends, tales, and family traditions in association with place names to tie together fragments of site specific stories that had been handed down over the generations. Thus, while in many cases, the personification of individuals and their associated place names may not be "ancient," the site documentation within the "story of Ka-miki" is of both cultural and historical value. (Maly 1997:5)

In relating the story for lands of Maulua, Maly and Maly (2006) detailed the following narrative taken from the story of Ka-Miki. As a preamble to this story, Maly and Maly (2006:13) explain:

> "*Kaao Hooniua Puuwai no Ka-Miki*" (The Heart Stirring Story of Ka-Miki) is about two supernatural brothers, Ka-Miki (The quick, or adept, one) and Maka-ʻiole (Rat [squinting] eyes), who traveled around the island of Hawaiʻi along the ancient *ala loa* and *ala hele* (trails and paths) that encircled the island. During their journey, the brothers competed in contests alongside the trails they traveled, and in famed *kahua* (contest arenas) and royal courts, against *ʻōlohe* (experts skilled in fighting or in other competitions, such as running, fishing, debating, or solving riddles, that were practiced by the ancient Hawaiians). They also challenged priests whose dishonorable conduct offended the gods of ancient Hawaiʻi. Ka-Miki and Maka-ʻiole were empowered by their ancestress, Ka-uluhe-nui-hihi-kolo-i-uka (The great entangled growth of *uluhe* fern which spreads across the uplands), a body-form of the goddess Haumea (the creative force of nature—also called Papa and Hina—who was a goddess of priests and competitors).

After passing through the southern portion of the Hilo District, Ka-Miki and his companions, Makaʻiole, Keahialaka, and Hilo Hanakāhi make their way to the compound of the chief and foremost *ʻōlohe*, Maulua-a-pio (for whom the *ahupuaʻa* of Maulua was named). In attempting to secure a contest for Ka-Miki, Hilo Hanakāhi traveled ahead of his companions to meet with his teacher, Maulua-a-pio. A meeting was agreed upon and Ka-Miki was invited into the *hālau leʻaleʻa* (competition long-house) of Maulua-a-pio where they partook in a meal and some *ʻawa*. After their feasting, Maulua-a-pio decided that he wanted to challenge the youthful Ka-Miki to a contest. In their first show of knowledge and wits, Ka-Miki began to name the winds associated with these lands, chanting thusly:

> *He lā makani ka hoʻi kāia o Koholālele, ke lele nei ka huna o ke kai iluna o nā pali, pali kahakā a ke koaʻe e lele ai i ka hoʻōulu a ka Ulumano ka makani hoʻoūlu-a o nā makalae. E ʻino, ʻino paha auaneʻi o Hilo, ʻino ke ala, ua ku nā pali laumania a ka lawaiʻa nihi ai kuʻukuʻu i ke kaula a ke ʻaki ala i ka niho! –*
>
> This is indeed a windy day at Koholālele, the sea mist flies above the cliffs, steep cliffs from which the tropic birds fly rising on the *Ulumano*, the wind which rises from the shores. It is perhaps a storm, a storm in Hilo, a storm along the paths on the sheer cliffs on which the fishermen tie their ropes and let them down to the nipping teeth [waves]. (Maly and Maly 2006:14)

Despite Ka-Miki declaring the presence of an impending storm, Maulua-a-pio rejects Ka-Miki's claim stating, "Where it the storm, all is calm, there are no waves upon the shore, the cool *Malanai* breeze blows along the cliff of the *hulaʻana"* (cliff trail which one swims). The two opponents continued their debate and in due time, they began discussing the names of other *ʻōlohe* of the Hilo Palikū region.

> "**Kalele-a-Welokā** is the *ʻōlohe* who is filled with knowledge and strength, he is the *kaulana ʻāina* (champion who maintains peace in the land) of the chief Palikū-a-Kīkoʻokoʻo. He has a full muscular body, like the mysterious *koa* trees which surround Hilo, there is no other like him."
>
> Ka-Miki then told Maulua, "He is indeed a great warrior, but the Kona wind is coming to scatter the branches of this *koa* tree." Maulua told Ka-Miki, "Where is this Kona wind which will knock over the tall dark *koa* of Hilo? This wind may knock over the *koa* of *ʻUmikoa*, but not the great *ʻōlohe*, the *aʻu* (sword fish) which leaps upon the waves, the ʻ*ahi kananā* (fierce tuna fish) of the deep sea, the *manō niuhi* (great man eating shark) of the dark ocean depths!"
>
> Maulua continued debating with Ka-Miki, and Hilo Hanakāhi called to his teacher, "I have fully explained the nature of this one who is here before you. If you continue in this manner, you will become like the little pebble knocked over in *kōnane*, and set aside in a little bundle." Maulua did not answer, but instead leapt to try and surprise attack Ka-Miki. Though he tried all manner of *lua* (techniques), Maulua was worn out and bound by KaMiki, unable to move.
>
> Ka-Miki told Maulua, "You have been bound in the net, twined from the hair of Ka-uluhe-nui-hihi-kolo-i-uka." With a smile, Ka-Miki then thanked Maulua for the test, telling him, "You are one of the best competitors I have met, there is but one problem, you are quickly worn out, you have no strength (a play on the name of the land Maulua, where one becomes wearied from traveling the steep valley cliffs). Therefore, let this test between Ka-Miki and Maulua be ended, unless you be killed like one who travels the precipitous cliff trail of Nuʻalolo, falling like the fire brands of Kāmaile, or the flying fire darts, the fluttering tribute of Makua-iki. Because you are a teacher of Hilo Hanakāhi, my traveling companion, I will release you." (Maly and Maly 2006:15)

After defeating Maulua, Ka-Miki and his companions proceeded with their journey, challenging other *ʻōlohe* who resided in the areas beyond Maulua. While the above-described narrative tells of the ancient trails, place names, and traditional activities, the following narrative describes a grueling battle taking place in the lands of Hilo Palikū between Poliʻahu, the goddess of the snow-covered mountain and her fiery rival, Pele.

Rivalry Between Pele and Poliʻahu and the Formation of Land in Hilo Palikū

A *moʻolelo* describing the formation of land between Laupāhoehoe and ʻOnomea is captured in the story titled Pele and the Snow-Goddess published by William Drake Westervelt in his book *Hawaiian legends of Volcanoes* (Westervelt 1916). This account, which features information about other snow goddesses, tells specifically of how Poliʻahu, the snow goddess of Mauna Kea gained control over the northern section of Hawaiʻi while Pele, the goddess of lava, retained dominance over the volcanically active southern part of the island. As a preamble to the telling of this story, Westervelt (1916:55) relates that these:

> …stories are nature-myths derived from the power of snow and cold to check volcanic action and sometimes clothe the mountain tops and upper slopes with white, which melted as the maidens came down closer to the sea through lands made fertile by flowing streams and blessed sunshine.

Poliʻahu, who often dawned and mantle of pure white *kapa* (tapa) cloth, was "best-known among the maidens of the mountains" (Westervelt 1916:57). She had a particular affection for the eastern cliffs of Hawaiʻi Island along the North Hilo and Hāmākua coast. The snow goddess would periodically descend the mountain and sported amongst mortals, mingled with the chiefs and people, and participated in the local festivities including *heʻe hōlua* (*hōlua* sledding). On one such occasion, Poliʻahu and the other snow maidens:

> …had come down Mauna Kea to a sloping hillside south of Hamakua. Suddenly in their midst appeared a stranger of surpassing beauty. Poliahu welcomed her and the races were continued. Some of the legend tellers think that Pele was angered by the superiority, real or fancied, of Poliahu. (Westervelt 1916:60)

While in the presence of the mysterious woman, Poliʻahu felt the ground grow warm and she immediately knew that the woman before here was none other than her enemy, Pele. In her fury, Pele tossed aside her disguise "and called for the forces of fire to burst open the doors of the subterranean caverns of Mauna Kea" (Westervelt 1916:60). Pele sent fountains of molten fire to the summit of the mountain causing Poliʻahu to flee to the summit to smother the fires with her snow mantle. Pele's raging fires captured a portion of Poliʻahu's mantle, however, the snow-goddess managed to regain her mantle and strength and once more attempted to cast it over the mountain. The fight between the two powerful goddesses caused the earth to shake violently sending great waves of water over the land and the cliffs to slide into the sea. Poliʻahu summoned the help of the other snow maidens, Lilinoe, Waiau, and Kahoupokāne

and they appeared as a great mass of clouds laden with frozen moisture. The snow goddesses sent torrents of snow to rain down on Pele's fires transforming the molten streams tracking towards the sea into hardened black lava. At last, the might of the snow maidens forced Pele's fires back into its depths and:

> Thus the ragged mass of Laupāhoe-hoe was formed, and the great ledge of the arch of Onomea, and the different sharp and torn lavas in the edge of the sea which mark the various eruptions of centuries past.
>
> Poliahu in legendary battles has met Pele many times. She has kept the upper part of the mountain desolate under her mantle of snow and ice, but down towad the sea most fertile and luxuriant valleys and hillside slopes attest the gifts of the goddess to the beauty of the island and the welfare of men. (Westervelt 1916:62)

From this battle, tradition says that despite Pele's attempt to overthrow Poli‘ahu with her great fires, she will always be defeated. As such, "Pele's kingdom has been limited to the southern half of the island" while Poli‘ahu rules the northern portion in which the project area is situated (Westervelt 1916:62). The following account, which is centered on the Hilo Palikū regions tells of a visit made by the gods Kū and his wife Hina, in their forms which Hawaiian named Kuahailo and Hinaaukekele, to Laupāhoehoe located north of Pīhā.

An Account for Kuahailo and Hinaaukekele

He Moolelo Kaao no Kuahailo a me Hinaaukekele, Kana Kaikamahine Hanauna (An account for Kuahailo and Hiaaukekele, his female relative) is a story that recounts the establishment of the highest-ranking genealogical lines of Hawai‘i. Published as a weekly serial in the Hilo-based Hawaiian language newspaper *Ka Hoku o Hawai‘i* from July 18, 1918, to March 13, 1919, the *mo‘olelo* follows Kuahailo and Hinaaukekele along their journey from their ancestral home of Kuaihelani to the various islands of Hawai‘i.

The segment of the *mo‘olelo* in Hilo Palikū takes place midway through the narrative and was published in installments between January 30, 1919, and February 27, 1919. At this point in the *mo‘olelo,* Hinaaukekele and her husband, Kahikikuaokalani, resided in Waipi‘o Valley. Their journey to Hilo Palikū began with a dialogue between Hinaaukekele and Kahikikuaokalani, where she expressed her desire to visit her grandmother, Hailikulamanu, and other relatives who lived in the *‘okana* of Hilo Hanakahi. Kahikikuaokalani agreed with Hinaaukekele to visit their relatives. They made their way to Hilo Hanakahi atop a traveling *‘ōhi‘a* tree filled with *lehua* blossoms. According to the *mo‘olelo,* the tree grew out of Hinaaukekele's *‘iewe* (placenta, afterbirth) that her mother, Hinauluohia, planted near their home in Paliuli.

As the couple traveled to Hilo Hanakahi, Kahikikuaokalani heard the yelling and cheering of many people coming from the valley of Laupāhoehoe (located to the north of the project area). He asked Hinaaukekele to instruct her traveling *‘ōhi‘a* tree to stop where all the commotion was coming from. In his curiosity, Kahikikuaokalani searched out the source of the cheering. He discovered that the noise was of bystanders who were cheering on two exceptionally skilled surfers, one from Hilo One and one from Hilo Palikū, who were competing against each other. The waves at Laupāhoehoe were well known across Hawai‘i Island and were the same waves that were favored by the famed *ali‘i,* ‘Umi, generations later.

When Hinaaukekele and Kahikikuaokalani arrived, the people of Laupāhoehoe shifted their attention away from the surfers and rushed towards the beautiful travelers atop the moving *‘ōhi‘a* tree. What made these travelers even more extraordinary was the fact that they were accompanied by numerous forest-dwelling birds and four low-lying rainbows. When Hinaaukekele inquired about the commotion, some spectators responded that they were celebrating the fact that their surfer, a Hilo Palikū man by the name of Kekuaiwa, beat Kenao, the surfer from Hilo One, and won forty *kapa* cloths and a long canoe in the process. When Hinaaukekele asked how Kekuaiwa won, the people responded that it was because he was more skilled at surfing in the rough waters of Laupāhoehoe as opposed to the calmer waters of Hilo One. Furthermore, Hinaaukekele inquired about the ruling chief of the area, in which the people of Laupāhoehoe responded that there was no ruling chief who lived in the valley but that they were subjects of Kanakea, a chiefess who resided in Hilo. Kanakea knew of Hinaaukekele, as she was the one who was sent to retrieve Kahikikuaokalani from O‘ahu.

Hinaaukekele then proceeded to tell the people of Laupāhoehoe to have the two surfers compete once more. The spectators enthusiastically followed these instructions and told the local *konohiki* (head man of an *ahupua‘a*) what they heard from these distinguished travelers. In turn, the *konohiki* told the surfers to take to the waves again, and the surfers agreed without complaint.

When Kekuaiwa and Kenao reached the wave break, both were intent on outdoing their competitor to become the champion of the waves. Kekuaiwa did not think twice about Kenao, for he surfed in the waters of Laupāhoehoe since he was a child. As a wave neared, Kenao paddled to a spot where the waves were easier to ride. Kekuaiwa knew what Kenao was doing and prepared himself for the competition ahead. Onshore, the majority of spectators believed that Kekuaiwa would win once more since he won the first time.

Enthused by the energy of the crowd and surfers, Kahikikuaokalani proposed to Hinaaukekele that they pick who they believed would win the surf competition. When Kahikikuaokalani told Hinaaukekele that she could pick first, she laughed, teasing him by saying that he only wanted her to choose Kekuaiwa, the obvious choice since he won the first competition, because he could rebuke her for choosing the former winner. Kahikikuaokalani laughed at Hinaaukekele's remarks and told his beloved that he was letting her choose first as a gesture of honor and respect and that either of the surfers could win.

When the couple looked down at the surfers who were poised to catch the next wave, Hinaaukele used her thoughts to secretly call her magical grandmother to let the surfer from Hilo One win the competition. When an excellent surfing wave neared, the two surfers caught it. They both rode splendidly. As they neared the shore, it was clear that the surfer from Hilo Palikū, Kekuaiwa, would win the competition. But as they neared the shore, Kekuaiwa saw a human hand emerge from the sea and snatched his board down into the depths. Kenao was thus the winner of the second round.

The spectators ashore were shocked to the point of speechlessness due to the outcome of the surfing competition. They could not explain how Kekuaiwa lost to Kenao. So too was Kahikikuaokalani puzzled by this turn of events, as he had no way of knowing that it was Hailikulamanu, Hinaaukekele's grandmother, who intervened. When the surfers came back to land, Hinaaukekele instructed someone to tell the surfers to come to her and Kahikikuaokalani. Kenao happily obliged to this request, but Kekuaiwa was furious about his loss and did not want to see these visitors out of embarrassment.

Kahikikuaokalani was still pondering the outcome of the competition. He realized in time that Hinaaukekele must have had something to do with Kenao's win, so he asked Hinaaukekele if he could leave and find Kekuaiwa, which she allowed him to do so. When he found Kekuaiwa, Kahikikuaokalani explained that it was because of Hinaaukekele's magical abilities that resulted in his loss during the surfing competition. Kekuaiwa then described how a human hand grabbed his board and pulled him down. In response, Kahikikuaokalani explained to Kekuaiwa that he had nothing to be ashamed of because it was his decision to bet against Hinaaukekele that resulted in his (Kekuaiwa's) loss. Kahikikuaokalani continued by describing how Hinaaukekele used her thoughts to call out to her grandmother to assist Kenao in winning the competition.

When Kahikikuaokalani returned to Hinaaukekele, she laughed because she knew that her secret was exposed. She turned to Kenao and asked him if he wanted to accompany them to Hilo One, in which he humbly declined due to their superior rank. From there Hinaaukekele and Kahikikuaokalani continued on their journey through Hilo Palikū until they reached Hilo One.

Lastly, the following account, although not mythological in nature, utilizes a famed saying that was said to have originated from the ancient days when Hilo's people were active in canoe carving.

Pau Kuhihewa Iā Hili Palikū-Completely Mistakened by Hilo Palikū

One of the sayings for the Hilo Palikū region is "pau kuhihewa iā Hilo Palikū," which translates to "Hilo Palikū is completely mistaken." In historical sources, authors used this saying as an expression of disdain for someone who lies or does keep promises. In August of 1900, an author under the penname "Hawaii Oiaio" published an article that explains the origins and usage of "pau kuhihewa iā Hilo Palikū. In his article titled "Pau Ole Kuhihewa Ia Hilo Palikū," Hawaii Oiaio addresses it to members of the Aloha ʻĀina political party, including Joseph Nawahī, William White, John Richardson, Thomas Clark, Reverend John Kalana Hihio, J. Nazareka, David Kalauokalani, James Kaulia, Robert Wilcox, and William Auld, which he chastises for their pro-Kingdom politics. Although the excerpt that is included below focuses on the story of the Hilo Palikū saying, the overall message of the article encourages readers to pursue leadership positions within the newly formed government of the Territory of Hawaiʻi:

> *O ka huaolelo a hopunaolelo maluna ae e kau ae la, "Pau kuhihewa ia Hilo Paliku," he huaolelo kaulana loa keia mai ka wa kahiko loa mai o ko kakou aina, mawaena o na ho loh [sic] elua, e lilo i mau halekipa, a i mau aikane "Punakeonaona, ina no Maui, Oahu, Kauai ke kanaka i hoaikane me ko Hilo, a ina paha ma Maui kahi i launa ai, alaila, ua mopopo [sic] no i ke kanaka o Hilo ka makemake o ka hoaloha o Maui he waa alaila, pane aku la ke kanaka o Hilo, he wahi waa no koʻu makemake no ia, e lawe koke mai hoi ha oe, ae, ua pono.*

> *Oi kali aku ke kanaka o Maui a, a hala ae ana he anahulu, a hala aku ana ua anahulu, pau ka palena o ka pono, o kau nae kai puhi aku la ia iala, a hoka iho la ke kanaka o Maui. Pane iho la ke kanaka o Maui, he lohe akahi no a ike maka, nolaila, ua ailolo na kanaka o Maui, Oahu, Molokai, Lanai, Kuai i ko Hilo Poe i ka hoopunipuni, pili nae keia i ka poe kalaiwaa.*
>
> The saying and sentence located above, "Hilo Palikū is mistaken completely," it is a legendary saying from the ancient times of our land, that arouse between two friends, who became best friends, and later became companions. "Punakeonaona, indeed if the person from Maui, Oahu, and Kauai befriended Hilo's [person], and if on Maui is where they enjoy each others company, and then, the person in Hilo would know that their Maui friend is in need of a canoe, and then, the Hilo people responds, I definitely have a canoe that was painted black, I will leave and then return, and then, the person from Maui responded, that is what I desire, please bring it quickly, indeed, it is needed.
>
> Whilst the person from Maui waited, a month passed, and another month passed, he reached his limit and became furious and disappointed. The person from Maui told the person from Hilo, I heard you but I have yet to see it with my own eye, therefore, the people of Maui, Oahu, and Lanai were scorned. Hilo's people, in particular the canoe carvers, trade in lies. (Oiaio 1900:6)

Although the saying is one that does not see people from Hilo Palikū as favorable or honest, it is one that speaks of the region's long history of interisland exchange and communication.

The Legacy of the *Māhele ʻĀina* of 1848

By the mid-19th-century, the Hawaiian Kingdom was an established center of commerce and trade in the Pacific, recognized internationally by the United States and other nations in the Pacific and Europe (Sai 2011). As Hawaiian political elites sought ways to modernize the burgeoning Kingdom, and as more Westerners settled in the Hawaiian Islands, major socioeconomic and political changes took place, including the formal adoption of a Hawaiian constitution by 1840, the change in governance from an absolute monarchy to a constitutional monarchy, and the shift towards a Euro-American model of private land ownership. This change in land governance was partially informed by ex-missionaries and Euro-American businessmen in the islands who were generally hesitant to enter business deals on leasehold lands that could be revoked from them at any time. *Mōʻī* (Ruler) Kauikeaouli (Kamehameha III), through intense deliberations with his high-ranking chiefs and political advisors, separated and defined the ownership of all lands in the Kingdom (King n.d.). They decided that three classes of people each had one-third vested rights to the lands of Hawaiʻi: the *Mōʻī*, the *aliʻi* and *konohiki*, and the native tenants (*hoaʻāina*). In 1846, King Kauikeaouli formed the Board of Commissioners to Quiet Land Titles (more commonly known as the Land Commission) to adopt guiding principles and procedures for dividing the lands, grant land titles, and act as a court of record to investigate and ultimately award or reject all claims brought before them (Bailey in Commissioner of Public Lands 1929). All land claims, whether by chiefs for an entire *ahupuaʻa* or *ʻili kūpono* (nearly independent *ʻili* land division within an *ahupuaʻa*, that paid tribute to the ruling chief and not to the chief of the *ahupuaʻa*), or by *hoaʻāina* 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, 1846) to be considered. This deadline was extended several times for chiefs and *konohiki*, but not for native tenants (Soehren 2005).

The King and some 245 chiefs 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.; Kuykendall 1938). Once Kauikeaouli and his chiefs accepted the principles of the Privy Council, the *Māhele ʻĀina* (Land Division) was completed in just forty days (on March 7, 1848). The names of nearly all of the *ahupuaʻa* and *ʻili kūpono* of the Hawaiian Islands, as well as the names of the chiefs who claimed them, were recorded in the *Buke Māhele* (*Māhele* Book) (Buke Māhele 1848; Soehren 2005). As this process unfolded, King Kauikeaouli, 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 for fee simple title by his subjects. Accordingly, the day after the division when the name of the last chief was recorded in the *Buke Māhele*, the King commuted about two-thirds of the lands awarded to him to the government (King n.d.). Unlike Kauikeaouli, the chiefs and *konohiki* were required to present their claims to the Land Commission to receive their Land Commission Awards (LCAw.). The chiefs who participated in the *Māhele* were also required to provide to the government commutations of a portion of their lands in order to receive a Royal Patent giving them title to their remaining lands. The lands surrendered to the government by the King and chiefs became known as "Government Land." The lands personally retained by the King became known as "Crown Land." Lastly, the lands received by the chiefs became known as "Konohiki Land" (Chinen 1958:vii; 1961:13). To expedite the work of the Land Commission, all lands awarded during the *Māhele* were

identified by name only, with the understanding that the ancient boundaries would prevail until the lands could be formally surveyed.

Pīhā Ahupuaʻa appears to have gone unclaimed as it does not appear in the *Buke Māhele* and was never assigned or awarded during the 1848 division between the King and chiefs. However, the ownership of Pīhā was the center of controversy when the Trustees of Bishop Estate claimed that Pīha (along with other lands) had been continuously held and claimed by Bernice Pauahi Bishop's ancestors (Rowland 2018). To settle this dispute, a compromise was reached by which the Minister of the Interior conveyed certain other lands to the Trustees, and they, in turn, conveyed the land of Pīhā (and other lands) to the Hawaiian Kingdom government. Thus, it was not until December 20, 1890, that Pīhā was included as Government Land (Rowland 2018).

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 (Garovoy 2005). Additionally, the *Kuleana* Act clarified rights to gather natural resources, as well as access rights to *kuleana* parcels, which were typically landlocked. 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 claim land were required to register their claim in writing (either in the Hawaiian or English language) by submitting a register to the Land Commission who assigned the claimant a number, and that number was used to track the claimant through the entire claims process. Subsequently, the claimant had to get supporting testimony from two individuals (typically neighbors) to confirm their claim to the land. The document generated as part of this process was known as a Native or Foreign Testimony depending upon the language used by the claimant. 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.

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, by name only, as a part of the *Māhele*. Subsequently, in 1874, the Boundary Commission was 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 of 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, upon the application of J. Dominis, agent of the Crown Lands and administrator for the estate of M. Kekuanaoa, the Boundary Commission met at the courthouse in Hilo to settle the boundaries of Pīhā Ahupuaʻa (Boundary Commission 1874:325-330). 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. Hitchcock testified that he surveyed the boundaries of Pīhā 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 (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 Hitchcock's 1875 map (Figure 13). 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 (ca. 1819-1824). 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…(ibid.: 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. (ibid.: 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 *ahupuaʻa* 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…(ibid.: 327)

When cross-examined Hemahema clarified that:

> …Nahuina and kumukawau are the same…From Kawau boundary between Nanue and Piha 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. (ibid.: 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. 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…(ibid.: 329)

Kupahu, the uncle of Alapai (the owner of Nanue Ahupuaʻa), 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…" (ibid.: 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, and Certificate of Boundaries be issued accordingly.

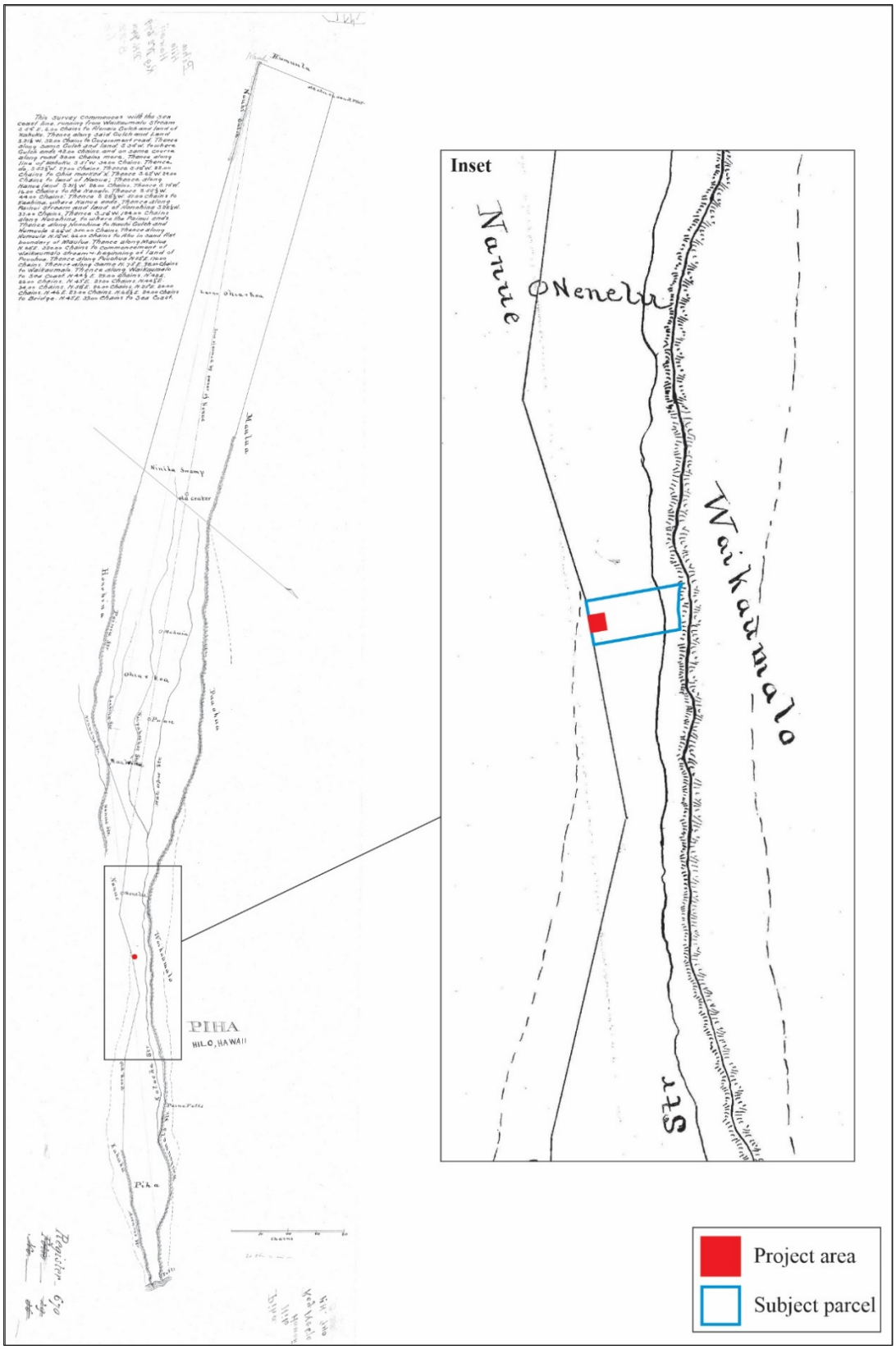

Figure 13. Hawai‘i Registered Map No. 670 prepared by Hitchcock (1874) in 1874 showing the approximate location of the project area within Pīhā Ahupua‘a.

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 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 along this region 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, 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 [Mauna Kea], rising about the centre [*sic*] 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. (Wilkes 1845:206)

Journalist Henry M. Whitney published the very first guidebook to the islands in 1875, titled *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.
>
> 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." (Whitney 1875:70-72)

The road to Laupāhoehoe from South Hilo was also described in George Bowser's *Hawaiian Kingdom Statistical and Commercial Directory* (Bowser 1880) 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. (Bowser 1880:536)

King David Kalākaua (Kalākaua 1888) described the lands of the northern portion of Hilo as he recounted the tale of ʻUmi-a-Līloa presented in his book, the *Legends and Myths of Hawaiʻi*. 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 *loʻi 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. (Kalākaua 1888:284)

Pīhā Ahupuaʻa During the Late Nineteenth and Twentieth Centuries

Following the conversion of Hawaiian land to fee-simple ownership and 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 were 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 about 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, constructed in 1890 on the shore at the foot of a 200-foot bluff overlooking 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 steam-powered vessels that anchored offshore.

The lands of Pīhā Ahupuaʻa (containing 4,250 acres) were leased to the Hakalau Plantation Co. on February 11, 1892 (Brown 1892), 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 project area, rather it remained as forest throughout the late 19th century and into the present. The degradation of the native forests was a catalyst for change in Hilo, and the effects related to deforestation had been ongoing since the early 1800s following the introduction of cattle and other ungulates by early European visitors (Bergin 2004). The importance of the forest lands and their role in preserving the watershed for agricultural purposes and the well-being of the people, in general, was recognized quite early on by the newly formed Territorial Government of Hawaiʻi (formed in 1900), and by the burgeoning 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 Lieutenant Governor A. L. C. Atkinson on July 24, 1905, and the Hilo Forest Reserve was created. The Hilo Forest Reserve was described thusly by the Division of Forestry in 1906:

> 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)

After the creation of the Hilo Forest Reserve, and just as the plantation's lease on its Pīhā lands was set to expire, large tracts of government land were set aside like Pīhā (and other parts of Hilo) by the territorial government to create

homesteads. The process for obtaining homestead lots was 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 anticipated Pīhā Homestead Tract commenced in 1912 and was completed by 1913, 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 the Interior 1914a:679). The location of the subject parcel with respect to the larger Pīhā Homestead tract is shown in Hawai‘i Registered Map 2568 from 1914 (Figure 14). The Pīhā-Kahuku Homestead Road, created as part of the homesteads subdivision and situated along the southeastern boundary of the project area separating it from the Kahuku Homesteads subdivision (see Figure 14), likely followed the route of the older trail delineating the Pīhā and Kahuku *ahupua‘a* boundary as indicated during Boundary Commission testimony proceedings provided for Pīhā during the late nineteenth century.

Not long after the formal subdivision of the Pīhā Homesteads, the Hakalau Plantation, now owned by C. Brewer & Co., questioned the legitimacy of the boundary between the homesteads and 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 1914b). Later that year, in June 1914, fifteen lots (Lots 9 through 28) within the *makai* third of the newly created Pīhā Homesteads subdivision were made available for homesteading and sold at auction. The eight additional lots (Lots 1 through 8) situated in the more *mauka* remainder of the homesteads and includes the subject parcel, identified as Lot 2 of the Pīhā Homestead (Figure 15), were not applied for despite the claim that the Pīhā Homestead lots were available for homesteading in 1912 and were not set for 10-year lease at public auction until the following year in June 1915 (Honolulu Star-Bulletin 1916). One month later, on July 14, 1915, a general ten-year lease for Lots 1 through 8 was purchased at auction by the Hakalau Plantation Company who also purchased 10-year leases on four additional lots (Lots 13 through 16) of the adjoining Kahuku Homesteads (Department of the Interior 1916). Collectively, all of the Pīhā Homestead lots were to be taken only by a Special Homestead Agreement, which had stipulations for an annual lease payment of $50 as well as a requirement to fence all lot boundaries (Herald 1915).

For unknown reasons, the Hakalau Plantation Company's lease was never fully executed and Lots 1 through 8 were eventually sold off to various homesteaders. Lot 2 (the subject parcel), a 17.24-acre parcel, was sold jointly with Lot 1 (an 18.3-acre parcel adjacent to Lot 2 to the west) to William Breithaupt on August 23, 1916, as Grant No. 8584 for $324.00 (Figure 16). Several other members of the Breithaupt family also purchased lands within Pīhā Homesteads, including Otto Breithaupt (Lots 5 and 6; Grant 7862), Ella Breithaupt (Lots 7 and 8, Grant No. 7863), and August K. Breithaupt (Grant No. 8328; Lots 15 and 16). It appears that less than a month after William Breithaupt's purchase, on September 8, 1916, Lots 1 and 2 were leased to Mike Lehuanui under Special Homestead Agreement No. 1252 but later transferred back to Breithaupt's possession three years later on September 10, 1919 (Rivenburgh 1917). Territory of Hawai‘i tax records indicate that Lots 1 and 2 (the current project area) were initially identified as belonging to TMK: (3) 3-2-004:011 and were transferred from William Breithaupt to August Breithaupt on September 21, 1936.

In 1939, the Territorial government appropriated monies for the construction of the Pīhā-Kahuku Road and by 1941, a survey was undertaken to establish a formal alignment (Rowland 2018). This resulted in portions of the road being realigned particularly in the vicinity of Lots 18 & 19, Lots 21 & 23, Lots 24 & 25, and Lots 26 & 27 (see Hawai‘i Registered Map No. 3060), all of which are located *makai* of the project area. The interest in the abandoned section of the original Pīhā-Kahuku Road was relinquished by the government in lieu of newly established alignment (Rowland 2018).

Around this time and until the first half of the 20th century, the Hakalau Plantation Company continued to operate on lands situated *makai* of the current project area. By the early 1940s, nearly forty percent of the sugarcane on the plantation was being cultivated by independent growers, some of whom had purchased various 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 eventually rebuilt, but the railroad was shut down indefinitely and the sugarcane was then trucked to the docks at Hilo.

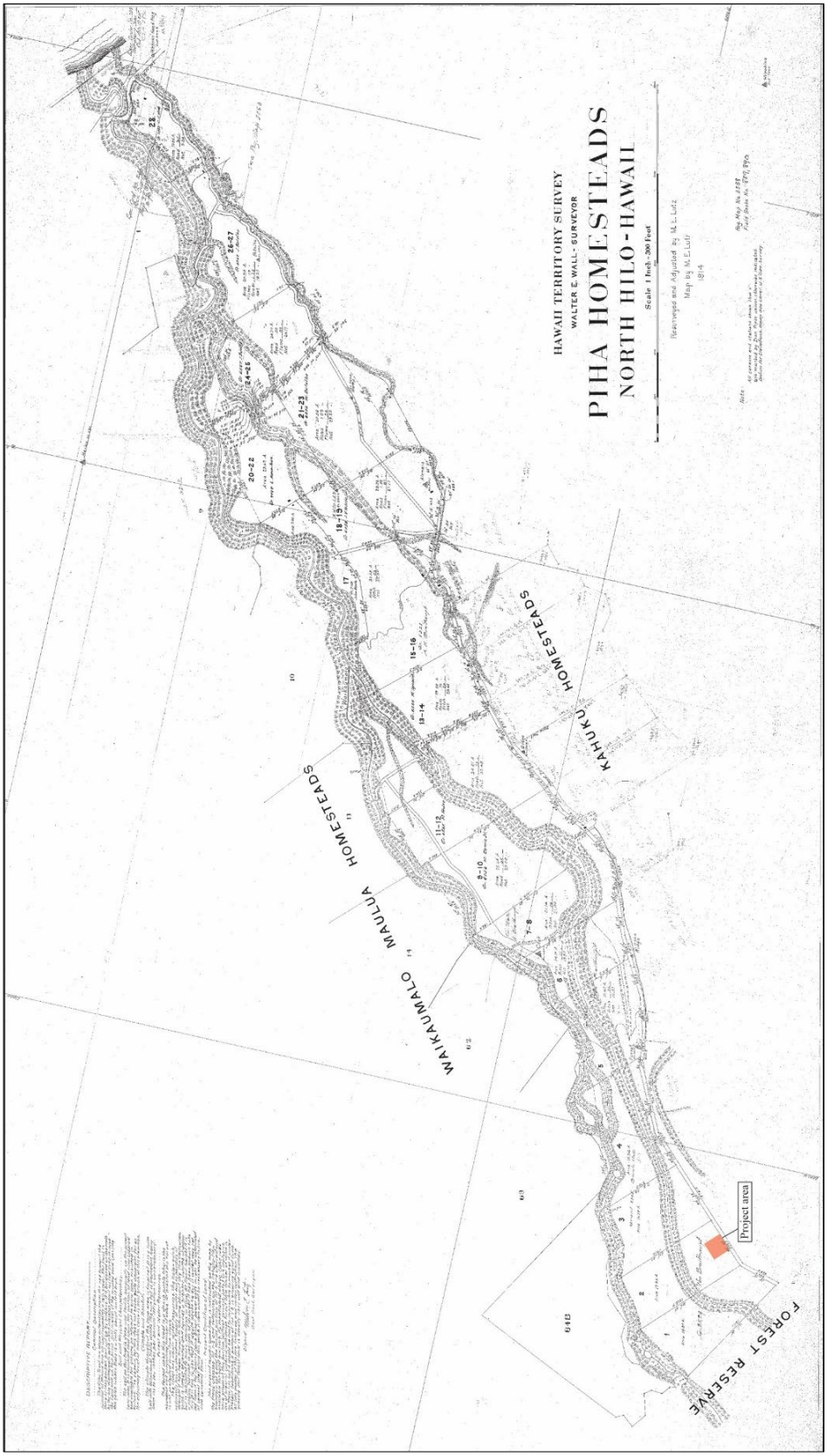

Figure 14. Hawai‘i Registered Map No. 2568 prepared in 1914 by M.E. Lutz showing the location of the current project area within Lot 2 of the Pīhā Homesteads (Lutz 1914).

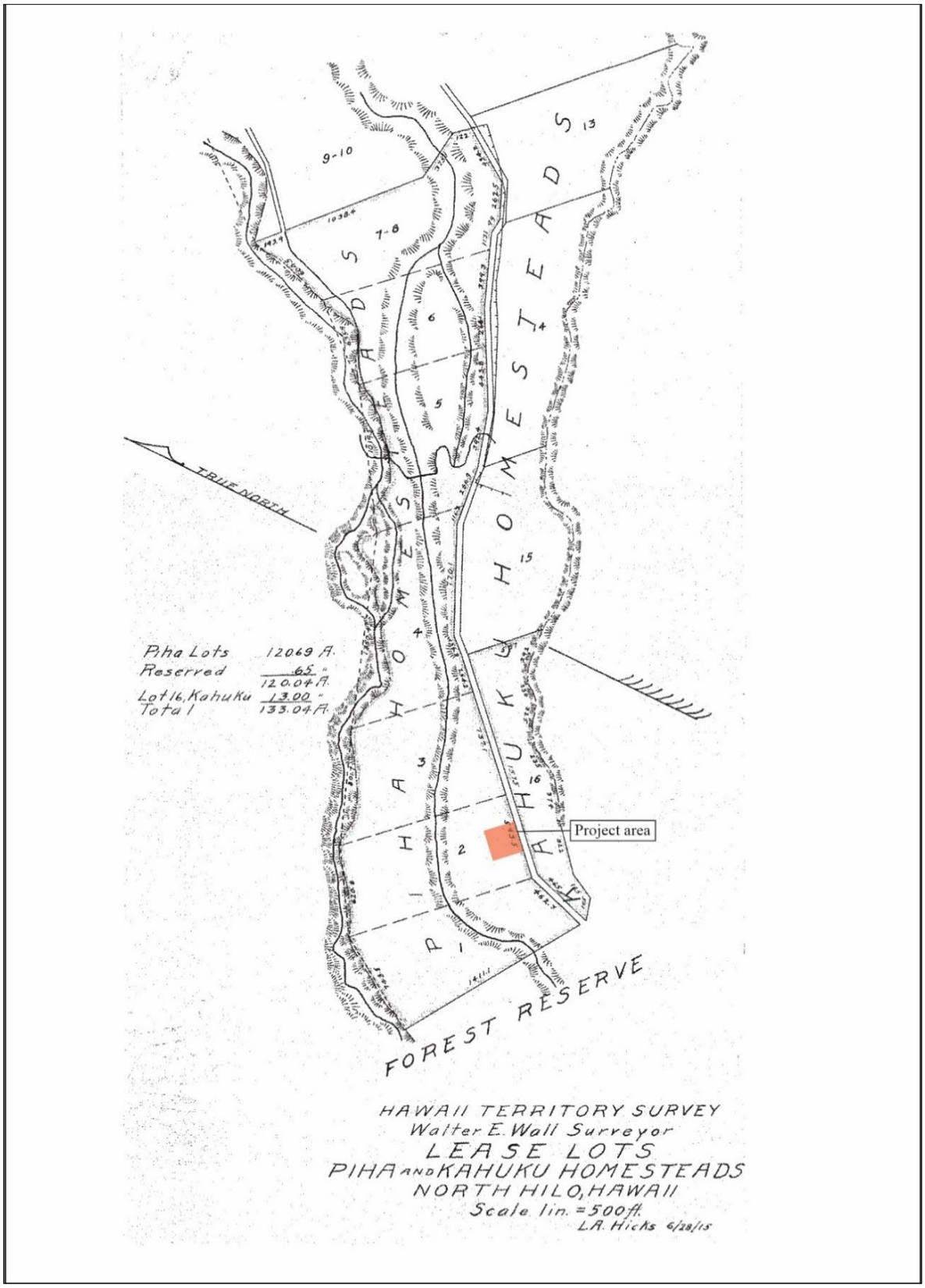

Figure 15. June 28, 1915, map by L. A. Hicks (1915) showing project area within Lot 2 of the Pīhā Homestead.

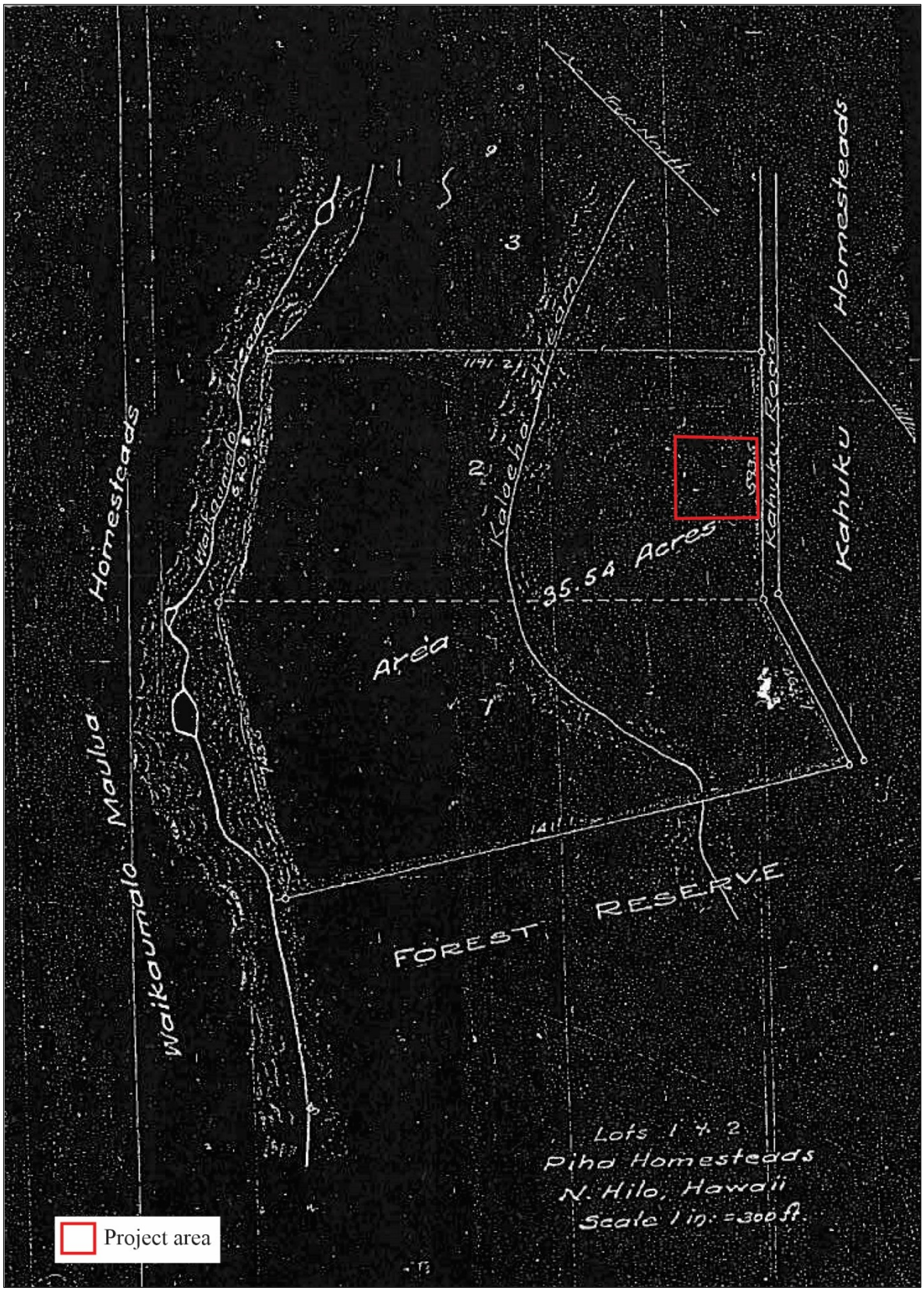

Figure 16. Project area shown within Lot 2 of the Pīhā Homesteads originally sold to William Breithaupt (Rowland 2018).

Six years following the *tsunami* in January 1952, Lots 1 and 2 were transferred from August Breithaupt's estate to Ella Breithaupt and eventually fell under the care of her own respective estate. By January 1953, six months prior to Ella Breithaupt's death (Honolulu Star-Bulletin 1953), a number of lots also presumably within the Pīhā Homesteads subdivision (including Lots 1 and 2) were being managed by her son and estate trustee, Graven Breithaupt, and collectively amassed under TMK: (3) 3-2-004:001. During this time, C. Brewer & Co. merged the Hakalau Plantation Company into the Pepeʻekeʻō Sugar Company (Dorrance and Morgan 2000), and sugar continued to serve as the dominant commercial industry in this portion of Hilo, although the project area remained uncultivated (Figure 17). In 1963, Lots 1 and 2 were part of 120.69-acres of land subsequently dropped into TMK: (3) 3-2-004:006 (along with Lots 3 through 8). Tax records are somewhat ambiguous but do indicate that 113.19 of the 120.69 acres were leased by Graven Breithaupt to Yoshinobu and his wife Tsutayo Yamada along with their son, Bob Takeshi Yamada, for a period of 80 years beginning on July 1, 1963, while the remaining 7.5-acres was reserved for another lessee by the name of Makoto Tawara. It appears that during this year, most of the lands encompassed by Parcel 006 were classified as undeveloped forest (totaling 52.21 acres), while 38.18 acres of the parcel consisted of gulch lands (presumably Kalaeha Stream/Gulch, which bisects the subject parcel). Twenty-five acres was listed as pasture, while the remaining 5.3 acres was identified as cane land.

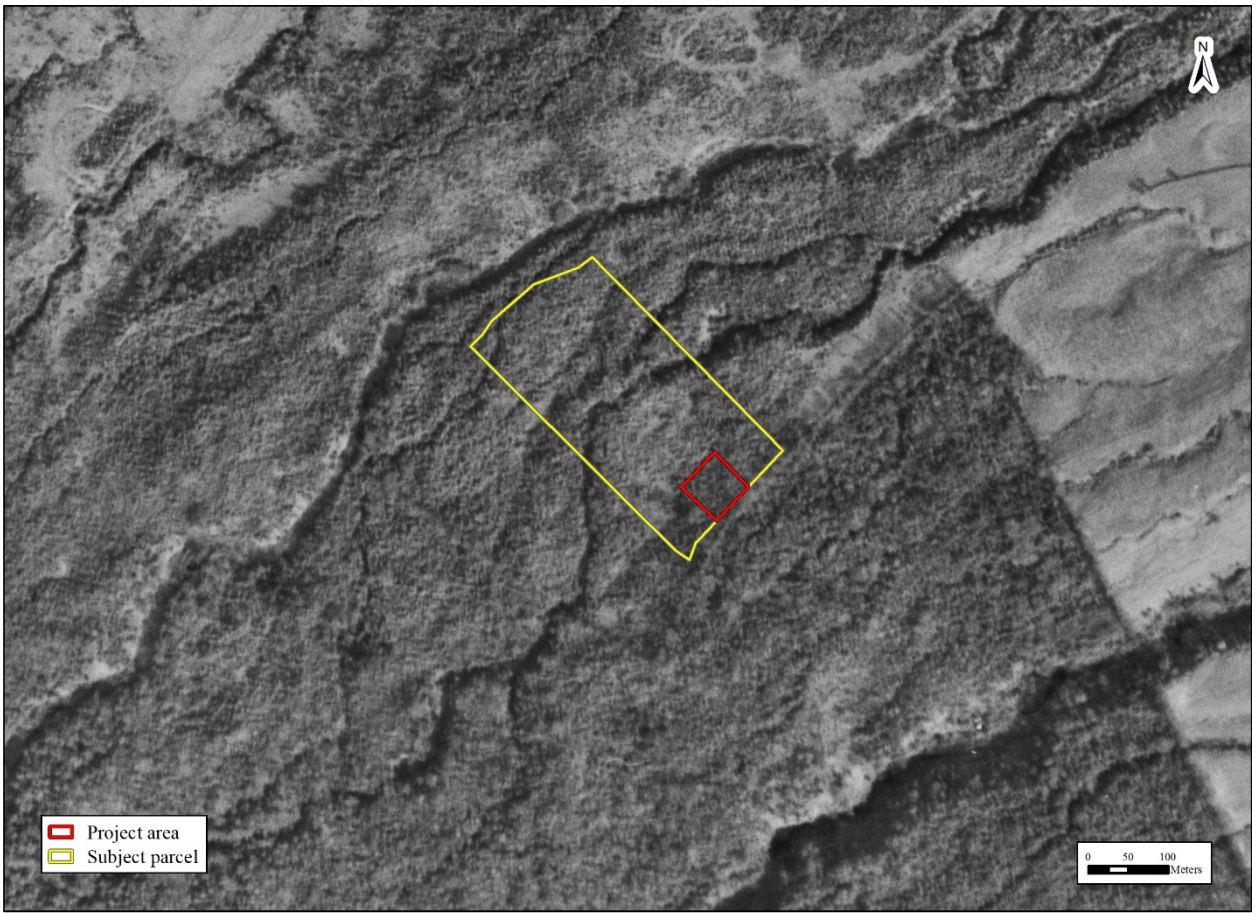

Figure 17. 1954 USGS aerial photograph showing the location of the project area.

Although Yoshinobu Yamada had previous experience as a cane planter prior to his lease of the lands (presumably encompassing or in the immediate vicinity of the project area), and later worked for and retired from Mauna Kea Sugar Company as a service truck helper (Hawaii Tribune-Herald 1985; Hilo Tribune-Herald 1934), it appears that the lands within and surrounding the current project area were never utilized for the cultivation of sugarcane by the Yamada family (see Figure 17). However, Makoto Tawara, the other lessee who received the remaining 7.5-acres of land within Parcel 006, is listed as a sugarcane grower in tax records spanning between 1953 and 1961 for Lots 7 and 8. Based on these records, it is likely that the 7.5-acres of land leased to Tawara were not for lands within the project area, but rather for lands within Lot 8 which he likely continued leasing for an indeterminate period as an independent grower for the plantation. It can thereby be suggested that from 1963 until at least 1968, the only utilization of the

remainder of the lands encompassed within Parcel 006 (Lots 1 through 7) were for pastoral use or were left fallow as undeveloped forest and gulch lands. A USGS topographic map from 1966 depicts the project area within a forest, indicating that it most likely remained undeveloped until this time (Figure 18).

Land use for the current project area is vague in the years following, and it appears that by 1970 the current project area was removed from the Parcel 006 designation which by this time details land use for just 30 acres of land. Despite the continued expansion of the sugarcane growing operation in the *makai* lands of Pīhā and with the merging of Pepeʻekeo Sugar Company into the Mauna Kea Sugar Company by C. Brewer & Co. into the Mauna Kea Agribusiness Company in 1973, it appears that the project area lands remained out of reach for the industry and sustained as an undeveloped, forested landscape until the present day (Figures 19 and 20). In 1994, the Mauna Kea Agribusiness Company harvested its last crop and closed its operations marking the end of Hilo's long-standing sugar industry.

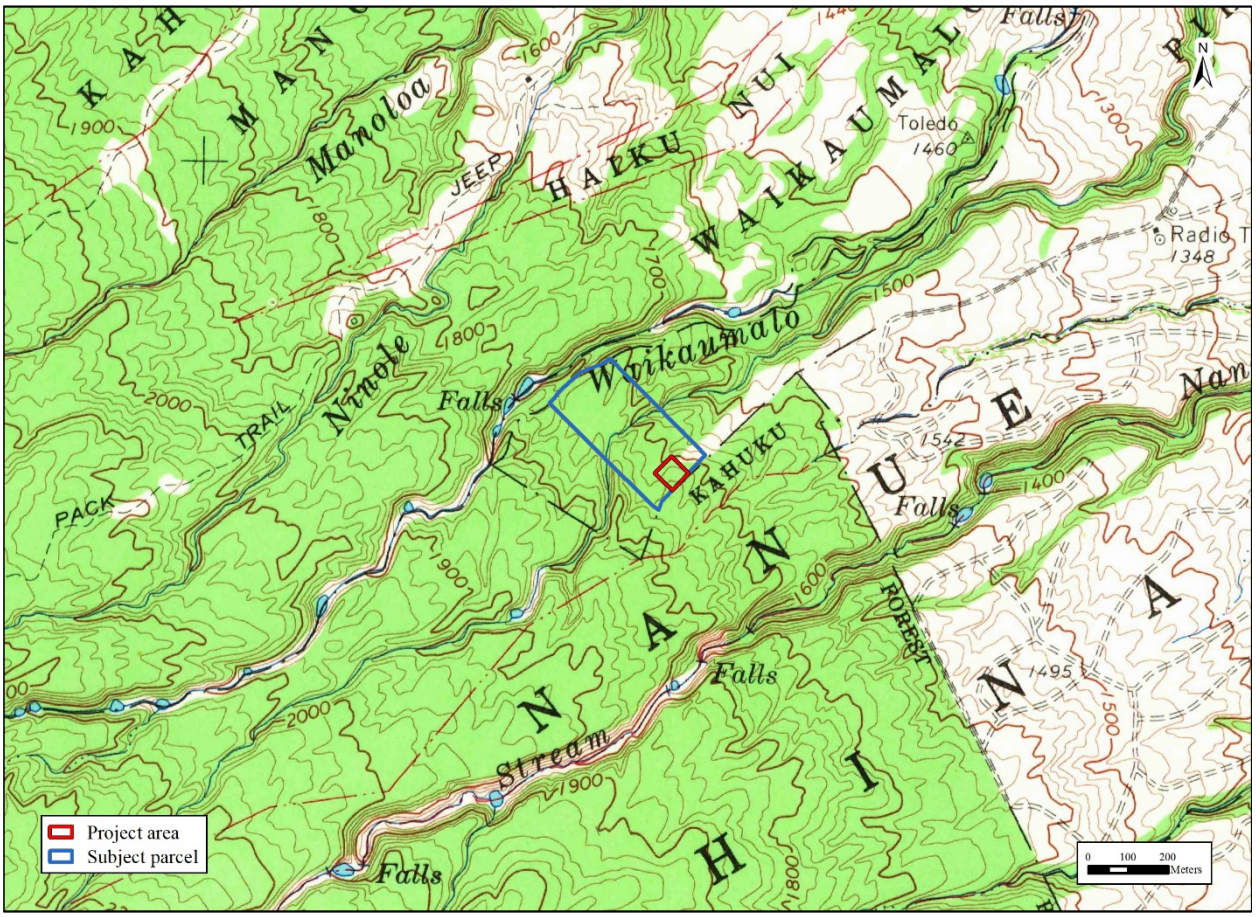

Figure 18. Portion of 1966 USGS Papaaloa quadrangle showing the location of the project area.

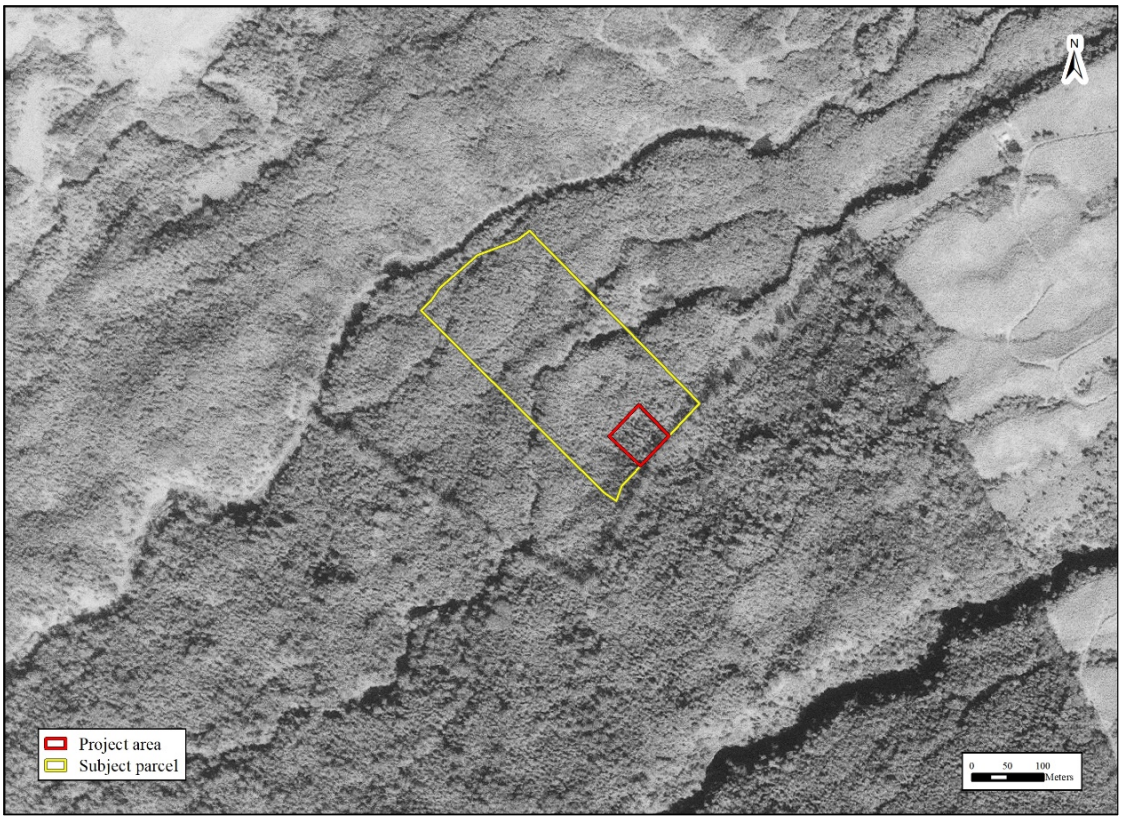

Figure 19. 1977 USGS aerial photograph showing the location of the project area.

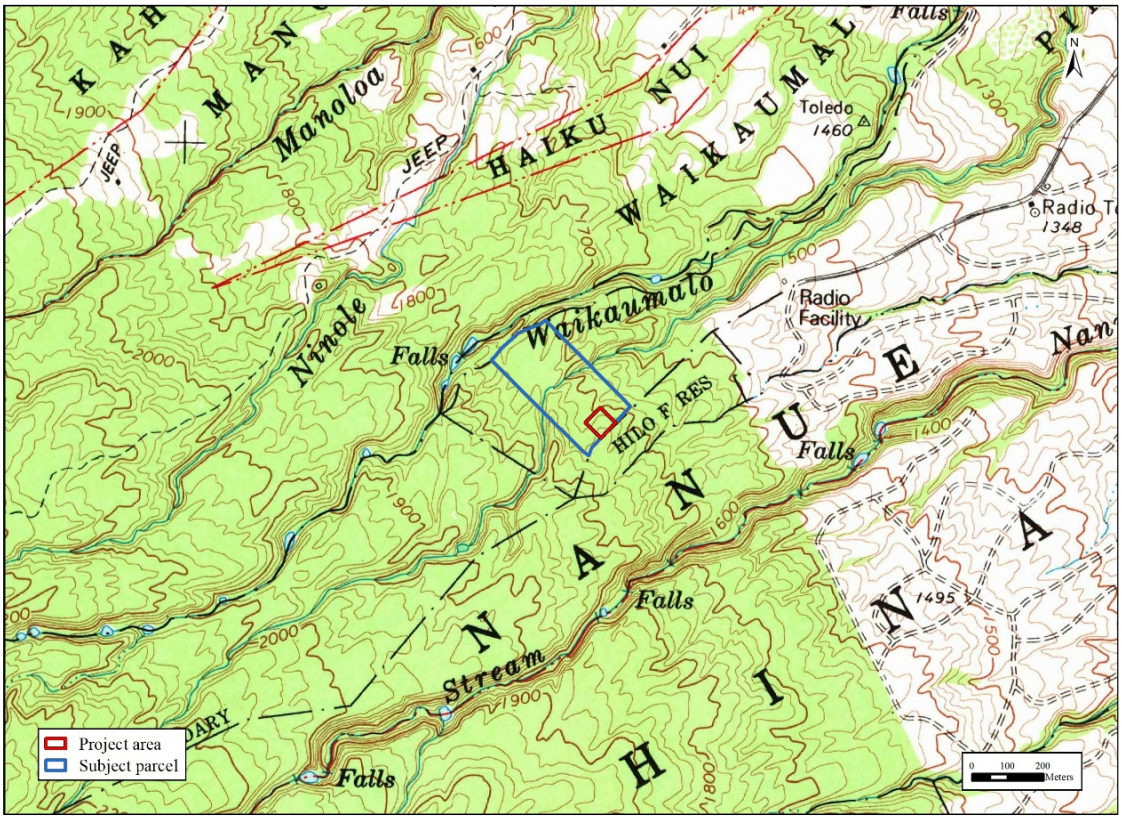

Figure 20. Portion of 1980 USGS Papaaloa quadrangle showing the location of the project area.

SUMMARY OF PREVIOUS STUDIES

There have been no previous archaeological studies conducted within the subject parcel and very few studies conducted anywhere within the district of the North Hilo at similar elevations. The first archaeological work conducted in East Hawai‘i was that of the early twentieth-century *heiau* researchers Thrum and Stokes (Stokes and Dye 1991; Thrum 1908). Neither investigator was able to identify *heiau* within Pīhā Ahupua‘a or, for that matter, within the broader region between Hilo One and Hilo Palikū in the vicinity of Laupāhoehoe Ahupua‘a. In the early 1930s, A.E. Hudson, working under the aegis of the Bishop Museum, 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 project area, although he did note the presence of a .25 mile square area of *kalo* terracing in the upper reaches of Hakalau Gulch situated east of the project area. According to Hudson (1932:218), there was formerly a *papamū* (*kōnane* game board) in the bottom of Hakalau Gulch, and the gulch was at one time identified as a robber’s stronghold.

More recently, Walker and Rosendahl (Walker and Rosendahl 1994a, 1994b) conducted an archaeological study of approximately 595 acres of land within Hakalau Nui Ahupua‘a in the South Hilo District, situated between Hawai‘i 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 1994a). Walker and Rosendahl reported that the study area had been extensively modified during the Historic Period for sugarcane cultivation, and that no archaeological sites resources were identified during the study.

In 1996, International Archaeological Research Institute, Inc. (IARII; Tomonari-Tuggle 1996) prepared a cultural resource overview for the Hakalau National Wildlife Refuge that included lands *mauka* of the current project area and outside of Pīhā Ahupua‘a. Very little archaeological work was undertaken during the study; however, Tomonari-Tuggle did provide a predictive model for site distribution within the upland forests of Hilo and indicated that such forested areas were utilized primarily for the collection of special resources:

> . . . 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 were surmised to have been encountered within the upland forests of the Hilo included 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. Tomonari-Tuggle (1996) described the lowest forest zone, in which the current project area is situated, as the wet *‘ōhi‘a* zone. This zone, characterized primarily by *‘ōhi‘a* forest and bog lands extending up to 4,000 feet in elevation, was indicated to have been an area largely used as a source of specialized forest resources such as hardwoods for crafts or construction, and forest birds for feathers.

A review of reports and correspondence on file at the DLNR-SHPD office in Hilo indicates that only two archaeological studies have been conducted in the vicinity of the current project area, but that DLNR-SHPD has previously written “no effect” letters for at least seven parcels within the Pīhā and Kahuku Homesteads (Figure 21). These “no effect” letters include a:

1. November 1, 1996 letter for TMK: (3) 3-2-004:025 (*Log No. 18344 Doc No. 9610ms04*); an
2. April 24, 1998 letter for TMK: (3) 3-2-004:027 (*Log No. 21307 Doc No. 9804PM15*); a
3. June 1, 1998 letter for TMK: (3) 3-2-004:039 (*Log No. 21050 Doc No. 9802PM03*); an
4. August 18, 1998 letter for TMK: (3) 3-2-004:041 (*Log No. 22025 Doc No. 9807ms17*); a
5. June 19, 2001 letter for TMK: (3) 3-2-004:043 and 044 (*Log No. 27706 Doc No. 0105ms08*); a
6. December 31, 2010 letter for TMK: (3) 3-2-004:045 (*Log No. 28884 Doc No. 0112PM10*); and an
7. April 17, 2013 letter for TMK: (3) 3-2-004:046 (*Log No. 2013.2304 Doc No. 1304SN05*)

The reason generally given for DLNR-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 significantly altered the landscape. DLNR-SHPD undertook no archaeological survey of the parcels listed above.

In 2018, ASM Affiliates (Clark 2018) conducted an archaeological survey of a roughly 5-acre portion of Lot 1 of the Pīhā Homesteads located west of the current project area (see Figure 21). While no archaeological resources were identified within the project area, as a result of the study, Clark (2018) did note that the alignment of the Pīhā-Kahuku Road was identified adjacent to the eastern boundary of the project area. In conjunction with the archaeological survey, ASM also prepared a Cultural Impact Assessment study (Tam Sing and Rechtman 2018) for the subject parcel. Culture-historical background information was prepared, and an interview was conducted with Mr. Ian Cole of the Department of Land and Natural Resources, Division of Forestry and Wildlife. Mr. Cole related that the area to the west of the subject parcel was within Unit C of the Hilo Forest Reserve and that it is accessed by various hunters. It was concluded that the proposed project (the construction of a single family dwelling) would not impact any traditionally valued cultural or historical resources or any cultural practices and beliefs.

More recently, in 2019, ASM Affiliates (Ka‘uhane and Clark 2019) conducted an archaeological survey of a roughly 3.2-acre portion of Lots 13-14 of the Pīhā Homesteads located to the northeast of the current project area (see Figure 21). As a result of the study, no archaeological resources were identified within the project area, and it was determined that the proposed development would not affect historic properties. A Cultural Impact Assessment study was also conducted for the subject parcel in which background information was prepared and interviews were conducted with local hunters Mr. Jed Cariaga and his partner, Ms. Natalie Tavares (Ka‘uhane and Brandt 2019). Mr. Cariaga shared stories of meeting with local *kupuna* (elders) including Mr. Souza who shared historical information with them about the area. He noted that the streams and gulches, including Waikaumalo and Kalaeha, are one of the ways they have accessed the *mauka* regions to hunt and also to gather stream resources including *‘ōpae* (shrimp) and freshwater prawns. Mr. Cariaga described encountering portions of the former sugar plantation flume system and freshwater springs within the stream, possible gravesites, and a *ko‘i* (adze). He related information shared with him by Mr. Souza who described a big lake in the upper portion of Pīhā where folks from the community would ride their mules to, hunt, and smoke meat. Concerning cultural practices and resources on the property, Mr. Cariaga noted that pig hunting is one of the known ongoing practices and that access into the reserve should remain open to the public.

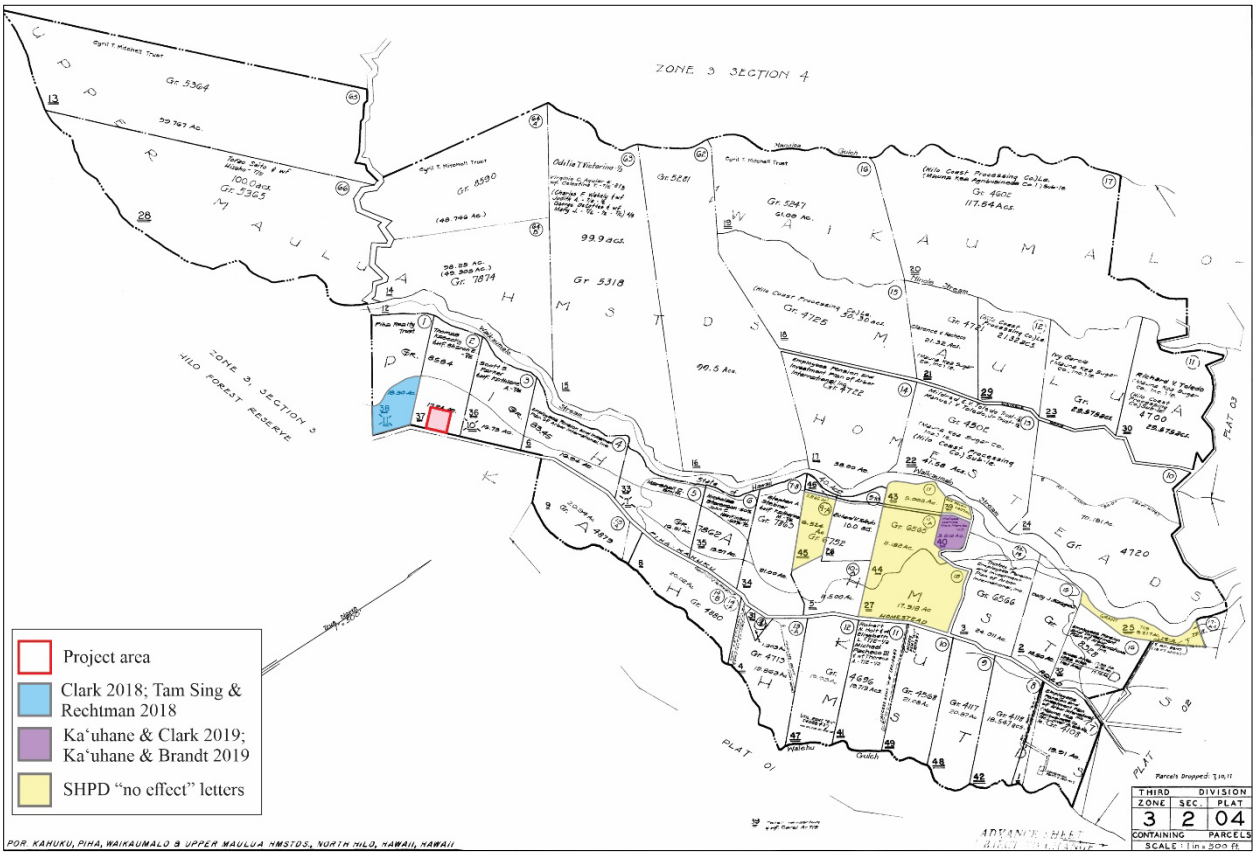

Figure 21. Location of previous studies conducted within Pīhā Ahupua‘a.

3. CONSULTATION

Gathering input from community members with genealogical ties and long-standing residency or relationships to the study area is vital to the process of assessing potential cultural impacts to resources, practices, and beliefs. It is precisely these individuals that ascribe meaning and value to traditional resources and practices. Community members often possess traditional knowledge and in-depth understanding that are unavailable elsewhere in the historical or cultural record of a place. As stated in the OEQC (1997) *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 project area. It is the present authors' further contention that the oral interviews should also be used to augment the process of assessing the significance of any identified traditional cultural properties. Thus, it is the researcher's responsibility to use the gathered information to identify and describe potential cultural impacts and propose appropriate mitigation as necessary. This section of the report begins with a description of the level of effort undertaken to identify persons believed to have knowledge of the study area, followed by the interview methodology. This section of the report concludes with a presentation of the interview summaries, all of which have been reviewed and approved to be included in this study by the interviewees.

In an effort to identify individuals knowledgeable about traditional cultural practices and/or uses associated with the current study area, a public notice was submitted to the Office of Hawaiian Affairs (OHA) on July 14, 2021 for publication in their monthly newspaper, *Ka Wai Ola*. The public notice was published in the August edition of *Ka Wai Ola* and a copy of the public notice is included as Appendix A in this report. As of the date of the current report, no responses have been received from the public notice.

Additionally, ASM staff attempted to contact seven individuals and one organization via email and/or phone whose names are listed below in Table 5. These individuals were identified as persons who were long-time residents of the area and believed to have knowledge of past land-use, history, or other cultural information. Of the eight individuals/organization contacted, four agreed to participate in this study. The names of the individuals who agreed to be interviewed as part of this study are Mr. Ian Cole, Mr. Jackson Bauer, Mr. Steven Bergfeld, and Mr. Victor Souza Jr. (see interview summaries below).

Table 5. Persons contacted for consultation

Name	*Affiliation*	*Date Contacted*	*Notes*
Jackson Bauer	DLNR- Nā Ala Hele Trails and Access	9/2/2021	see summary below
Honohina Hongwanji	n/a	9/2/2021	no response
Susan Forbes	Hakalau Home	9/2/2021	forwarded email to other community members
Ian Cole	DLNR- Wildlife Program Manager	9/2/2021	see summary below
Keola Medeiros	Hunter	9/2/2021	left voicemail no response
Steve Bergfeld	DLNR- Hawai‘i Branch Manager	9/2/2021	see summary below
Victor Souza Jr.	Local resident/hunter	9/3/2021	see summary below
Drean Barley	Local resident	9/7/2021	no response

INTERVIEW METHODOLOGY

While interviews for CIAs are typically held in persons and sometimes accompanied by a site visit, in light of the COVID-19 pandemic and state social distancing recommendations, all interviews were conducted via phone. Prior to the interview, ASM staff provided information about the nature and location of the proposed project and informed the potential interviewees about the current study. The potential interviewees were informed that the interviews were completely voluntary and that they would be given an opportunity to review their interview summary prior to inclusion in this report. With their consent, ASM staff then asked questions about their background, their knowledge of past land use, and history of the project area, as well as their knowledge of any past or ongoing cultural practices. The informants were also invited to share their thoughts on the proposed development and offer mitigative solutions. Below are the interview summaries that have been reviewed and approved by the consulted parties.

IAN COLE

On September 2, 2021, ASM staff, Lokelani Brandt contacted Mr. Ian Cole, the Department of Land and Natural Resources (DLNR) East Hawai‘i Wildlife Program Manager. In the brief telephone conversation, Mr. Cole shared that there is a public right-of-way that allows entry into the Hilo Forest Reserve which is used primarily by local hunters. Mr. Cole noted that DLNR had more recently installed a hunter check-in station located in the vicinity of the Coast Guard chainlink fence. Mr. Cole added that he was not sure how frequently hunters utilize this area but since they have installed the hunter check-in station, the DLNR now has some data regarding its use. Aside from the information shared, Mr. Cole was not familiar with the subject parcel or the history of the area. He recommended ASM staff contact local hunter, Mr. Keola Medeiros and Mr. Steve Bergfeld as he believed they would know more about this area.

JACKSON BAUER

ASM staff, Lokelani Brandt conducted a telephone interview with Mr. Jackson Bauer, the DLNR Nā Ala Hele Trails and Access Specialist on September 2, 2021. Mr. Bauer explained that historically there were trails that extended into the forest and that for the most part, appear to have followed the *ahupua‘a* boundaries. He shared that because of the local substrate and vegetation, findings physical evidence of the trail is difficult. He believes that prior to the plantation and homestead, the subject parcel was likely intact native forest and access to the uplands of Pīhā would have been for specific cultural practices including bird hunting and *koa* (*Acacia koa*) harvesting. He also suspects that those who came into this forested area did so periodically and likely stayed for short durations; thus leaving little to no evidence of their time there and if any of the evidence was organic in nature, it has most likely decomposed. He went on to add that during the 20th-century, land use in the project area vicinity changed when the homestead was created. He described that in 2018, Nā Ala Hele prepared an abstract for TMK parcel 038 (located along the subject parcel’s (*mauka*) western boundary) in which it was found that in 1941, the original Pīhā-Kahuku Road was realigned to its current location and today, this road (which runs along the subject parcel’s southeastern boundary) is the agreed-upon public access road to the forest reserve. Mr. Bauer emphasized that although this portion of the road (in the immediate vicinity of the subject parcel) is not paved, it is a public County road and that any development must not impede upon its boundaries or block access into the forest reserve. Lastly, Mr. Bauer provided a copy of the 2018 Nā Ala Hele Trail and Access System Pīhā-Kahuku Road abstract which was prepared for Lot 1 (TMK: (3) 3-2-004:038), which is included in Appendix B of this report as well as CSF and Registered Maps (some of which have been utilized in this report).

STEVEN BERGFELD

At the recommendation of Mr. Ian Cole, on September 2, 2021, ASM staff, Lokelani Brandt conducted a phone interview with Mr. Steven Bergfeld. Mr. Bergfeld is the DLNR’s Hawai‘i Branch Manager and has hunted in the Pīhā portion of the Hilo Forest Reserve. Mr. Bergfeld noted that his father-in-law, Mr. Victor Souza Jr. who grew up at the bottom of Pīhā-Kahuku Road, in Pīhā Homestead, along with his late father (Victor Souza Sr.) and late uncle Jules Souza and other community members have and continue to hunt in this portion of the forest reserve. Mr. Bergfeld shared that in the past they used to hunt on the subject parcel and other parts of the forest reserve. He briefly shared some memories of family members camping in the uplands of Pīhā where they would ride horses and hunt. He described that in the past, they would drive up the Pīhā-Kahuku Road and cross the pasture owned by Mr. Aguiar and walk up the old road and from there they would hunt. Otherwise they would enter the forest from Pīhā-Kahuku Road to access the forest reserve. Mr. Bergfeld added that the DLNR has recently installed a hunter check-in station and is now beginning to gather data on the hunting activity in this area. As such, the DLNR does not have much historical data on the local hunting activity. Nonetheless, he stated that it is important for landowners who live in the vicinity of the forest reserve to know that even though they may not see a lot of hunters, hikers, cultural gatherers or other forest users and activity regularly, in the interest of these individuals, ensuring unobstructed access to the forest reserve is vital.

VICTOR SOUZA JR.

At the recommendation of Mr. Steven Bergfeld, ASM staff Lokelani Brandt conducted a telephone interview with Mr. Victor Souza Jr. Mr. Souza was born and raised in Pīhā on a homestead property originally obtained by his grandmother located at the *makai* end of the homestead. Mr. Souza shared fond memories of growing up in Pīhā and hunting in the forest reserve. When asked about his early memories of the area, Mr. Souza stated that the subject parcel

was always forested and that he would hike on the old trails, some of which followed the streams and plantation ditches and flumes to enter the forest. He noted that pigs were the only thing they hunted in this forest.

Mr. Souza fondly described the Pīhā forest as "being so much more beautiful" when compared to today. He shared that today the forest has lots of noxious weeds but growing up he remembered seeing large *hāpuʻu* (*Cibotium glaucum*), *ʻōlapa* (*Cheirodendron trigynum*), large *koa* (*Acacia koa*) and *ʻōhiʻa* (*Metrosideros polymorpha*). He recalled that before *waiawī* (strawberry guava; *Psidium cattleyanum*) and other noxious weeds arrived in this forest, it was much more open and clear. He commented that during the plantation era, there was always access to the forest but after the closure of the plantation, access became limited.

In addition to the forest being more pristine, he described accessing the streams to obtain drinking water during their hunting trips. He remembered their hunting trips being very long, sometimes from sun up to sun down, and packing a container of orange juice mix and a large jug. He described collecting fresh spring water from the stream and mixing it with his orange juice mix which he would enjoy while on their hunting expeditions. He stated that growing up, the stream water was clean and that they didn't have to worry about things like "lepto" (leptospirosis). When asked about other uses of the streams, he shared that they used to gather *ʻōpae* (shrimp) and watercress that were planted in patches along the stream. He recalled the *ʻōpae* being prepared "*poke*" style or fried. He noted that today, he no longer sees *ʻōpae* and that the streams have become filled with algae. Mr. Souza spoke about Waikaumalo Stream and another tributary "vein" that extended in the subject parcel that they called "Make-man stream" which can be translated as dead-man Stream. Mr. Souza related the following story, which he had learned from his family as a child, about two hunters that went into the forest. While on their return trip, one of the hunters who had become tired decided to go to the tributary stream to get some water. As the hunter knelt down and bent over to take a drink of water, he was pulled forward by the weight of his pack and drowned in the stream. Being that the hunter didn't return home, the community went in search of the man who was later found in the stream. From that day, the stream (likely Kalaeha stream) became know at Make-man stream.

Mr. Souza remembered going to the forest as a young boy accompanied by his uncles (father's brothers) David and Johnny Souza and his dad Victor Sr. He noted that they taught him how to hunt and navigate the forest using the old trails. He shared that his family would hunt between the areas of Hakalau all the way to ʻOʻokala and that one of the practices of the hunters was to maintain the trails. Mr. Souza spoke specifically about a trail know as "Paperbark Trail." In describing the route of this trail, Mr. Souza stated that the trail went along Waikaumalo stream to the hunting area which was marked by a paperbark tree and orchids and anthuriums, the latter two of which were planted by his family members. He shared that while growing up, hunting was a particularly important activity, especially during the mid-1940s (~1946) when the plantation workers went on strike. He described that during the strike, the community members would rotate their hunting expeditions and that they had set up a camp in an area further *mauka* with a "lake" surrounded by Alexander palm trees. The pigs that they caught were then brought down from the mountains and taken to the local "soup kitchen" where they were prepared into a meal and distributed to the community. He said that in this way, "the whole community had food." He opined that the pigs that they harvested from this forest were always healthy and that they never really dealt with sick pigs which is more common today. He added that during World War II, while he was training for the Vietnam War, they would hunt and catch pigs for the military. Mr. Souza reflected how hunting provided food for their family and that the meat was prepared in many ways including sausage, pork water cress soup, and salt pork.

He reflected that "everything changes" and felt that he had grown up in the best of times, having enjoys the forest, the food that the land provided, and the community. He shared that sometimes his grandkids go up the stream to swim but because of the poor water quality, he encourages them to stay out. Mr. Souza's final comments were "everything changes."

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" (OEQC 1997:1). The guidelines also identify the types of cultural resources, associated with cultural practices and beliefs that are subject to assessment. These include other types of historic properties, both man-made and natural, submerged cultural resources, and traditional cultural properties. The origin of the concept and the expanded definition of traditional cultural property is found in *National Register Bulletin 38* published by the U.S. Department of Interior-National Park Service (Parker and King 1998). An abbreviated definition is provided below:

> "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.

"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 CIA has adopted 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 the 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.

SUMMARY OF CULTURE-HISTORICAL BACKGROUND

The culture-historical background information gathered as part of this study revealed that traditionally, Pīhā Ahupua'a extended across various ecological zones that included, but were not limited to, the *wao kānaka*, *wao lipo*, *wao nāhele*, *wao kele*, and the *wao akua*. Based on the substrate and native vegetation, the project area appears to be within the *wao lipo*, a zone recognized by its tall trees. Due to the widespread presence of water and muddy conditions, the project area also appears to contain elements of the *wao kele*, defined as the rain belt region of a forest . Traditionally, these zones were not accessed regularly by the general populace, rather it was reserved for specific Hawaiian cultural practices including *kia manu* (bird catching), the hewing and carving of *koa* wood for canoes and likely other

hardwood species, and gathering of non-timber plants. The harvesting of native birds for subsistence, artistic, and symbolic purposes was an important part of certain traditional practices (Gomes 2016). Perhaps, the most famed traditional use of native birds involved the use of their feathers from which spectacular royal insignia including *ahu'ula* (feathered capes), *mahi'ole* (feathered helmets), *lei* (garlands), *kāhili* (feathered standards), and other adornments were intricately crafted.

Furthermore, Pīhā is not explicitly referenced in traditional accounts, however, its precontact and mythic history can be traced, by its association, to the greater *'okana* of Hilo Palikū. Celebrated for its cliffs, wind-swept *kula* lands dissected by its many gulches and streams, and forested uplands, the native inhabitants adapted their horticultural and habitation practices to this rugged environment. Settlements were often scattered above the streams on the *kula* lands and along the coast. Planting areas were separated with wetland *kalo* being planted in irrigated terraces along the stream embankments while non-irrigated plants such as dryland *kalo*, *'uala*, *mai'a*, *kō*, and *'ulu* were planted within the upper portion of the stream embankments and on the *kula* lands.

At the time of the *Māhele 'Āina* of 1848, Pīhā went unclaimed but later, a dispute arose with the Trustees of the Bishop Estate who claimed that Pīhā along with other lands had been continuously held by the ancestors of Bernice Pauahi Bishop. This dispute was settled and the Minister of the Interior conveyed Pīhā along with other lands to the Hawaiian Kingdom government, thus establishing Pīhā as Government Land. Boundary Commission testimonies gathered in 1875 revealed that an old trail, traditionally utilized by bird catchers extended along the Pīhā-Kahuku boundary while a trail utilized by canoe carvers was along the Nanue boundary—the *ahupua'a* that begins only slightly to the northeast of the subject parcel where Kahuku terminates—extended *mauka* and led to a place named Ka'ahina where canoes were made.

In the decades following the privatization of land as a result of the *Māhele 'Āina*, the landscape of North Hilo particularly in the area between the coast and up to roughly the 2,000-foot elevation was cleared to make way for the growing sugar plantation industry. However, within Pīhā sugar appears to have been cultivated only to about the 1,500-foot elevation, just *makai* of the subject parcel. In 1892, the Hakalau Plantation Co. secured a lease for the approximately 4,250-acre Pīhā Ahupua'a, thus marking the beginning of sugar cultivation in this area. By 1906, the Territorial Government established the Hilo Forest Reserve whose *makai* Pīhā boundary is located to the west of the subject parcel. Between 1912 and 1914, a survey staking out the boundaries of the Pīhā Homestead was completed and the lower portion of the *ahupua'a* was subdivided into 28 lots. The subject parcel is Lot 2 of the Pīhā Homestead track, which was sold to William Breithaupt, along with Lot 1, on August 23, 1916, as Grant No. 8584 for $324.00. Lot 2 (along with several other lots within the Pīhā Homestead) was held by the Breithaupt family for many decades however, it appears that the subject parcel was never developed and has remained as forested land until the present-day.

IDENTIFICATION OF TRADITIONAL AND CUSTOMARY PRACTICES, VALUED CULTURAL RESOURCES

The information from the culture-historical background information in conjunction with the results of the consultation process revealed the following with respect to traditional and customary practices and valued cultural resources.

Bird Hunting, Koa Logging, and the Cultural Value of the Forest

Historical records indicate that the forested areas of Pīhā were traditionally utilized by bird hunters and canoe carvers to gather native bird species and *koa* logs. The gathering of *koa* wood to make canoes is an on ongoing cultural practice, however, there is no indication that such practice is occurring within Pīhā Ahupua'a or the subject parcel. The traditional practice of gathering native bird species is no longer actively practice, which is a direct result of historical socio-political changes that led to the demise of the practice itself in conjunction with the changes in the local ecology. While the gathering of native bird species for cultural purposes is no longer practiced, the artisanal crafts (i.e. Hawaiian feather work) associated with this practice is still ongoing but does not take place within the subject parcel. While these traditions are not actively practiced within Pīhā, recognizing these practices reinforces the importance of Pīhā's culturally valued forested lands to the area's native inhabitants.

Furthermore, the forest in its entirety, was and still is, a valued cultural resource. The forest provided an abundance of plant resources and helped to capture water, which were essential to the lifeways of the area's native inhabitants. In addition to the tangible resources, the forest was and still is revered for it is considered a place where the myriad of gods in all their plant forms dwelled. Respect for the forest's tangible and intangible resources was traditionally demonstrated by limiting access to certain cultural practitioners who had a particular responsibility and who carried out the appropriate cultural protocols.

Trails, Roads, and Hunting

Access into the forest was from established trails that traditionally (based on the historical record) appears to have, for the most part, followed the *ahupuaʻa* boundaries. As the cultural practices that relied on these trails waned (i.e. bird hunting and *koa* harvesting), so did the use of the trails. As noted by Mr. Bauer, identifying any precontact or historic period trail is exceptionally difficult due to the substrate and vegetation. Furthermore, the archaeological inventory survey conducted on the subject parcel did not identify any trails or other historic properties.

Following the establishment of the Hilo Forest Reserve (ca. 1906) and Pīhā Homestead (ca. 1915), the Pīhā-Kahuku Road was laid out, the alignment of which is coterminous with the subject parcel's southern boundary. As stated in Nā Ala Hele Trail and Access Program Pīhā-Kahuku Road abstract prepared in 2018 (see Appendix B), the Pīhā-Kahuku Road is a public County road that provides public access into the Hilo Forest Reserve. However, unlike other parts of this road located *makai* (east) of the subject parcel, the County does not actively maintain that portion of the road adjacent to the subject parcel's southern boundary. The results from the consultation revealed that following the establishment of the Pīhā Homestead and throughout the sugar plantation era, area residents utilized the Pīhā-Kahuku Road and other trails, some of which followed the various streams including Waikaumalo and Kalaeha to access the subject parcel and the greater Hilo Forest Reserve for subsistence purposes, specifically pig hunting. Given the subject parcel is forested and undeveloped, several of the parties consulted as part of this study (and prior CIA studies) described accessing the parcel in the past for subsistence purposes. As shared by Mr. Souza, the trails that they used to access the forest reserve was maintained by the local hunters and were sometimes marked by certain plants including orchids and anthuriums.

Stream Resources

The parties interviewed as part of this study (and prior CIA studies) described accessing the streams for subsistence purposes. It was noted that the streams including Waikaumalo and Kalaeha were accessed to gather freshwater, watercress, *ʻōpae*, and prawns. It was further specified by Mr. Souza that obtaining freshwater from the stream is no longer possible because of poor water quality. It is unclear if watercress is still found along portions of the streams, however, the gathering of *ʻōpae* and stream prawns appears to be actively practiced along Waikaumalo.

PROPOSED RECOMMENDATIONS AND MITIGATIVE MEASURES

The following recommendations and mitigative measures are provided to ensure the above-described cultural practices, valued cultural resources, and beliefs are protected. It is understood that the project area footprint does not encompass the entire parcel, thus it is believed that this approach may result in a lighter impact on the area's forest resources. In light of this, it is recommended that the landowner make efforts to preserve the native forest in the areas outside of the project area footprint and that any landscaping planned within the project area incorporate native plants suitable to the local ecology.

Concerning the Pīhā-Kahuku Road (which is coterminous with the subject parcel's southeastern boundary), it will be reiterated here that this is a public roadway that provides local hunters and other practitioners access into the Pīhā portion of the Hilo Forest Reserve. There should be no efforts to block or restrict access along this roadway. The landowner should anticipate that vehicles may park along this roadway periodically as access into the forest reserve is by foot only.

Concerning stream resources, the project area is sufficiently distant from both Waikaumalo and Kalaeha streams that any cultural practices associated with these streams would not be impacted by the proposed development. However, as these streams are part of the larger cultural landscape of Pīhā and the Hilo Palikū region, all precautions should be taken to maintain the health and flow of the stream.

In summary, the recommendations provided above are intended to ensure that the proposed development activities considered the concerns and thoughts shared by the consulted parties. These recommendations are also intended to support the landowner in being mindful of the cultural, social, and environmental uniqueness of Hawaiʻi. Conducting background research, consulting with community members, and taking steps towards mitigating any potential cultural impacts is done so in the spirit and practice of *Aloha ʻĀina*, a contemporary movement founded on traditional practices and beliefs that emphasize the intimate relationship that exists between Native Hawaiians and the *ʻāina* (land). If the landowner assumes ownership of their right and responsibility, we recommend it be done so in that same spirit and practice. Attention to, and implementation of the above-described issues and measures relative to the above-identified cultural resources, practices, and beliefs will help to ensure that no such resources, practices, or beliefs will be adversely affected by the proposed development.

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APPENDIX A.
KA WAI OLA PUBLIC NOTICE

CULTURAL IMPACT ASSESSMENT FOR ROUGHLY 17.2-ACRE PARCEL IN PIHĀ AHUPUA'A, NORTH HILO DISTRICT, ISLAND OF HAWAI'I

ASM Affiliates is preparing a Cultural Impact Assessment (CIA) for a single-family residence being proposed on a portion of a roughly 17.2-acre parcel (TMK: (3) 3-2-004:037 located in Pihā Ahupuaʻa, North Hilo District, Island of Hawaiʻi. Please contact ASM Affiliates if you would like to participate or contribute to this study by sharing your manaʻo about any cultural or historical resources or other information you believe may be relevant. This includes, but not limited to, knowledge of past land use, history, traditional cultural uses of the proposed project area; or those who are involved in any ongoing cultural practices that may be occurring on or in the general vicinity of the subject property. If you have and can share any such information please contact Lokelani Brandt (lbrandt@asmaffiliates.com); phone (808) 969-6066, mailing address ASM Affiliates 507-A E. Lanikaula Street, Hilo, HI 96720. Mahalo.

APPENDIX B.
NĀ ALA HELE PĪHĀ KAHUKU ROAD ABSTRACT
PREPARED FOR TMK: (3) 3-2-004:038

NA ALA HELE
Hawai'i Trail & Access System

December 14, 2018

Ref: H18:14 Piha Kahuku

TO: Kylee Widemann, Hawaii Island Forestry Associate

FROM: Doris Moana Rowland, Na Ala Hele Trails and Access Program Abstractor

SUBJECT: Comments regarding Conservation District Use Application (CDUA) HA-3830 for the Ramos Single Family Residence situate at Piha, North Hilo, Island of Hawaii, designated as Tax Map Key: 3-2-004:038

Available records disclose the Piha Kahuku Road (also known as Kahuku Piha Road) that adjoins the southern boundary of the subject parcel is a public county road that provides direct access to the Hilo Forest Reserve. The basis for this opinion is discussed below together with a brief history as to how the government acquired the ahupuaa of Piha.

The land of Piha 1 & 2

The land of Piha 1&2 was never assigned or awarded at the time of the Mahele of 1848. Controversy arose over the ownership of this land when the Trustees of the Estate of Bernice Pauahi Bishop claimed this land as an heir to certain lands which had been continuously held and claimed by her ancestors. In order to settle the controversy a compromise was proposed whereby the Minister of the Interior conveyed other lands to the Trustees who in turn conveyed the land of Piha (besides other lands) to the Kingdom of Hawaii on December 20, 1890. Thus the land of Piha was made a part of the Government land of the Kingdom of Hawaii. Unaware of this settlement, the author of the Archaeological Assessment of the subject CDUA erroneously categorized the land of Piha as Crown land.

The survey of the Piha Tract began in 1912 was completed by 1913. In 1915 William Breithaupt applied for and received Special Homestead Agreement No. 1252. Upon successful completion of all requirements of this agreement, the government sold the subject parcel to Breithaupt in fee simple in 1924. Land Patent (Grant) No. 8584 was issued to Breithaupt by the Governor of the Territory of Hawaii (see attachment). The Piha-Kahuku Road was identified in Grant 8584 as the Kahuku-Piha Road being 40 feet wide, running outside of the Breithaupt parcel along its southern boundary. This road is also shown on Registered Map No. 2568 (RM 2568) titled "Piha Homesteads" dated 1914 (see attached). Both the survey sketch made a part of Grant 8584 and RM 2568 show the road provides direct access to the Forest Reserve.

Division of Forestry & Wildlife • Dept. of Land & Natural Resources • 1151 Punchbowl Street • Honolulu, Hawaii 96813

Piha Kahuku Road is a public county road

The government laid out and appropriated money in 1939 for construction of the Piha Kahuku Road, which today is a public county road pursuant to Chapter 264-1, Hawaii Revised Statutes. This section provides that "public highways are of two types: (1) State or federal-aid highways which are all those under the jurisdiction of the department of transportation, and (2) County highways, which are all other public highways."

Section 264-2, Hawaii Revised Statutes, then provides that "the ownership of all county highways is transferred to and vested in the respective counties in which the county highways lie." This language was enacted by Act 221, 1965 Hawaii Session Laws 338.

The subject CDUA reports the portion of Piha Kahuku in the vicinity of the Ramos parcel is overgrown up to the boundary of the State Forest Reserve property. While the condition of the road may not be ideal, it is my opinion based on the evidence in the documents and maps I have reviewed, the Piha Kahuku Road is a public road that provides direct access to the Forest Reserve. As a public road access is secure for all persons who wish to enter the Forest Reserve.

Please contact me at 587-0057 if you have any questions or concerns regarding the Piha Kahuku Road.

2313 of

Land Patent No. 8584

(Grant)

Issued On

SPECIAL HOMESTEAD AGREEMENT

By THIS PATENT the Governor of the Territory of Hawaii, in conformity with the laws of the United States of America and of the Territory of Hawaii, makes known to all men that he has this day granted and confirmed unto

WILLIAM BREITHAUPT

for the consideration of his *having paid into the Treasury the sum of* THREE HUNDRED TWENTY-FOUR AND 00/100 *Dollars,* $ 324.00 ,

and for the further consideration of his having complied with the terms and conditions of Special Homestead Agreement No. 1252, all in accordance with the provisions of Section 73 of the Hawaiian Organic and Section 352 et seq. of the Revised Laws of Hawaii of 1915,

all of the land situate at PIHA HOMESTEADS

in the District of NORTH HILO *Island of* HAWAII *bounded and described as follows:*

Lots 1 & 2, Reg. Map 2568, First Land Dist.

Beginning at a 2 inch galvanized iron pipe at the East corner of Lot 2, the South corner of Lot 3, and on the North side of the Kahuku-Piha 40 foot road, the coordinates of said point of beginning referred to Government Survey Trig. Station "Haiku" being 8748.7 feet South and 6736.9 feet West, as shown on Government Survey Registered Map No. 2568, and running by true azimuths:

1. 44° 33' 593.5 feet along the Kahuku-Piha Road to a pipe;
2. 16° 18' 462.7 feet along the Kahuku-Piha Road to a pipe on Forest Reserve boundary;
3. 121° 40' 1411.1 feet along Forest Reserve to a pipe on top of the South edge of the Waikaumalo Gulch;
4. Thence along the top of the South edge of Waikaumalo Gulch to a pipe, the direct azimuth and distance being: 211° 41' 743.5 feet;
5. Thence still along the top of the South edge of the Waikaumalu Gulch to a pipe, the direct azimuth and distance being: 236° 47' 30" 620.8 feet;
6. 315° 20' 1191.2 feet along Lot 3 to the point of beginning.

AREA 35.54 ACRES.

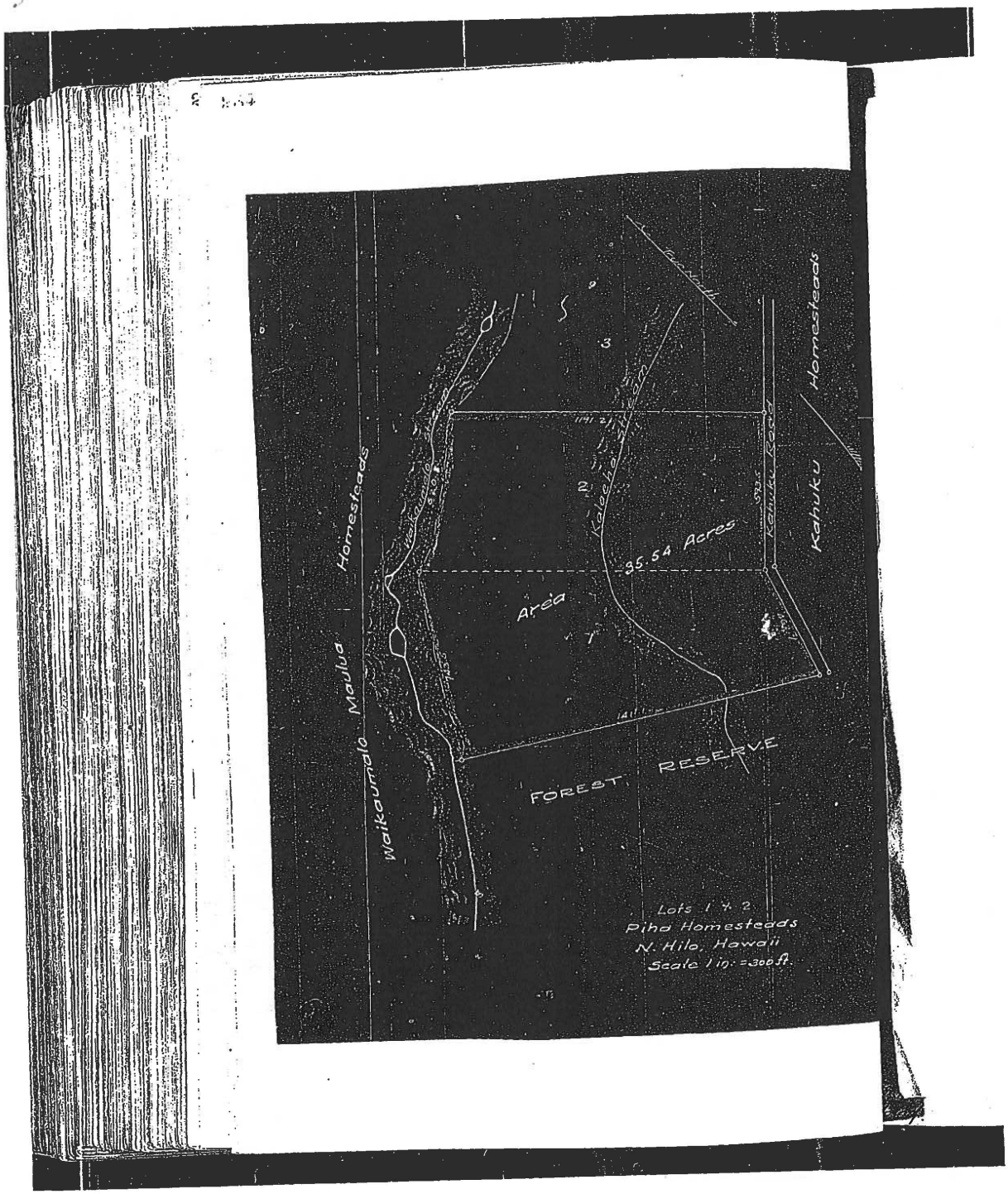
Excepting and reserving therefrom the Kalaeha Stream and all riparian rights in and to this stream and the waters thereof.

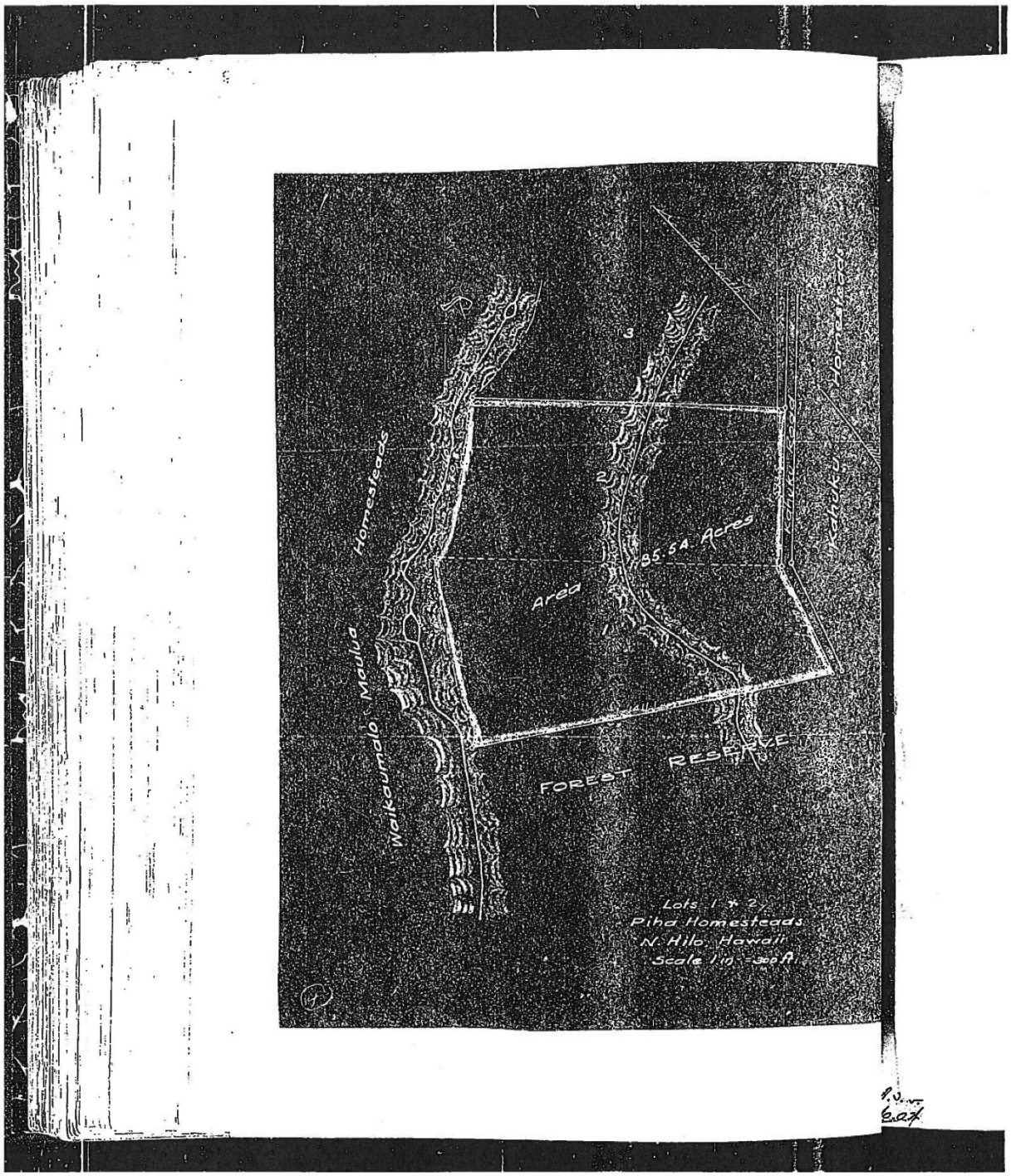
285

Attached hereto and made a part of Grant No. 8584.

W R Farrington
Governor of Hawaii.

J Bailey
Commissioner of Public Lands.


Waikaumalo Maulua Homesteads
Kalehua
35.54 Acres
Area
Kahuku Road
Kahuku Homesteads
FOREST RESERVE
Lots 1 & 2
Piha Homesteads
N. Hilo, Hawaii
Scale 1 in. = 300 ft.


Homesteads
Waikaumalo
Maulua
Area
85.5 A. Acres
Kahuku
Homesteads
FOREST
RESERVE
Lots 1 & 2
Piha Homesteads
N. Hilo, Hawaii
Scale 1 in = 300 ft.

Kahuku / Homesteads

285

Containing 35.54 *Acres, more or less.*

TO HAVE AND TO HOLD the above granted Land unto the said

WILLIAM BREITHAUPT

and his *heirs and assigns forever;*

Subject, however, to the conditions contained in Section 73 of the Hawaiian Organic Act, and more particularly of that portion thereof which reads as follows:

"No public land for which any such certificate (of occupation), (right of purchase) lease, or (cash freehold agreement or special homestead) agreement is issued after May 27, 1910, or any part thereof or interest therein or control thereof shall, without the written consent of the commissioner and governor, thereafter, whether before or after a homestead lease or patent has been issued thereon, be or be contracted to be in any way, directly or indirectly, by process of law or otherwise, conveyed, mortgaged, leased or otherwise transferred to or acquired or held by or for the benefit of any alien or corporation; or, before or after the issuance of a homestead lease or before the issuance of a patent, to or by or for the benefit of any other person; or, after the issuance of a patent, to or by or for the benefit of any person who owns, holds, or controls, directly or indirectly, other land or the use thereof the combined area of which and the land in question exceeds eighty acres. The prohibitions of this paragraph shall not apply to transfers or acquisitions by inheritance or between tenants in common. Any land in respect of which any of the foregoing provisions shall be violated shall forthwith be forfeited and resume the status of public land and may be recovered by the Territory or its successors in an action of ejectment or other appropriate proceedings."

IN WITNESS WHEREOF, The Governor of the Territory of Hawaii has hereto set his hand and caused the Great Seal of the Territory to be hereunto affixed, this

22nd *day of* December *A. D. 19*24

W R Farrington

BY THE GOVERNOR:

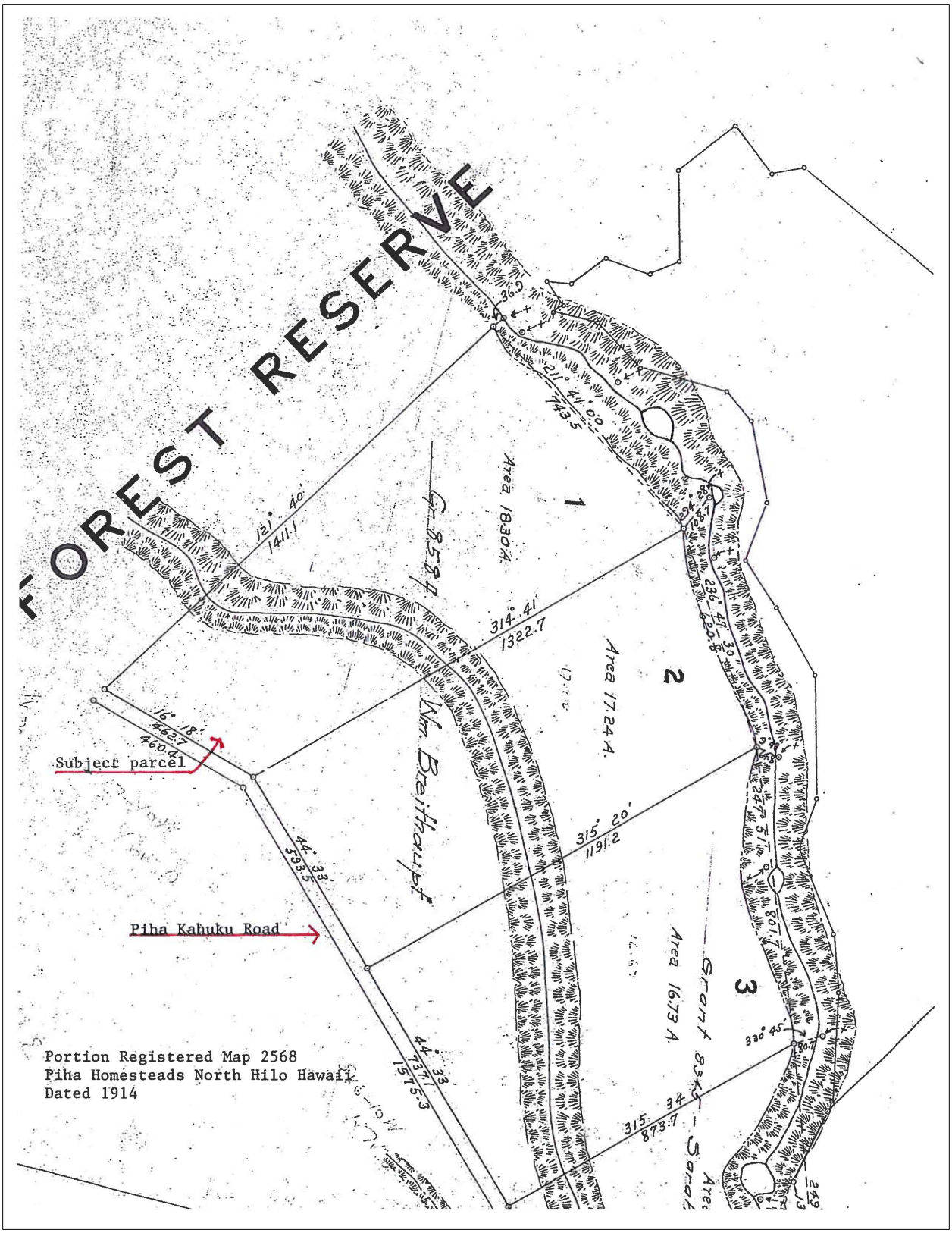
C P Bailey

Commissioner of Public Lands.

Approved as to form:

A W Stewart

1st Deputy Attorney General.


FOREST RESERVE
Subject parcel
Piha Kahuku Road
Portion Registered Map 2568
Piha Homesteads North Hilo Hawaii
Dated 1914
Area 18.30 A.
Area 17.24 A.
Area 16.73 A.
1
2
3
Grant 8358
Wm Braithwaite
Grant 8357 - Sarah
121° 40'
1411.1
314° 41'
1322.7
315° 20'
1191.2
315° 34'
873.7
44° 33'
1575.3
44° 33'
593.5
16° 18'
460.7
460.4
211° 41' 00"
743.5
236° 47' 30"
620.8
330° 45'
36.9